ENVIRONMENTAL COMPLIANCE MANUAL

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT
SUDBURY, STOW, & HUDSON, MASSACHUSETTS

Prepared for:

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LIST OF ATTACHMENTS

Record of Change

Record of Change		
Revision	Date	Description
0	05/25/2022	Original Issuance Date

1.0 Introduction and Key Contact Information

Epsilon Associates ("Epsilon") has developed this document to serve as the Environmental Compliance Manual ("ECM") for the Sudbury to Hudson Transmission Reliability Project ("the Project"). This ECM contains all the environmental permits/approvals obtained by Eversource to construct the Project.

This ECM is the primary resource and field reference to be used by construction personnel and environmental monitors to ensure compliance with all permit conditions during construction and post-construction. *Pre-construction requirements are not included in this ECM*.

The ECM sections provide the key compliance requirements contained within the various permits as they relate to the following:

- Environmental Monitoring Requirements and Team (Section 2.0);
- Coordination Requirements (Section 3.0);
- Project Sequencing Considerations and Requirements (Section 4.0);
- Vegetation and Rail Removal Activities (Section 5.0);
- Erosion Control Requirements (Section 6.0);
- Soil and Groundwater Management (Section 7.0);
- Pollution Prevention (Section 8.0);
- State-Listed Species and Vernal Pools (Section 9.0);
- Impaired and Sensitive Waterbodies (Section 10.0);
- Important Wildlife Habitat Features (Section 11.0);
- Invasive Species Requirements (Section 12.0);
- Bridge Construction Activities (Section 13.0); and
- Plantings and Restoration Requirements (Section 14.0)

The attachments to this document include each specific permit approval and/or the Project specific plans or protocols that must be adhered to. *Although the following sections provide an overview of the key compliance requirements, the attachments to the ECM are the documents that should be referenced for specific details.*

Please be aware that there may be other "permits" obtained for the Project, which are not environmental in nature, such as Grants of Locations and/or Street Opening Permits. These permits/approvals are not included in this manual. This ECM will be maintained by the Epsilon Team, who are serving as Eversource's Environmental Compliance Contractor Team for the Project.

There is a comprehensive Permit Compliance Checklist included as Attachment I for reference to all "during construction", and" post-construction" compliance requirements.

2.0 Environmental Monitoring Team and Requirements

It is required that all construction personnel on the Project be familiar with the environmental compliance requirements for the Project and will attend a project-specific environmental training session prior to working at the Project Site. As such, it is expected that all construction personnel will be responsible for environmental monitoring and compliance during the construction and restoration phase of the Project.

The following sections outline the Environmental Monitoring Team and the requirements for frequency of monitoring as dictated by the various permit approvals applicable to the Project.

2.1 Environmental Monitoring Team

The following are the key individuals responsible for managing and environmental monitoring team and for ensuring corrective actions are implemented.

Eversource Project Manager

Mike Hager (508) 341-5815 michael.hager@eversource.com

Eversource Environmental Department Representative

Matt Devlin (508) 596-0147 matthew.devlin@eversource.com

Epsilon Associates Team (Environmental Compliance Manager)

Marc Bergeron (508) 212-0420 mbergeron@epsilonassociates.com

Epsilon Associates Team (Environmental Compliance Assistant Manager)

Rebecca Weissman (339) 203-7045 rebecca.weissman@swca.com

Bond Project Manager

Jason Languedoc (617) 777-3587 jlanguedoc@bond-civilutility.com

BOND Environmental Compliance Officer

Matt Stock (617) 512-6766 mstock@bond-civilutility.com

G. Greene Co. Inc. Project Manager

Patrick Farrington (617) 212-3201 pfarrington@ggreene.com

G. Greene Co. Inc. Site Superintendent

Nick DeSisto (617) 519-3256 ndesisto@ggreene.com

E.T. & L. Corp. Environmental Compliance Officer

Daren Ducharme (978) 793-1287 dducharme@etlcorp.com

2.2 Environmental Monitoring Requirements

2.2.1 Entire Project Alignment

- Minimum once every 7 calendar days and within 24 hours of 0.25 inch or greater precipitation event or within 24 hrs. of snowmelt discharge from storm that produces over 3.25 inches of snow in a 24-hr. period (See page 41 of Attachment A)
- All sites discharging dewatering water must complete inspections of dewatering operations once per day on any day there is a dewatering discharge. The contractors must check for signs of sediment or other visual indicators of pollution in dewatering discharges and take corrective action, when needed.
- When dewatering to sensitive waters, Eversource's Environmental Monitor must sample that dewatering water at least once per day for turbidity analysis. They must then compare the weekly average results with the assigned benchmark threshold of that waterbody. Where weekly average turbidity results exceed the benchmark, the contractor must take corrective action. Sensitive Waters that will require turbidity monitoring if they receive dewatering discharges are listed in table 2-1 (below):

Table 2-1 High Quality, Outstanding Resource, and Special Receiving Waters

	Is this surface water designated as a Tier 2, Tier 2.5 or Tier 3 water?			**If you answered yes, specify which Tier (2, 2.5, or 3) the surface water is designated as.**
	Yes	No		
Assabet River	☒	☐		Tier 2. High quality water.
Hop Brook	☒	☐		Tier 2. High quality water.
White Pond	☒	☐		Tier 2.5 Outstanding Resource Water.
Hudson wetlands 1-21 (H1-H21)	☒	☐		Tier 2. High quality water.
Sudbury wetlands 1-45 (S1-S45)	☒	☐		Tier 2. High quality water.

- Turbidity Monitoring results should be sent on a weekly basis to Marian Spahn (spahn.marian@epa.gov) at EPA Region 01.
  - Any occurrences of non-compliance should be communicated as soon as possible to Andrew Spejewski at EPA Region 01 (spejewski.andrew@epa.gov).

2.2.2 Town-Specific

The following bullets highlight town-specific conditions that are in addition to the requirements listed in Section 2.2.1 above. If a town is not listed then there are no town-specific requirements for this topic and the requirements in Section 2.2.1 should be adhered to.

Sudbury

- An independent Environmental Monitor, hired by the Conservation Commission and paid for by the Applicant Environmental Monitor shall be provided to oversee the following activities:

- Inspect Erosion & Sediment control barriers prior to any land disturbance, each year prior to vernal pool migration and, as needed. (page 19 of Attachment E-1)
- Be on site during initial tree removal, invasive species clearing, bridge platform installation, dewatering, excavation/construction over culverts, and drainage structures, and wetland replication activities (page 19 of Attachment E-1)
- Be notified of all dewatering activities and be on site during dewatering activities whenever proposed within 50 feet of a wetland, or when extensive dewatering is required (page 19 of Attachment E-1)
- Ensure adherence to reporting of all activities associated with permit-related compliance, including but not limited to items such as erosion control, dewatering, and time of year restrictions (page 19 of Attachment E-1)

Hudson

- There shall be a qualified Environmental Monitor on site at all times that work is being performed in jurisdictional wetland areas, and a qualified Vernal Pool Biologist for work within 450 of vernal pools from March 1 to June 1 (page 17 of Attachment G-1)

3.0 Coordination and Reporting Requirements

3.1 Town-Specific

The following bullets highlight town-specific conditions for coordination with local regulatory personnel and boards.

3.1.1 Sudbury

- Submit an erosion control Inspection Report to the Sudbury Conservation Commission weekly during construction, and after every major storm event of ½ inch or greater (page 20 of Attachment E-1 (i))
- Submit a Stormwater Construction Site Inspection Report (Stormwater Pollution and Prevention Plan Inspection Report) to the Sudbury Planning Board every two weeks during construction, and after every major storm event of ½ inch or greater (page 6 of Attachment E-2(D))
- The contractor will provide the office of Planning and Community Development with weekly construction reports with location of active stockpiles and erosion control measures (page 7 of Attachment E-2(G))
- If conditions are encountered that suggest soil may require additional evaluation or special handling based on visual, olfactory, or field screening results, excavation activities in that area will immediately be stopped and Eversource, their Licensed Site Professional, and the Conservation Commission will be contacted immediately to evaluate the observations and recommend requirements for proper handling. (Page 19 of Attachment E-1 (c)).

- Submit weekly reports to the Conservation Commission that details work completed each week and anticipated work for the coming week, including: identifying when work is located in areas of potential elevated levels of soil and groundwater contamination; when dewatering activities will be conducted; and, reports on active stockpiles. (Page 20 of Attachment E-1 (f))

3.1.2 Stow

- Eversource will notify the Commission of project meetings and provide notes (page 16 of Attachment F-1(26))
- Eversource will submit weekly inspection reports to the Conservation Commission (Attachment F-1)
- The Epsilon Team will notify the Commission if dewatering is deemed necessary during construction activities (page 17 of Attachment F-1(30))

3.1.3 Hudson

- The Epsilon Team will notify the Commission in advance if dewatering is required (page 19 of Attachment G-1(34))
- Eversource will submit weekly inspection reports to the Conservation Commission (Attachment G-1)

4.0 Project Sequencing Considerations and Requirements

4.1 Entire Project Alignment

- The contractor will install Erosion and Sediment Controls as shown on the plans prior to any vegetation clearing and and/or grading (Attachments E-1, F-1, & G-1)
- The Epsilon Team will amend the SWPPP on an on-going basis to reflect any sequencing revisions or changes (Attachment A)
- Time of Year Restrictions related to rare species and vernal pools must be adhered to (Section 9.0)

4.2 Town-Specific

The following bullets highlight town-specific conditions which will be in addition to the requirements listed in Section 4.1.1 above. If a town is not listed then there are no town-specific requirements for this topic and the requirements in Section 4.1.1 should be adhered to.

4.2.1 Sudbury

- The contractor will revegetate areas adjacent to vernal pools immediately following the completion of all work in these areas (page 22 of Attachment E-1(z))
- The contractor will construct the wetland replication area during vegetation removal and prior to the construction of structures in that vicinity (page 22 of Attachment E-1(bb))
- Epsilon will arrange for the Commission to inspect all permanent stormwater infiltration BMPs for acceptance prior to construction demobilization to a new location within the ROW (page 22 of Attachment E-1(x))
- The Epsilon Team will request a Certificate of Compliance at the end of each phase of work (page 18 of Attachment E-1(cc))
- Eversource will file an Amendment with the Commission should Phase II not commence within three years of completion of Phase I (page 23 of Attachment E-1(jj))

4.2.2 Stow

- Eversource shall notify the Commission upon the completion of the work in Phase 1 (page 18 of Attachment F-1(38))

4.2.3 Hudson

- The contractor will provide the Commission with detailed sequencing of the bridge removal work based on water levels and other conditions prior to start of work, so that the Commission can complete a site inspection before it commences (page 18 of Attachment G-1(32))
- Eversource will submit an as-built plan to the Commission prior to the issuance of a Certificate of Compliance (page 20 of Attachment G-1(44))

5.0 Vegetation Removal Activities

5.1 Entire Project Alignment

- The contractor will install Erosion and Sediment Controls as shown on the plans prior to any vegetation clearing and and/or grading (Attachments E-1, F-1, & G-1)

5.2 Town-Specific

The following bullets highlight town-specific conditions which will be in addition to the requirements listed in Section 5.1.1 above. If a town is not listed then there are no town-specific requirements for this topic and the requirements in Section 5.1.1 should be adhered to.

5.2.1 Sudbury

- Stumping and grubbing activities shall not adversely affect woody vegetation or soils outside the erosion control barrier. Logs, stumps and other large woody debris in and/or

overhanging the resource areas shall be left undisturbed to maximize food source and habitat (page 21 of Attachment E-1(m))

- Minimize tree/limb clearing to that only required to access the project site with equipment and to conduct the approved work. Equipment shall be chosen which minimizes required clearing to the maximum extent practicable. Retain as many limbs overhanging the work area as possible (page 21 of Attachment E-1(n))

- Need to walk the corridor with the Commission or Agent to determine the extent of canopy that can be retained (page 21 of Attachment E-1(n))

- Vegetation removed from the site shall be chipped directly into a truck and removed from the project site (page 21 of Attachment E-1(o))

- Identify woody material for reuse on site for the creation of wildlife habitat features and retain (page 21 of Attachment E-1(o))

5.2.2 Hudson

- The contractor will remove all stumps from the site; no burying of stumps on site is permitted (page 17 of Attachment G-1(20))

6.0 Erosion & Sediment Control Requirements

6.1 Entire Project Alignment

- The contractor shall install Erosion and Sediment (E&S) Controls as per the Project Plans
- The contractor will complete maintenance of E&S controls by the close of the next business day
- The Epsilon Team will document why maintenance cannot be performed by the next business day to allow up (7) additional calendar days from the time of discovery of the condition requiring maintenance
- Eversource and/or the contractor will take corrective actions immediately and complete the work within 7 calendar days
- The Epsilon Team will record extenuating circumstances on a Corrective Action Form when it is not possible to complete the action within 7 days
- The contractor will establish a stabilized construction entrance consisting of a stone pad at each access point off public roads
- The contractor will address sediment track out with daily street sweeping; If track-out occurs on a non-workday, sediment will be removed by the end of the next workday
- The contractor will remove the stabilized construction entrance/exit and installing final finishing materials upon the completion of earth-disturbing activities

- The contractor will perform dust control as detailed in the SWPPP
- The contractor will install all perimeter controls in accordance with manufacturer recommendations
- The contractor will remove accumulated sediment from perimeter controls when it reaches 50% capacity and dispose of appropriately
- The contractor will place syncopated silt-fences, as prescribed on the Project Plans at the limits of work within 450 feet of a vernal pools
- The contractor will place turbidity curtain at the downgradient edge of disturbed areas within open water; staked silt fence used as an alternative will be staked along the shoreline, not across flowing water
- The contractor will record storm drain inlet protection activities in project logs

6.2 Town-Specific

The following bullets highlight town-specific conditions which will be in addition to the requirements listed in Section 6.1.1 above. If a town is not listed then there are no town-specific requirements for this topic and the requirements in Section 6.1.1 should be adhered to.

6.2.1 Sudbury

- During Phase I, Eversource shall be responsible for installing and maintaining erosion controls (page 7 of Attachment E-2(I1))
- During Phase II, DCR shall be responsible for installing and maintaining erosion controls. Following completion of Phase II and inspection by a Planning Board representative, DCR shall be responsible for removal of all erosion control barriers (page 7 of Attachment E-2(I2))
- The contractor shall not use proposed infiltration basins as sediment basins; Additional erosion controls shall be installed to protect infiltration basins from sedimentation until contributing areas are stable (page 8 of Attachment E-2(J))
- There shall be no drafting of water from wetland resource areas for dust control, for watering plantings, or any other activity. (Page 18 of Attached E-1 (aa))

6.2.2 Stow

- The contractor will ensure the areas of construction shall remain in a stable condition at the close of each construction day. All trenches shall be backfilled or secured at the completion of each work day (page 17 of Attachment F-1(29))

6.2.3 Hudson

- The contractor will use only approved erosion controls, including (a) silt fence or (b) silt fence with compost filter tubes, double-staked straw bales, or wattles, as shown on the plans (page 17 of Attachment G-1(23))

- The contractor will ensure that erosion controls are invasive seed free (page 17 of Attachment G-1(23))
- The contractor will use Syncopated fencing within 450 feet of vernal pools (page 17 of Attachment G-1(23))
- The contractor will utilize a silt curtain in Fort Meadow Brook near the bridge if conditions warrant (page 17 of Attachment G-1(23))
- Eversource will maintain erosion controls if there is a gap between Phase I and Phase 2. Erosion control in Priority and Estimated Habitat of Rare Species and within 450 feet of Vernal Pools may require removal (page 19 of Attachment G-1(39))
- The contractor will install a leaching catch basin at station 119 (page 19 of Attachment G-1(37))

7.0 Soil and Groundwater Management

A Soil and Groundwater Management Plan has been developed for the Project and is included in the SWPPP in Attachment O. *This document should be the main document to refer to related to this topic*.

7.1 Entire Project Alignment

- Eversource, the Epsilon Team, and the Commission will determine locations for any stockpiled sediment or soil
- All soil stockpiles will be surrounded by perimeter controls
- The contractor will provide cover or appropriate temporary stabilization to stockpiles that will remain inactive/unused for more than 14 days
- The contractor will consult with Eversource prior to any deviations to stockpile controls from those specified in the SWPPP
- The Epsilon Team will conduct a daily dewatering inspection for all dewatering activities, as is required as part of the CGP
- The Epsilon Team will conduct daily Turbidity Monitoring per the CGP when dewatering water discharges to any "Sensitive Waters"
- The contractor will discharge uncontaminated dewatering water to vegetated, upland areas of the site to promote infiltration
- The contractor will comply with velocity dissipation requirements of Part 2.2.11 of the GCP
- The contractor will replace and clean the filter media used in the dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications
- The contractor will avoid soil compaction by limiting vehicle and equipment use in areas to be restored or used for infiltration

7.2 Town-Specific

The following bullets highlight town-specific conditions which will be in addition to the requirements listed in Section 7.1.1 above. If a town is not listed then there are no town-specific requirements for this topic and the requirements in Section 7.1.1 should be adhered to.

7.2.1 Sudbury

- The contractor will conduct test pits/borings at the location of each proposed "area of increased infiltration" and provide to the commission. At a minimum, soil tests shall be conducted in the vicinity of Stations 502+00, 511+00, 570+00, and 579+0 (page 7 of Attachment E-2(F))
- The contractor will not keep stockpiles for more than 7 days in Sudbury (page 22 of Attachment E-1(u))
- The contractor will not use equipment with 3 psi or greater in areas where final grading, aeration, and vegetation restoration/mitigation have been completed (page 17 of Attachment E-1(x))
- The contractor will ensure that dewatering activities do not discharge to wetland resource areas and are as far away as possible (page 21 of Attachment E-1(q))
- Loam borrow brought to the site to stabilize work area after completing Phase I shall be sourced appropriately. Use of impacted soils (from contamination or invasive seed) shall be prohibited (Page 22 of Attachment E-1 (dd))

7.2.2 Hudson

- Eversource will notify the Commission of any remedial activities or changes to the work plans required due to the potential presence of PFAS in the Zone II wellhead area or other jurisdictional areas (page 19 of Attachment G-1(36) Sudbury Conservation Commission to be copied on correspondence (Page 21 of Attachment E-1 (s))
- The contractor will not discharge any dewatering water directly into any waterbodies, BVW, or inner 100' of RFA (page 19 of Attachment G-1(34))
- The Epsilon Team will notify the Commission in advance if dewatering is required within jurisdictional areas (page 19 of Attachment G-1(34))

8.0 Pollution Prevention

8.1 Entire Project Alignment

Pollution prevention involves trash removal, chemical storage, sanitary waste management, and other related measures designed to prevent non-stormwater pollutants from impacting regulated areas.

- The contractor will maintain a copy of all Material Safety Data Sheets (MSDS) for materials or products used during construction will be kept in the office trailer
- The contractor will ensure portable toilets will be placed away from waters of the U.S., stormwater inlets and/or conveyances, and will be secured in place and disposed of by a licensed contractor
- The contractor is responsible for coordinating spill prevention and cleanup coordination per the CGP, and will notify the 24-hour Emergency Contact (Section 2.2) immediately if a spill occurs
- The contractor will remove trash daily from the Project Site
- Vehicle washing allowed on the Project Site

8.2 Town-Specific

The following bullets highlight town-specific conditions which will be in addition to the requirements listed in Section 8.1.1 above. If a town is not listed then there are no town-specific requirements for this topic and the requirements in Section 8.1.1 should be adhered to.

8.2.1 Sudbury

- The contractor will not store chemicals or hazardous wastes on the site (page 8 of Attachment E-2(O-3))
- Eversource nor the contractor will apply fertilization, herbicide, or pesticide within any vernal pool, vegetated wetland, or waterway (page 8 of Attachment E-2(O-5))
- The contractor will not use de-icing products on the site (page 27 of Attachment E-1(h))
- The contractor will not use coal tar-based pavement sealants on site (page 27 of Attachment E-1(f))
- The contractor will use clean fill when backfilling excavations (page 6 of Attachment E-1(7) and page 17 of Attachment E-1(u))
- The contractor will not use soil excavated from Hudson to backfill in Sudbury (page 21 pf Attachment E-1(s))
- No equipment cleaning or refueling may occur within wetland or upland resource area, with the exception of the crane. For cranes positioned within wetland jurisdiction for more than one day, the Applicant shall provide secondary containment to contain any leaks that may emanate from equipment (Page 17 of Attachment E-1 (v))

8.2.2 Stow

- Eversource will notify MassDEP and the Commission if on-site excavation or other site work during Phase 1 or Phase 2 reveals any reportable soil contamination (page 17 of Attachment F-1(33))
- The contractor will not discharge any concrete wash-out water within the 100' buffer or within 100' of any drainage system (page 17 of Attachment F-1(31))
- The contractor will not store chemicals or hazardous wastes shall be stored on the site (page 17 of Attachment F-1(35))
- The contractor will not refuel within the 100’ buffer zone (page 17 of Attachment F-1(35))
- The contractor will not dump of leaves, woody debris, dog waste, excessive snow and any other materials is permitted in the 100’ buffer zone (page 19 of Attachment F-1(40))

8.2.3 Hudson

- Eversource will notify MassDEP and the Commission if on-site excavation or other site work during Phase 1 or Phase 2 reveals any reportable soil contamination (page 19 of Attachment G-1(35))

9.0 State-Listed Species and Vernal Pools

9.1 Entire Project Alignment

- The contractor will implement the Eastern Box “Turtle Protection Plan” (dated August 2, 2021) as proposed (Attachment B-2)
- The contractor will implement “The Corridor Management Plan for Massachusetts Central Rail Trail and Sudbury-Hudson Transmission Reliability Project” (dated 5/31/2018) as proposed (Attachment B-1)
- The contractor will observe timing restrictions for construction activities within Whip-poor-will habitats (May 1 -August 1) (Attachment B-1 and B-3) The contractor shall endeavor to refrain from construction activities within Priority Habitat from April 15 to August 1. (Page 18 of Attachment E-1 (f))
- The Epsilon Team will submit a compliance report to NHESP within 30 days of the completion of work (Attachment B-1)

9.2 Town-Specific

The following bullets highlight town-specific conditions for state-listed species and vernal pools.

9.2.1 Sudbury

- The contractor will implement the Eastern Box “Turtle Protection Plan” (dated August 2, 2021) as proposed (Attachment B-2)

- The contractor will implement "The Corridor Management Plan for Massachusetts Central Rail Trail and Sudbury-Hudson Transmission Reliability Project" (dated 5/31/2018) as proposed (Attachment B-1)
- The contractor will observe timing restrictions for construction activities within Whip-poor-will habitats (May 1 -August 1) (Attachment B-1 and B-3) The contractor shall endeavor to refrain from construction activities within Priority Habitat from April 15 to August 1. (Page 18 of Attachment E-1 (f))
- The Epsilon Team will conduct turtle sweeps between March 1 and June l, prior to vehicles traveling down the project site within vernal pool buffers (including certified, certifiable, and presumed vernal pools) (page 16 of Attachment E-1(p))
- The Epsilon Team will conduct turtle sweeps between April 1 and October 31, prior to initiation of work each day, or prior to vehicles travelling through the Box Turtle Protection Area (page 16 of Attachment E-1(p))
- The Epsilon Team will submit a compliance report to NHESP within 30 days of the completion of work (Attachment B-1)
- The Epsilon Team will submit a report every 6 months to the Commission documenting the wildlife habitat removal and restoration efforts implemented, including monitoring of vernal pools (page 21 of Attachment E-1(l))
- Work with 450 feet of vernal pools is prohibited between March 1 and June 1. The Applicants shall have a qualified Environmental Monitor on site to monitor vehicular traffic during this Time of Year restriction, should a suitable alternative route not be available. (Page 19 of Attachment E-1 (h))

9.2.2 Stow

- The Epsilon Team will submit a compliance report to NHESP within 30 days of the completion of work (Attachment B-1)

9.2.3 Hudson

- The contractor will observe timing restrictions for construction activities within Whip-poor-will habitats (May 1 -August 1) (Attachment B-1 and B-3)
- The Epsilon Team will conduct turtle sweeps between March 1 and June l, prior to vehicles traveling down the project site within vernal pool buffers (including certified, certifiable, and presumed vernal pools (page 18 of Attachment G-1(28))
- The Epsilon Team will conduct turtle sweeps between April 1 and October 31, prior to initiation of work each day, or prior to vehicles travelling through the Box Turtle Protection (page 18 of Attachment G-1(28))
- The Epsilon Team will submit a compliance report to NHESP within 30 days of the completion of work (Attachment B-1)

10.0 Dewatering near "Sensitive Waters"

10.1 Entire Project Alignment

- The Eversource Environmental Monitor will conduct turbidity monitoring where dewatering water is discharged to/or within 100 feet of- "Impaired Receiving Waters" (Table 3-6 of SWPPP) or to Tier 2, Tier 2.5, or Tier 3 waters (Table 3-7 of SWPPP), which are located within 1-mile down-stream of any project discharge points (page 26 of Attachment A)
- "Sensitive Waters" on the project alignment that may require turbidity monitoring are listed in the table below:

	Is this surface water designated as a Tier 2, Tier 2.5 or Tier 3 water?		**If you answered yes, specify which Tier (2, 2.5, or 3) the surface water is designated as.**
	Yes	No	
Assabet River	☒	☐	Tier 2. High quality water.
Hop Brook	☒	☐	Tier 2. High quality water.
White Pond	☒	☐	Tier 2.5 Outstanding Resource Water.
Hudson wetlands 1-21 (H1-H21)	☒	☐	Tier 2. High quality water.
Sudbury wetlands 1-45 (S1-S45)	☒	☐	Tier 2. High quality water.

(page 28 of Attachment A)

11.0 Important Wildlife Habitat Features

11.1 Entire Project Alignment

- Wildlife habitat features must be created as shown on the Project Plans

11.2 Town-Specific

The following bullets highlight town-specific conditions related to this topic.

11.2.1 Sudbury

- Wildlife habitat features must be created as shown on the Project Plans
- The Epsilon Team will submit a report every 6 months to the Commission documenting the wildlife habitat removal and restoration efforts implemented, including monitoring of vernal pools (page 21 of Attachment E-1(l))
- All wildlife habitat replication and restoration shall be completed during the first growing season to avoid impacts over two growing seasons (page 23 of Attachment E-1(kk)

12.0 Invasive Species and Equipment Cleaning Requirements

12.1 Town-Specific

The following bullets highlight town-specific conditions related to this topic.

12.1.1 Sudbury

- The contractor will provide certification to the Commission that all equipment, including timber mats, are cleaned and certified invasive species free, prior to start of work (page 17 of Attachment E-1(w))
- Implement Invasive Species Mitigation Plan developed by SWCA.
- Monitor all areas of disturbance for invasive species and manually remove if encountered for duration of project until 90% native vegetation is established (page 17 of Attachment E-1(y))
- Monitor wetland replication area for invasive species until 90% native vegetation is established (page 17 of Attachment E-1(z))
- Eversource will provide annual inspection reports to the Commission for the 3.3-acre invasive species management area after the initial 5-year management period (page 26 of Attachment E-1(b))

12.1.2 Hudson (See Attachment G, Hudson Environmental Permits)

- The contractor will clean all equipment and timber mats prior to use on the site. No cleaning is permitted within the 100-foot Buffer Zone, Riverfront Area, or any other Resource Area (page 38 of Attachment G-1(38))

13.0 Bridge Construction Activities

13.1 Town-Specific

The following bullets highlight town-specific conditions related to this topic.

13.1.1 Sudbury

- The contractor shall provide the Commission with detailed plans of the crane mat location and installation a minimum of one week prior to installation (page 21 of Attachment E-1(p))
- The contractor shall notify the Commission at least three (3) business days in advance of the removal of the crane mats at Bridge 127 (page 21 of Attachment E-1(r))
- The contractor will coordinate with the Commission on the appropriate netting to be installed under the bridge 128 during bridge work (page 25 of Attachment E-1(d))

14.0 Plantings and Restoration Requirements

14.1 Entire Project Alignment

- The contractor will adhere to all the specific seed mix and supplemental planting requirements for the Project (page 62 of Attachment A)
- The contractor will use vegetative and non-vegetative stabilization measures during the project (Page 62-64 of Attachment A).
- Non-vegetative stabilization practices may include applying straw mulch or an erosion control blanket (page 64 of Attachment A).
- The contractor will conduct temporary, rapid vegetative stabilization using annual grasses, such as annual rye (page 66 of Attachment A).
- The contractor will apply hydroseed-mulch at a rate of 90 pounds per 1,000 square feet. Steeper slopes (greater than 10 percent) will be covered with a fiber matrix (page 78 of Attachment A).

14.2 Town-Specific

The following bullets highlight town-specific conditions which will be in addition to the requirements listed in Section 14.1.1 above. If a town is not listed then there are no town-specific requirements for this topic and the requirements in Section 14.1.1 should be adhered to.

14.2.1 Sudbury

- The contractor will aerate compacted soils prior to· being revegetated (page 18 of Attachment E-1(bb))
- The Epsilon Team will provide written mitigation reports to the Commission by December 1 of each year the Order is active (page 22 of Attachment E-1(y))
- The contractor will stabilize areas adjacent to vernal pools immediately following the completion of all necessary grading in these areas (page 22 of Attachment E-1(z))
- The Epsilon Team will submit Mitigation plantings reports for the vernal pool margins for a minimum of two growing seasons and annual reports (page 22 of Attachment E-1(z))
- The Epsilon Team shall inspect, approve, and provide photo documentation of all plant stock to the Commission (page 22 of Attachment E-1(aa))
- The contractor will not use fertilizers within jurisdictional areas (page 26 of Attachment E-1(c))
- The contractor will use biodegradable jute netting to stabilize slopes as soon as possible (page 24 of Attachment E-1 (c))
- Eversource and the Epsilon Team will monitor the wetland replication area for invasive species, and manually remove them for the life of the Order (page 17 of Attachment E-1(y))

14.2.2 Stow

- The contractor will ensure soil contaminated with Japanese knotweed and/or knotweed rhizomes is not reused (page 18 of Attachment F-1(37))
- The Environmental Monitor document areas contaminated with Japanese knotweed within 500' of the eastern and western Town of Stow line prior to start of work (page 18 of Attachment F-1(37))

14.2.3 Hudson

- The contractor will use pesticide-free seed mixes for all restoration areas (page 17 of Attachment G-1(23))
- Eversource will monitor and maintain the restoration areas if there is a gap between Phase 1 and Phase 2 (page 19 of Attachment G-1(39))
- The Epsilon Team will monitor the Mitigation plantings for two (2) full growing seasons and provide annual reports to the Commission (page 19 of Attachment G-1(43))
- Eversource will maintain all sedimentation barriers until all disturbed areas have been fully stabilized (page 5 of Attachment G-1(18))

Attachment A

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

Stormwater Pollution Prevention Plan (SWPPP)

Sudbury to Hudson Transmission Reliability Project

Sudbury, Stow, & Hudson, Massachusetts

Prepared for:

NSTAR Electric d/b/a Eversource Energy
Eversource Energy
247 Station Drive
Westwood, MA 02090

Prepared by:

Epsilon Associates, Inc.
3 Mill & Main Place, Suite 250
Maynard, MA 01754

April 11, 2022
Version 1

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1.0 INTRODUCTION

This Stormwater Pollution Prevention Plan ("SWPPP") has been prepared for the Sudbury-Hudson Transmission Reliability Project ("the Project") to address the requirements of the U.S. Environmental Protection Agency ("USEPA") National Pollutant Discharge Elimination System ("NPDES") Construction General Permit ("CGP") for Stormwater Discharges from Construction Activity (2022, USEPA). This SWPPP presents project-specific details that demonstrate the Project's compliance with all applicable requirements of the CGP.

In summary, the CGP became effective on February 17, 2022 and is valid until February 16, 2027. A copy of the CGP and the relevant Appendices to the Project are included as Attachment A.

In general, the CGP gives Project Operators of construction activities that meet the eligibility requirements of Part 1.1 of the CGP, authorization to discharge the following (See Section 1.2 of the CGP):

- Stormwater, including stormwater runoff, snowmelt runoff, and surface runoff and drainage, associated with a construction activity,
- Stormwater discharges from on or off-site construction support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, etc.) provided certain conditions outlined in Section 1.2.1 (c.) of the CGP are met, and
- Non-stormwater associated with some construction activities (e.g., water used to control dust, water used to wash vehicles and equipment, etc.) provided certain conditions outlined in Section 1.2.2 of the CGP are met.

You are a Project Operator if you have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or you have day-to-day operation control of those activities at a project that are necessary to ensure compliance with the permit conditions.

It is possible to have multiple Project Operators on the same project, and all Project Operators must file for and obtain permit coverage. Subcontractors are generally not considered Project Operators for the purposes of the CGP; however, each Project Operator must work with Eversource to determine the classification for subcontractors and the Project Operator will be responsible to ensure subcontractors perform work in accordance with this CGP-compliant SWPPP and other permits obtained for the Project.

All Project Operators and Subcontractors employees must attend Environmental Compliance Training, provided by Eversource, to become eligible to perform work on the Project Site.

1.1 How to Use this SWPPP

This manual is project-specific and must be maintained and continuously updated to reflect the construction activities and associated compliance during the construction phase of the Project. The Eversource Environmental Representative and their designated Environmental Compliance Team (the

Epsilon Team) will work with the Project Operator to ensure all appropriate activity logs and sections of this SWPPP are updated and maintained accordingly. Any revisions must be communicated to the local permitting authorities in the weekly report to be submitted to these agencies, which include but are not limited to each local Conservation Commission and the Sudbury Planning Board.

1.2 What is a Project Operator?

The CGP provides permit coverage for Project Operators to discharge stormwater from construction sites. An Operator is any party associated with a construction project that meets either of the following two criteria:

- The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
- The party has day-to-day operational control of those activities at a project, which are necessary to ensure compliance with a SWPPP for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions).

Operators are responsible for maintaining compliance with the terms of the CGP.

All operators who wish to obtain coverage to discharge stormwater under the CGP must submit and certify their own NOI to the Environmental Protection Agency (EPA).

Eversource adopts the role of both the Project Owner and Project Operator.

BOND Civil & Utility Construction, Inc. (BOND) will adopt the role of Project Operator. Any subcontractor of BOND will be considered a Subcontractor and BOND will be responsible for ensuring that their Subcontractors comply with all requirements in this document.

Any additional contractors and subcontractors must coordinate with Eversource to determine if they qualify as a Project Operator or a Subcontractor.

All Project Operators must identify a designee who will serve as the duly authorized representative for their respective organizations and who will be responsible for overseeing compliance with all environmental requirements, including the CGP. Each designee must sign the Delegation of Authority form. This form certifies that each designee has reviewed and will be responsible for ensuring their companies will follow the provisions of the SWPPP. Signed Delegation of Authority forms are included as Attachment B. In addition, Attachment B contains the key signatories to the SWPPP. Lastly, Subcontractors must certify that they have read and will comply with all environmental requirements, including the CGP. Executed forms for Subcontractors is included in Attachment B as well.

1.3 Eligibility for Permit Coverage

To be covered under the CGP, a party must meet the eligibility conditions and follow the requirements for obtaining permit coverage. To be eligible for coverage:

- You must be an Operator of a construction site for which discharges will be covered under this permit.

- The project's construction activities:
  - Will disturb one (1) or more acres of land, or less than one (1) acre of land if the project is part of a larger common plan that will ultimately disturb one (1) or more acres of land.
  - Have been designated by EPA as needing permit coverage under 40 CFR 122.26(a)(1)(v) or 40 CFR 122.26(b)(15)(ii).
- Discharges from your site are not already covered by a different NPDES permit for the same discharge or in the process of having coverage under a different NPDES permit for the same discharge denied, terminated, or revoked.
- The Project meets the requirements relevant to the Endangered Species Act (ESA) (See Section 9.1).
- The Project meets the requirements relevant to preservation of Historic Properties (See Section 9.2).
- The Project meets the requirements relevant to water quality impacts to designated waters (See Section 3.2. Refer to Part 1.1.8 and 1.1.9 of the CGP).

Project Operators must file and certify an NOI at least fourteen (14) days prior to the start of project activities. https://www.epa.gov/compliance/npdes-ereporting

1.4 Compliance Requirements

Compliance with the CGP is achieved by:

- Developing a SWPPP manual (this document);
- Identifying project operators and responsible parties and obtaining authorization to perform permit compliance activities. (Section 2.1 and Attachment B);
- Submitting and certifying a Notice of Intent (NOI) to the USEPA CGP Program;
- Installing a sign or other notice posted conspicuously at a safe, publicly accessible location, in close proximity to the project site. At a minimum, the notice shall include:
  - The NPDES Permit tracking number,
  - A contact name and phone number for obtaining additional project information,
  - The location where an EPA inspector or a member of the public may access a copy of the current SWPPP,
  - The statement: "If you observe indicators of stormwater pollutants in the discharge or in the receiving waterbodies, contact the EPA through the following website: https://www.epa.gov/enforcement/report-environmental-violations."
- Updating this SWPPP as necessary and maintaining compliance with the CGP and any and all local, state, and federal permit conditions during construction period activities; and
- Maintaining an updated copy of the SWPPP on the project site.

1.5 Document Control Responsibilities

EPA-issued authorizations must be kept on site at the Project field office so that they can be made available at the time of an on-site inspection by the USEPA. In addition, this document must be made available upon request by the USEPA, a state; tribal; or local agency that approves stormwater management plans; the operator of a storm sewer system receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS). These documents may be made available to the general public by federal, state, or local agencies.

If an on-site location is unavailable for storing these documents, a notice of the plan's location must be posted near the main entrance of the construction site.

The SWPPP must be kept up to date throughout the construction period until a Notice of Termination (NOT) Form has been submitted to the EPA. From the date of submital of the NOT form, the SWPPP documents must be maintained by the Operator(s) for a period of three years.

The SWPPP is a dynamic document and must be continually updated by the Operator(s) throughout construction. All updates to this SWPPP will be completed by Eversource and/or their designated Environmental Consultant. It is the responsibility of the Operator(s) to provide a single designee responsible for ensuring all necessary updates are provided to Eversource and/or their designated Environmental Consultant.

Task Completed	Task	See Sections
☒	Designate and Provide Contact Information for the Responsible Parties	Section 1 Attachment B
☐	Provide documentation confirming EPA authorization of the Project	Attachment C
☒	Provide a construction schedule including dates of major earthwork, stabilization and/or erosion control installations.	Table 24 Attachment M
☒	Review the Erosion and Sediment Controls described in this manual and add or update as needed. Document the installation and maintenance of Erosion and Sediment Controls.	Section 7 Attachment D Attachment J Attachment K
☒	Identify any chemical treatments that may be applied to the site and describe dosage, application techniques, and training for personnel.	Section 7.12
☒	Identify potential sources of pollution.	Table 48 Section 8.1
☒	Provide documentation of correspondence congruent with the Endangered Species Act	Section 9.1 Attachment E
☒	Provide documentation of correspondence with Massachusetts Historical Commission. Submit the Project Notification Form (PNF) to Massachusetts Historic Commission	Section 9.2 Attachment F

☒	Provide documentation of compliance with DEP regulations 310 CMR 27.00 (Underground Injection Wells)	Not Applicable

2.0 CONTACT INFORMATION AND RESPONSIBLE PARTIES

2.1 Operators(s)

Individuals identified in this section are designated responsible parties for each of the Project Operators. Project Operators may include, but not be limited to the Site Owner, the Project Owner, and the general contractor.

The following information must be kept current during the construction period if any ownership changes or any temporary or permanent staff changes occur.

Table 2-1 Project Role: Owner/Operator

Company or Organization:	Eversource
Name:	Michael Hager
Address:	247 Station Drive
City, State, Zip	Westwood, MA 02090
Telephone:	(508) 341-5815
Fax/Email:	Michael.Hager@eversource.com
Title:	Project Manager

Table 2-2 Project Role: Owner/Operator

Company or Organization:	Eversource
Name:	Matt Devlin
Address:	247 Station Drive
City, State, Zip	Westwood, MA 02090
Telephone:	(508) 596-0147
Fax/Email:	matthew.devlin@eversource.com
Title:	Licensing & Permitting Representative

Table 2-3 Project Role: General Contractor/Operator

Company or Organization:	BOND
Name:	Matt Stock
Address:	10 Cabot Road, Suite 300
City, State, Zip	Medford, MA 02155
Telephone:	(617) 512-6766
Fax/Email:	mstock@bond-civilutility.com
Title:	Construction Supervisor

Table 2-4 Project Role: General Contractor/Operator

Company or Organization:	G Greene Construction Co. Inc.
Name:	Nick DeSisto
Address:	240 Lincoln Street
City, State, Zip	Allston, MA 02134
Telephone:	617-519-3256
Fax/Email:	ndesisto@ggreene.com
Title:	General Superintendent

Table 2-5 Project Role: Subcontractor

Company or Organization:	E.T.&L. Corp.
Name:	Daren Ducharme
Address:	873 Great Rd
City, State, Zip	Stow, MA 01775
Telephone:	978-793-1287
Fax/Email:	dducharme@etlcorp.com
Title:	General Superintendent

2.2 24-hour Emergency Contact Information

The individuals identified in this Section will be available to respond to emergency conditions on the site 24 hours a day, 7 days a week.

Table 2-6 24-hour Emergency Contact (Primary)

Company or Organization:	BOND
Name:	Matt Stock
Address:	10 Cabot Road, Suite 300
City, State, Zip	Medford, MA 02155
Telephone:	(617) 512-6766
Fax/Email:	mstock@bond-civilutility.com
Title:	Construction Supervisor

Table 2-7 24-hour Emergency Contact (Secondary)

Company or Organization:	Eversource
Name:	Michael Hager
Address:	247 Station Drive
City, State, Zip	Westwood, MA 02090
Telephone:	(508) 341-5815
Fax/Email:	Michael.Hager@eversource.com
Title:	Project Manager

2.3 Delegation of Authority, Required Signatures, and Subcontractor Certification

The individual authorized to sign/certify the NOI (Attachment C) is granted the authority to sign the

- SWPPP,
- Inspection Reports,
- Corrective Action Reports and
- Other permit documents.

Alternatively, the individual may delegate this authority. A duly authorized representative may only sign the documents if:

- This authorization specifies either an individual or a position (e.g., Environmental Compliance Officer) who has the responsibility for the overall operation of the regulated area or who has overall responsibility for environmental matters.
- This SWPPP includes a signed, dated written authorization.

The duly authorized representative cannot be a subcontractor or a third party. A duly authorized third party may conduct inspections and corrective actions and may complete reports, but the NOI signer/certifier or duly authorized representative identified here must sign the reports.

Attachment B contains the Delegation of Authority, Signatories to the SWPPP, and the Subcontractor Certification documentation.

Table 2-7 Duly Authorized Representative or Position (Primary)

Company or Organization:	Eversource
Name:	Matt Devlin
Address:	247 Station Drive
City, State, Zip	Westwood, MA 02090
Telephone:	(508) 596-0147
Fax/Email:	matthew.devlin@eversource.com
Title:	Licensing and Permitting Representative

Table 2-8 Duly Authorized Representative or Position (Secondary, optional)

Company or Organization:	Epsilon Associates
Name:	Marc Bergeron
Address:	3 Mill & Main Place, Suite 250
City, State, Zip	Maynard, MA 01754
Telephone:	(508) 212-0420
Fax/Email:	mbergeron@epsilonassociates.com
Title:	Environmental Compliance Manager

Table 2-9 Duly Authorized Representative or Position (Tertiary, optional)

Company or Organization:	SWCA
Name:	Rebecca Weissman
Address:	1900 West Park Drive, Suite 280
City, State, Zip	Westborough, MA 01581
Telephone:	(339) 203-7045
Fax/Email:	Rebecca.weissman@swca.com
Title:	Environmental Compliance Asst. Manager

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2.4 Stormwater Team

The duties of these personnel include one or more of the following:

- Prepare the Draft SWPPP
- Finalize the SWPPP
- Implement the SWPPP
- Oversee maintenance practices identified as BMPs in the SWPPP
- Conduct or provide for inspection and monitoring activities
- Identify other potential pollutant sources and make sure that they are added to the plan
- Identify any amendments to the SWPPP necessitated by field conditions and make sure they are implemented
- Ensure that any design changes during construction are addressed in the SWPPP

All Operators and/or Subcontractors that will use this SWPPP for compliance with the terms of their CGP must provide a certification agreement to do so. The certification agreements are located in Attachment B.

Table 2-10 Stormwater Team 1 (Primary Contractor)

Company or Organization:	BOND
Name:	Matt Stock
Address:	10 Cabot Road, Suite 300
City, State, Zip	Medford, MA 02155
Telephone:	(617) 512-6766
Fax/Email:	mstock@bond-civilutility.com
Title:	Construction Supervisor

Table 2-11 Stormwater Team 2 (Project Owner/Operator)

Company or Organization:	Eversource
Name:	Matt Devlin
Address:	247 Station Drive
City, State, Zip	Westwood, MA 02090
Telephone:	(508) 596-0147
Fax/Email:	matthew.devlin@eversource.com
Title:	Licensing and Permitting Representative

Table 2-12 Stormwater Team 3 (Environmental Compliance Manager)

Company or Organization:	Epsilon Associates
Name:	Marc Bergeron
Address:	3 Mill & Main Place, Suite 250
City, State, Zip	Maynard, MA 01754
Telephone:	(508) 212-0420
Fax/Email:	mbergeron@epsilonassociates.com
Title:	Environmental Compliance Manager

Table 2-13 Stormwater Team 4 (Environmental Compliance – Assistant Manager)

Company or Organization:	SWCA
Name:	Rebecca Weissman
Address:	1900 West Park Drive, Suite 280
City, State, Zip	Westborough, MA 01581
Telephone:	(339) 203-7045
Fax/Email:	Rebecca.weissman@swca.com
Title:	Environmental Compliance Asst. Manager

2.5 Personnel Responsible for Inspections

Inspections are to be performed by "qualified personnel", as defined in Part 4.1 of the CGP, and shall include all areas of the site disturbed by construction activity and areas used for materials storage that are exposed to precipitation.

The Inspector must look for evidence of, or the potential for, pollutants entering the storm water system, inspect the BMPs installed as part of the Plan, inspect the site drainage outfalls, inspect the site egress points for tracking, and inspect material, waste, borrow, or equipment storage and maintenance areas. If, in the course of the inspection, the inspector identifies an eroded area or an area impacted by sedimentation, additional erosion and sedimentation controls will be implemented, the discharge will be documented, and the SWPPP will be revised to include these changes.

Inspection forms are available in Attachment J.

Table 2-14 Personnel Authorized to Perform Inspections

Name: Title:	Terry D. Ramborger (AECOM) Erosion Control Specialist
Name: Title:	John Vieira (AECOM) Scientist/Wildlife Biologist
Name: Title:	Scott Egan (AECOM) Scientist/Wildlife Biologist
Name: Title:	Alison Holmes (SWCA) Scientist/Erosion Control Specialist
Name: Title:	Ariel Leclerc (SWCA) Scientist/Erosion Control Specialist
Name: Title:	Marc Bergeron (Epsilon Associates) – Lead Environmental Inspector Scientist/Erosion Control Specialist

2.6 Personnel Responsible for Completing Corrective Actions

The following personnel are responsible for completing corrective action forms (Attachment K).

Table 2-15 Personnel Responsible for Completing Corrective Actions (Primary)

Company or Organization:	BOND
Name:	Matt Stock
Address:	10 Cabot Road, Suite 300
City, State, Zip	Medford, MA 02155
Telephone:	(617) 512-6766
Fax/Email:	mstock@bond-civilutility.com
Title:	Construction Supervisor

Table 2-16 Personnel Responsible for Completing Corrective Actions (Secondary, optional)

Company or Organization:	G Greene Construction Co. Inc.
Name:	Nick DeSisto
Address:	240 Lincoln Street
City, State, Zip	Allston, MA 02134
Telephone:	617-519-3256
Fax/Email:	ndesisto@ggreene.com
Title:	General Superintendent

3.0 SITE EVALUATION AND PROJECT SCHEDULE OVERVIEW

The following sections provide an overview of the existing conditions along the Project and present an overview of the anticipated project schedule. It is important to note that wetlands and waterbodies ("receiving waters") along the Project are designated as either "Impaired" or "High Quality". Each of these designations have unique monitoring, stabilization, and best management practices requirements as outlined in this document.

All Environmental Monitors and Project Operators need to be familiar with the classification of all receiving waters along the Project and are responsible to ensure compliance with all associated CGP, local, state and federal requirements for each.

3.1 Project/Site Information

Table 3-1 Project Name and Address

Project/Site Name:	Sudbury-Hudson Transmission Reliability Project
Project Street/Location:	Inactive MBTA ROW in Sudbury, Marlborough, Stow, and Hudson; and Wilkins St and Forest Ave in Hudson
City:	Sudbury, Marlborough, Stow, Hudson
State:	Massachusetts
Zip:	Various
County:	Middlesex

Table 3-2 Project Coordinates

Type	Latitude		Longitude	
Sudbury Substation	42.359997	N	71.397021	W
Hudson Substation	42.387273	N	71.556489	W

Table 3-3 Source for coordinate information

	Source
☐	USGS topographic map
☐	EPA Website
☐	GPS
☒	Other: (Maps.google.com)

Table 3-4 Horizontal Reference Datum

	Reference
☐	NAD 27
☒	NAD 83 or WGS 84
☐	Unknown
☐	Other:

3.1.1 Additional Information

Yes	No	
☐	☒	Is the project/site located on Indian country lands, or located on a property of religious or cultural significance to an Indian tribe? If yes, provide the name of the Indian tribe associated with the area of Indian country (including the name of Indian reservation if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property: n/a If you are conducting earth-disturbing activities in response to a public emergency, document the cause of the public emergency *(e.g., natural disaster, extreme flooding conditions)*, information substantiating its occurrence *(e.g., state disaster declaration)*, and a description of the construction necessary to reestablish effective public services: n/a
☐	☒	Are you applying for permit coverage as a "federal operator" as defined in Appendix A of the CGP?

3.2 Discharge Information

Yes	No	
☒	☐	Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)?
☒	☐	Are there any surface waters that are located within 50 feet of your construction disturbances?

3.2.1 Receiving Waters

The following table lists the receiving waters along the Project.

Table 3-5 Receiving Waters

Number	Name
1	Assabet River
2	Fort Meadow Brook
3	Hop Brook
4	Unnamed Stream/Tributary to Hop Brook
5	Dudley Brook
6	Hudson wetlands 1-21 (H1-H21)
7	Sudbury wetlands 1-45 (S1-S45)
8	White Pond
9	Lake Boon

3.2.2 Impaired Receiving Waters

The following table identifies the receiving waters along the Project which are identified as "impaired" according to the interactive map of the 2020 integrated list of waters available online at: http://www.mass.gov/eea/agencies/massdep/water/watersheds/integrated-list-of-waters.html.

Table 3-6 Impaired Receiving Waters

Is this surface water listed as impaired?			**If you answered yes, then answer the following:**				
	Yes	No	What pollutants are causing the impairment?	Has a TMDL been completed? Yes	Has a TMDL been completed? No	Title of the TMDL document	Pollutant(s) for which there is a TMDL
Assabet River	☒	☐	(Debris/Floatables/Trash); (Non-Native Aquatic Plants); Aquatic Plants (Macrophytes); Escherichia coli; Excess Algal Growth; Fecal Coliform; Nutrient/ Eutrophication Biological Indicators; Oxygen, Dissolved; Phosphorus (Total); Taste and Odor.	☒	☐	Assabet River Total Maximum Daily Load for Total Phosphorus *(CN 201.0)*	Phosphorus

Table 3-6 Impaired Receiving Waters (Continued)

	Is this surface water listed as impaired?		If you answered yes, then answer the following:				
	Yes	No	What pollutants are causing the impairment?	Has a TMDL been completed?		Title of the TMDL document	Pollutant(s) for which there is a TMDL
Hop Brook	☒	☐	(Non-Native Aquatic Plants); Aquatic Plants (Macrophytes); Dissolved oxygen saturation; Escherichia coli; Excess Algal Growth; Oxygen, Dissolved; Phosphorus (Total); Turbidity. Oxygen, Dissolved; Phosphorus (Total).	☐	☒		
Unnamed Tributary to Hop Brook	☒	☐	Dissolved oxygen saturation; Excess Algal Growth; Oxygen, Dissolved; Phosphorus (Total); Total Suspended Solids (TSS).	☐	☒		
Lake Boon	☒	☐	Exotic Species, Noxious Aquatic Plants	☒	☐	Lake Boon TDML Restoration Plan	Phosphorus

3.2.3 High Quality, Outstanding Resource, and Special Resource Waters

In Massachusetts, Tier 2 waters are listed as "High Quality Waters." All wetlands that are not designated as an Outstanding Resource Water are considered a High-Quality Water (Refer to antidegradation designations, link below).

In Massachusetts, Tier 2.5 waters are listed as Outstanding Resource Water, Public Water Supply, and/or Tributary to Public Water Supply, and all wetlands bordering Outstanding Resource Waters and all vernal pools.

In Massachusetts, Tier 3 waters are defined as Special Resource Waters, which are certain waters of exceptional significance, such as waters in national or state parks and wildlife refuges. Special Resource waters are assigned at the discretion of the Massachusetts Department of Environmental Protection and subject to protection as outlined at 314 CMR 4.04(4).

Tier 2, Tier 2.5, and Tier 3 waters are identified and listed in the Massachusetts Water Quality Standards 314 CMR 4.00. The following table lists the High Quality, Outstanding Resource, and Special receiving waters along the Project as designated by the specific antidegradation designations at: https://www.mass.gov/doc/antidegradation-implementation-procedures-0/download

Table 3-7 High Quality, Outstanding Resource, and Special Receiving Waters

	Is this surface water designated as a Tier 2, Tier 2.5 or Tier 3 water?		If you answered yes, specify which Tier (2, 2.5, or 3) the surface water is designated as.
	Yes	No	
Assabet River	☒	☐	Tier 2. High quality water.
Hop Brook	☒	☐	Tier 2. High quality water.
White Pond	☒	☐	Tier 2.5 Outstanding Resource Water.
Hudson wetlands 1-21 (H1-H21)	☒	☐	Tier 2. High quality water.
Sudbury wetlands 1-45 (S1-S45)	☒	☐	Tier 2. High quality water.

3.2.4 Inspections and Turbidity Monitoring Requirements for off-site Dewatering Discharges

For those portions of the Project that discharge dewatering off the site, the following must occur:

Dewatering water discharge: Inspections must be conducted in accordance with Part 4.6.3 of the CGP, which during the discharge once per day on which the discharge occurs. The Part 4.2 inspection frequency still applies to all other portions of the site unless the site is affected by either the increased frequency in Part 4.3.1 or the reduced frequency in Part 4.4.

Turbidity Monitoring: For those portions of the Project that discharge dewatering within 100 feet of-or directly to "Impaired Receiving Waters" (Table 3-6) or to Tier 2, Tier 2.5, or Tier 3 waters (Table 3-7), turbidity monitoring must be conducted (See CGP, Part 7.2.8). For this project this includes dewatering discharges that leave the site and enter the waterbodies and wetlands listed in Table 3-7 (above).

- **Sampling frequency.** Collect at least one turbidity sample from your dewatering discharge each day a discharge occurs next to these receiving waters.

- **Sampling location.** Samples must be taken at all points where dewatering water is discharged. Samples must be taken after the dewatering water has been treated by installed treatment devices pursuant to Parts 2.4.1 and 2.4.3 and prior to its discharge off site into a receiving water, constructed or natural site drainage feature, or storm drain inlet.

- **Representative samples.** Samples taken must be representative of the dewatering discharge for any given day as required in the CGP, Appendix G (standard permit conditions), Part G.10.2.

- **Test methods.** Samples must be measured using a turbidity meter that reports results in nephelometric turbidity units (NTUs) and conforms with a Part 136-approved method (e.g., methods 180.1 and 2130). You are required to use the meter, and conduct a calibration verification prior to each day's use, consistent with the manufacturer's instructions. The data should be recorded on the EPA issued Turbidity Monitoring Report Form in Attachment J.

3.3 Project Description

3.3.1 General Description

NSTAR Electric Company d/b/a Eversource Energy (Eversource) is proposing to construct, operate, and maintain an approximate 9-mile, 115-kilovolt (kV) underground transmission line extending from Eversource's Sudbury Substation on Boston Post Road (Route 20) in Sudbury, Massachusetts (Sudbury Substation) to Hudson Light & Power Department's (HLPD) substation at Forest Avenue in Hudson, Massachusetts (Hudson Substation). The new transmission line and related improvements at Sudbury Substation comprise the Sudbury-Hudson Transmission Reliability Project (the Project).

The Project will provide also base for and support construction of a portion of the Mass Central Rail Trail (MCRT), which will be constructed as a separate and independent phase from this Project. The Project will be installed primarily along an inactive railroad right-of-way (ROW) owned by the Massachusetts Bay Transportation Authority (MBTA). The Project originates at the Sudbury Substation and travels northwest along the MBTA ROW passing through short sections of Marlborough and Stow before entering Hudson, where it travels underground within public roadways for 1.3 miles after exiting the MBTA ROW, terminating at the Hudson Substation. The New Line will pass mostly through the Towns of Sudbury and Hudson and will cross short sections of the Town of Stow and the City of Marlborough.

The Project includes the following work activities:

- Installation of new equipment at Sudbury Substation
- Within MBTA ROW:
  - Vegetation removal within the limit of work (no stumping)
  - Installation of erosion and sediment controls with on-going monitoring and maintenance
  - Rail and tie removal
  - Grading to create construction platform
  - Installation of stormwater management features
  - Construction of wetland replication area
  - Construction of bridges and other crossings
  - Installation of manholes and duct bank
  - Installation of electrical and signal conduit for MCRT at road crossings
  - Final grading of the gravel base for MCRT
  - Cable pulling, splicing, testing, and commissioning
  - Loaming, seeding, and planting of disturbed areas

- Within Public Roadways:
  - Installation of sediment controls
  - Manhole installation
  - Roadway trench excavation, duct bank installation, and pavement restoration
  - Cable pulling, splicing, and testing
  - Final pavement restoration

3.3.2 Site Maps

Attachment D contains the Project Plans for this Project.

3.3.3 Size/Footprint of the Project

The project activities will occupy the footprint identified below.

Table 3-8 Footprint of the Project Area

Area Description	Area (acres)
Total property size **(MBTA ROW)**	89.7
Total area of construction disturbance	30.9
Maximum area to be disturbed at any one time	4.8

3.3.4 Construction Activities Sequencing and Logging Requirements

Construction activities, phasing, and sequencing are generally performed at the discretion of the General Contractor and may be determined or refined during the construction period. Project Operators are responsible for maintaining a construction log that address the following project activities.

Projected Construction Sequence

The projected construction sequence presented in this section is the best estimate of the construction sequence at the time that this SWPPP template was prepared. If the general sequence presented here changes during the course of the project, amend the SWPPP to include the revised project construction sequence.

Table 3-9 Projected Construction Sequence

Action	Projected Dates
In-road portion/underground duct bank installation	05/1/2022-TBD
Installation of Erosion and Sediment Controls (ESCs)	6/1/2022 – 8/5/2022
Hudson & Sudbury preconstruction ESCs inspections	6/6/2022 – 8/30/2022
Vegetation Removal Activities (including tree clearing)	6/6/2022 – 8/30/2022
Removal of existing rails and ties	6/15/2022 – 9/21/2022
Cut/Fill to Subgrade	6/29/2022 – 12/8/2022
Excavate, Install Duct Bank Conduit, Backfill	6/22/2022 – 12/18/2022
Bridge 128 Construction (Hop Brook)	7/1/2022 – 12/28/2023
Chestnut Street Underpass Construction	7/29/2022 – 12/20/2022
Bridge 127 Construction (Hop Brook)	7/29/2022 – 10/06/2023
Bridge 130 Construction (Fort Meadow Brook)	9/8/2022 – 12/20/2022
Cattle Crossing Construction (Hudson)	10/20/2022 – 5/12/2023
Final Grade and Installation of Gravel	2/17/2023 – 1/8/2024
Installation of Plantings/Final Seeding Treatment	4/6/2023 – 5/13/2024

Refer to Attachment M for a Detailed Construction Schedule, and the Construction Activities Log (Attachment I) for construction activities performed to date.

Required Preconstruction Support Activities

The following activities are required by each Town's Order of Conditions prior to the start of any land disturbance.

Sudbury

- **Project Signage (OOC General Condition 10)** A sign shall be displayed at the site not less than two square feet or more than three square feet in size bearing the words, " Massachusetts Department of Environmental Protection" [or 'MassDEP"] File Number :"301-1287".

- **Resource Area Boundary Marking (OOC General Condition 17)** Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

- **Construction Scheduling (OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – F**) At least two weeks prior to the start of Phase I, the Applicant shall provide a construction schedule detailing construction activities and sequencing. This shall be amended as necessary throughout construction. Weekly reports shall be submitted to the Commission that details work completed each week and anticipated work for the coming week, including identifying when work is

located in areas of potential elevated levels of soil and groundwater contamination. These reports

- shall include anticipated dewatering activities so that oversight can be provided by the Commission or its Agent, if found necessary, and include the location of active stockpiles with confirmation that appropriate erosion control measures are being implemented.

- **Soil and Groundwater Management Plan (OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – C)** At least two weeks prior to any land disturbance, a Soil and Groundwater Management Plan (SGMP) prepared in conjunction with the selected contractor shall be submitted to the Conservation Commission for review and comment. The Applicant shall give due consideration to address comments received from the Commission that are needed to protect wetland resource areas functions and values. The SGMP will develop means and methods to manage soils and groundwater encountered during project construction activities including soil excavation, groundwater dewatering, and railroad tie and track removal. If conditions are encountered that suggest soil may require additional evaluation or special handling based on visual, olfactory, or field screening results, excavation activities in that area will immediately be stopped and Eversource, their Licensed Site Professional, and the Conservation Commission will be contacted immediately to evaluate the observations and recommend requirements for proper handling. The Commission shall be copied on all related correspondence.

Stow

- **Project Signage (Town of Stow-OOC General Condition 10 & Special Condition 24)** At least one week prior to construction start, A sign shall be displayed at the site not less than two square feet or more than three square feet in size bearing the words, " Massachusetts Department of Environmental Protection" [or 'MassDEP"] File Number :"299-677".

- **Resource Area Boundary Marking (OOC General Condition 17 & Special Condition 24)** At least one week prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

- **Contact List (OOC Special Condition 24)** At least one week prior to the anticipated start of construction provide the Commission with the name(s) and contact numbers(s) of the person(s) responsible on site for compliance with this Order, including the on-site Environmental Monitor.

- **Certificate of Understanding (OOC Special Condition 24)** At least one week prior to the anticipated start of construction provide the Commission with the signed Certificate of Understanding, signed by both Eversource and on-site supervisor responsible for the project.

Hudson

- **Project Signage (OOC General Condition 10)** A sign shall be displayed at the site not less than two square feet or more than three square feet in size bearing the words, " Massachusetts Department of Environmental Protection" [or 'MassDEP"] File Number :"190-0647".

- **Resource Area Boundary Marking (OOC General Condition 17)** Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

- **Contact List (OOC Special Condition 24)** Provide the Conservation Commission with the name and telephone number in writing, of the person who will be immediately responsible for supervision of all work on the project site and compliance with this Order of Conditions. The Con Com shall be notified in the event that the site supervisor or contractor is changed.

- **Limits of Work Marking (OOC Special Condition 24)** Clearly mark the limits of work in the field and instruct all workers not to work beyond the limits.

- **Project Timelines (OOC Special Condition 24)** Notify the Commission of the date upon which work will commence and provide the most up-to-date project timeline and project workflow.

Construction Activity Logging, Reporting, and Communication Requirements

For each phase of construction, the dates the following activities are completed must be documented in the Construction Activities Schedule and Log (Attachment I). In addition, the construction schedule must be updated as necessary during the duration of the Project (Attachment M).

- Installation of stormwater controls, and when they will be made operational;

- Commencement and duration of earth-disturbing activities, including clearing, grubbing, mass grading, site preparation (i.e., excavating, cutting, and filling), final grading, and creation of soil and vegetation stockpiles requiring stabilization;

- Cessation, temporarily or permanently, of construction activities on the site, or in designated portions of the site;

- Final or temporary stabilization of areas of exposed soil. The dates for stabilization must reflect the applicable deadlines to which you are subject to in Part 2.2.1; and

- Removal of temporary stormwater control measures, removal of construction equipment and vehicles, and cessation of any pollutant-generating activities.

In addition, the following reporting and/or communication activities are required for the duration of the Project, as per each Town's Order of Conditions and associated municipal permits:

Prior to Construction

Sudbury

- **Wildlife Habitat Reporting (OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – L)** During Phase 1, the Applicant's wildlife biologist or other qualified individual shall document the location of all important habitat features that will be removed (such as brush piles,

snags, overhanging trees, logs within or near the water, large woody debris, etc.) to quantify the number of features removed and provide confirmation that work did not result in-the-loss of important wildlife habitat features. Brush, large woody debris, and logs shall be replaced within or near the water, generally in the location of where they were removed. Reports shall be provided to the Conservation Commission at least every six (6) months, for the life of the Order, documenting wildlife habitat removal and restoration efforts implemented, including monitoring of vernal pools

- **Cold Water Fisheries Antidegradation Plan (OOC Special Condition: Part I: General Conditions: For Phase I and Phase II – Q):** The baseflow and baseline water quality of all Cold-Water Fisheries shall be established pre- construction. Baseline monitoring shall be accomplished to ensure there is no degradation of water quality over time from this project. The Applicants shall submit a detailed plan, subject to the Commission's approval, to specify water quality monitoring parameters, including times, methodology, analyses, and reporting. Post construction, monitoring may be required and may continue in the Certificate of Compliance based on monitoring result up to that time.

    - **Invasive Species Mapping (OOC Special Condition: Part I: General Conditions: For Phase I and Phase II – R**) Prior to commencement of each Phase, the Conservation Commission or its Agent shall map the corridor for the presence of invasive species within and adjacent to the limit of work. The information generated from this mapping shall be used to identify any new invasive species populations or significant expansions of invasive species that are a direct result from the Project. Mapping shall be used by the Applicants to implement a program to control invasive species populations to ensure the functions of wetland resource areas in the limits of work that have been restored with native vegetation are not subject to degradation by expansion of invasive species. If the Commission or its agent determines that the Project resulted in new or significantly expanded invasive populations, the Applicants shall implement a program to control these populations to ensure the project does not result in additional degradation of wetland resource areas.

    - **Invasive Species Management Plan (OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – B)** At least four weeks prior to any land disturbance, an Invasive Species Management Plan shall be developed and submitted to the Conservation Commission for review and approval. Said Management Plan shall involve removal of invasive species and revegetation with native species for a period of five (5) years from a minimum of3.3 acres of land within the MBTA Right-of-Way, but outside the proposed limit of work, and shall focus efforts on improving wildlife habitat in areas identified through the Wildlife Habitat Evaluation and peer review thereof as being most impacted from proposed work. Following implementation, the Invasive Species Management Area shall be managed in accordance with Perpetual Condition b. contained within this Order

    - **Limit of Work and Erosion Control Locating (OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – J)** The Limit of Work/erosion control location shall be survey located in the field and certified by a Mass Registered Professional Land Surveyor, installed under the oversight of the Applicant's

Environmental Monitor, and reviewed by the Commission and/or its Agent prior to commencement of any site work.

- Crane Mat Location and Installation (Hop Brook) (OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – P) The contractor shall provide detailed plans of the crane mat location and installation a minimum of one week prior to installation. All work and impacts associated with installation, removal, and stabilization of the crane areas shall be conducted in strict compliance

- with the Project Plans and Details and shall be reviewed and approved by the Commission and/or its Agent prior to installation and shall be installed under the supervision of the independent Environmental Monitor.

  - **(OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – R)** The Conservation Commission and their representative shall be notified at least three (3) business days in advance of the removal of the crane mats at Bridge 127.

    - Invasive Species Management (OOC Special Condition: Part I: General Conditions: For Phase I and Phase II - W; Stormwater Management Permit: II. Conditions and Requirements – M) All equipment, including timber mats, shall be cleaned and certified invasive species free, prior to entering the site. Such certification shall be provided to the Commission prior to commencement of mobilization into the site and when remobilized within the project site. All areas of disturbance shall be monitored for invasive species, which shall be manually removed if encountered.

    - Preconstruction Culvert Inspections (Stormwater Management Permit: II. Conditions and Requirements – C; OOC Special Condition Part II Conditions Specific to Phase I - D) At least two weeks prior to any land disturbance, a structural engineer shall inspect the culverts and drainage structures within the Project Site to determine whether they are structurally sound to (a) function hydrologically and (b) withstand the planned construction activities and shall provide a report of the findings to the Planning Board. If any culvert does not meet these requirements or is damaged during construction, it shall be replaced with a culvert that meets current MA Stream Crossing Standards to the maximum extent practicable, as determined by the Sudbury Conservation Commission or its Agent. Any recommended improvements to these structures, not included in this Permit, shall be required to submit a separate permit application and/or permit amendments for further evaluation.

Preconstruction Inspection (OOC Special Condition: Part II Conditions Specific to Phase I – K) Prior to any site disturbance, with the exception of the installation of the erosion control barrier, the Applicant shall schedule a pre-construction site visit with the Conservation Coordinator as least one week prior to commencement of work. At a minimum, those in attendance at this site visit should include the Applicant, construction supervisor, and environmental monitors involved in the project.

Stow

- **Project Meeting Notifications (OOC Special Condition 26)** The Stow Conservation Commission shall be notified of the time and location of regular project meetings relative to construction within the Town of Stow and provided with copies of meeting notes as applicable.

Hudson

- **Erosion and Sediment Control Preconstruction Inspection (OOC Special Condition 24)** Properly install all siltation controls according to the plans approved and arrange with the Commission to have a site visit after installation, before work begins.
- **Bridge Removal Notifications (OOC Special Condition 32)** Detailed sequencing of the bridge removal work based on water levels and other conditions at the time of removal shall be provided to the Commission prior to commencement of work in this area. A silt curtain shall be used if conditions warrant. The Conservation Agent shall be notified when bridge removal is to begin and perform a site inspection before work commences.
- **Invasive Species Management (OOC Special Condition 38)** All equipment and timber mats shall be cleaned prior to use on the site to prevent the introduction of invasive species. If it is necessary to clean construction equipment while on site, it must be cleaned outside of the 100-foot Buffer Zone, Riverfront Area, or any other Resource Area.

During Construction

Sudbury

- Test Pits/Borings for Areas of Increase Infiltration (OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – V; Stormwater Management Permit: II. Conditions and Requirements – F) Additional test pits/borings at the location of each proposed "area of increase infiltration" shall be conducted during construction to verify soil conditions, infiltration rates, and groundwater levels, and provided to the Conservation Commission for review. At a minimum, soil tests shall be conducted in the vicinity of Stations 502+00, 511+00, 570+00, and 579+00. A report of the findings, comparison with expectations, and a statement on the appropriateness of the design shall be provided to the Conservation Commission for review. If findings are not consistent with the assumptions made for the stormwater management design, revisions to the design and approval of modifications to the Plan may be required.
- **Stormwater Infiltration BMP Inspections (OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – X)** The

Conservation Commission and/or their agent shall inspect all permanent stormwater infiltration BMPs for acceptance prior to construction demobilization to a new location within the ROW.

- **Wetland Replication (OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – BB)** The wetland replication area shall be constructed during vegetation removal in the vicinity of the replication area and prior to the construction of structures in that vicinity.
- **Environmental Monitoring (OOC Special Condition Specific to Phase I: Eversource Underground Transmission Line – I)** The Applicant shall ensure there is a qualified Environmental Monitor(s) on site at all times overseeing work that is subject to this Order. The Environmental Monitor(s) shall send weekly erosion control inspection reports and reports following any storm event of ½ inch of rain or greater, to the Conservation Commission.

Stow

- **Dewatering Notifications (OOC Special Condition 32)** The Commission shall be notified if dewatering is deemed necessary during construction activities and given an opportunity to review the proposed location and method of dewatering prior to the commencement of dewatering activities. No direct discharge to a waterbody is permitted. No overland discharge of water is allowed within 100 feet of vegetated wetlands.
- **Contaminated Soils Reporting (OOC Special Condition 33)** If on-site excavation or other site work during Phase 1 or Phase 2 reveals any soil contamination in reportable concentrations or quantities, the Stow Conservation Commission shall receive notification concurrent with Mass DEP and shall be

  - copied on all correspondence relating to site investigation and remedial actions. Remedial activities may require filing of an additional Notice of Intent in accordance with the Wetlands Protection Act and Stow Wetlands Bylaw.

Hudson

- **Excavated Material Management (OOC Special Condition 20)** No excavated material shall be disposed of in violation of any local, state, or federal laws. All stumps must be removed from the site; no burying of stumps on site is permitted.

- **Reportable Soil Contamination Communication (OOC Special Condition 35)** If on-site excavation or other work reveals any soil contamination in reportable concentrations or quantities, the Conservation Commission shall be notified and shall be copied on all related correspondence.

- **Construction Scheduling Notifications (OOC Special Condition 30)** Detailed construction sequencing and schedules shall be submitted to the Commission electronically, as they are completed or whenever they are revised.
- **Remediation Notifications (OOC Special Condition 36)** The Conservation Commission shall be notified of any remedial activities or changes to the work plans required due to the potential presence of PFAS in the Zone II wellhead area or other jurisdictional areas.

Post-Construction

Sudbury

- **Phase Related Certificates of Compliance (OOC Special Condition: Part I: General Conditions: For Phase I and Phase II – CC)** Upon completion of the work associated within each phase, the Applicants shall forthwith request in writing that a Certificate of Compliance be issued stating that the work has been satisfactorily completed and clearly documenting any deviations or deficiencies from the approved plans. Proposed work limits and in an area subject to the Commission's jurisdiction, an erosion control plan shall be submitted in advance to the Commission's representative for review and approval.
- **Order of Conditions Amendments (OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – JJ)** Should Phase II not commence within three years of completion of Phase I, the Applicant shall file an Amendment to bring the stormwater management into full compliance with the Town of Sudbury Stormwater Regulations.

- **(OOC Part V: Certification of Compliance Requirements – A)** Following completion of Phase I, Eversource shall request a Partial Certificate of Compliance. This Request shall be accompanied by as-built plans, stamped by a professional land surveyor or other qualified professional, detailing all elements of Phase I including all restoration plantings, wetlands replication, all stormwater management elements, post construction structural report, provide a cut/fill analysis for the project by stream reach and elevations to confirm adequate compensatory storage is provided and affidavit from all site professionals that all aspects of this Order were adhered to, along with reports associated with mitigation activities. Any deviations from the approved plans shall be specifically called out on the as-built plan. A report on the restoration/mitigation plantings and invasive species management

- program shall be provided that includes an assessment of the plant community composition in the context of the wildlife habitat restoration. Vegetation outside the limit of work shall also be evaluated to confirm no negative impacts occurred outside the limit of work.

Stow

- **Phasing Notification (OOC Special Condition 38)** Eversource shall notify the Commission upon the completion of the work in Phase 1. Eversource shall be required to maintain erosion controls and site stabilization until

a Phase 1 Partial Certificate of Compliance is received by Eversource or the Conservation Commission receives formal notification via OCR that they are commencing Phase 2 and a Certificate of Understanding is received from OCR per Condition #25.

Hudson

- **Certificate of Compliance (OOC Special Condition 41)** Prior to the issuance of a Certificate of Compliance the site shall be stabilized with vegetation or other measures approved by the Conservation Commission.
- **Permit Close-out (OOC Special Condition 44)** Prior to the issuance of a Certificate of Compliance, the applicant shall submit to the Conservation Commission for review and approval an as-built plan and a letter of compliance stamped by a registered professional engineer. Said plan and letter shall show that all conditions of this Order have been complied with in substantial compliance with the Order and explain any differences from the approved plans.

3.3.5 Allowable Non-Stormwater Discharges

Congruent with Section 1.2.2 of the CGP, the following non-stormwater discharges associated with construction activities are authorized under this permit provided that, with the exception of water used to control dust and to irrigate vegetation in stabilized areas, these discharges are not routed to areas of exposed soil on the site and the discharges also meet the requirements of Part 2 of the CGP.

Table 3-10 Allowable non-stormwater discharges likely occur at the Project Site

	Likely to be Present at the Site?	
Types of Allowable Non-Stormwater Discharges Present at the Site	Yes	No
Discharges from emergency fire-fighting activities	☐	☒
Fire hydrant flushing	☐	☒
Landscape irrigation	☒	☐
Waters used to wash vehicles and equipment	☒	☐
Water used to control dust	☒	☐
Potable water including uncontaminated water line flushing	☐	☒
Routine external building wash down	☐	☒
Pavement wash waters	☐	☒
Uncontaminated air conditioning or compressor condensate	☐	☒
Uncontaminated, non-turbid discharges of ground water or spring water	☒	☐
Foundation or footing drains	☐	☒
Uncontaminated construction dewatering water	☒	☐

4.0 INSPECTIONS, CORRECTIVE ACTIONS, AND AMENDMENTS

4.1 Inspection Schedule

Section 4.2 and Section 4.3 of the CGP specify minimum inspection frequencies required for the Project. Section 4.2 specifies the minimum inspection frequency for a typical site. Section 4.3 specifies the minimum inspection frequency for locations along the Project that discharge to sensitive waters. Sensitive waters are defined as sediment or nutrient-impaired waters (See Table 3-6) or waters that are identified by the State, tribe or EPA as Tier 2, Tier 2.5, or Tier 3 (see Table 3-7).

Table 4-1 Project Inspection Schedule

Does the project area discharge to sensitive waters?	Inspection Frequency
☒ Yes	Once every 7 calendar days AND Within 24 hours of an event 0.25 inches or greater OR Within 24 hours of a snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period
☐ No	Choose one option below:
	☐ Once every 7 calendar days
	☐ Once every 14 calendar days AND Within 24 hours of an event 0.25 inches or greater

To determine if a storm event of 0.25 inch or greater has occurred on the site, data will be obtained from the weather station at:

Blueberry Hill – KMASUDBU29 in Sudbury, MA.

For any day of rainfall during normal business hours that measures 0.25 inches or greater, the date and rainfall amount must be recorded in the Construction Activities Log (Section 3.3.4).

The Site Inspection Log and Inspection Forms are maintained in Attachment J.

Record daily rainfall that exceeds 0.25 inches in the Construction Activities Log (Section 3.3.4).

4.1.1 Reductions in Inspection Frequency

Inspection frequency may be reduced to once per month if:

- You may reduce the frequency of inspections to twice per month for the first month, no more than 14 calendar days apart, then once per month until permit coverage is terminated consistent any area

of your site where the stabilization has been completed and are documented in the Construction Activities and the Grading and Stabilization Logs.

- The project is experiencing frozen soil conditions and earthwork is not occurring within regulated wetland resource areas.

Exceptions may also be made for drought-stricken areas, refer to Part 4.4.2 for additional information.

Suspension of Construction Activities due to Frozen Conditions

If the project will suspend construction activities due to frozen conditions, the project may temporarily suspend inspections on the site until thawing conditions begin to occur if:

- Runoff is unlikely due to continuous frozen conditions that are likely to continue at the site for at least 3 months based on historic seasonal averages. If unexpected weather conditions (such as above freezing temperatures or rain on snow events) make discharges likely, the contractor must immediately resume regular inspection frequency as described in Parts 4.2 or 4.3, if applicable,
- Land disturbances have been suspended,
- All disturbed areas of the site have been temporarily or permanently stabilized in accordance with Part 2.2.14.a of the CGP,
- All erosion controls must be in good working order prior to the suspension of inspections, and
- Temporary suspensions in inspections will be communicated to the local Conservation Commissions.

Continuation of Construction Activities Despite Frozen Conditions

If the project will continue construction activities despite frozen conditions, the project may temporarily reduce inspections to once per month until thawing conditions begin to occur if:

- Runoff is unlikely due to continuous frozen conditions that are likely to continue at the site for at least 3 months based on historic seasonal averages. If unexpected weather conditions (such as above freezing temperatures or rain on snow events) make discharges likely, the contractor must immediately resume regular inspection frequency as described in Parts 4.2 or 4.3, if applicable;
- Land disturbances have been suspended; and
- All disturbed areas of the site have been temporarily or permanently stabilized in accordance with Part 2.2.14.a of the CGP.

Record changes in the inspection frequency in the Construction Activities Log (Section 3.3.4).

Project-Specific Inspection Requirements

Additionally, the contractor is required to comply with the following conditions:

Sudbury

- **(OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – A)** Work with Conservation Commission to get an independent Environmental Monitor, hired by the Conservation Commission and paid for by the Applicant prior to the start of construction.
- **(OOC Conditions Specific to Phase I:** Eversource **Underground Transmission Line – A)** An independent Environmental Monitor, hired by the Conservation Commission and paid for by the Applicant, shall be provided to oversee the following activities:

- Review the erosion control barrier following installation but prior to any land disturbance and each year prior to vernal pool species migration. Conduct spot inspections of vernal pools during construction and/or review reports provided by the Applicant's environmental monitor to ensure no negative impact to vernal pools during construction.
- Be on site during initial tree removal and invasive species clearing activities, within the limit of work.
- Review and ensure appropriate reporting of all activities associated with construction scheduling, erosion control monitoring, compliance with the project's SWPPP, and environmental monitoring activities including ensuring adherence to time of year restrictions.
- Be on site during bridge platform installation and spot inspections during bridge construction.
- Be notified of all dewatering activities and be on site during dewatering in sensitive locations, i.e. whenever excavation is proposed within 50 feet of a wetland, or when extensive dewatering will be needed. Specific oversight locations will be determined with the contractor, prior to commencement of work.
- Review restoration/mitigation areas including being on site during the construction of the wetland replication area.
- Be on site to oversee excavation/construction activities over culverts and drainage structures.
- Be available to respond to emergency situations, should they arise.

- **(OOC Part VI: Conditions In Perpetuity – B)** To ensure the environmental integrity of the site is maintained to offset the permitted activity, after the initial management period of five (5) years, the 3.3-acre invasive species management areas shall be monitored annually for the presence of invasive species and annual reports shall be submitted to the Conservation Office. Any areas found to contain concentrations of invasive species and/or should the plant community within the

management area exceed l 0% invasive species, the management area shall be managed by DCR in accordance with a program developed in consultation with the Commission's representative.

- **(Stormwater Management Permit: II. Conditions and Requirements – D)** A Stormwater Construction Site Inspection Report (Stormwater Pollution and Prevention Plan Inspection Report) shall be generated by the Applicant or its representative for this Project, at a minimum, every two weeks during construction, and after every major storm event.
- **(Stormwater Management Permit: II. Conditions and Requirements – G)** Construction reports with a summary of past week activities and look ahead at anticipated activities with advanced notification of anticipated phasing transitions shall be provided to Planning and Community Development on a weekly basis. On-site meetings shall be provided throughout construction, as needed, and indicated by the Planning and Community Development Environmental Planner. Site stabilization measures

- should be reviewed for adequacy and adjustments to the sediment and erosion control plan may be considered to optimize site stabilization. Reports shall include the location of active stockpiles with confirmation that appropriate erosion control measures are being implemented.

Stow

N/A

Hudson

Environmental Monitoring (OOC Special Condition 29) There shall be a qualified Environmental Monitor on site at all times that work is being performed in jurisdictional wetland areas. The Environmental Monitor shall send weekly reports and reports following any storm events of½ inch or greater electronically to the Conservation Agent.

Environmental Monitoring (OOC Special Condition 25) Resumes of Environmental Monitors being considered for the project shall be submitted to the Commission for review.

If the chosen Environmental Monitor does not have a qualified Vernal Pool Biologist or equivalent, a separate Vernal Pool Specialist shall be hired by the applicant to approve and supervise work within 450 feet of Vernal Pools during the TOY restriction of March I to June I. A qualified Vernal Pool Specialist will have at least three years of experience conducting vernal pool assessments or surveys in the northeastern United States.

4.2 Maintenance Action

Under the CGP, maintenance of stormwater controls is defined as minor repairs or other upkeep performed to ensure the site's stormwater controls remain in effective operating condition, not including significant repairs or the need to install a new or replacement control.

4.2.1 Maintenance Action Timelines

For any required maintenance actions project operators must:

- Immediately initiate the needed work and complete such work by the close of the next business day.
- If it is infeasible to complete the routine maintenance by the close of the next business day, you must document why this is the case and why the repair or other upkeep to be performed should still be considered routine maintenance in your inspection report and complete such work no later than seven (7) calendar days from the time of discovery of the condition requiring maintenance.

4.3 Corrective Action Directives

Project Operators must take corrective action to address any of the following conditions if they appear at the project site:

- A stormwater control needs significant repair or replacement
- A stormwater control necessary to comply with the permit was not installed, or was installed incorrectly
- A discharge from the project site is causing an exceedance of water quality standards to receiving waters
- A prohibited discharge has occurred (refer to Part 1.3 of the CGP)
- The weekly average of your turbidity monitoring results exceeds the 50 NTU benchmark (or alternate benchmark if approved by EPA pursuant to Part 3.3.2b); or

You observe or you are informed by EPA, State, or local authorities of the following:

- A sediment plume, suspended solids, unusual color, presence of odor, decreased clarity, or presence of foam; and/or
- A visible sheen on the water surface or visible oily deposits on the bottom or shoreline of the receiving water;

4.3.1 Corrective Action Timelines

For any required corrective action (refer to part 5.1 of the CGP), project operators must:

- Immediately take all reasonable steps to address the condition, including cleaning up any contaminated surfaces so that the material will not discharge in subsequent storm events.
- When the problem does not require a new or replacement control or significant repair, the corrective action must be completed by the close of the next business day.

- When the problem requires a new or replacement control, or significant repair, install the new or modified control by no later than 7 calendar days from the time of discovery.

- If it is not possible to complete the action within 7 days, record the extenuating circumstances in detail on a Corrective Action Form (Attachment K).

4.3.2 Corrective Action Reports

For each corrective action taken, complete a corrective action report in accordance with the following (refer to Part 5.4 of the CGP):

- Within 24 hours of identifying the condition requiring corrective action, document the condition and the date/time it was identified.

- Within 24 hours of completing the corrective action, document the action taken and note whether any modifications to the SWPPP are required.

The Corrective Action Log and Corrective Action Report Forms are maintained in Attachment K.

4.4 Amendments

This SWPPP must be amended, and the amendments must be recorded in the amendment log if any of the following conditions apply:

- Whenever new operators become active in construction activities on your site, or you make changes to your construction plans, stormwater controls, or other activities at your site that are no longer accurately reflected in your SWPPP. This includes changes made in response to corrective actions triggered under Part 5. You do not need to modify your SWPPP if the estimated dates in Part 7.2.3.f change during the course of construction;

- To reflect areas on your site map where operational control has been transferred (and the date of transfer) since initiating permit coverage;

- If inspections or investigations by EPA or its authorized representatives determine that SWPPP modifications are necessary for compliance with this permit;

- Where EPA determines it is necessary to impose additional requirements on your discharge, the following must be included in your SWPPP:

  - A copy of any correspondence describing such requirements; and
  - A description of the controls that will be used to meet such requirements.

- To reflect any revisions to applicable federal, state, tribal, or local requirements that affect the stormwater controls implemented at the site; and

- If applicable, if a change in chemical treatment systems or chemically enhanced stormwater control is made, including use of a different treatment chemical, different dosage rate, or different area of application.

The Amendment Log is maintained in Attachment H.

5.0 STAFF TRAINING

5.1 Training

Each Project Operator or group of Operators must assemble a Stormwater Team to carry out compliance activities associated with the requirements of the CGP. Prior to the commencement of construction activities, the Operators must ensure that the personnel on the stormwater team understand the requirements of this permit and their specific responsibilities with respect to those requirements.

All Project Operators and Subcontractors employees must attend Environmental Compliance Training, provided by Eversource, to become eligible to perform work on the Project Site.

All of the personnel responsible for the following activities must be trained to understand the relevant requirements under the terms of the CGP including:

- The design, installation, maintenance, and/or repair of stormwater controls (and pollution prevention controls)
- Permits that include provisions for stormwater and erosion control management include:
  - Sudbury, Stow, and Hudson Orders of Conditions
  - Sudbury Stormwater Management Permit
  - USACE General Permits for Massachusetts authorization
- The application and storage of treatment chemicals (if applicable)
- Conducting and documenting inspections (Part 4 of the CGP)
- Performing and documenting corrective actions (Part 5 of the CGP)
- Minimum training measures for the stormwater team must include:
  - Permit deadlines associated with the installation, maintenance, and removal of stormwater controls and stabilization
  - The location of all stormwater controls on the site required by this permit and how they must be maintained
  - The proper procedures to follow with respect to the permit's pollution prevention requirements
  - When and how to conduct inspections, record findings, and take corrective actions.

All members of the stormwater team must have easy access to an electronic or paper copy of the applicable portions of this permit, the most updated copy of the SWPPP, and other relevant documents associated with the SWPPP including logs and completed forms.

The Training Log and Attendance Records are maintained in Attachment G.

6.0 NOTIFICATIONS

6.1 Notice of Intent (NOI)

Following the completion of the draft SWPPP, project operators may submit their NOIs to the EPA.

Permit coverage does not begin until 14 calendar days from the date that the NOI is certified by a person authorized in accordance with Appendix I of the CGP.

Within 14 calendar days, the EPA may notify the Operator(s) that the authorization has been delayed or denied.

Project NOIs and authorizations are maintained in Attachment C.

6.2 Notice of Termination (NOT)

Operators are required to continue to comply with all conditions and requirements in the permit until coverage is terminated under this permit.

To terminate permit coverage, all Operators must submit a complete and accurate NOT to the EPA. The NOT certifies that an Operator has met the requirements for termination as listed in Part 8 of the CGP. Operators must use NPDES eReporting Tool (NeT) to electronically prepare and submit an NOT for the CGP.

https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting

Operators must submit the NOT within 30 calendar days after any of the triggering conditions listed in Part 8.2 of the CGP.

An Operator's authorization to discharge under the CGP terminates at midnight of the calendar day that a complete NOT is processed and posted on EPA's website.

Project NOTs and authorizations are maintained in Attachment C.

7.0 EROSION AND SEDIMENT CONTROLS

Stormwater controls have been designed, installed, and maintained in compliance with Part 2.1 of the CGP and as shown on the Project Plans in Attachment D, and in compliance with the specifications detailed in the municipal permits for the Towns of Sudbury, Stow, and Hudson.

Erosion and Sediment Controls must be installed as per the Project Plans in Attachment D, in compliance with the specifications detailed in the municipal permits for the Towns of Sudbury, Stow, and Hudson, and implemented to address the requirements of Part 2.2 of the CGP.

This section of the SWPPP provides general guidance for compliance with the CGP. Ultimately the project Operators are responsible for making sure sufficient controls are implemented to effectively meet the conditions of the CGP.

Any deviations to erosion and sediment controls shown on the Project Plans in Attachment D must be approved the Eversource Environmental Representative prior to implementation. Any proposed deviations must comply with the Eversource Best Management Practices Manual (See Attachment N). Note that these deviations are also subject to review and approval from the local Conservation Commission representatives.

The purpose of an erosion and sedimentation control program is to minimize the discharge of pollutants from earth-disturbing activities during the construction phase of the project. The program described in this SWPPP incorporates BMPs specified in guidelines developed by the DEP[1] and the U.S. Environmental Protection Agency[2] and complies with the requirements of the NPDES General Permit for Storm Water Discharges from Construction Activities.

Proper implementation of the erosion and sedimentation control program will:

- Minimize exposed soil areas through temporary stabilization and construction sequencing;
- Minimize sediment track-out from the site;
- Minimize the generation of dust;
- Minimize soil compaction;
- Place structures to manage stormwater runoff and erosion; and
- Establish permanent vegetative cover or other forms of stabilization in accordance with Part 2.2.14 of the CGP.

1 Massachusetts Department of Environmental Protection, 1993. Massachusetts Nonpoint Source Management Manual, The Megamanual: A Guidance Document for Municipal Officials.

2 United States Environmental Protection Agency, 1992. Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

The Contractor will install stormwater controls prior to the commencement of each phase of earth-disturbing activities per Part 2.1.3 of the CGP and as per the approved Project Plan set in Attachment D. All manufactured control measures will be installed and maintained in accordance with the manufacturer's specifications, and in compliance with the specifications detailed in the additional conditions listed below:

Sudbury

- Erosion Control Installation and Maintenance (OOC Part III: Erosion, Sedimentation, Stabilization Conditions for Phase I and Phase II – F) During Phase I, Eversource shall be responsible for installing and maintaining erosion controls within the project site. Following completion of Phase I, Eversource shall continue to maintain erosion controls until DCR commences Phase II, provided that Eversource shall remove erosion controls from areas stabilized at the completion of Phase I, as confirmed by the Commission or its agent. Every effort shall be made during Phase I to stabilize areas within vernal pool habitat immediately following final grade.
- Responsibiity of Sediment and Erosion Controls (Stormwater Management Permit: II. Conditions and Requirements – I): Responsibility of sediment and erosion control will depend on project phasing.

- During Phase I, Eversource shall be responsible for installing and maintaining erosion controls within the project site. Eversource may remove erosion controls from areas restored and revegetated as part of Phase I work if the Planning Board representative has inspected those areas and confirmed they are stabilized sufficiently. In the period between Phase I and Phase II, any erosion controls removed in areas that have been properly stabilized shall be reinstalled prior to commencement of Phase II.
    - During Phase II, DCR shall be responsible for installing and maintaining erosion controls on the Project Site during the performance of all Phase II construction activities, which may include utilizing erosion controls that were installed and maintained by Eversource if those erosion controls remain in proper condition and demarcate the limit of Phase II work. Otherwise, DCR shall install new erosion controls as required for Phase II, including in any restored and revegetated areas where Eversource was authorized to remove erosion controls.
    - Following completion of Phase II and inspection by a Planning Board representative, DCR shall be responsible for removal of all erosion control barriers.
    - **Sediment Basins (Stormwater Management Permit: II. Conditions and Requirements – J)** Proposed infiltration basins shall not be used as sediment basins during construction. Additional erosion controls shall be installed to protect infiltration basins from sedimentation until contributing areas are stable.

- **Erosion Control Removal (OOC Part III: Erosion, Sedimentation, Stabilization Conditions for Phase I and Phase II – H)** Should the time between Phase I and Phase II exceed one year, the site shall be assessed every six months, in the presence of the Commission or its Agent, to determine if erosion controls containing areas that are stable which will not be destabilized during Phase II, can be removed.

Stow

- **Sediment and Erosion Control Installation, Maintenance, and Monitoring (OOC Special Condition 27)** Sediment and erosion control devices shall be installed in accordance with the final plan by Eversource prior to the beginning of Phase 1 construction, and shall be maintained for the duration of construction on the site. If there is a gap between Phase 1 and Phase 2, Eversource shall be responsible for monitoring and maintaining erosion controls and site stabilization until Phase 2 commences or until a Partial Certificate of Compliance is issued for Phase 1 in accordance with the condition below. A second erosion control barrier inspection shall be required prior to the commencement of Phase 2, and the Commission may require that erosion controls be replaced or repaired by the Department of Conservation and Recreation at this time in order to maintain their full functionality.
- **Daily Site Stabilization Measures (OOC Special Condition 29)** The areas of construction shall remain in a stable condition at the close of each construction day. All trenches shall be backfilled or secured at the completion of each work day. Sediment and erosion controls shall be inspected daily and repaired or reinforced or replaced as necessary, with any accumulated sediments removed as needed. A stockpile of additional sediment and erosion controls shall be maintained on the site for this purpose.
- **Final Stabilization and Erosion Control Removal (OOC Special Condition 34)** If disturbed areas are not permanently stabilized by the end of the growing season, the owner must monitor the area and install or repair sediment and erosion controls to protect the resource area until the site is stabilized.
- **Erosion Control/Limit of Work (OOC Special Condition 28)** The erosion controls shall serve as a limit of work and no activity, including stockpiling or storage of material, is permitted beyond the sediment controls. The sediment and erosion control specifications in this Order and on the final plans will be the minimum standards for this project; the Commission may require additional measures. These will be maintained in good repair until the disturbed area is re-vegetated and stabilized to the satisfaction of the Stow Conservation Commission at which time they must be

removed. The Stow Conservation Commission shall be contacted and approval obtained prior to removal of sediment and erosion controls.

Hudson

- **Types and Locations of Erosion Controls (OOC Special Condition 23)** Erosion controls shall consist of(a) silt fence or (b) silt fence with compost filter tubes, double-staked straw bales, or wattles, as shown on the plans. Only invasive seed free erosion controls shall be used. Syncopated fencing shall be used within 450 feet of vernal pools. A silt curtain shall be used in Fort Meadow Brook near the bridge if conditions warrant.
- **Sediment ane Erosion Control installation, maintenance, and monitoring (OOC Special Condition 39)** If there is a gap between Phase I and Phase 2, erosion controls shall be maintained by Eversource. Erosion control in Priority and Estimated Habitat of Rare Species and within 450 feet of Vernal Pools may require removal. This shall be determined by a site walk with the applicant and Conservation Agent.
- **Removal of Erosion Controls (OOC Special Condition 42)** Prior to the issuance of a Certificate of Compliance and after the site has been stabilized, all erosion controls shall be removed from the site.

7.1 Natural Buffers or Equivalent Sediment Controls

The requirements for natural buffers are described in Part 2.2.1 and Appendix G of the CGP. This section of the SWPPP describes project compliance activities to maintain natural buffers in compliance with the CGP.

7.1.1 Buffer Compliance Alternatives

Are there any surface waters within 50 feet of the project's earth disturbances?

☒ YES ☐ NO

(Note: If no, no further documentation is required under Section 7.1 of this SWPPP Manual.)

If there are surface waters within 50 feet of the project's earth disturbances, continue below:

- ☐ The project will provide and maintain a 50-foot undisturbed natural buffer.
- Note (1): The project must show the 50-foot boundary line of the natural buffer on the Site Map.
- Note (2): The project must show on the Site Map how all discharges from the construction disturbances through the natural buffer area will first be treated by the site's erosion and sediment controls. Also, show on the site map any velocity dissipation devices used to prevent erosion within the natural buffer area.

- ☒ The project will provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by additional erosion and sediment controls, which in combination achieves the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

- Note: The project undisturbed buffer differs along the Project alignment and is demarcated by the Limits of Work shown on the Project Plans in Attachment D. All erosion and sediment controls that will treat runoff are also shown on the Project Plans in Attachment D.

- ☐ It is infeasible to provide and maintain an undisturbed natural buffer of any size, therefore the project will implement erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

- ☐ The project qualifies for one of the exceptions described in the CGP Appendix G, Part G.2. (If this box is checked, provide information on the applicable buffer exception that applies in Section 7.1.1.2.)

7.1.2 Buffer Exceptions

Indicate whether any of the following exceptions to the buffer requirements apply to the project site. Refer to Part 2.2.1 and Appendix G.2 of the CGP for more information.

- ☐ There is no discharge of stormwater to the surface water that is located 50 feet from my construction disturbances.

- ☐ No natural buffer exists due to preexisting development disturbances that occurred prior to the initiation of planning for this project.

- Note (1): If this exception applies, no further documentation is required to achieve compliance with Part 2.2.1.

- Note (2): Where some natural buffer exists but portions of the area within 50 feet of the surface water are occupied by preexisting development disturbances, the project must comply with Part 2.2.1 and Appendix G.2.2 of the CGP.

- ☒ For "linear construction sites" (see Appendix A), you are not required to comply with this requirement if site constraints (e.g., limited right-of-way) make it infeasible to implement one of the Part 2.2.1.a compliance alternatives, provided that, to the extent feasible, you limit disturbances within 50 feet of any waters of the U.S. and/or you provide supplemental erosion and sediment controls to treat stormwater discharges from earth disturbances within 50 feet of the receiving water You must also document in your SWPPP your rationale for why it is infeasible for you to implement one of the Part 2.2.1.a compliance alternatives, and describe any buffer width retained and supplemental erosion and sediment controls installed.

- ☐ The project qualifies as "small residential lot" construction and meets the compliance alternatives described in Appendix G.3 of the CGP.

- ☐ Buffer disturbances are authorized under a CWA Section 404 permit.

- Note (1): If this exception applies, no further documentation is required under Section 7.1 of this SWPPP Manual.

- Note (2): This exception only applies to the limits of disturbance authorized under the Section 404 permit and does not apply to any upland portion of the construction project.

- ☐ Buffer disturbances will occur for the construction of a water-dependent structure or water access area (e.g., pier, boat ramp, and trail).

- Note (1): If this exception applies, no further documentation is required under Section 7.1 of this SWPPP Manual.

7.2 Perimeter Controls

Refer to Part 2.2.3 of the CGP for information on the requirements for perimeter controls. Attachment D – Project Plans provides detailed locations and specifications for the perimeter controls to be implemented on the Project.

7.2.1 General Perimeter Controls

Installation of perimeter controls must be completed prior to the commencement of earth-disturbance activities. This section of the SWPPP provides examples of perimeter controls that the General Contractor may use to effectively control stormwater on construction sites. The General Contractor may select and install perimeter controls at their discretion. The locations of perimeter controls should be clearly identified on the Site Map.

The General Contractor will record activities associated with perimeter controls in the following project logs:

Table 7-1 Recording Requirements: Perimeter Controls

Action	Recorded in
Installation	Construction Activities Log
Inspection	Inspection Log
Maintenance	Corrective Action Log
Removal	Construction Activities Log

7.2.2 Specific Perimeter Controls

If the General Contractor elects to use controls that are not specified in this SWPPP manual, the contractor will prepare documentation describing the control installation, inspection, maintenance, and removal procedures and record the actions in the appropriate project logs.

Compost Filter Tube

Compost Filter Tubes consist of a jute mesh or other approved biodegradable material filled with compost and placed at the limit of work held in place with stakes. They are appropriate for use as perimeter controls.

The General Contractor will prepare and install compost filter tubes in accordance with manufacturer recommendations.

Inspection and Maintenance Requirements

Inspection and maintenance activities for compost filter tubes will include:

Table 7-2 Maintenance Requirements: Compost Filter Tubes

Inspection Item	Condition	Maintenance Activity
Condition	Torn outer fabric	Replace
Continuity	Break in continuous perimeter	Re-install existing -or- Install new to close any gaps
Sediment Build-up	Accumulated sediment at one-half the above ground height of the control	Remove the sediment and dispose properly

Syncopated silt-fence

Staked silt-fence erosion control devices are commonly used to intercept, filter, and reduce the velocity of stormwater run-off. They are appropriate for use as perimeter controls. Syncopated silt fence includes offset section of fencing to intentionally create gaps every 200 feet adequate for small wildlife to pass.

The General Contractor will place syncopated silt-fences at the downgradient edge of disturbed areas within 450 feet of a vernal pool, they are held in place by wooden stakes.

Inspection and Maintenance Requirements

Inspection and maintenance activities for syncopated silt fences will include:

Table 7-3 Maintenance Requirements: Syncopated Silt Fence

Inspection Item	Condition	Maintenance Activity
Condition	Rotted or torn	Replace
Continuity	Break in continuous perimeter or insufficient overlap between silt fence sections	Re-install existing -or- Install new to close any gaps
Sediment Build-up	Accumulated sediment at one-half the above ground height of the control	Remove the sediment and dispose properly
Placement	Silt fence not dug into the ground to prevent underflow	Reset, repair and/or re-install

Turbidity Curtain

Floating turbidity curtain may be used in open water areas to intercept, filter, and reduce the spread of turbidity within open water as part of the bridge replace work. They are appropriate for use as perimeter controls.

The General Contractor will place turbidity curtain at the downgradient edge of disturbed areas within open water. They are held in place by weighted toes and securing ropes to the shoreline. To be used in open water conditions where water depth is adequate to allow proper extension of the turbidly curtain skirt.

Inspection and Maintenance Requirements

Inspection and maintenance activities for turbidity curtains will include:

Table 7-4 Maintenance Requirements: Turbidity Curtains

Inspection Item	Condition	Maintenance Activity
Condition	Torn, loss of floatation at top	Replace
Continuity	Break in continuous perimeter	Re-install existing -or- Install new to close any gaps
Sediment Build-up	Accumulated sediment at one-half the above ground height of the control	Remove the sediment and dispose properly
Placement	Place along shoreline only! **DO NOT install across flowing water.**	Reset, repair and/or re-install

Staked Silt Fence

Staked silt fence erosion control devices are commonly used to intercept, filter, and reduce the spread of turbidity within open water as part of bridge replacement work. They are appropriate for use as perimeter controls. This is an alternative perimeter control to turbidity curtain in open water.

The General Contractor will place tall silt fence at the downgradient edge of disturbed areas within open water. They are held in place by driven stakes. To be used in open water conditions where water depth is adequate to allow installation of the silt fence proper but too shallow for installation of a turbidly curtain.

Inspection and Maintenance Requirements

Inspection and maintenance activities for staked tall silt fences will include:

Table 7-5 Maintenance Requirements: Staked Tall Silt Fence

Inspection Item	Condition	Maintenance Activity
Condition	Torn, fallen down stake	Replace, or reinstall
Continuity	Break in continuous perimeter	Re-install existing -or- Install new to close any gaps
Sediment Build-up	Accumulated sediment at one-half the above ground height of the control	Remove the sediment and dispose properly
Placement	Place along shoreline only! **DO NOT install across flowing water.**	Reset, repair and/or re-install

7.3 Sediment Track-out

Refer to Part 2.2.4 of the CGP for information on the requirements for sediment track-out controls. Attachment D – Project Plans provides detailed locations and specifications for the sediment track-out pads to be implemented on the Project.

7.3.1 General Track-out Controls

Sediment track-out controls may be structural or non-structural.

Non-structural controls including:

- Restricting vehicle use to properly designated exit points.
- Sweeping, shoveling, or vacuuming to manually remove sediment from public rights-of-way (hosing or sweeping sediment directly into a stormwater conveyance, storm drain inlet, or surface water is prohibited).

In the event that sediment is tracked-out of the site onto the surface of off-site streets, other paved areas, and sidewalks, the contractor will remove the deposited sediment by the end of the same workday. If track-out occurs on a non-workday, the contractor will remove the sediment by the end of the next workday.

The General Contractor may select and install structural sediment track-out controls at their discretion. The General Contractor shall specify locations of structural controls on the Site Map.

The General Contractor will record activities associated with sediment track-out controls in the following project logs:

Table 7-6 Recording Requirements: Sediment Track-out Controls

Action	Recorded in
Installation	Construction Activities Log
Inspection	Inspection Log
Maintenance	Corrective Action Log
Removal	Construction Activities Log

7.3.2 Specific Track-out Controls

If the General Contractor elects to use controls that are not specified in this SWPPP manual, the contractor will prepare documentation describing the control installation, inspection, maintenance, and removal procedures and record the actions in the appropriate project logs.

Stabilized Construction Entrance/Exit

The General Contractor will establish a stabilized construction entrance consisting of a stone pad at each access point off public roads. The construction entrance may include a cross-slope to direct runoff to a protected receiving area. If track-out is observed after construction begins, the General Contractor will take additional measures to address sediment track out.

Following completion of earth-disturbing activities, the General Contractor will remove the stabilized construction entrance/exit and installing final finishing materials. Inspection and maintenance activities for sediment track-out controls will include:

Table 7-7 Maintenance Requirements: Construction Entrance

Inspection Item	Condition	Maintenance Activity
Construction access routes adjacent to the disturbance area	Sediment present on vehicle travel surfaces	Sweep, shovel, or vacuum sediment from the surface, dispose of properly
Construction Entrance Condition	Muddy or sediment-laden	Add a top-dressing of stone or gravel

Sudbury

- **Site Access (OOC Special Conditions Part I General Project Conditions for Phase I and Phase II - S)** The site shall be accessed predominantly from public ways. If alternative access points are needed, the Applicants will first direct the contractor to use previously disturbed areas outside wetlands jurisdiction. If alternative access is found to be needed within wetlands jurisdiction, access may be permitted within previously disturbed areas that will not require additional vegetation removal or additional impacts to wetland resource areas, with approval from the Commission's representative. No equipment turnaround locations outside the limit of work are permitted.

7.4 Stockpiled Sediment or Soil

Refer to Part 2.2.5 of the CGP for information on the requirements for stockpile controls. Please refer to Section 7.4.2 for Project-Specific stockpiling requirements. ***In general, close coordination with the Eversource Environmental Representative and the Epsilon Team will be necessary to determine locations for any stockpiled sediment or soil. In addition, it will be necessary to coordinate with the local Conservation Commissions representative to review and approve stockpile locations. Attachment D – Project Plans provides the specifications for the dust and erosion controls to be implemented for stockpiled soil and/or sediment on the Project.***

The Contractor will provide cover or appropriate temporary stabilization to stockpiles that will remain inactive/unused for more than 14 days. Note that stockpiles cannot remain for more than 7 days in Sudbury. Temporary stabilization may be performed using vegetative or non-vegetative stabilization practices. Refer to Section 7.13 for more information on stabilization practices.

7.4.1 General Stockpile Controls

In accordance with Part 2.2.5 of the CGP, the contractor must comply with the following requirements for any stockpiles or land clearing debris composed, in whole or in part, of sediment or soil:

- Locate the piles outside of any natural buffers established under Part 2.2.1 and physically separated from other stormwater conveyances, drain inlets, and areas where stormwater flows are concentrated.
- Protect from contact with stormwater (including run-on) using a temporary perimeter sediment barrier;
- Provide cover or appropriate temporary stabilization to avoid direct contact with precipitation or wind;
- Do not hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance storm drain inlet, or water of the U.S.

Table 7-8 Recording Requirements: Stockpile Controls

Action	Recorded in
Installation	Construction Activities Log Grading and Stabilization Log
Inspection	Inspection Log
Maintenance	Corrective Action Log
Removal	Construction Activities Log Grading and Stabilization Log

7.4.2 Project-Specific Stockpiling Procedures, Duration, and Approvals

If the General Contractor elects to use controls that are not specified in Attachment D, then the Contractor should use controls included in Eversource's Best Management Practices Manual (Attachment N). ***Any deviations to stockpile controls from those specified in Attachment D must be approved the Eversource Environmental Representative prior to implementation. Note that these deviations are also subject to review and approval from the local Conservation Commission representatives.***

Additionally, the contractor must implement the following practices relative to Stockpile controls:

Sudbury

- (OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – U; Stormwater Management Permit: II. Conditions and Requirements – H) Stockpiling of materials within the ROW shall be limited in size and duration *(<u>one-week maximum</u>)* and shall be located as far from sensitive areas as possible. Soil stockpiles shall be covered with tarp or plastic sheet and surrounded by erosion controls. Excess soil not

reused within the Project site shall be stockpiled outside the ROW and wetland jurisdiction. Weekly reports prepared by the Environmental Monitors throughout construction will identify-the locations of active stockpiles and will confirm that the appropriate erosion control measures are being implemented.

Vegetative Stabilization

There are specific vegetation stabilization requirements and specifications for the Project. The Project Plan set in Attachment D contains all the specific seed mix and supplemental planting requirements for the Project. There shall be no deviations allowed for permanent vegetative stabilization measures.

Sudbury

- **(OOC Special Condition: Part I: General Conditions: For Phase I and Phase II – BB)** Every effort shall be made to reduce soil compaction. Compacted soils shall be aerated prior to· being revegetated.

- **(OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – Y)** Written reports shall be submitted by December 1 of each year the Order is active that details mitigation efforts that have been implemented, success of implementation, and anticipated activities the following growing season. Mitigation and Restoration areas shall be deemed substantially in compliance when there is a minimum of 90% cover with native species and free of invasive species.
- **(OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – Z)** Areas adjacent to vernal pools shall be revegetated immediately following the completion of all necessary grading in these areas, and the revegetation in these areas shall be monitored so erosion controls can be removed as soon as field conditions allow. Mitigation plantings around the vernal pool margins shall be monitored for successful establishment for a minimum of two growing seasons and annual reports documenting establishment shall be submitted to the Commission.
- **(OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – AA)** Prior to planting, the Applicant's Environmental Monitor shall inspect, approve, and provide photo documentation of all plant stock. Any species substitutions must be provided to the Commission, in writing, including a justification for substation, for review and approval prior to implementation.
- **(OOC Part VI: Conditions In Perpetuity – C)** Fertilizers shall not be used within jurisdictional areas.
- (Stormwater Management Permit: II. Conditions and Requirements – L) Native plants should be used for plantings throughout the site.
- **(OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – CC)** All plantings must survive for at least two growing seasons or be replaced at the expense of the Applicant.
- **(OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – DD)** Loam borrow brought to the site to stabilize the work area after completing Phase 1 shall be sourced appropriately. Use of impacted soils (from contamination or invasive seed) shall be prohibited.

- **(OOC Special Condition: Part I: General Conditions: For Phase I and Phase II – Y)** All areas of disturbance shall be monitored for invasive species, which shall be manually removed if encountered, for the duration of the project and until such time as a minimum of 90% native vegetative cover is established.

    - **(OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – HH)** Every effort shall be made to restore disturbed area with a similar soil composition to that which it was removed.

- **(OOC Special Condition: Part I: General Conditions: For Phase I and Phase II – Z)** The wetland replication area and land adjacent thereto shall be monitored for invasive species, and manually removed when found, for the life of the Order. The wetland replication area shall be considered substantially restored when it contains a minimum of 90% cover with native species. Replications that do not properly restore the functions and values of altered resource areas will not be deemed acceptable no matter how closely they adhere to approved engineered plans

Stow

- **(OOC Special Condition 37)** All imported soils shall be clean and reasonably free of invasive species. No soil contaminated with Japanese knotweed and/or knotweed rhizomes may be reused in Stow. The Environmental Monitor shall identify and document any areas contaminated with Japanese knotweed within 500' of the eastern and western Town of Stow line prior to commencing construction.

Hudson

- **(OOC Special Condition 31**) The applicant shall endeavor to locate a supplier of pesticide-free seed mixes. All restoration seed mixes shall be pesticide-free if practicable. Documentation of seed sources shall be provided to the Commission, prior to purchase if practicable.
- **(OOC Special Condition 40)** If there is a gap between Phase I and Phase 2, Eversource shall be responsible for the health of the restoration areas and the control of invasive species in these areas.
- **(OOC Special Condition 43)** and/or resource areas or as part of any mitigation plan have successfully established or may require replanting in case of significant failure.

- During this 2-year period, the applicant/property owner shall submit a report from a qualified wetlands scientist or landscape specialist at the end of each growing season describing the condition of the plantings following installation. If greater than 25% of plantings are not in good health then replacement plantings are required.

- The consultant shall prepare a final report on the status of the plantings as part of the Request for Two (2) full growing seasons shall be required to determine that any plantings within buffer zones a Certificate of Compliance. Successful establishment of the plantings will mean that at least 75% of the plantings have survived and are in good health and that the planting is free of invasive species. Successful establishment is a requirement for the issuance of a Certificate of Compliance.

  - **(OOC Special Condition 21)** Plantings must be native plants or substitutions only as identified on the approved plans. No invasive VEGETATION shall be planted.
  - **(OOC General Condition 18)** At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation

or other means. additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

Non-Vegetative Stabilization

Non-vegetative stabilization practices may include applying straw mulch or an erosion control blanket. There are specific non-vegetative stabilization details and specifications in the Project Plan set provided as Attachment D for the Project. Refer to Section 7.13.2.2 for more information.

Sudbury

- **(OOC Part III: Erosion, Sedimentation, Stabilization Conditions for Phase I and Phase II – C)** Stabilization of slopes shall be accomplished as soon as possible. Biodegradable jute netting shall be properly anchored in place, secured with non-chemically treated biodegradable materials. Should non-biodegradable fasteners be needed, with prior approval by the Commission and/or its agent, the Applicants may use non-biodegradable fasteners with the condition that the Applicants shall provide confirmation that all fasteners have been removed once the area is deemed fully stabilized by the Commission and/or its representative.
- **(OOC Part III: Erosion, Sedimentation, Stabilization Conditions for Phase I and Phase II – D)** Appropriate netting shall be installed under the bridge 128 during bridge work to prevent debris from- entering the stream. The Applicants shall contact the Conservation Office once installed for review prior to commencement of bridge work.

7.5 Minimize Dust

Refer to Part 2.2.6 of the CGP for information on the requirements for minimizing dust.

The General Contractor will record activities associated with dust controls in the following project logs:

Table 7-9 Recording Requirements: Dust Controls

Action	Recorded in
Installation	Construction Activities Log
Inspection	Inspection Log
Maintenance	Corrective Action Log
Removal	Construction Activities Log

Wetting the soil and/or spreading calcium chloride will be performed, as necessary, to minimize the movement of dust and fine-grained sediment. Fugitive dust created by movement of equipment or trucks along the project corridor or dust generated by wind warrant application of dust control measures. If water is used for dust control, it shall be applied as a fine spray to wet the upper 0.5 inch of soil.

7.6 Minimize the Disturbance of Steep Slopes

Refer to Part 2.2.7 of the CGP for information on the requirements for controls on steep slopes. The Project Plans provided as Attachment D show the limits of work and all areas of disturbance. There shall be no deviation from these limits of work allowed.

Where a state, tribe, local government, or industry technical manual (e.g., stormwater BMP manual) has defined what is to be considered a "steep slope", the CGP automatically adopts that definition. Where no such definition exists, steep slopes are automatically defined as those that are 15 percent or greater in grade.

The General Contractor will record activities associated with steep-slope controls in the following project logs:

Table 7-10 Recording Requirements: Steep Slope Stabilization Controls

Action	Recorded in
Installation	Construction Activities Log Grading and Stabilization Log
Inspection	Inspection Log
Maintenance	Corrective Action Log
Removal	Construction Activities Log Grading and Stabilization Log

7.6.1 General Steep Slope Controls

During the design phase of the project, the design engineers minimized construction impacts to steep slopes to the maximum extent practicable.

Where disturbances to steep slopes are still required, the General Contractor will minimize disturbances through the implementation of erosion and sediment control practices designed for use on steep slopes.

Stabilization practices on steep slopes will occur within 14 days after grading or construction activities have temporarily or permanently ceased.

7.6.2 Specific Steep Slope Controls

If the General Contractor elects to use controls that are not specified in this SWPPP manual, the contractor will prepare documentation describing the control installation, inspection, maintenance, and removal procedures and record the actions in the appropriate project logs.

Vegetative controls

Vegetative slope stabilization practices will be used to minimize erosion on slopes of 3:1 or flatter. Temporary, rapid stabilization will be completed using annual grasses, such as annual rye. Permanent stabilization will be completed as specified on the Project Plans in Attachment D.

A suitable topsoil, good seedbed preparation, soil amendments, and water will be provided for effective establishment of these vegetative stabilization methods. Vegetation will be applied or planted as per the specifications in Attachment D. Mulch may also be applied following permanent seeding activities to protect soil from the impact of falling rain and to increase the capacity of the soil to absorb water.

Refer to Section 7.13.2.1 for inspection and maintenance activities for vegetative stabilization controls.

Erosion Control Blanket

Erosion control blankets may be combined with vegetative controls to minimize erosion on slopes 3:1 or steeper. Erosion control blankets shall consist of a non-woven bio-degradable material and shall be installed by anchoring the top of the blanket in a 6-inch-deep trench. The trench shall be backfilled and compacted after the blanket is secured with staples. The erosion control blanket will be installed in the direction of potential flow. Edges of the blankets must be stapled with approximately 4 inches overlap where 2 or more strip widths are required.

Refer to Section 7.13.2.2 for inspection and maintenance activities for non-vegetative stabilization controls.

7.7 Topsoil

Refer to Part 2.2.8 of the CGP for information on the requirements for the preservation of topsoil.

The General Contractor will record activities associated with topsoil controls in the following project logs:

Table 7-11 Recording Requirements: Topsoil Controls

Action	Recorded in
Stockpiling	Construction Activities Log Grading and Stabilization Log
Disposal	Construction Activities Log Grading and Stabilization Log

Topsoil will be preserved to the maximum extent practicable. Where it is infeasible to preserve topsoil in place, it will be repurposed throughout the site or stockpiled and disposed of in accordance with local, state, and federal regulations, as necessary.

7.8 Soil Compaction

Refer to Part 2.2.9 of the CGP for information on the requirements for the reduction of soil compaction.

To avoid soil compaction, the General Contractor will limit vehicle and equipment use in areas where final vegetative stabilization will occur or where infiltration practices will be installed.

Prior to seeding or planting of areas where final vegetative stabilization will occur or where infiltration practices will be installed the soil will be inspected to determine if compaction will hinder vegetative growth.

If compaction has occurred, techniques that condition soil to support vegetative growth will be implemented. Soil conditioning techniques shall be specified, as needed by the General Contractor.

Sudbury

- **Soil Compaction (OOC Special Conditions Part I for Phase I and II – X)** Heavy mechanical equipment (exerting a ground pressure of 3 psi or greater) will not be allowed in areas where final grading, aeration, and vegetation restoration/mitigation have been completed, including restored and replicated wetland resource areas. Following completion of restoration areas, erosion controls or other method of demarcation shall be implemented to prevent further alteration of restoration areas.

7.9 Storm Drain Inlets

Refer to Part 2.2.10 of the CGP for information on the requirements for the protection of storm drain inlets.

The General Contractor will record activities associated with storm drain inlet protection in the following project logs:

Table 7-12 Recording Requirements: Stormdrain Inlet Controls

Action	Recorded in
Installation	Construction Activities Log
Inspection	Inspection Log
Maintenance	Corrective Action Log
Removal	Construction Activities Log

7.9.1 General Storm Drain Inlet Controls

Prior to any earth-disturbing activities inlet protection measures will be installed. Storm drain inlet controls are required at all storm drain inlets that carry stormwater flow from the project site to a water of the U.S., even if they are located downgradient from a construction period stormwater BMP.

7.9.2 Specific Storm Drain Inlet Controls

If the General Contractor elects to use controls that are not specified in this SWPPP manual, the contractor will prepare documentation describing the control installation, inspection, maintenance, and removal procedures and record the actions in the appropriate project logs.

Siltsack Sediment Traps

The General Contractor may choose to use Siltsack sediment traps at the project site. They may be installed at the inlets of existing and proposed catch basins. At locations where silt sacks are used, the catch basin grates will be placed over the siltsack to secure it into place.

Straw Bale and Non-Woven Filter Fabric

The General Contractor may choose to use Straw bale barriers at the project site. They may be installed at the inlets of existing and proposed catch basins. At locations where straw bales are used, a layer of non-woven filter fabric will be placed beneath the grate of each catch basin to secure it into place.

Inspection and Maintenance Requirements

Inspection and maintenance activities for storm drain inlet controls includes:

Table 7-13 Maintenance Requirements: Storm Drain Inlet Controls

Inspection Item	Condition	Maintenance Activity
Sediment accumulation	Sediment buildup at filter layer	Sweep, shovel, or vacuum sediment from the filter surface, dispose of properly.
Continuity	Breaks in continuous barrier	Install new or re-install original barrier structure.
Clogging	Standing water	Sweep, shovel, or vacuum sediment from the filter surface, dispose of properly. Install new or re-install restored filter layer.

Additionally, the contractor must comply with the following conditions:

Sudbury

- **(OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – D)** At least two weeks prior to any land disturbance, a structural engineer and wildlife biologist shall inspect the culverts and drainage structures within the Project Site to determine whether they are structurally sound to (a) function hydrologically, (b) withstand the planned construction activities, and (c) evaluate their wildlife migration functions, and shall provide a report of the finding to the Commission. If any culverts do not meet these requirements or is damaged during construction, it shall be repaired or replaced with a culvert that meets current MA Stream Crossing Standards to the maximum extent practicable, as determined by the Commission or its Agent. Any recommended improvements to these structures, not included in this Notice, shall be required to submit a separate Notice of Intent and/or an Amendment to this Order to the Commission for further evaluation. Following completion of Phase I and Phase II a similar structural evaluation shall be conducted to confirm work did not affect culverts and drainage structures.

Stow

N/A

Hudson

- **(OOC Special Condition 37)** The catch basin at station 119 shall be a leaching catch basin.

7.10 Stormwater Basins

Although no stormwater basins are proposed for this project, the contractor must comply with the following conditions:

Sudbury

- **(OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – W)** infiltration basins shall not be used as sediment basins during construction. Additional erosion controls shall be installed to protect infiltration basins from sedimentation until contributing areas are stable.

Stow

N/A

Hudson

N/A

7.11 Use of Chemical Treatment

Refer to Part 2.2.13 of the CGP for information on the requirements for chemical treatment.

Record activities associated with chemical treatment in the following project logs:

Table 7-14 Recording Requirements: Chemical Treatment Controls

Action	Recorded in
Training	Training Log
Installation	Construction Activities Log
Inspection	Inspection Log
Maintenance	Corrective Action Log
Removal	Construction Activities Log

7.11.1 Specific Chemical Treatment Controls

No specific chemical treatment controls are anticipated to be utilized by the General Contractor for the Project. The General Contractor must only utilize mechanical means to remove vegetation along the Project. **The use of herbicides is not allowed along any portion of the Project**.

If a specific chemical treatment control, other than herbicides, is identified to be necessary, the General Contractor is required to obtain approval from the Eversource Environmental Representative prior to implementation. Note that the Eversource Environmental Representative will need to coordinate with the appropriate local boards prior to issuance of an approval to the Contractor. In addition, the General Contractor is responsible for listing all approved treatment chemicals in the table below, as necessary. If any of the chemicals are cationic, the General Contractor must also receive authorization from the Regional Office of the EPA and indicate such approval in the Table 7-19.

Table 7-15 List of Treatment Chemicals and Dosage/Use to be used on Site

Chemical	Dosage and Application Details	Cationic Authorization in Attachment P
None Proposed		☐
		☐
		☐
		☐
		☐
		☐
		☐
		☐

7.12 Site Stabilization

The following sections outline the specific site stabilization requirements for the Project. These requirements are based upon Part 2.2.14 of the CGP. In summary, there are specific vegetation stabilization requirements and specifications for the Project. The Project Plan set in Attachment D contains all the specific seed mix and supplemental planting requirements for the Project. There shall be no deviations allowed for permanent vegetative stabilization measures.

The General Contractor will record activities associated with site stabilization in the following project logs:

Table 7-16 Recording Requirements: Site Stabilization Controls

Action	Recorded in
Installation	Construction Activities Log Grading and Stabilization Log
Inspection	Inspection Log
Maintenance	Corrective Action Log
Removal	Construction Activities Log Grading and Stabilization Log

7.12.1 General Site Stabilization Controls

The contractor will implement and maintain stabilization measures that minimize erosion from exposed portions of the site in accordance with Parts 2.2.14a and 2.2.14b of the CGP.

- For discharges to sediment- or nutrient-impaired waters or to a water that is identified by Massachusetts or the EPA as a Tier 2, Tier 2.5, or Tier 3 water, complete stabilization as soon as practicable but no later than 7 calendar days after stabilization has been initiated. Refer to Table 3-7 for a list of these receiving waters along the Project.

- For all other discharges, initiate stabilization measures immediately in any areas of exposed soil where construction activities have ceased and will not resume for 14 or more calendar days. The EPA may propose an accelerated schedule if site conditions warrant additional protection measures. Some exceptions for unforeseen circumstances apply, refer to Parts 2.2.14(a)(iii) of the CGP. Document any departures from the standard timeline in the construction activities log.

Site stabilization practices may be temporary or permanent, vegetative, or non-vegetative.

7.12.2 Specific Site Stabilization Controls

There are specific vegetation stabilization requirements and specifications for the Project. The Project Plan set in Attachment D contains all the specific seed mix and supplemental planting requirements for the Project. There shall be no deviations allowed for permanent vegetative stabilization measures.

Vegetative Stabilization

Temporary, rapid vegetative stabilization will be completed using annual grasses, such as annual rye. There are specific vegetation stabilization requirements and specifications for the Project. The Project Plan set in Attachment D contains all the specific seed mix and supplemental planting requirements for the Project. There shall be no deviations allowed for permanent vegetative stabilization measures.

The Contractor will provide a suitable topsoil, good seedbed preparation, soil amendments, and water for effective establishment of these vegetative stabilization methods.

Mulch may also be applied following permanent seeding activities to protect soil from the impact of falling rain and to increase the capacity of the soil to absorb water.

Non-Vegetative Stabilization

Non-vegetative stabilization practices may consist of the application of mulch or erosion control blankets.

Mulch Application

If application of mulch is necessary, mulch will be applied at a rate of 90 pounds per 1,000 square feet. The mulch will be anchored with a tacking coat (non-tar) applied by a hydroseeder. Steeper slopes (greater than 10 percent) will be covered with a bonded fiber matrix.

Erosion Control Blanket

Erosion control blankets will consist of bio-degradable materials such as mats of woven jute and/or coconut fiber.

Erosion control blankets may be combined with vegetative controls. For permanent stabilization applications, erosion control blankets shall consist of a non-woven bio-degradable material and shall be installed by anchoring the top of the blanket in a 6-inch-deep trench. The trench shall be backfilled and compacted after the blanket is secured with staples. Edges of the blankets must be stapled with approximately 4 inches overlap where two or more strip widths are required.

Erosion control blankets are applied to the soil surface as a continuous sheet and are used to protect disturbed areas from erosion and to enhance seed growth, typically where moving water is likely to wash out new vegetative plantings and mulches are ineffective.

Inspection and Maintenance Requirements

Inspection and maintenance activities for site stabilization will include:

Table 7-17 Maintenance Requirements: Site Stabilization

Inspection Item	Condition	Maintenance Activity
Surface	Erosion	Reinforce the surface using a vegetative or non-vegetative stabilization measure

Inspection Item	Condition	Maintenance Activity
SWPPP		Maintain the SWPPP throughout the construction period in accordance with the terms of the CGP.

7.13 Dewatering Practices

Refer to Part 2.4 of the CGP for information on the requirements for dewatering. Note that all proposed dewatering locations must be reviewed by and approved by the Environmental Compliance Manager.

All proposed dewatering locations must be reviewed and approved by the Eversource Environmental Representative and will require review and approval by the local Conservation Commission representative prior to use.

7.13.1 General Dewatering Practices

If project activities require dewatering, the General Contractor will implement dewatering practices to comply with the following requirements. As mentioned above, please note that all proposed dewatering locations must be reviewed by and approved by the Environmental Compliance Manager prior to use. Proposed dewatering locations within wetland resource areas will be subject to review and approval by the local Conservation Commission prior to use.

The General Contractor:

- Will treat dewatering discharges with controls to minimize discharges of pollutants
- Will not discharge visible floating solids or foam
- Will use an oil-water separator or suitable filtration device that is designed to remove oil, grease, or other products if dewatering water is found to contain these materials.
- Will discharge water to vegetated, upland areas of the site to promote infiltration.
- Will comply with velocity dissipation requirements of Part 2.2.11
- Will handle backwash water by either hauling it away or returning it to the beginning of the treatment process
- Will replace and clean the filter media used in the dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.

The General Contractor may select and install dewatering controls at their discretion. The General Contractor shall specify locations of structural controls on the Site Map.

The General Contractor will record activities associated with dewatering controls in the following project logs:

Table 7-18 Recording Requirements: Dewatering Controls

Action	Recorded in
Installation	Construction Activities Log
Inspection	Inspection Log
Maintenance	Corrective Action Log
Removal	Construction Activities Log

7.13.2 Project-Specific Dewatering Practices

If the General Contractor elects to use controls that are not specified in this SWPPP manual, the contractor will prepare documentation describing the control installation, inspection, maintenance, and removal procedures and record the actions in the appropriate project logs.

For those portions of the Project that discharge dewatering off the site, the following must occur:

Dewatering water discharge: Inspections must be conducted in accordance with Part 4.6.3 of the CGP, which during the discharge once per day on which the discharge occurs. The Part 4.2 inspection frequency still applies to all other portions of the site unless the site is affected by either the increased frequency in Part 4.3.1 or the reduced frequency in Part 4.4.

Turbidity Monitoring Requirements: For sites discharging dewatering water to or within 100 feet of any "sensitive waters" (i.e., receiving waters listed as impaired for sediment or a sediment-related parameter (as defined in Appendix A), or receiving waters designated as a Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes) you are required to comply with the benchmark monitoring requirements in this Part and document the procedures you will use at your site in your SWPPP pursuant to Part 7.2.8

- **Sampling frequency.** You must collect at least one turbidity sample from your dewatering discharge each day a discharge occurs.

- **Sampling location.** Samples must be taken at all points where dewatering water is discharged. Samples must be taken after the dewatering water has been treated by installed treatment devices pursuant to Parts 2.4.1 and 2.4.3 and prior to its discharge off site into a receiving water, constructed or natural site drainage feature, or storm drain inlet.

- **Representative samples.** Samples taken must be representative of the dewatering discharge for any given day as required in Appendix G (standard permit conditions), Part G.10.2.

- **Test methods.** Samples must be measured using a turbidity meter that reports results in nephelometric turbidity units (NTUs) and conforms with a Part 136-approved method (e.g., methods 180.1 and 2130). You are required to use the meter, and conduct a calibration verification prior to each day's use, consistent with the manufacturer's instructions.

Dewatering Filter Bag

The dewatering filter bag consists of a non-woven geotextile filter fabric placed at the outlet of one (maximum diameter) six-inch discharge hose. If the dewatering filter bag will be used as a construction period dewatering control device, any bags will be placed on relatively flat terrain, free of brush and stumps. If rough ground conditions make punctures likely, a geotextile fabric will be placed beneath the filter bag. Unattended filter bags will be encircled with a straw bale and silt fence barrier.

Inspection and Maintenance Requirements

All dewatering structures will be placed as far away from wetland resources as practicable. Filter bags used during construction will be bundled and removed for proper disposal. Filter media shall be cleaned and replaced in all dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.

Additionally, the contractor must comply with the following conditions:

Sudbury

- **(OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – Q)** Dewatering activities shall be located as far as possible from wetland resource areas and shall be prohibited from discharging to Bordering Vegetated Wetlands, Isolated Vegetated Wetlands, Land Under Water Bodies and Waterways, or within the inner Riverfront Area. Dewatering may only occur in other upland resource areas provided adequate control measures are implemented and locations are identified by the contractor and review and approved by the Commission and/or its agent prior to implementation.

Stow

N/A

Hudson

- **(OOC Special Condition 34)** If dewatering is necessary, water will not be discharged directly into any waterbodies, BVW, or inner 100' of RFA. The Conservation Commission shall be notified in advance if dewatering is required within jurisdictional areas and shall inspect the work site before dewatering commences if such inspection can occur within 24 hours of notification.

8.0 POLLUTION PREVENTION

8.1 Potential Sources of Pollution

The following list identifies pollutant generating activities that are likely to occur on the project site in accordance with Part 7.2.3.g of the CGP.

Table 8-1 Pollutant Generating Activities and Pollutants Located on Site

Pollutant-generating Activity	Pollutants or Pollutant Constituents (that could be discharged if exposed to stormwater)	Location on Site (or reference SWPPP site map where this is shown)
Vehicle Maintenance	Petroleum-based products	
Cleared & Graded Areas	Soil erosion	
Portable Toilets	Sewage	
Fuel Tanks	Fuel oil, gasoline, other fuels	
Storage Areas	Soil erosion, fuel oil, gasoline, concrete, vehicle fluids, paints, solvents, adhesives	

In addition to the general practices outline in this section, the contractor must comply with the following conditions:

- Sudbury
- **(Stormwater Management Permit: II. Conditions and Requirements – O)** The following source control and pollution prevention measures shall be employed on the site to prevent contamination of stormwater runoff:
  - Debris shall be removed from the paved path regularly, ideally swept with a vacuum or regenerative air sweeper.
  - Measures shall be taken to control litter on the site.
  - No chemicals or hazardous wastes shall be stored on the property.
  - Slow-release nitrogen and low phosphorus fertilizers shall be applied sparingly to prevent wash off.
  - No fertilization, herbicide, or pesticide application shall occur within any vernal pool, vegetated wetland, or waterway. Eversource, as part of their operations, shall not conduct fertilization, herbicide, or pesticide application. DCR shall not use herbicides within any vernal pool, vegetated wetland, or waterway. Invasive species removal by DCR will be by mechanical means when possible and spot treatments of herbicide by a licensed applicator when other approaches are not effective. This Condition is ongoing and does not expire with the expiration of the Order of Conditions or the issuance of a Certificate of Compliance.

- Hazardous wastes shall be used and disposed of properly.
- No vehicle washing shall be allowed on the property.
- Vehicles shall be maintained and clean up fluid spills/drips shall occur with absorbent materials immediately.
- Personnel shall be educated on implementation of spill abatement and containment procedures.
- No de-icing products shall be used on the site.
- No coal tar-based pavement sealants are to be used on site.

♦ **(OOC Special Conditions Part I for Phase I and II – U)** Any fill used in connection with this project shall be clean fill, containing no trash, refuse, rubbish or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles or parts of any of the foregoing.

♦ **(OOC Special Conditions Part II Conditions Specific to Phase I Eversource Underground Transmission Line – S)** Other than the grading of minor amounts of soil within the immediate vicinity of the Hudson/Sudbury town boundary, no soil excavated from Hudson may be used in Sudbury. The Sudbury Conservation Commission shall be copied if the Hudson Conservation Commission is notified of any remedial activities or changes to the work plans required due to the potential presence of PFAS in jurisdictional areas in Hudson.

♦ **(OOC Special Condition Part II Conditions Specific to Phase I Eversource Underground Transmission Line – T)** The Applicant shall ensure that any reuse of on-site soils shall not result in the degradation of soil or groundwater in the area.

Stow

♦ **(OOC Special Condition 31)** Concrete wash-out water shall not be discarded within the 100' buffer or within 100' of any drainage system that may discharge to wetlands or outside of the limit of work. All washout materials will be managed with an appropriate BMP. If concrete is spilled during construction, spilled materials shall be removed from the buffer zone and disposed of properly.

♦ **(OOC Special Condition 35)** There shall be no outside storage of chemicals, oil, fuel, fertilizer, or other potentially hazardous materials within the limit of work. No refueling shall occur within the 100' buffer. A spill containment kit shall be kept on site at all times.

♦ **(OOC Special Condition 36)** All waste and excavated material including railroad ties and tracks shall be disposed of in accordance with applicable laws. Any fill or borrow material brought onto the project site in Stow from outside of Stow shall be 1) re-located from qualified immediately adjacent residential areas per DEP's Best Management Practices for Controlling Exposure to soil during the Development of Rail Trails; 2) certified as clean fill by the supplier; or 3) subject to analytical testing.

- **(OOC Special Condition 40)** No dumping of leaves, woody debris, dog waste, excessive snow and any other materials is permitted in or within 100' of wetland resource areas, including the Riverfront Area.

Hudson

- **(OOC Special Condition 33)** Trash removal shall be performed along the ROW, even outside the limits of work, as practicable. Locations of trash removal shall be determined by a site walk of the applicant and Conservation Agent and/or Commissioner.

8.2 Fueling and Maintenance of Equipment or Vehicles

Fueling shall take place at least 100 feet away from any vegetated wetland or open water areas. Any proposed fueling within 100 feet of a vegetated wetland or open water area shall be approved by the Environmental Compliance Manager.

When fueling or maintaining equipment or vehicles, the contractor will adhere to the following requirements specified in Part 2.3.1 of the CGP:

- Provide an effective means of eliminating the discharge of spilled or leaked chemicals, including fuels and oils, from these activities.
- If applicable, comply with the Spill Prevention Control and Countermeasures (SPCC) requirements in 40 CFR 112 and Section 311 of the CWA;
- Ensure adequate supplies are available at all times to handle spills, leaks, and disposal of used liquids;
- Use drip pans and absorbents under or around leaky vehicles;
- Dispose of or recycle oil and oily wastes in accordance with other federal, state, tribal, or local requirements;
- Clean up spills or contaminated surfaces immediately, using dry clean up measures where possible, and eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge. Do not clean surfaces by hosing the area down.

Sudbury

- **(OOC Special Conditions Part I for Phase I and II – V)** No equipment cleaning or refueling may occur within a wetland or upland resource area, with the exception of the crane. For cranes positioned within wetland jurisdiction for more than one day, the Applicant shall provide secondary containment to contain any leaks that may emanate from equipment.

8.3 Washing of Equipment and Vehicles

When washing equipment and/or vehicles, the contractor will adhere to the following requirements specified in part 2.3.2 of the CGP.

- Provide an effective means of minimizing the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other types of washing.

- Ensure that there is no discharge of soaps, solvents, or detergents in equipment and vehicle wash water.

- For storage of soaps, detergents, or solvents, the contractor must provide either cover (e.g., plastic sheeting or temporary roofs) to prevent these detergents from coming into contact with rainwater, or a similarly effective means designed to prevent the discharge of pollutants from these areas.

- Washing is not allowed within 100 feet of a vegetated wetland or open waterbody.

Effective controls may include, but are not restricted to, locating activities away from surface waters and stormwater inlets or conveyances and directing wash waters to a sediment basin or sediments trap, using filtration devices, such as filter bags or sand filters, or using other similarly effective controls.

Refer to Part 2.3.4 of the CGP for additional requirements for handling wash water associated with concrete, paint, or stucco.

8.4 Storage, Handling, and Disposal of Construction Products, Materials, and Wastes

When storing, handling, and disposing of construction products, materials, and wastes, the contractor will adhere to the following good-housekeeping practices specified in part 2.3.3 of the CGP.

- An effort will be made to store only enough product required to do the job;

- Products will be kept in their original containers with the original manufacturer's label;

- Substances will not be mixed with one another unless recommended by the manufacturer;

- Whenever possible, all of a product will be used before disposing of the container;

- Manufacturer's recommendations for proper use and disposal will be followed; and

- The site superintendent will inspect the storage area daily to ensure proper use and disposal of materials on-site.

The following practices will reduce the risks associated with hazardous materials (e.g., petroleum products, solvents):

- A copy of all Material Safety Data Sheets (MSDS) for materials or products used during construction will be kept in the office trailer;

- Products will be kept in original containers unless they are not re-sealable;

- Original labels and material safety data (MSD sheets) will be retained; they contain important product information; and

- If surplus product must be disposed, manufacturer's or local- and state-recommended methods for proper disposal will be followed.

- The storage of these materials is not allowed within 100 feet of a vegetated wetland or open waterbody.

Sudbury

- **OOC Special Conditions Part I General Project Conditions for Phase I and Phase II – T)** Laydown areas shall be located predominantly outside resource areas subject to the Commission's jurisdiction. If any construction laydown area is proposed outside of the currently proposed work limits and in an area subject to the Commission's jurisdiction, an erosion control plan shall be submitted in advance to the Commission's representative for review and approval.

8.4.1 Building Products

In accordance with CGP Part 2.3.3.b, all containers will be tightly sealed and covered with plastic sheeting or a temporary roof when not required for use. Excess materials will be properly disposed according to manufacturer's instructions or state and local regulations and shall not be discharged to the storm sewer system. No storage will occur within 100 feet of a wetland or waterway.

8.4.2 Pesticides, Herbicides, Insecticides

Pesticides, herbicides, and insecticides will not be used at the Project Site.

8.4.3 Diesel Fuel, Oil, Hydraulic Fluids, Other Petroleum Products, and Other Chemicals

In accordance with CGP Part 2.3.3.c products stored on site will be contained in water-tight containers with either

- A cover to minimize the exposure of the container to precipitation and to stormwater or

- Or a similarly effective means detained to minimize the discharge of pollutants from these areas such as secondary containment

All on-site vehicles will be monitored for leaks and will receive regular preventive maintenance to reduce the chance of leakage. Spills will be cleaned up immediately, using dry clean-up methods where possible. The source of the spill will be eliminated to prevent continuation of an on-going discharge.

No vehicle maintenance or handling of petroleum products will occur within 100 feet of a wetland or waterway.

Any asphalt substances used on-site will be applied according to manufacturer's recommendations. No petroleum-based or asphalt substances will be stored within 100 feet of a wetland or waterway.

8.4.4 Hazardous or Toxic Waste

In accordance with CGP Part 2.3.3.d, the contractor will:

- Separate hazardous or toxic waste from construction and domestic waste;
- Store waste in sealed containers, which are constructed of suitable materials to prevent leakage and corrosion, and which are labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements and all other applicable federal, state, tribal, or local requirements;

- Store all containers that will be stored outside within appropriately sized secondary containment (e.g., spill berms, decks, spill containment pallets) to prevent spills from being discharged, or provide a similarly effective means designed to prevent the discharge of pollutants from these areas (e.g., storing chemicals in covered area or having a spill kit available on site); and

- Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly.

- Hosing will not be utilized as a method to clean surfaces or spills.

- Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge.

All hazardous waste materials (e.g., petroleum products, solvents) will be disposed in the manner specified by local and state regulation, or by the manufacturer. Site personnel will be instructed in these practices, and the site construction supervisor will be responsible for seeing that these procedures are followed.

8.4.5 Construction and Domestic Waste

In accordance with CGP Part 2.3.3.e, the contractor will provide waste containers (e.g., dumpster or trash receptacle) of sufficient size and number to contain construction and domestic wastes. Waste containers will be covered to prevent precipitation from entering the container and becoming a source of pollution. Alternatively, the waste container will be kept in secondary containment to prevent discharges of contaminated stormwater.

Daily loose trash removal will prevent litter, construction debris, and construction chemicals exposed to stormwater from becoming a pollutant source for stormwater discharges. All loose trash will be placed in appropriate storage containers and will be disposed of properly.

The General Contractor will identify the areas to be used for storing dumpsters, compactors or other raw or waste materials on the Site Map.

8.4.6 Large Structures Built or Renovated prior to January 1980

In accordance with CGP Part 2.3.3.f, the contractor will implement controls to minimize the exposure of PCB-containing building materials including paint, caulk, and pre-1980s fluorescent light fixtures to precipitation and stormwater and ensure that disposal of such materials is performed in compliance with applicable state, federal and local laws.

8.4.7 Sanitary Waste

Portable toilets will be placed away from waters of the U.S., stormwater inlets and/or conveyances and will be secured in place so that they will tip or be knocked over. All sanitary waste will be collected from the portable units by a licensed contractor as required and disposed in compliance with state and local regulations.

8.5 Washing of Applicators and Containers used for Paint, Concrete or Other Materials

In compliance with the prohibition in CGP Parts 2.3.4, the contractor must provide an effective means of eliminating the discharge of water from the washout and cleanout of stucco, paint, concrete, form release oils, curing compounds, and other construction materials. To comply with this requirement, the contractor must:

- Direct all wash water into a leak-proof container or leak-proof pit. The container or pit must be designed so that no overflows can occur due to inadequate sizing or precipitation;
- Handle washout or cleanout wastes as follows:
  - Do not dump liquid wastes in storm sewers;
  - Dispose of liquid wastes in accordance with applicable requirements in Part 2.3.3; and
  - Remove and dispose of hardened concrete waste consistent with handling of other construction wastes in Part 2.3.3.
- Locate any washout or cleanout activities as far away as possible from surface waters and stormwater inlets or conveyances, and, to the extent practicable, designate areas to be used for these activities and conduct such activities only in these areas.
- The location of all washouts and/or cleanout areas shall be reviewed by approved by the Environmental Compliance Manager.

8.6 Pavement Sweeping

Pavement sweeping may be performed daily or as needed when track-out has occurred. The sweeping program will remove sediments and contaminants directly from paved surfaces before their release into stormwater runoff. Pavement sweeping has been demonstrated to be an effective initial treatment for reducing pollutant loading into stormwater.

8.7 Spill Prevention and Response

The permit defines a spill as "the release of a hazardous or toxic substance from its container or containment." The following practices will be followed for spill control, notification, and cleanup:

The General Contractor is responsible for the daily operations and is also responsible for coordinating spill prevention and cleanup coordination. The General Contractor will designate at least three other site personnel to receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of the responsible spill personnel will be posted in the material storage area and in the on-site office trailer.

- Spills of toxic or hazardous material in excess of reportable quantities, as established in the under 40 CFR 110, 40 CFR 117, or 40 CFR 302, will be reported to the following agencies as soon as the General Contractor has knowledge of the release:

Massachusetts Department of Environmental Protection Division of Hazardous Waste	(617) 292-5851 or (978) 661-7679
National Response Center	(800) 424-8802

o

- All spills will be cleaned up immediately after discovery;
- The spill area will be kept well ventilated, and personnel will wear protective clothing to prevent injury from contact with a hazardous substance; and
- Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be informed of the procedures and the location of the information and cleanup supplies;
- Materials and equipment necessary for spill cleanup will be kept in the material storage area on-site. Equipment and materials will include, but will not be limited to the emergency response equipment listed herein;

A comprehensive Spill Prevention Control and Countermeasure (SPCC) plan will be developed and implemented by the General Contractor and other Operators. At a minimum the SPCC, will discuss:

- Spill prevention equipment;
- Spill prevention supplies provided on-site; and
- Spill prevention training to be provided by the Owner and/or Tenant to designated employees.

8.7.1 Initial Notification

In the event of a spill the notify the 24-hour Emergency Contact (Section 0) immediately.

The 24-hour Emergency Contact or their chosen delegate will immediately notify emergency response services and notify the local boards and commissions at the first possible opportunity:

- Fire Department (immediately)
- The Police Department, (immediately)
- The Board of Health (at first opportunity)
- And the Conservation Commission (at first opportunity)

8.7.2 Further Notification

Based on the assessment from the Fire Chief, additional notification to a cleanup contractor may be made. The Massachusetts Department of Environmental Protection (DEP) and the EPA may be notified depending upon the nature and severity of the spill. The Fire Chief will be responsible for determining the

level of cleanup and notification required. The attached list of emergency phone numbers shall be posted in the main construction/facility office and readily accessible to all employees. A hazardous waste spill report shall be completed as necessary using the attached form.

8.7.3 Assessment - Initial Containment

The supervisor or manager will assess the incident and initiate containment control measures with the appropriate spill containment equipment included in the spill kit kept on-site. A list of recommended spill equipment to be kept on site is included on the following pages.

8.7.4 Reporting

A copy of the Spill Report Template is included in Attachment L.

Table 8-2 Emergency Notification Phone Numbers

1A	24-hour Contact	Eversource Project Manager – Michael Hager	T: (508) 341-5815
1B	Alternate Contact	BOND Site Superintendent Matt Stock	T: (617) 512-6766
2	Fire and Police		911
3	Cleanup Contractor	Clean Harbors Field Services	T: (508) 970-8672
4	MassDEP		T: (800) 340-1133
5A	National Response Center		T: (800) 424-8802
5B	USEPA		T: (800) 424-8802
6A	Sudbury Board of Health		T: (978) 440-5479
6B	Hudson Board of Health		T: (978) 562-2020
6C	Stow Board of Health		T: (978) 897-4592
7A	Sudbury Conservation Commission	Coordinator Lori Capone	T: (978) 440-5470
7B	Hudson Conservation Commission	Agent/Planner Pam Helinek	T: (978) 562-2948
7C	Stow Conservation Commission	Coordinator Kathy Sferra	T: (978) 897-8615

Post this list of emergency contact numbers in the main construction/facility office in a location that is readily accessible to all employees.

Emergency Response Equipment

The following is an example of an equipment and materials list that must be prepared by the Owner and Tenant. Equipment and Supplies on this list shall be maintained at all times and stored in a secure area for long-term emergency response need.

Table 8-3 Emergency Response Equipment

Supply	Quantity	Supplier
Sorbent Pillows (Pigs)	2	http://www.newpig.com
Sorbent Boom/Sock	25 feet	Item # KIT276 — mobile container with two pigs, 26 feet of sock
Sorbent Pads	50	50 pads, and five pounds of absorbent (or equivalent)
Lite-Dri® Absorbent	5 pounds	http://www.forestry-suppliers.com
Shovel	1	Item # 33934 — Shovel (or equivalent)
Pry Bar	1	Item # 43210 — Manhole cover pick (or equivalent)
Goggles	1 pair	Item # 23334 — Goggles (or equivalent)
Heavy Gloves	1 pair	Item # 90926 — Gloves (or equivalent)

9.0 COMPLIANCE WITH OTHER REGULATIONS

9.1 Endangered Species

Appendix D of the CGP describes eligibility requirements with regard to the protection of threatened and endangered species and designated critical habitat.

9.1.1 Eligibility Criterion

Under which criterion listed in Appendix D of the CGP are you eligible for coverage under this permit?

☐ A ☐ B ☐ C ☐ D ☒ E

- Criterion A. No federally listed threatened or endangered species or their designated critical habitat(s) are likely to occur in your site's "action area" as defined in Appendix A of the CGP.

- Criterion B. The construction site's discharges and discharge-related activities were already addressed in another operator's valid certification of eligibility for your action area under eligibility Criterion A, C, D, E, or F and there is no reason to believe that federally listed species or federally designated critical habitat not considered in the prior certification may be present or located in the "action area". To certify your eligibility under this Criterion, there must be no lapse of NPDES permit coverage in the other operator's certification. By certifying eligibility under this Criterion, you agree to comply with any effluent limitations or conditions upon which the other operator's certification was based. You must include in your NOI the tracking number from the other operator's notification of authorization under this permit. If your certification is based on another operator's certification under Criterion C, you must provide EPA with the relevant supporting information required of existing dischargers in Criterion C in your NOI form.

- Criterion C. Federally listed threatened or endangered species or their designated critical habitat(s) are likely to occur in or near your site's "action area," and your site's discharges and discharge-related activities are not likely to adversely affect listed threatened or endangered species or critical habitat. This determination may include consideration of any stormwater controls and/or management practices you will adopt to ensure that your discharges and discharge-related activities are not likely to adversely affect listed species and critical habitat. To make this certification, you must include the following in your NOI: 1) any federally listed species and/or designated habitat location in your "action area"; and 2) the distance between your site and the listed species or designated critical habitat (in miles). You must also include a copy of your site map with your NOI.

- Criterion D. Coordination between you and the Services has been concluded. The coordination must have addressed the effects of your site's discharges and discharge-related activities on federally listed threatened or endangered species and federally designated critical habitat and must have resulted in a written concurrence from the relevant Service(s) that your site's discharges and discharge-related activities are not likely to adversely affect listed species or critical habitat. You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

- Criterion E. Consultation between a Federal Agency and the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service under Section 7 of the ESA has been concluded. The consultation must have addressed the effects of the construction site's discharges and discharge-related activities on federally listed threatened or endangered species and federally designated critical habitat. The result of this consultation must be either:

  - A biological opinion that concludes that the action in question (considering the effects of your site's discharges and discharge-related activities) is not likely to jeopardize the continued existence of listed species, nor the destruction or adverse modification of critical habitat; or
  - Written concurrence from the applicable Service(s) with a finding that the site's discharges and discharge-related activities are not likely to adversely affect federally listed species or federally designated habitat.
  - You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

- Criterion F. Your construction activities are authorized through the issuance of a permit under Section 10 of the ESA, and this authorization addresses the effects of the site's discharges and discharge-related activities on federally listed species and federally designated critical habitat. You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

9.1.2 Supporting Documentation

Provide documentation for the applicable eligibility criterion you select in Appendix D of the CGP, as follows:

For criterion A, indicate the basis for your determination that no federally listed threatened or endangered species or their designated critical habitat(s) are likely to occur in your site's action area (as defined in Appendix A of the CGP). Check the applicable source of information you relied upon:

☐ Specific communication with staff of the U.S. Fish & Wildlife Service or National Marine Fisheries Service.

☐ Publicly available species list.

☒ Other source: iPaC

For criterion B, provide the Tracking Number from the other operator's notification of permit authorization:

Provide a brief summary of the basis used by the other operator for selecting criterion A, B, C, D, E, or F:

For criterion C, provide the following information:

- Any federally listed species and/or designated habitat located in your "action area"
- The distance between your site and the listed species or designated critical habitat (in miles). You must also include a copy of your site with you NOI.

For criterion D, E, or F, attach copies of any letters or other communication between you and the U.S. Fish & Wildlife Service or National Marine Fisheries Service concluding consultation or coordination activities.

Supporting documentation related to project compliance with the Endangered Species Act is provided in Attachment E.

Additionally, the contractor must comply with the following conditions:

Sudbury

- **(MESA No Take Determination (NHESP No. 15-34327) Condition 1)** The Eastern Box Turtle Protection Plan (dated 5/31/2018) must be implemented as proposed.
- **(MESA No Take Determination (NHESP No. 15-34327) Condition 2)** The Corridor Management Plan for Massachusetts Central Rail Trail and Sudbury-Hudson Transmission Reliability Project (dated 5/31/2018) must be implemented as proposed.
- **(MESA No Take Determination (NHESP No. 15-34327) Condition 3)** Timing restrictions for construction activities within Whip-poor-will habitats must be implemented, as proposed unless otherwise approved by the Division.

(MESA No Take Determination (NHESP No. 15-34327) Condition 4) Within thirty (30) days of the completion of the transmission line project, or as otherwise approved by the Division, the Applicant shall submit a compliance report containing, including a summary of construction timelines and photographs, to the Division documenting the completion of the project.

- **(OOC Conditions Related to Endangered Species Management For Phase I and Phase II – F)** Unless otherwise approved by the Division, construction activities within Priority Habitat must not occur during the Eastern Whip-poor-will breeding season (May 1 -August 1), as proposed. The Applicants shall endeavor to refrain from construction activities within Priority Habitat from April 15 to August 1.
- **(OOC Special Condition: Part I: General Conditions: For Phase I and Phase II – P)** All Time-of-Year restrictions and sweeps required by the Natural Heritage and Endangered Species Program shall be followed. Time-of-Year restrictions for work within 450 feet of all vernal pools shall be March 1 through June 1. Between March 1 and June l, the Applicants' Environmental Monitor shall conduct sweeps prior to vehicles traveling down the project site within vernal pool buffers (including certified, certifiable, and presumed vernal pools). Between April 1 and October 31, the Applicants' environmental monitor shall conduct turtle sweeps prior to initiation of work each day, or prior to vehicles travelling through the Box Turtle Protection Area.
- **(OOC Conditions Related to Endangered Species Management For Phase I and Phase II – H)** Work within 450 feet of vernal pools is prohibited between March 1 and June 1. The Applicants shall have a

qualified Environmental Monitor on site to monitor vehicular traffic during this Time of Year restriction, should a suitable alternative route not be available.

- **(OOC Conditions Specific to Phase I: Eversource Underground Transmission Line – KK)** All wildlife habitat replication and restoration shall be completed during the first growing season of Phase I to avoid a significant adverse project/site-specific impact or an adverse cumulative impact on wildlife for more than two growing seasons. Should Phase II not commence within two years of completion of Phase I, erosion controls or other methods of demarcation shall be implemented to prevent further alteration of restored areas. No important wildlife habitat features restored during Phase I shall be removed during Phase II.
- **(OOC Conditions Related to Endangered Species Management For Phase I and Phase II – G**) Within thirty (30) days of the completion of work, or as otherwise approved by the Division, the Applicants shall submit a compliance report to the Division and Commission documenting the completion of the project and compliance with all conditions herein, including a summary of construction timelines and photographs.

Stow

- **(MESA No Take Determination (NHESP No. 15-34327) Condition 4)** Within thirty (30) days of the completion of the transmission line project, or as otherwise approved by the Division, the Applicant shall submit a compliance report containing, including a summary of construction timelines and photographs, to the Division documenting the completion of the project.

Hudson

- **(OOC Special Condition 28)** All Time-Of-Year (TOY) construction restrictions and sweeps required by the Natural Heritage and Endangered Species Program shall be followed. Time-of-Year restrictions for work within 450 feet of vernal pools shall be March I through June I. Between March I and June I, the Environmental Monitor shall conduct sweeps prior to vehicles traveling down the Project Site within vernal pool buffers. Between April I and Oct 31, the Environmental Monitor shall conduct turtle sweeps prior to initiating work in, or prior to vehicles traveling through, the Box Turtle Protection Area.

- **(MESA No Take Determination (NHESP No. 15-34327) Condition 4)** Within thirty (30) days of the completion of the transmission line project, or as otherwise approved by the Division, the Applicant shall submit a compliance report containing, including a summary of construction timelines and photographs, to the Division documenting the completion of the project.

9.2 Historic Preservation

Appendix E of the CGP describes eligibility requirements with regard to the protection of historic properties, including tribal lands.

The Operator responsible for finalizing this SWPPP must:

- Respond to the questions below for :
  - Appendix E, Step 2
  - Appendix E, Step 3
  - Appendix E, Step 4
- Insert copies of correspondance with the Massachusetts Historical Commission into Attachment F.

9.2.1 Appendix E, Step 1

Do you plan on installing any of the following stormwater controls at your site? Check all that apply below, and proceed to Appendix E, Step 2.

☐ Dike

☐ Berm

☐ Catch Basin

☐ Pond (Bioretention Basin)

☒ Stormwater Conveyance Channel (e.g., ditch, trench, perimeter drain, swale, etc.)

☒ Culvert

☐ Other type of ground-disturbing stormwater control: Subsurface infiltration structures

(Note: If you will not be installing any ground-disturbing stormwater controls, no further documentation is required for this section of the SWPPP template.)

9.2.2 Appendix E, Step 2

If you answered yes in Step 1, have prior surveys or evaluations conducted on the site already determined that historic properties do not exist, or that prior disturbances at the site have precluded the existence of historic properties?

☐ YES ☒ NO

If yes, no further documentation is required for this section of the SWPPP template. If no, proceed to Appendix E, Step 3.

9.2.3 Appendix E, Step 3

If you answered no in Step 2, have you determined that your installation of subsurface earth-disturbing stormwater controls will have no effect on historic properties?

☐ YES ☒ NO

If yes, provide documentation of the basis for your determination. If no, proceed to Appendix E, Step 4.

9.2.4 Appendix E, Step 4

If you answered no in Step 3, did the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Office (THPO), or other tribal representative (whichever applies) respond to you within 15 calendar days to indicate whether the subsurface earth disturbances caused by the installation of stormwater controls affect historic properties?

☐ YES ☒ NO

If no, no further documentation is required for this section of the SWPPP template.

If yes, describe the nature of their response:

☒ Written indication that adverse effects to historic properties from the installation of stormwater controls can be mitigated by agreed upon actions. *(See Attachment F)*

☐ No agreement has been reached regarding measures to mitigate effects to historic properties from the installation of stormwater controls.

☐ Other:

Supporting documentation related to project compliance with the Historic Preservation is provided in Attachment F.

Attachment A

2022 NPDES Construction General Permit (CGP)

National Pollutant Discharge Elimination System (NPDES)
Construction General Permit (CGP) for Stormwater Discharges from Construction Activities

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §1251 et. seq., (hereafter CWA), as amended by the Water Quality Act of 1987, P.L. 100-4, "operators" of construction activities (defined in Appendix A) that meet the requirements of Part 1.1 of this National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP), are authorized to discharge pollutants in accordance with the effluent limitations and conditions set forth herein. Permit coverage is required from the "commencement of construction activities" (see Appendix A) until one of the conditions for terminating CGP coverage has been met (see Part 8.2).

This permit becomes effective on 12:00 am, February 17, 2022.

This permit and the authorization to discharge expire at 11:59pm, February 16, 2027.

Signed and issued this 18 day of January 2022

DEBORAH SZARO
Digitally signed by DEBORAH SZARO
Date: 2022.01.18 08:31:14 -05'00'

Deborah Szaro,
Acting Regional Administrator, EPA Region 1.

Signed and issued this 18 day of January 2022

JAVIER LAUREANO
Digitally signed by JAVIER LAUREANO
Date: 2022.01.18 11:21:16 -05'00'

Javier Laureano,
Director, Water Division, EPA Region 2.

Signed and issued this 18 day of January 2022

CARMEN GUERRERO PEREZ
Digitally signed by CARMEN GUERRERO PEREZ
Date: 2022.01.18 10:19:51 -04'00'

Carmen Guerrero-Perez,
Director, Caribbean Environmental Protection Division, EPA Region 2.

Signed and issued this 18 day of January 2022

CATHERINE LIBERTZ
Digitally signed by CATHERINE LIBERTZ
Date: 2022.01.18 12:05:24 -05'00'

Catherine A. Libertz,
Director, Water Division, EPA Region 3.

Signed and issued this 18 day of January 2022

JEANEANNE GETTLE
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Date: 2022.01.18 13:09:48 -05'00'

Jeaneanne Gettle,
Director, Water Division, EPA Region 4.

Signed and issued this 18 day of January 2022

Digitally signed by TERA FONG
Date: 2022.01.18 13:03:49 -06'00'

Tera Fong,
Director, Water Division, EPA Region 5.

Signed and issued this 18 day of January 2022

CHARLES MAGUIRE
Digitally signed by CHARLES MAGUIRE
DN: c=US, o=U.S. Government, ou=Environmental Protection Agency, cn=CHARLES MAGUIRE, 0.9.2342.19200300.100.1.1=68001003650036
Date: 2022.01.18 14:06:55 -06'00'

Charles W. Maguire,
Director, Water Division, EPA Region 6.

Signed and issued this 18 day of January 2022

JEFFERY ROBICHAUD
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Date: 2022.01.18 14:41:37 -06'00'

Jeffery Robichaud,
Director, Water Division, EPA Region 7.

Signed and issued this 18 day of January 2022

DARCY OCONNOR
Digitally signed by DARCY OCONNOR
Date: 2022.01.18 14:00:05 -07'00'

Darcy O'Connor,
Director, Water Division, EPA Region 8.

Signed and issued this 18 day of January 2022

TOMAS TORRES
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Tomás Torres,
Director, Water Division, EPA Region 9.

Signed and issued this 18 day of January 2022

DANIEL OPALSKI
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Date: 2022.01.18 15:10:20 -08'00'

Daniel D. Opalski,
Director, Water Division, EPA Region 10.

CONTENTS

1 HOW TO OBTAIN COVERAGE UNDER THE CONSTRUCTION GENERAL PERMIT (CGP)

To be covered under this permit, you must meet the eligibility conditions and follow the requirements for obtaining permit coverage in this Part.

1.1 ELIGIBILITY CONDITIONS

1.1.1 You are an "operator" of a construction site for which discharges will be covered under this permit. For the purposes of this permit and in the context of stormwater discharges associated with construction activity, an "operator" is any party associated with a construction project that meets either of the following two criteria:

- **a.** The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
- **b.** The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions.

Where there are multiple operators associated with the same project, all operators must obtain permit coverage.[1] Subcontractors generally are not considered operators for the purposes of this permit.

1.1.2 Your site's construction activities:

- **a.** Will disturb one or more acres of land, or will disturb less than one acre of land but are part of a common plan of development or sale (as defined in Appendix A) that will ultimately disturb one or more acres of land; or
- **b.** Have been designated by EPA as needing permit coverage under 40 CFR § 122.26(a)(1)(v) or 40 CFR § 122.26(b)(15)(ii);

1.1.3 Your site is located in an area where EPA is the permitting authority and where coverage under this permit is available (see Appendix B);

1.1.4 Discharges from your site are not:

- **a.** Already covered by a different NPDES permit for the same discharge; or
- **b.** In the process of having coverage under a different NPDES permit for the same discharge denied, terminated, or revoked.[2, 3]

1.1.5 You can demonstrate you meet one of the criteria in the Endangered Species Protection section of the Notice of Intent (NOI) that you submit for coverage under this permit, per Part 1.4, with respect to the protection of Federally listed endangered or threatened species and Federally designated critical habitat under the Endangered Species Act

[1] If the operator of a "construction support activity" (see Part 1.2.1c) is different than the operator of the main site, that operator must also obtain permit coverage. See Part 7.1 for clarification on the sharing of permit-related functions between and among operators on the same site and for conditions that apply to developing a SWPPP for multiple operators associated with the same site.

[2] Parts 1.1.4a and 1.1.4b do not include sites currently covered under the 2017 CGP that are in the process of obtaining coverage under this permit, nor sites covered under this permit that are transferring coverage to a different operator.

[3] Notwithstanding a site being made ineligible for coverage under this permit because it falls under the description of Parts 1.1.4a or 1.1.4b, above, EPA may waive the applicable eligibility requirement after specific review if it determines that coverage under this permit is appropriate.

(ESA). If the EPA Regional Office grants you a waiver from electronic reporting per Part 1.4.2, you must complete the ESA worksheet in Appendix D to demonstrate you meet one of the criteria and submit it with your paper NOI (Appendix I).

1.1.6 You have completed the screening process in Appendix E relating to the protection of historic properties; and

1.1.7 You have complied with all requirements in Part 9 imposed by the applicable State, Indian Tribe, or Territory in which your construction activities and/or discharge will occur.

1.1.8 For "new sources" (as defined in Appendix A) only:

a. EPA has not, prior to authorization under this permit, determined that discharges from your site will not meet applicable water quality standards. Where such a determination is made prior to authorization, EPA may notify you that an individual permit application is necessary. However, EPA may authorize your coverage under this permit after you have included appropriate controls and implementation procedures designed to bring your discharge into compliance with this permit, specifically the requirement to meet water quality standards. In the absence of information demonstrating otherwise, EPA expects that compliance with the requirements of this permit, including the requirements applicable to such discharges in Part 3, will result in discharges that meet applicable water quality standards.

b. Discharges from your site to a Tier 2, Tier 2.5, or Tier 3 water[4] will not lower the water quality of the applicable water. In the absence of information demonstrating otherwise, EPA expects that compliance with the requirements of this permit, including the requirements applicable to such discharges in Part 3.2, will result in discharges that will not lower the water quality of such waters.

1.1.9 If you plan to add "cationic treatment chemicals" (as defined in Appendix A) to stormwater and/or authorized non-stormwater prior to discharge, you may not submit your NOI until you notify your applicable EPA Regional Office (see Appendix J) in advance and the EPA Regional Office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will result in discharges that meet applicable water quality standards.

[4] Note: Your site will be considered to discharge to a Tier 2, Tier 2.5, or Tier 3 water if the first receiving water to which you discharge is identified by a State, Tribe, or EPA as a Tier 2, Tier 2.5, or Tier 3 water. For discharges that enter a storm sewer system prior to discharge, the first receiving water to which you discharge is the waterbody that receives the stormwater discharge from the storm sewer system. The current list of Tier 2, Tier 2.5, and Tier 3 waters located in the areas eligible for coverage under this permit can be found at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates. You can also use EPA's Discharge Mapping Tool (https://www.epa.gov/npdes/epas-stormwater-discharge-mapping-tools) to assist you in identifying whether any receiving waters to which you discharge are listed as impaired (and the pollutant for which it is impaired) and whether an approved total maximum daily load (TMDL) exists for that waterbody.

1.2 TYPES OF DISCHARGES AUTHORIZED[5]

1.2.1 The following stormwater discharges are authorized under this permit provided that appropriate stormwater controls are designed, installed, and maintained (see Parts 2 and 3):

- **a.** Stormwater discharges, including stormwater runoff, snowmelt runoff, and surface runoff and drainage, associated with construction activity under 40 CFR § 122.26(b)(14) or § 122.26(b)(15)(i);
- **b.** Stormwater discharges designated by EPA as needing a permit under 40 CFR §122.26(a)(1)(v) or § 122.26(b)(15)(ii);
- **c.** Stormwater discharges from on or off-site construction support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) provided that:
  - **i.** The support activity is directly related to the construction site required to have permit coverage for stormwater discharges;
  - **ii.** The support activity is not a commercial operation, nor does it serve multiple unrelated construction sites;
  - **iii.** The support activity does not continue to operate beyond the completion of the construction activity at the site it supports; and
  - **iv.** Stormwater controls are implemented in accordance with Part 2 and Part 3 for discharges from the support activity areas; and
- **d.** Stormwater discharges from earth-disturbing activities associated with the construction of staging areas and the construction of access roads conducted prior to active mining.

1.2.2 The following non-stormwater discharges associated with your construction activity are authorized under this permit provided that, with the exception of water used to control dust and to irrigate vegetation in stabilized areas, these discharges are not routed to areas of exposed soil on your site and you comply with any applicable requirements for these discharges in Parts 2 and 3:

- **a.** Discharges from emergency fire-fighting activities;
- **b.** Fire hydrant flushings;
- **c.** Landscape irrigation;
- **d.** Water used to wash vehicles and equipment, provided that there is no discharge of soaps, solvents, or detergents used for such purposes;
- **e.** Water used to control dust;
- **f.** Potable water including uncontaminated water line flushings;

[5] See "Discharge" as defined in Appendix A. Note: Any discharges not expressly authorized in this permit cannot become authorized or shielded from liability under CWA Section 402(k) by disclosure to EPA, State, or local authorities after issuance of this permit via any means, including the Notice of Intent (NOI) to be covered by the permit, the SWPPP, or during an inspection.

g. External building washdown, provided soaps, solvents, and detergents are not used, and external surfaces do not contain hazardous substances (as defined in Appendix A) (e.g., paint or caulk containing polychlorinated biphenyls (PCBs));

h. Pavement wash waters, provided spills or leaks of toxic or hazardous substances have not occurred (unless all spill material has been removed) and where soaps, solvents, and detergents are not used. You are prohibited from directing pavement wash waters directly into any receiving water, storm drain inlet, or constructed or natural site drainage features, unless the feature is connected to a sediment basin, sediment trap, or similarly effective control;

i. Uncontaminated air conditioning or compressor condensate;

j. Uncontaminated, non-turbid discharges of ground water or spring water;

k. Foundation or footing drains where flows are not contaminated with process materials such as solvents or contaminated ground water; and

l. Uncontaminated construction dewatering water[6] discharged in accordance with Part 2.4.

1.2.3 Also authorized under this permit are discharges of stormwater listed above in Part 1.2.1, or authorized non-stormwater discharges listed above in Part 1.2.2, commingled with a discharge authorized by a different NPDES permit and/or a discharge that does not require NPDES permit authorization.

1.3 PROHIBITED DISCHARGES[7]

The discharges listed in this Part are prohibited outright or authorized only under the identified conditions. To prevent the discharges in Parts 1.3.1 through 1.3.5, operators must comply with the applicable pollution prevention requirements in Part 2.3 or ensure the discharge is authorized by another NPDES permit consistent with Part 1.2.3 for commingled discharges.

1.3.1 Wastewater from washout of concrete, unless managed by an appropriate control as described in Part 2.3.4;

1.3.2 Wastewater from washout and/or cleanout of stucco, paint, form release oils, curing compounds, and other construction materials;

1.3.3 Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;

1.3.4 Soaps, solvents, or detergents used in vehicle and equipment washing or external building washdown; and

1.3.5 Toxic or hazardous substances from a spill or other release.

[6] EPA notes that operators may need to comply with additional procedures to verify that the dewatering discharge is uncontaminated. Operators should review Part 9 to determine if any of these requirements apply to their discharge and should ensure that they have complied with any State, Tribal, or local dewatering requirements that apply.

[7] EPA includes these prohibited non-stormwater discharges here as a reminder to the operator that the only non-stormwater discharges authorized by this permit are at Part 1.2.2. Any unauthorized non-stormwater discharges must be covered under an individual permit or alternative general permit.

1.4 SUBMITTING YOUR NOTICE OF INTENT (NOI)

All "operators" (as defined in Appendix A) associated with your construction site who meet the Part 1.1 eligibility conditions, and who seek coverage under this permit, must submit to EPA a complete and accurate NOI in accordance with the deadlines in Table 1 prior to commencement of construction activities (as defined in Appendix A).

Exception: If you are conducting construction activities in response to a public emergency (e.g., mud slides, earthquake, extreme flooding conditions, widespread disruption in essential public services), and the related work requires immediate authorization to avoid imminent endangerment to human health, public safety, or the environment, or to reestablish essential public services, you may discharge on the condition that a complete and accurate NOI is submitted within 30 calendar days after commencing construction activities (see Table 1) establishing that you are eligible for coverage under this permit. You must also provide documentation in your Stormwater Pollution Prevention Plan (SWPPP) to substantiate the occurrence of the public emergency pursuant to Part 7.2.3i.

1.4.1 Prerequisite for Submitting Your NOI

You must develop a SWPPP consistent with Part 7 before submitting your NOI for coverage under this permit.

1.4.2 How to Submit Your NOI

You must use EPA's NPDES eReporting Tool (NeT) to electronically prepare and submit your NOI for coverage under the 2022 CGP unless you received a waiver from your applicable EPA Regional Office.

To access NeT, go to https://cdx.epa.gov/cdx.

Waivers from electronic reporting may be granted based on one of the following conditions:

a. If your operational headquarters is physically located in a geographic area (i.e., ZIP code or census tract) that is identified as under-served for broadband Internet access in the most recent report from the Federal Communications Commission; or

b. If you have limitations regarding available computer access or computer capability.

If the EPA Regional Office grants you approval to use a paper NOI, and you elect to use it, you must complete the form in Appendix H.

1.4.3 Deadlines for Submitting Your NOI and Your Official Date of Permit Coverage

Table 1 provides the deadlines for submitting your NOI and the official start date of your permit coverage, which differ depending on when you commence construction activities.

Table 1 NOI Submittal Deadlines and Official Start Date for Permit Coverage.

Type of Operator	NOI Submittal Deadline[8]	Permit Authorization Date[9]
Operator of a new site (i.e., a site where construction activities commence on or after February 17, 2022)	At least 14 calendar days before commencing construction activities.	14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied.
Operator of an existing site (i.e., a site with 2017 CGP coverage where construction activities commenced prior to February 17, 2022)	No later than May 18, 2022.	14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied. Provided you submit your NOI no later than May 18, 2022, your authorization under the 2017 CGP is automatically continued until you have been granted coverage under this permit or an alternative NPDES permit, or coverage is otherwise terminated.
New operator of a permitted site (i.e., an operator that through transfer of ownership and/or operation replaces the operator of an already permitted construction site that is either a "new site" or an "existing site")	At least 14 calendar days before the date the transfer to the new operator will take place.	14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied.
Operator of an "emergency-related project" (i.e., a project initiated in response to a public emergency (e.g., mud slides, earthquake, extreme flooding conditions, disruption in essential public services), for which the related work requires immediate authorization to avoid imminent endangerment to human health or the environment, or to reestablish essential public services)	No later than 30 calendar days after commencing construction activities.	You are considered provisionally covered under the terms and conditions of this permit immediately, and fully covered 14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied.

[8] If you miss the deadline to submit your NOI, any and all discharges from your construction activities will continue to be unauthorized under the CWA until they are covered by this or a different NPDES permit. EPA may take enforcement action for any unpermitted discharges that occur between the commencement of construction activities and discharge authorization.

[9] Discharges are not authorized if your NOI is incomplete or inaccurate or if you are not eligible for permit coverage.

1.4.4 Modifying your NOI

If after submitting your NOI you need to correct or update any fields, you may do so by submitting a "Change NOI" form using NeT. Waivers from electronic reporting may be granted as specified in Part 1.4.2. If the EPA Regional Office has granted you approval to submit a paper NOI modification, you may indicate any NOI changes on the same NOI form in Appendix H.

When there is a change to the site's operator, the new operator must submit a new NOI, and the previous operator must submit a Notice of Termination (NOT) form as specified in Part 8.3.

The following modifications to an NOI form will result in a 14-day review process:

- Changes to the name of the operator;
- Changes to the project or site name;
- Changes to the estimated area to be disturbed;
- Changes to the name of the receiving water[10], or additions to the applicable receiving waters;
- Changes to eligibility information related to endangered species protection or historic preservation;
- Changes to information provided related to the use of chemical treatment at your site; and
- Changes to answers provided regarding the demolition of structures over 10,000 square feet of floor space built or renovated before January 1, 1980.

During the 14-day review process, you may continue to operate based on the information provided in your original NOI, but you must wait until the review period has ended before you may commence or continue activities on any portion of your site that would be affected by any of the above modifications, unless EPA notifies you that the authorization is delayed or denied.

1.4.5 Your Official End Date of Permit Coverage

Once covered under this permit, your coverage will last until the date that:

a. You terminate permit coverage consistent with Part 8; or

b. You receive permit coverage under a different NPDES permit or a reissued or replacement version of this permit after expiring on February 16, 2027; or

c. You fail to submit an NOI for coverage under a reissued or replacement version of this permit before the deadline for existing construction sites where construction activities continue after this permit has expired.

1.5 REQUIREMENT TO POST A NOTICE OF YOUR PERMIT COVERAGE

You must post a sign or other notice of your permit coverage at a safe, publicly accessible location in close proximity to the construction site. The notice must be located so it is visible from the public road that is nearest to the active part of the construction

[10] As defined in Appendix A, a "receiving water" is "a "Water of the United States" as defined in 40 CFR §122.2 into which the regulated stormwater discharges.

site, and it must use a font large enough to be readily viewed from a public right-of-way.[11] At a minimum, the notice must include:

a. The NPDES ID (i.e., permit tracking number assigned to your NOI and the EPA webpage where a copy of the NOI can be found (https://permitsearch.epa.gov/epermit-search/ui/search));

b. A contact name and phone number for obtaining additional construction site information;

c. The Uniform Resource Locator (URL) for the SWPPP (if available), or the following statement: "If you would like to obtain a copy of the Stormwater Pollution Prevention Plan (SWPPP) for this site, contact the EPA Regional Office at [*include the appropriate CGP Regional Office contact information found at* https://www.epa.gov/npdes/contact-us-stormwater#regional];" and

d. The following statement "If you observe indicators of stormwater pollutants in the discharge or in the receiving water, contact the EPA through the following website: https://www.epa.gov/enforcement/report-environmental-violations."

2 TECHNOLOGY-BASED EFFLUENT LIMITATIONS

You must comply with the following technology-based effluent limitations in this Part for all authorized discharges.[12]

2.1 GENERAL STORMWATER CONTROL DESIGN, INSTALLATION, AND MAINTENANCE REQUIREMENTS

You must design, install, and maintain stormwater controls required in Parts 2.2, 2.3, and 2.4 to minimize the discharge of pollutants in stormwater from construction activities.[13] To meet this requirement, you must:

2.1.1 Account for the following factors in designing your stormwater controls:

a. The expected amount, frequency, intensity, and duration of precipitation;[14]

b. The nature of stormwater runoff (i.e., flow) and run-on at the site, including factors such as expected flow from impervious surfaces, slopes, and site drainage features. You must design stormwater controls to control stormwater volume, velocity, and peak flow rates to minimize discharges of pollutants in stormwater and to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points; and

c. The soil type and range of soil particle sizes expected to be present on the site.

[11] If the active part of the construction site is not visible from a public road, then place the notice of permit coverage in a position that is visible from the nearest public road and as close as possible to the construction site.

[12] For each of the effluent limits in Part 2, as applicable to your site, you must include in your SWPPP (1) a description of the specific control(s) to be implemented to meet the effluent limit; (2) any applicable design specifications; (3) routine maintenance specifications; and (4) the projected schedule for installation/implementation. See Part 7.2.6.

[13] The permit does not recommend or endorse specific products or vendors.

[14] Stormwater controls must be designed using the most recent data available to account for recent precipitation patterns and trends.

If your site is exposed to or has previously experienced major storms, such as hurricanes, storm surge, extreme/heavy precipitation, and flood events, you should also include consideration of and contingencies for whether implementing structural improvements, enhanced/resilient stormwater controls, and other mitigation measures may help minimize impacts from stormwater discharges from such major storm events.

2.1.2 Design and install all stormwater controls in accordance with good engineering practices, including applicable design specifications.[15]

2.1.3 Complete installation of stormwater controls by the time each phase of construction activities has begun.

a. By the time construction activity in any given portion of the site begins, install and make operational any downgradient sediment controls (e.g., buffers, perimeter controls, exit point controls, storm drain inlet protection) that control discharges from the initial site clearing, grading, excavating, and other earth-disturbing activities.[16]

b. Following the installation of these initial controls, install and make operational all stormwater controls needed to control discharges prior to subsequent earth-disturbing activities.

2.1.4 Ensure all stormwater controls are maintained and remain in effective operating condition during permit coverage and are protected from activities that would reduce their effectiveness.

a. Comply with any specific maintenance requirements for the stormwater controls listed in this permit, as well as any recommended by the manufacturer.[17]

b. If at any time you find that a stormwater control needs routine maintenance (i.e., minor repairs or other upkeep performed to ensure the site's stormwater controls remain in effective operating condition, not including significant repairs or the need to install a new or replacement control), you must immediately initiate the needed work, and complete such work by the close of the next business day. If it is infeasible to complete the routine maintenance by the close of the next business day, you must document why this is the case and why the repair or other upkeep to be performed should still be considered routine maintenance in your inspection report under Part 4.7.1c and complete such work no later than seven (7) calendar days from the time of discovery of the condition requiring maintenance.

c. If you must repeatedly (i.e., three (3) or more times) make the same routine maintenance fixes to the same control at the same location, even if the fix can be completed by the close of the next business day, you must either:

   i. Complete work to fix any subsequent repeat occurrences of this same problem under the corrective action procedures in Part 5, including keeping any records

[15] Design specifications may be found in manufacturer specifications and/or in applicable erosion and sediment control manuals or ordinances. Any departures from such specifications must reflect good engineering practices and must be explained in your SWPPP. You must also comply with any additional design and installation requirements specified for the effluent limits in Parts 2.2, 2.3, and 2.4.

[16] Note that the requirement to install stormwater controls prior to each phase of construction activities for the site does not apply to the earth disturbance associated with the actual installation of these controls. Operators should take all reasonable actions to minimize the discharges of pollutants during the installation of stormwater controls.

[17] Any departures from such maintenance recommendations made by the manufacturer must reflect good engineering practices and must be explained in your SWPPP.

of the condition and how it was corrected under Part 5.4; or

ii. Document in your inspection report under Part 4.7.1c why the specific reoccurrence of this same problem should still be addressed as a routine maintenance fix under this Part.[18]

d. If at any time you find that a stormwater control needs a significant repair or that a new or replacement control is needed, you must comply with the corrective action deadlines for completing such work in in Part 5.2.1c.

2.2 EROSION AND SEDIMENT CONTROL REQUIREMENTS

You must implement erosion and sediment controls in accordance with the following requirements to minimize the discharge of pollutants in stormwater from construction activities.

2.2.1 Provide and maintain natural buffers and/or equivalent erosion and sediment controls for discharges to any receiving waters that is located within 50 feet of the site's earth disturbances.

a. **Compliance Alternatives.** For any discharges to receiving waters located within 50 feet of your site's earth disturbances, you must comply with one of the following alternatives:

i. Provide and maintain a 50-foot undisturbed natural buffer; or

ii. Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve, in combination, the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or

iii. If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

See Appendix F, Part F.2 for additional conditions applicable to each compliance alternative.

b. **Exceptions.** See Appendix F, Part F.2 for exceptions to the compliance alternatives.

2.2.2 Direct stormwater to vegetated areas and maximize stormwater infiltration and filtering to reduce pollutant discharges, unless infiltration would be inadvisable due to the underlying geology (e.g., karst topography) and ground water contamination concerns, or infeasible due to site conditions.[19]

[18] Such documentation could include, for example, that minor repairs completed within the required timeframe are all that is necessary to ensure that the stormwater control continues to operate as designed and installed and that the stormwater control remains appropriate for the flow reaching it.

[19] Operators should consider whether factors such as specific contaminant concerns from the construction site, the underlying soils or geology, hydrology, depth to the ground water table, or proximity to source water or wellhead protection area(s) make the site unsuitable for infiltrating construction stormwater. Site conditions that may be of particular concern include proximity to: a current or future drinking water aquifer; a drinking water well or spring (including private/household wells); highly conductive geology such as karst; known pollutant hot spots, such as hazardous waste sites, landfills, gas stations, brownfields; an on-site sewage system or underground storage tank; or soils that do not allow for infiltration. Operators may find it helpful to consult EPA's Drinking Water Mapping Application to Protect Source Waters (DWMAPS). DWMAPS is an online mapping tool that can be used to locate drinking water providers, potential sources of contamination, polluted waterways, and information on protection initiatives in the site area.

2.2.3 Install sediment controls along any perimeter areas of the site that are downslope from any exposed soil or other disturbed areas.[20]

a. The perimeter control must be installed upgradient of any natural buffers established under Part 2.2.1, unless the control is being implemented pursuant to Part 2.2.1a.ii-iii;

b. To prevent stormwater from circumventing the edge of the perimeter control, install the perimeter control on the contour of the slope and extend both ends of the control up slope (e.g., at 45 degrees) forming a crescent rather than a straight line;

c. After installation, to ensure that perimeter controls continue to work effectively:

   i. Remove sediment before it has accumulated to one-half of the above-ground height of any perimeter control; and

   ii. After a storm event, if there is evidence of stormwater circumventing or undercutting the perimeter control, extend controls and/or repair undercut areas to fix the problem.

d. **Exception**. For areas at "linear construction sites" (as defined in Appendix A) where perimeter controls are infeasible (e.g., due to a limited or restricted right-of-way), implement other practices as necessary to minimize pollutant discharges to perimeter areas of the site.

2.2.4 Minimize sediment track-out.

a. Restrict vehicle use to properly designated exit points;

b. Use appropriate stabilization techniques[21] at all points that exit onto paved roads;

   i. **Exception**: Stabilization is not required for exit points at linear utility construction sites that are used only episodically and for very short durations over the life of the project, provided other exit point controls[22] are implemented to minimize sediment track-out;

c. Implement additional track-out controls[23] as necessary to ensure that sediment removal occurs prior to vehicle exit; and

d. Where sediment has been tracked-out from your site onto paved roads, sidewalks, or other paved areas outside of your site, remove the deposited sediment by the end of the same business day in which the track-out occurs or by the end of the next business day if track-out occurs on a non-business day. Remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. You are prohibited from hosing or sweeping tracked-out

[20] Examples of perimeter controls include filter berms; different types of silt fence such as wire-backed silt fence, super silt fence, or multi-layer geotextile silt fence; compost filter socks; gravel barriers; and temporary diversion dikes.

[21] Examples of appropriate stabilization techniques include the use of aggregate stone with an underlying geotextile or non-woven filter fabric, and turf mats.

[22] Examples of other exit point controls include preventing the use of exit points during wet periods; minimizing exit point use by keeping vehicles on site to the extent possible; limiting exit point size to the width needed for vehicle and equipment usage; using scarifying and compaction techniques on the soil; and avoiding establishing exit points in environmentally sensitive areas (e.g., *karst areas; steep slopes).*

[23] Examples of additional track-out controls include the use of wheel washing, rumble strips, and rattle plates.

sediment into any constructed or natural site drainage feature, storm drain inlet, or receiving water.[24]

2.2.5 Manage stockpiles or land clearing debris piles composed, in whole or in part, of sediment and/or soil:[25]

a. Locate the piles outside of any natural buffers established under Part 2.2.1 and away from any constructed or natural site drainage features, storm drain inlets, and areas where stormwater flow is concentrated;

b. Install a sediment barrier along all downgradient perimeter areas of stockpiled soil or land clearing debris piles;[26]

c. For piles that will be unused for 14 or more days, provide cover[27] or appropriate temporary stabilization (consistent with Part 2.2.14);

d. You are prohibited from hosing down or sweeping soil or sediment accumulated on pavement or other impervious surfaces into any constructed or natural site drainage feature, storm drain inlet, or receiving water.

2.2.6 Minimize dust. On areas of exposed soil, minimize dust through the appropriate application of water or other dust suppression techniques to control the generation of pollutants that could be discharged in stormwater from the site.

2.2.7 Minimize steep slope disturbances. Minimize the disturbance of "steep slopes" (as defined in Appendix A).[28]

2.2.8 Preserve native topsoil, unless infeasible.[29]

2.2.9 Minimize soil compaction.[30] In areas of your site where final vegetative stabilization will occur or where infiltration practices will be installed:

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[24] Fine grains that remain visible (e.g., staining) on the surfaces of off-site streets, other paved areas, and sidewalks after you have implemented sediment removal practices are not a violation of Part 2.2.4.

[25] The requirements in Part 2.2.5 do not apply to the storage of rock, such as rip rap, landscape rock, pipe bedding gravel, and boulders. Refer to Part 2.3.3a for the requirements that apply to these types of materials.

[26] Examples of sediment barriers include berms, dikes, fiber rolls, silt fences, sandbags, gravel bags, or straw bale.

[27] Examples of cover include tarps, blown straw and hydroseeding.

[28] Where disturbance to steep slopes cannot be avoided, operators should consider implementing controls suitable for steep slope disturbances that are effective at minimizing erosion and sediment discharge (e.g., preservation of existing vegetation, hydraulic mulch, geotextiles and mats, compost blankets, earth dikes or drainage swales, terraces, velocity dissipation devices). To identify slopes and soil types that are of comparatively higher risk for sediment discharge in areas of the country where the CGP is in effect, operators can use the tables in Appendix F (see Tables F-2 thru F-6).

[29] Stockpiling topsoil at off-site locations, or transferring topsoil to other locations, is an example of a practice that is consistent with the requirements in Part 2.2.8. Preserving native topsoil is not required where the intended function of a specific area of the site dictates that the topsoil be disturbed or removed. For example, some sites may be designed to be highly impervious after construction, and therefore little or no vegetation is intended to remain, or may not have space to stockpile native topsoil on site for later use, in which case it may not be feasible to preserve topsoil.

[30] Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted.

a. Restrict vehicle and equipment use in these locations to avoid soil compaction; and

b. Before seeding or planting areas of exposed soil that have been compacted, use techniques that rehabilitate and condition the soils as necessary to support vegetative growth.

2.2.10 Protect storm drain inlets.

a. Install inlet protection measures that remove sediment from discharges prior to entry into any storm drain inlet that carries stormwater from your site to a receiving water, provided you have authority to access the storm drain inlet.[31] Inlet protection measures are not required for storm drain inlets that are conveyed to a sediment basin, sediment trap, or similarly effective control; and

b. Clean, or remove and replace, the inlet protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, remove the deposited sediment by the end of the same business day in which it is found or by the end of the following business day if removal by the same business day is not feasible.

2.2.11 Control stormwater discharges, including both peak flowrates and total stormwater volume, to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points.[32]

2.2.12 If you install a sediment basin or similar impoundment:

a. Situate the basin or impoundment outside of any receiving water. and any natural buffers established under Part 2.2.1;

b. Design the basin or impoundment to avoid collecting water from wetlands;

c. Design the basin or impoundment to provide storage for either:

i. The calculated volume of runoff from a 2-year, 24-hour storm;[33] or

ii. 3,600 cubic feet per acre drained.

d. Utilize outlet structures that withdraw water from the surface of the sediment basin or similar impoundment, unless infeasible;[34]

e. Use erosion controls and velocity dissipation devices to prevent erosion at inlets and outlets; and

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[31] Inlet protection measures can be removed in the event of flood conditions or to prevent erosion.

[32] Examples of stormwater controls that can be used to comply with this requirement include the use of erosion controls and/or velocity dissipation devices (e.g., check dams, sediment traps), within and along the length of a constructed site drainage feature and at the outfall to slow down stormwater.

[33] Operators may refer to https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates for guidance on determining the volume of precipitation associated with their site's local 2-year, 24-hour storm event.

[34] The circumstances in which it is infeasible to design outlet structures in this manner are rare. Exceptions may include areas with extended cold weather, where using surface outlets may not be feasible during certain time periods (although they must be used during other periods). If you determine that it is infeasible to meet this requirement, you must provide documentation in your SWPPP to support your determination, including the specific conditions or time periods when this exception will apply.

f. Remove accumulated sediment to maintain at least one-half of the design capacity and conduct all other appropriate maintenance to ensure the basin or impoundment remains in effective operating condition.

2.2.13 If using treatment chemicals (e.g., *polymers, flocculants, coagulants*):

a. **Use conventional erosion and sediment controls before and after the application of treatment chemicals.** Chemicals may only be applied where treated stormwater is directed to a sediment control *(*e.g., *sediment basin, perimeter control)* before discharge.

b. **Select appropriate treatment chemicals***.* Chemicals must be appropriately suited to the types of soils likely to be exposed during construction and present in the discharges being treated *(*i.e., *the expected turbidity, pH, and flow rate of stormwater flowing into the chemical treatment system or area).*

c. **Minimize discharge risk from stored chemicals.** Store all treatment chemicals in leak-proof containers that are kept under storm-resistant cover and surrounded by secondary containment structures *(*e.g., *spill berms, dikes, spill containment pallets),* or provide equivalent measures designed and maintained to minimize the potential discharge of treatment chemicals in stormwater or by any other means *(*e.g., *storing chemicals in a covered area, having a spill kit available on site and ensuring personnel are available to respond expeditiously in the event of a leak or spill)*.

d. **Comply with State/local requirements.** Comply with applicable State and local requirements regarding the use of treatment chemicals.

e. **Use chemicals in accordance with good engineering practices and specifications of the chemical provider/supplier.** Use treatment chemicals and chemical treatment systems in accordance with good engineering practices, and with dosing specifications and sediment removal design specifications provided by the provider/supplier of the applicable chemicals, or document in your SWPPP specific departures from these specifications and how they reflect good engineering practice.

f. **Ensure proper training.** Ensure all persons who handle and use treatment chemicals at the construction site are provided with appropriate, product-specific training prior to beginning application of treatment chemicals. Among other things, the training must cover proper dosing requirements.

g. **Perform additional measures specified by the EPA Regional Office for the authorized use of cationic chemicals.** If you have been authorized to use cationic chemicals at your site pursuant to Part 1.1.9, you must perform all additional measures as conditioned by your authorization to ensure the use of such chemicals will not result in discharges that do not meet water quality standards.

2.2.14 Stabilize exposed portions of the site. Implement and maintain stabilization measures (*e.g., seeding protected by erosion controls until vegetation is established,*[35] *sodding, mulching, erosion control blankets, hydromulch, gravel*) that minimize erosion from any areas of exposed soil on the site in accordance with Part.

[35] If you will be evaluating the use of some type of erosion control netting to the site as part of your site stabilization, EPA encourages you to consider employing products that have been shown to minimize

a. Stabilization Deadlines:[36]

Table 2 Deadlines for Initiating and Completing Site Stabilization.

Total Amount of Land Disturbance Occurring At Any One Time[37]	Deadline
i. Five acres or less (≤5.0) **Note: this includes sites disturbing more than five acres (>5.0) total over the course of a project, but that limit disturbance at any one time *(i.e., phase the disturbance)* to five acres or less (≤5.0)**	• Initiate the installation of stabilization measures immediately[38] in any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days;[39] and • Complete the installation of stabilization measures as soon as practicable, but no later than 14 calendar days

impacts on wildlife. For instance, the U.S. Fish & Wildlife Service provides recommendations on the type of netting practices that are considered "wildlife friendly," including those that use natural fiber or 100 percent biodegradable materials and that use a loose weave with a non-welded, movable jointed netting, as well as those products that are not wildlife friendly including square plastic netting that are degradable (e.g., photodegradable, UV-degradable, oxo-degradable), netting made from polypropylene, nylon, polyethylene, or polyester. Other recommendations include removing the netting product when it is no longer needed. See https://www.fws.gov/midwest/eastlansing/library/pdf/WildlifeFriendlyErosionControlProducts_revised.pdf for further information. There also may be State, Tribal, or local requirements about using wildlife friendly erosion control products.

[36] EPA may determine, based on an inspection carried out under Part 4.8 and corrective actions required under Part 5.3, that the level of sediment discharge on the site makes it necessary to require a faster schedule for completing stabilization. For instance, if sediment discharges from an area of exposed soil that is required to be stabilized are compromising the performance of existing stormwater controls, EPA may require stabilization to correct this problem.

[37] Limiting disturbances to five (5) acres or less at any one time means that at no time during the project do the cumulative earth disturbances exceed five (5) acres. The following examples would qualify as limiting disturbances at any one time to five (5) acres or less:

1. The total area of disturbance for a project is five (5) acres or less.
2. The total area of disturbance for a project will exceed five (5) acres, but the operator ensures that no more than five (5) acres will be disturbed at any one time through implementation of stabilization measures. In this way, site stabilization can be used to "free up" land that can be disturbed without exceeding the five (5)-acre cap to qualify for the 14-day stabilization deadline. For instance, if an operator completes stabilization of two (2) acres of land on a five (5)-acre disturbance, then two (2) additional acres could be disturbed while still qualifying for the longer 14-day stabilization deadline.

[38] The following are examples of activities that would constitute the immediate initiation of stabilization:

1. Prepping the soil for vegetative or non-vegetative stabilization as long as seeding, planting, and/or installation of non-vegetative stabilization products takes place as soon as practicable, but no later than one (1) calendar day of completing soil preparation;
2. Applying mulch or other non-vegetative product to the exposed area;
3. Seeding or planting the exposed area;
4. Starting any of the activities in # 1 – 3 on a portion of the entire area that will be stabilized; and
5. Finalizing arrangements to have stabilization product fully installed in compliance with the deadlines for completing stabilization.

[39] The requirement to initiate stabilization immediately is triggered as soon as you know that construction work on a portion of the site is temporarily ceased and will not resume for 14 or more days, or as soon as you know that construction work is permanently ceased. In the context of this provision, "immediately" means as soon as practicable, but no later than the end of the next business day, following the day when the construction activities have temporarily or permanently ceased.

Total Amount of Land Disturbance Occurring At Any One Time[37]	Deadline
	after stabilization has been initiated.[40]
ii. More than five acres (>5.0)	• Initiate the installation of stabilization measures immediately[41] in any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days;[42] and • Complete the installation of stabilization measures as soon as practicable, but no later than seven (7) calendar days after stabilization has been initiated.[43]

b. Exceptions:

i. Arid, semi-arid, and drought-stricken areas (as defined in Appendix A)**.** If it is the seasonally dry period (as defined in Appendix A)[44] or a period in which drought is occurring, and vegetative stabilization measures are being used:

(a) Immediately initiate and, within 14 calendar days of temporary or permanent cessation of work in any portion of your site, complete the installation of temporary non-vegetative stabilization measures to the extent necessary to prevent erosion;

(b) As soon as practicable, given conditions or circumstances on the site, complete all activities necessary to seed or plant the area to be stabilized; and

(c) If construction is occurring during the seasonally dry period, indicate in your SWPPP the beginning and ending dates of the seasonally dry period and your site conditions. Also include the schedule you will follow for initiating and completing vegetative stabilization.

ii. Unforeseen circumstances. Operators that are affected by unforeseen circumstances[45] that delay the initiation and/or completion of vegetative stabilization:

[40] If vegetative stabilization measures are being implemented, stabilization is considered "installed" when all activities necessary to seed or plant the area are completed, including the application of any non-vegetative protective cover (e.g., mulch, erosion control blanket), if applicable. If non-vegetative stabilization measures are being implemented, stabilization is considered "installed" when all such measures are implemented or applied.

[41] See footnote 38.

[42] See footnote 39.

[43] See footnote 40.

[44] The term "seasonally dry period" as defined in Appendix A refers to a month in which the long-term average total precipitation is less than or equal to 0.5 inches. Refer to EPA's Seasonally Dry Period Locator Tool at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates and supporting maps for assistance in determining whether a site is operating during a seasonally dry period for the area.

[45] Examples include problems with the supply of seed stock or with the availability of specialized equipment and unsuitability of soil conditions due to excessive precipitation and/or flooding.

(a) Immediately initiate and, within 14 calendar days, complete the installation of temporary non-vegetative stabilization measures to prevent erosion;

(b) Complete all soil conditioning, seeding, watering or irrigation installation, mulching, and other required activities related to the planting and initial establishment of vegetation as soon as conditions or circumstances allow it on your site; and

(c) Document in the SWPPP the circumstances that prevent you from meeting the deadlines in Part 2.2.14a and the schedule you will follow for initiating and completing stabilization.

iii. Discharges to a sediment- or nutrient-impaired water or to a water that is identified by your State, Tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes. Complete stabilization as soon as practicable, but no later than seven (7) calendar days after stabilization has been initiated.

c. Final Stabilization Criteria (for any areas not covered by permanent structures)**:**

i. Establish uniform, perennial vegetation *(*i.e.*, evenly distributed, without large bare areas)* to provide 70 percent or more of the vegetative cover native to local undisturbed areas; and/or

ii. Implement permanent non-vegetative stabilization measures[46] to provide effective cover of any areas of exposed soil.

iii. Exceptions:

(a) **Arid, semi-arid, and drought-stricken areas** (as defined in Appendix A). Final stabilization is met if the area has been seeded or planted to establish vegetation that provides 70 percent or more of the vegetative cover native to local undisturbed areas within three (3) years and, to the extent necessary to prevent erosion on the seeded or planted area, non-vegetative erosion controls have been applied to provide cover for at least three years without active maintenance.

(b) **Disturbed areas on agricultural land that are restored to their preconstruction agricultural use.** The Part 2.2.14c final stabilization criteria do not apply.

(c) **Areas that need to remain disturbed.** In limited circumstances, stabilization may not be required if the intended function of a specific area of the site necessitates that it remain disturbed, and only the minimum area needed remains disturbed *(*e.g., *dirt access roads, utility pole pads, areas being used for storage of vehicles, equipment, materials).*

2.3 POLLUTION PREVENTION REQUIREMENTS[47]

You must implement pollution prevention controls in accordance with the following requirements to minimize the discharge of pollutants in stormwater and to prevent the discharge of pollutants from spilled or leaked materials from construction activities.

[46] Examples of permanent non-vegetative stabilization measures include riprap, gravel, gabions, and geotextiles.

[47] Under this permit, you are not required to minimize exposure for any products or materials where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

2.3.1 For equipment and vehicle fueling and maintenance:

a. Provide an effective means of eliminating the discharge of spilled or leaked chemicals, including fuels and oils, from these activities;[48]

b. If applicable, comply with the Spill Prevention Control and Countermeasures (SPCC) requirements in 40 CFR part 112 and Section 311 of the CWA;

c. Ensure adequate supplies are available at all times to handle spills, leaks, and disposal of used liquids;

d. Use drip pans and absorbents under or around leaky vehicles;

e. Dispose of or recycle oil and oily wastes in accordance with other Federal, State, Tribal, or local requirements; and

f. Clean up spills or contaminated surfaces immediately, using dry clean up measures (do not clean contaminated surfaces by hosing the area down), and eliminate the source of the spill to prevent a discharge or a continuation of an ongoing discharge.

2.3.2 For equipment and vehicle washing:

a. Provide an effective means of minimizing the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other types of wash waters;[49]

b. Ensure there is no discharge of soaps, solvents, or detergents in equipment and vehicle wash water; and

c. For storage of soaps, detergents, or solvents, provide either (1) cover *(*e.g., *plastic sheeting, temporary roofs)* to minimize the exposure of these detergents to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas.

2.3.3 For storage, handling, and disposal of building products, materials, and wastes:[50]

a. *For building materials and building products*,[51] provide either (1) cover (e.g., *plastic sheeting, temporary roofs*) to minimize the exposure of these products to

[48] Examples of effective means include:

- Locating activities away from receiving waters, storm drain inlets, and constructed or natural site drainage feature so that stormwater coming into contact with these activities cannot reach waters of the U.S.;
- Providing secondary containment (e.g., *spill berms, dikes, spill containment pallets*) and cover where appropriate; and
- Having a spill kit available on site and ensuring personnel are available to respond expeditiously in the event of a leak or spill.

[49] Examples of effective means include locating activities away from receiving waters and storm drain inlets or constructed or natural site drainage features and directing wash waters to a sediment basin or sediment trap, using filtration devices, such as filter bags or sand filters, or using other similarly effective controls.

[50] Compliance with the requirements of this permit does not relieve compliance requirements with respect to Federal, State, or local laws and regulations governing the storage, handling, and disposal of solid, hazardous, or toxic wastes and materials.

[51] Examples of building materials and building products typically present at construction sites include asphalt sealants, copper flashing, roofing materials, adhesives, concrete admixtures, and gravel and mulch stockpiles.

precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas.

Exception: Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

b. *For pesticides, herbicides, insecticides, fertilizers, and landscape materials:*

i. In storage areas, provide either (1) cover (e.g., *plastic sheeting, temporary roofs*) to minimize the exposure of these chemicals to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas; and

ii. Comply with all application and disposal requirements included on the registered pesticide, herbicide, insecticide, and fertilizer label (see also Part 2.3.5).

c. *For diesel fuel, oil, hydraulic fluids, other petroleum products, and other chemicals:* The following requirements apply to the storage and handling of chemicals on your site. If you are already implementing controls as part of an SPCC or other spill prevention plan that meet or exceed the requirements of this Part, you may continue to do so and be considered in compliance with these provisions provided you reference the applicable parts of the SPCC or other plans in your SWPPP as required in Part 7.2.6b.viii.

i. If any chemical container has a storage capacity of less than 55 gallons:

(a) The containers must be water-tight, and must be kept closed, sealed, and secured when not being actively used;

(b) If stored outside, use a spill containment pallet or similar device to capture small leaks or spills; and

(c) Have a spill kit available on site that is in good working condition (i.e., not damaged, expired, or used up) and ensure personnel are available to respond immediately in the event of a leak or spill.

ii. If any chemical container has a storage capacity of 55 gallons or more:

(a) The containers must be water-tight, and must be kept closed, sealed, and secured when not being actively used;

(b) Store containers a minimum of 50 feet from receiving waters, constructed or natural site drainage features, and storm drain inlets. If infeasible due to site constraints, store containers as far away from these features as the site permits. If site constraints prevent you from storing containers 50 feet away from receiving waters or the other features identified, you must document in your SWPPP the specific reasons why the 50-foot setback is infeasible, and how you will store containers as far away as the site permits;

(c) Provide either (1) cover (e.g., temporary roofs) to minimize the exposure of these containers to precipitation and to stormwater, or (2) secondary containment (e.g., curbing, spill berms, dikes, spill containment pallets, double-wall, above-ground storage tank); and

(d) Have a spill kit available on site that is in good working condition (i.e., not

damaged, expired, or used up) and ensure personnel are available to respond immediately in the event of a leak or spill. Additional secondary containment measures are listed at 40 CFR § 112.7(c)(1).

iii. Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly. You are prohibited from hosing the area down to clean surfaces or spills. Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge.

d. *For hazardous or toxic wastes:*[52]

i. Separate hazardous or toxic waste from construction and domestic waste;

ii. Store waste in sealed containers, constructed of suitable materials to prevent leakage and corrosion, and labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements and all other applicable Federal, State, Tribal, or local requirements;

iii. Store all outside containers within appropriately-sized secondary containment (e.g., *spill berms, dikes, spill containment pallets*) to prevent spills from being discharged, or provide a similarly effective means designed to prevent the discharge of pollutants from these areas *(*e.g., *storing chemicals in a covered area, having a spill kit available on site);*

iv. Dispose of hazardous or toxic waste in accordance with the manufacturer's recommended method of disposal and in compliance with Federal, State, Tribal, and local requirements;

v. Clean up spills immediately, using dry clean-up methods, and dispose of used materials properly. You are prohibited from hosing the area down to clean surfaces or spills. Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge; and

vi. Follow all other Federal, State, Tribal, and local requirements regarding hazardous or toxic waste.

e. *For construction and domestic wastes:*[53]

i. Provide waste containers *(*e.g., *dumpster, trash receptacle)* of sufficient size and number to contain construction and domestic wastes;

(a) For waste containers with lids, keep waste container lids closed when not in use, and close lids at the end of the business day and during storm events. For waste containers without lids, provide either (1) cover *(*e.g., *a tarp, plastic sheeting, temporary roof)* to minimize exposure of wastes to precipitation, or (2) a similarly effective means designed to minimize the discharge of pollutants *(*e.g., *secondary containment)*;

(b) On business days, clean up and dispose of waste in designated waste

[52] Examples of hazardous or toxic waste that may be present at construction sites include paints, caulks, sealants, fluorescent light ballasts, solvents, petroleum-based products, wood preservatives, additives, curing compounds, and acids.

[53] Examples of construction and domestic wastes include packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, styrofoam, concrete, demolition debris; and other trash or discarded materials.

containers; and

(c) Clean up immediately if containers overflow, and if there is litter elsewhere on the site from escaped trash.

ii. Waste containers are not required for the waste remnant or unused portions of construction materials or final products that are covered by the exception in Part 2.2.3a provided that:

(a) These wastes are stored separately from other construction or domestic wastes addressed by Part 2.3.3e.i (i.e., wastes not covered by the exception in Part 2.3.3a). If the wastes are mixed, they must be stored in waste containers as required in Part 2.3.3e.i; and

(b) These wastes are stored in designated areas of the site, the wastes are described in the SWPPP (see Part 7.2.6b.ix), and identified in the site plan (see Part 7.2.4i).

f. *For sanitary waste*, position portable toilets so they are secure and will not be tipped or knocked over, and are located away from receiving waters, storm drain inlets, and constructed or natural site drainage features.

2.3.4 For washing applicators and containers used for stucco, paint, concrete, form release oils, curing compounds, or other materials:

a. Direct wash water into a leak-proof container or leak-proof and lined pit designed so no overflows can occur due to inadequate sizing or precipitation;

b. Handle washout or cleanout wastes as follows:

i. For liquid wastes:

(a) Do not dump liquid wastes or allow them to enter into constructed or natural site drainage features, storm inlets, or receiving waters;

(b) Do not allow liquid wastes to be disposed of through infiltration or to otherwise be disposed of on the ground;

(c) Comply with applicable State, Tribal, or local requirements for disposal

ii. Remove and dispose of hardened concrete waste consistent with your handling of other construction wastes in Part 2.3.3e; and

c. Locate any washout or cleanout activities as far away as possible from receiving waters, constructed or natural site drainage features, and storm drain inlets, and, to the extent feasible, designate areas to be used for these activities and conduct such activities only in these areas.

2.3.5 For the application of fertilizers:

a. Apply at a rate and in amounts consistent with manufacturer's specifications, or document in the SWPPP departures from the manufacturer specifications where appropriate in accordance with Part 7.2.6b.x;

b. Apply at the appropriate time of year for your location, and preferably timed to coincide as closely as possible to the period of maximum vegetation uptake and growth;

c. Avoid applying before heavy rains that could cause excess nutrients to be discharged;

d. Never apply to frozen ground;

e. Never apply to constructed or natural site drainage features; and

f. Follow all other Federal, State, Tribal, and local requirements regarding fertilizer application.

2.3.6 Emergency Spill Notification Requirements

Discharges of toxic or hazardous substances from a spill or other release are prohibited, consistent with Part 1.3.5. Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR part 110, 40 CFR part 117, or 40 CFR part 302 occurs during a 24-hour period, you must notify the National Response Center (NRC) at (800) 424-8802 or, in the Washington, DC metropolitan area, call (202) 267-2675 in accordance with the requirements of 40 CFR part 110, 40 CFR part 117, and 40 CFR part 302 as soon as you have knowledge of the release. You must also, within seven (7) calendar days of knowledge of the release, provide a description of the release, the circumstances leading to the release, and the date of the release. State, Tribal, or local requirements may necessitate additional reporting of spills or discharges to local emergency response, public health, or drinking water supply agencies.

2.4 CONSTRUCTION DEWATERING REQUIREMENTS

Comply with the following requirements to minimize the discharge of pollutants from dewatering[54] operations.

2.4.1 Route dewatering water through a sediment control (e.g., sediment trap or basin, pumped water filter bag) designed to prevent discharges with visual turbidity; [55]

2.4.2 Do not discharge visible floating solids or foam;

2.4.3 The discharge must not cause the formation of a visible sheen on the water surface, or visible oily deposits on the bottom or shoreline of the receiving water. Use an oil-water separator or suitable filtration device (such as a cartridge filter) designed to remove oil, grease, or other products if dewatering water is found to or expected to contain these materials;

2.4.4 To the extent feasible, use well-vegetated (e.g., grassy or wooded), upland areas of the site to infiltrate dewatering water before discharge.[56] You are prohibited from using receiving waters as part of the treatment area;

2.4.5 To prevent dewatering-related erosion and related sediment discharges:

a. Use stable, erosion-resistant surfaces (e.g., well-vegetated grassy areas, clean filter stone, geotextile underlayment) to discharge from dewatering controls;

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[54] "Dewatering" is defined in Appendix A as "the act of draining accumulated stormwater and/or ground water from building foundations, vaults, and trenches, or other similar points of accumulation."

[55] For the purposes of this permit, visual turbidity is present where there is a sediment plume in the discharge or the discharge appears cloudy, or opaque, or has a visible contrast that can be identified by an observer.

[56] See footnote 19.

b. Do not place dewatering controls, such as pumped water filter bags, on steep slopes (as defined in Appendix A); and

c. At all points where dewatering water is discharged, comply with the velocity dissipation requirements of Part 2.2.11.

2.4.6 For backwash water, either haul it away for disposal or return it to the beginning of the treatment process;

2.4.7 Replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications; and

2.4.8 Comply with dewatering-specific inspection requirements in Part 4.

3 WATER QUALITY-BASED EFFLUENT LIMITATIONS

3.1 GENERAL EFFLUENT LIMITATION TO MEET APPLICABLE WATER QUALITY STANDARDS

Discharges must be controlled as necessary to meet applicable water quality standards. Discharges must also comply with any additional State or Tribal requirements that are in Part 9.

In the absence of information demonstrating otherwise, EPA expects that compliance with the conditions in this permit will result in stormwater discharges being controlled as necessary to meet applicable water quality standards. If at any time you become aware, or EPA determines, that discharges are not being controlled as necessary to meet applicable water quality standards, you must take corrective action as required in Parts 5.1 and 5.2, and document the corrective actions as required in Part 5.4.

EPA may insist that you install additional controls (to meet the narrative water quality-based effluent limit above) on a site-specific basis, or require you to obtain coverage under an individual permit, if information in your NOI or from other sources indicates that your discharges are not controlled as necessary to meet applicable water quality standards. This includes situations where additional controls are necessary to comply with a wasteload allocation in an EPA-established or approved TMDL.

If during your coverage under a previous permit, you were required to install and maintain stormwater controls specifically to meet the assumptions and requirements of an EPA-approved or established TMDL (for any parameter) or to otherwise control your discharge to meet water quality standards, you must continue to implement such controls as part of your coverage under this permit.

3.2 WATER QUALITY-BASED CONDITIONS FOR SITES DISCHARGING TO CERTAIN IMPAIRED AND HIGH QUALITY RECEIVING WATERS

For any portion of the site that discharges to a sediment or nutrient-impaired water or to a water that is identified by your State, Tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes,[57] you must comply with the inspection frequency specified in Part 4.3 and you must comply with the stabilization deadline specified in Part 2.2.14b.iii.[58]

[57] Refer to Appendix A for definitions of "impaired water" and "Tier 2," "Tier 2.5," and "Tier 3" waters. For assistance in determining whether your site discharges to impaired waters, EPA has developed a tool that is available at https://www.epa.gov/npdes/epas-stormwater-discharge-mapping-tools. For assistance in determining whether your site discharges to a Tier 2, 2.5, or 3 water, refer to the list of such waters at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates.

[58] If you qualify for any of the reduced inspection frequencies in Part 4.4, you may conduct inspections in

If you discharge to a water that is impaired for a parameter other than a sediment-related parameter or nutrients, EPA will inform you if any additional controls are necessary for your discharge to be controlled as necessary to meet water quality standards. These controls might include those necessary for your discharge to be consistent with the assumptions of any available wasteload allocation in any applicable TMDL. In addition, EPA may require you to apply for and obtain coverage under an individual NPDES permit.

In addition, on a case-by-case basis, EPA may notify operators of new sites or operators of existing sites with increased discharges that additional analyses, stormwater controls, and/or other measures are necessary to comply with the applicable antidegradation requirements, or notify you that an individual permit application is necessary.

If you discharge to a water that is impaired for polychlorinated biphenyls (PCBs) and are engaging in demolition of any structure with at least 10,000 square feet of floor space built or renovated before January 1, 1980, you must:

a. Implement controls[59] to minimize the exposure of PCB-containing building materials, including paint, caulk, and pre-1980 fluorescent lighting fixtures, to precipitation and to stormwater; and

b. Ensure that disposal of such materials is performed in compliance with applicable State, Federal, and local laws.

3.3 TURBIDITY BENCHMARK MONITORING FOR SITES DISCHARGING DEWATERING WATER TO PROTECT THE WATER QUALITY OF SENSITIVE WATERS

For sites discharging dewatering water to "sensitive waters" (i.e., receiving waters listed as impaired for sediment or a sediment-related parameter (as defined in Appendix A), or receiving waters designated as a Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes) you are required to comply with the benchmark monitoring requirements in this Part and document the procedures you will use at your site in your SWPPP pursuant to Part 7.2.8. A summary of these requirements is included in Table 1.

EPA notes that the benchmark threshold is not an effluent limitation, rather it is an indicator that the dewatering controls may not be working to protect water quality, which the operator must investigate and correct as appropriate. A benchmark exceedance is not a permit violation. However, if a benchmark exceedance triggers corrective action in Part 5.1.5a, failure to conduct any required action is a permit violation.

Where there are multiple operators associated with the same site, the operators may coordinate with one another to carry out the monitoring requirements of this Part in order to avoid duplicating efforts. Such coordinating arrangements must be described in the SWPPP consistent with Part 7.2.8. Regardless of how the operators divide the

accordance with Part 4.4 for any portion of your site that discharges to a sensitive water.

[59] Examples of controls to minimize exposure of PCBs to precipitation and stormwater include separating work areas from non-work areas and selecting appropriate personal protective equipment and tools, constructing a containment area so that all dust or debris generated by the work remains within the protected area, and using tools that minimize dust and heat (<212°F). For additional information, refer to Part 2.3.3 of the CGP Fact Sheet.

responsibilities for monitoring and reporting, each operator remains responsible for compliance with these requirements.[60]

3.3.1 Turbidity monitoring requirements[61]

a. **Sampling frequency.** You must collect at least one turbidity sample from your dewatering discharge each day a discharge occurs.

b. **Sampling location.** Samples must be taken at all points where dewatering water is discharged. Samples must be taken after the dewatering water has been treated by installed treatment devices pursuant to Parts 2.4.1 and 2.4.3 and prior to its discharge off site into a receiving water, constructed or natural site drainage feature, or storm drain inlet.

c. **Representative samples.** Samples taken must be representative of the dewatering discharge for any given day as required in Appendix G (standard permit conditions), Part G.10.2.

d. **Test methods.** Samples must be measured using a turbidity meter that reports results in nephelometric turbidity units (NTUs) and conforms with a Part 136-approved method (e.g., methods 180.1 and 2130). You are required to use the meter, and conduct a calibration verification prior to each day's use, consistent with the manufacturer's instructions.

3.3.2 Turbidity benchmark

a. The benchmark threshold for turbidity for this permit is 50 NTUs (referred to elsewhere in this permit as the "standard 50 NTU benchmark") unless EPA has authorized the use of an alternate benchmark in accordance with Part 3.3.2b.

b. **Request for alternate benchmark threshold.**

i. At any time prior to or during your coverage under this permit, you may request that EPA approve a benchmark for your site that is higher than 50 NTUs if you have information demonstrating the higher number is the same as your receiving water's water quality standard for turbidity. Unless EPA approves an alternate benchmark, you will be required to use the standard 50 NTU benchmark. To request approval of an alternate benchmark, you must submit the following information to your applicable EPA Regional Office (see Appendix K):
(a) The current turbidity water quality standard that applies to your receiving

[60] For instance, if Operator A relies on Operator B to meet the Part 3.3.1 turbidity monitoring requirements, the Part 3.3.4 reporting and recordkeeping requirements, and the Part 5.2.2 corrective action provisions when applicable, Operator A does not have to duplicate these same functions if Operator B is implementing them for both operators to be in compliance with the permit. However, Operator A remains responsible for complying with these permit requirements if Operator B fails to take actions that were necessary for Operator A to comply with the permit. See also footnote 83. EPA notes that both Operator A and B are required to submit turbidity monitoring reports as required under Part 3.3.4, however, Operator A's report does not need to include the data collected by Operator B as long as Operator B submits the required data and Operator A's report indicates that it is relying on Operator B to report the data. See Part 3.3.4a.

[61] Operators may find it useful to consult EPA's *Monitoring and Inspection Guide for Construction Dewatering*, available at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates, which provides guidelines on how to correctly monitor for turbidity, determine if the weekly average exceeds the benchmark, and, if so, how to proceed with corrective action.

water and the source/citation.[62]

(b) If the applicable turbidity water quality standard requires information on natural or background turbidity levels (e.g., "no more than 10 NTU above natural turbidity levels") to determine the specific standard for the receiving water, include available data that can be used to establish the natural turbidity levels of your receiving water (including literature studies or Federal, State, Tribal, or local government data). Data must be representative of the natural turbidity levels of your specific receiving water. Identify the source(s) of all data provided, including if the data are from samples you collected of the receiving water.

ii. EPA will inform you of its decision on whether to approve the requested alternate benchmark within 30 days. EPA may approve your request, request additional time (e.g., if additional information is needed to substantiate the data you provided), or deny your request. Unless and until EPA approves your request to use an alternate benchmark, you are required to use the standard benchmark of 50 NTUs and take any required corrective actions if an exceedance occurs.

3.3.3 Comparison of turbidity samples to benchmark. Compare the weekly average[63] of your turbidity monitoring results to the standard 50 NTU benchmark, or alternate benchmark if approved by EPA.

a. If the weekly average of your turbidity monitoring results exceeds the standard benchmark (or your approved alternate benchmark), you are required to conduct follow-up corrective action in accordance with Part 5.2.2 and document any corrective action taken in your corrective action log in accordance with Part 5.4**.**

b. For averaging purposes, a "monitoring week" starts with a Monday and ends on Sunday. Once a new monitoring week starts, you will need to calculate a new average for that week of turbidity monitoring results.[64] A weekly average may consist of one or more turbidity monitoring results.

c. Although you are not required to collect and analyze more than one turbidity sample per day from your dewatering discharge, if you do collect and analyze more than one sample on any given day, you must include any additional results in the

[62] For instance, if your site is located in Washington, DC, and you are discharging to a Class B water, for which the water quality standard is that turbidity may not increase above ambient levels by more than 20 percent, you would reference "Water Quality Standards for the District of Columbia, Chapter 11, Section 1104.8."

[63] A "weekly average" is defined as the sum of all of the turbidity samples taken during a "monitoring week" divided by the number of samples measured during that week. Average values should be calculated to the nearest whole number.

[64] For example, if turbidity samples from your dewatering discharge in week 1 result in values of 30 NTU on Tuesday, 40 NTU on Wednesday, and 45 NTU on Thursday, your weekly average turbidity value would be 38.33 NTU ((30+40+45) ÷ 3 = 38 NTU). If in week 2, your turbidity samples resulted in values of 45 NTU on Monday, 30 NTU on Tuesday, 25 NTU on Wednesday, and 15 NTU on Thursday, you would calculate a new average for that week, which would yield an average turbidity value of 28.75 NTU ((45+30+25+15) ÷ 4 = 29 NTU). By comparison, if your samples on consecutive days from Friday to Monday were 60 NTU, 45 NTU, 40 NTU, and 43 NTU, respectively, and there are no other dewatering discharges for the remainder of the week, you would calculate one weekly average for the Friday to Sunday to be 48 NTU ((60+45+40) ÷ 3 = 48 NTU), and a separate weekly average for the one Monday to be 43 NTU (43 ÷ 1 = 43 NTU).

calculation of your weekly average (i.e., add all individual results for that monitoring week and divide by the total number of samples).[65]

d. If you are conducting turbidity monitoring for more than one dewatering discharge point, you must calculate a weekly average turbidity value for each discharge point and compare each to the turbidity benchmark.

3.3.4 Reporting and recordkeeping.

a. You must submit reports of your weekly average turbidity data to EPA no later than 30 days following the end of each monitoring quarter. If there are monitoring weeks in which there was no dewatering discharge, or if there is a monitoring quarter with no dewatering discharge, indicate this in your turbidity monitoring report. If another operator associated with your same site is conducting turbidity monitoring on your behalf pursuant to Part 3.3, indicate this in your turbidity monitoring report.

b. For the purposes of this permit, the following monitoring quarters and reporting deadlines apply:

Table 3. Monitoring Quarters and Deadlines for Reporting Turbidity Benchmark Monitoring Data.

Monitoring Quarter #	**Months**	**Reporting Deadline** (no later than 30 days after end of the monitoring quarter)
1	January 1 – March 31	April 30
2	April 1 – June 30	July 30
3	July 1 – September 30	October 30
4	October 1 – December 31	January 30

c. You must use EPA's NPDES eReporting Tool (NeT) to electronically submit your quarterly turbidity data, unless, consistent with Part 1.4.2, you received a waiver from your applicable EPA Regional Office. If the EPA Regional Office grants you approval to use a paper turbidity monitoring report form, and you elect to use it, you must complete the form in Appendix K. If EPA approves of your request to use an alternate turbidity benchmark pursuant to Part 3.3.2b, EPA will substitute the alternate benchmark in your NeT account.

d. For each day in which you are required to monitor, you must record the monitoring information required by Appendix G, Parts G.10.2 and G.10.3 and retain all such information for a period of at least three years from the date this permit expires or from the date your authorization is terminated.

[65] For example, if during a monitoring week you take two turbidity samples on Tuesday with a value of 30 NTU and 35 NTU, three samples on Wednesday with a value of 40 NTU, 45 NTU, and 48 NTU, and one sample on Thursday with a value of 45 NTU, your weekly average turbidity value for this week would be 41 NTU ((30+35+40+45+48+45) ÷ 6 = 41 NTU).

Table 4. Summary of Turbidity Benchmark Monitoring Requirements.

Applicability	Sampling Requirement	Turbidity Benchmark	Corrective Action	Reporting
Sites discharging dewatering water to a sediment-impaired water or to a water designated as a Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes.	Collect at least one turbidity sample per day, from each discharge point, on any day there is a dewatering discharge. Use turbidity sampling procedures specified in Part 3.3.1.	Compare the weekly average of your turbidity monitoring results to the 50 NTU benchmark (or alternate benchmark if approved by EPA).	If the weekly average of turbidity monitoring results exceeds the 50 NTU turbidity benchmark (or alternate benchmark if approved by EPA), you are required to take follow-up corrective action in accordance with Part 5.2.2.	Report all weekly average turbidity monitoring results on a quarterly basis via NeT-CGP (unless use of the paper monitoring form in Appendix K is approved by EPA) no later than 30 days following the end of each monitoring quarter.

4 INSPECTION REQUIREMENTS

4.1 PERSON(S) RESPONSIBLE FOR CONDUCTING SITE AND DEWATERING INSPECTIONS

The person(s) inspecting your site may be a person on your staff or a third party you hire to conduct such inspections. You are responsible for ensuring that any person conducting inspections pursuant to this Part is a "qualified person." A qualified person is someone who has completed the training required by Part 6.3.

4.2 FREQUENCY OF INSPECTIONS.[66]

At a minimum, you must conduct a site inspection in accordance with one of the two schedules listed below, unless you are subject to the Part 4.3 site inspection frequency for discharges to sediment or nutrient-impaired or high quality waters, or qualify for a Part 4.4 reduction in the inspection frequency:

4.2.1 At least once every seven (7) calendar days; *or*

4.2.2 Once every 14 calendar days *and* within 24 hours[67] of the occurrence of:

- **a.** A storm event that produces 0.25 inches or more of rain within a 24-hour period.
  - **i.** If a storm event produces 0.25 inches or more of rain within a 24-hour period (including when there are multiple, smaller storms that alone produce less than 0.25 inches but together produce 0.25 inches or more in 24 hours), you are required to conduct one inspection within 24 hours of when 0.25 inches of rain or more has fallen.

[66] Inspections are only required during the site's normal working hours.

[67] For the purposes of the inspection requirements in this Part, conducting an inspection "within 24 hours" means that once either of the two conditions in Parts 4.2.2a or 4.2.2b are met you have 24 hours from that time to conduct an inspection. For clarification, the 24 hours is counted as a continuous passage of time, and not counted by business hours (e.g., 3 business days of 8 hours each). When the 24-hour inspection time frame occurs entirely outside of normal working hours, you must conduct an inspection by no later than the end of the next business day.

ii. If a storm event produces 0.25 inches or more of rain within a 24-hour period on the first day of a storm and continues to produce 0.25 inches or more of rain on subsequent days, you must conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the last day of the storm that produces 0.25 inches or more of rain (i.e., only two inspections would be required for such a storm event).[68]

b. A discharge caused by snowmelt from a storm event that produces 3.25 inches[69] or more of snow within a 24-hour period. You are required to conduct one inspection once the discharge of snowmelt from a 3.25-inch or more snow accumulation occurs. Additional snowmelt inspections are only required if following the discharge from the first snowmelt, there is a discharge from a separate storm event that produces 3.25 inches or more of snow.

4.2.3 To determine whether a storm event meets either of the thresholds in Parts 4.2.2a or 4.2.2b:

a. For rain, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any 24-hour period during which there is 0.25 inches or more of rainfall, you must record the total rainfall measured for that day in accordance with Part 4.7.1d.

b. For snow, you must either take measurements of snowfall at your site,[70] or rely on similar information from a local weather forecasting provider that is representative of your location.

4.3 INCREASE IN INSPECTION FREQUENCY FOR CERTAIN SITES.

The increased inspection frequencies established in this Part take the place of the Part 4.2 inspection frequencies for the portion of the site affected.

4.3.1 For any portion of the site that discharges to a sediment or nutrient-impaired water or to a water that is identified by your State, Tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes (see Part 3.2), you must conduct an once every seven (7) calendar days *and* within 24 hours of the occurrence of a storm event that produces 0.25 inches or more of rain within a 24-hour period, or within 24 hours of a snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period.

[68] For example, if 0.30 inches of rain falls on Day 1, 0.25 inches of rain falls on Day 2, and 0.10 inches of rain fall on Day 3, you would be required to conduct a first inspection within 24 hours of the Day 1 rainfall and a second inspection within 24 hours of the Day 2 rainfall, but a third inspection would not be required within 24 hours of the Day 3 rainfall.

[69] This is the amount of snow that is equivalent to 0.25 inches of rain, based on information from the National Oceanic and Atmospheric Administration (NOAA) indicating that 13 inches of snow is, on average, equivalent to 1 inch of rain. See https://www.nssl.noaa.gov/education/svrwx101/winter/faq/.

[70] For snowfall measurements, EPA suggests use of NOAA's National Weather Service guidelines at https://www.weather.gov/jkl/snow_measurement. These guidelines recommend use of a "snowboard" (a piece of wood about 16 inches by 16 inches) that is placed in an unobstructed part of the site on a hard surface.

Refer to Parts 4.2.3a and 4.2.3b for the requirements to determine if a storm event produces enough rain or snow to trigger the inspection requirement.

4.3.2 **For sites discharging dewatering water,** you must conduct an inspection in accordance with Part 4.6.3 during the discharge once per day on which the discharge occurs. The Part 4.2 inspection frequency still applies to all other portions of the site, unless the site is affected by either the increased frequency in Part 4.3.1 or the reduced frequency in Part 4.4.

4.4 REDUCTIONS IN INSPECTION FREQUENCY

4.4.1 Stabilized areas.

a. You may reduce the frequency of inspections to twice per month for the first month, no more than 14 calendar days apart, then once per month until permit coverage is terminated consistent with Part 8 in any area of your site where the stabilization steps in Part 2.2.14a have been completed. If construction activity resumes in this portion of the site at a later date, the inspection frequency immediately increases to that required in Parts 4.2 and 4.3, as applicable. You must document the beginning and ending dates of this period in your SWPPP.

b. **Exception.** For "linear construction sites" (as defined in Appendix A) where disturbed portions have undergone final stabilization at the same time active construction continues on others, you may reduce the frequency of inspections to twice per month for the first month, no more than 14 calendar days apart, in any area of your site where the stabilization steps in Part 2.2.14a have been completed. After the first month, inspect once more within 24 hours of the occurrence of a storm event that produces 0.25 inches of rain or more within a 24-hour period, or within 24 hours of a snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period. If there are no issues or evidence of stabilization problems, you may suspend further inspections. If "wash-out" of stabilization materials and/or sediment is observed, following re-stabilization, inspections must resume at the inspection frequency required in Part 4.4.1a. Inspections must continue until final stabilization is visually confirmed following a storm event that produces 0.25 inches of rain or more within a 24-hour period.

4.4.2 **Arid, semi-arid, or drought-stricken areas** (as defined in Appendix A). If it is the seasonally dry period[71] or a period in which drought is occurring, you may reduce the frequency of inspections to once per month and within 24 hours of the occurrence of a storm event that produces 0.25 inches of rain or more within a 24-hour period, or within 24 hours of a snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period. You must document that you are using this reduced schedule and the beginning and ending dates of the seasonally dry period in your SWPPP. Follow the procedures in Part 4.2.3a and 4.2.3b, accordingly, to determine if a storm event occurs that produces 0.25 inches or more of rain or 3.25 inches or more of snow within a 24-hour period. For any 24-hour period during which there is 0.25 inches or more of rainfall, or 3.25 inches or more of snow, you must record the total rainfall or snow measured for that day in accordance with Part 4.7.1d.

[71] See footnote 44.

4.4.3 Frozen conditions:

a. If you are suspending construction activities due to frozen conditions, you may temporarily suspend inspections on your site until thawing conditions (as defined in Appendix A) begin to occur if:

   i. Discharges are unlikely due to continuous frozen conditions that are likely to continue at your site for at least three (3) months based on historic seasonal averages.[72] If unexpected weather conditions (such as above freezing temperatures or rain events) make discharges likely, you must immediately resume your regular inspection frequency as described in Parts 4.2 and 4.3, as applicable;

   ii. Land disturbances have been suspended; and

   iii. All disturbed areas of the site have been stabilized in accordance with Part 2.2.14a.

b. If you are still conducting construction activities during frozen conditions, you may reduce your inspection frequency to once per month if:

   i. Discharges are unlikely due to continuous frozen conditions that are likely to continue at your site for at least three (3) months based on historic seasonal averages. If unexpected weather conditions (such as above freezing temperatures or rain events) make discharges likely, you must immediately resume your regular inspection frequency as described in Parts 4.2 and 4.3, as applicable; and

   ii. Except for areas in which you are actively conducting construction activities, disturbed areas of the site have been stabilized in accordance with Part 2.2.14a.

You must document the beginning and ending dates of this period in your SWPPP.

4.5 AREAS THAT MUST BE INSPECTED

During your site inspection, you must at a minimum inspect the following areas of your site:

4.5.1 All areas that have been cleared, graded, or excavated and that have not yet completed stabilization consistent with Part 2.2.14a;

4.5.2 All stormwater controls, including pollution prevention controls, installed at the site to comply with this permit;[73]

4.5.3 Material, waste, borrow, and equipment storage and maintenance areas that are covered by this permit;

4.5.4 All areas where stormwater typically flows within the site, including constructed or natural site drainage features designed to divert, convey, and/or treat stormwater;

4.5.5 All areas where construction dewatering is taking place, including controls to treat the dewatering discharge and any channelized flow of water to and from those controls;

[72] Use data sets that include the most recent data available to account for recent precipitation patterns and trends.

[73] This includes the requirement to inspect for sediment that has been tracked out from the site onto paved roads, sidewalks, or other paved areas consistent with Part 2.2.4.

4.5.6 All points of discharge from the site; and

4.5.7 All locations where stabilization measures have been implemented.

You are not required to inspect areas that, at the time of the inspection, are considered unsafe to your inspection personnel.

4.6 REQUIREMENTS FOR INSPECTIONS

4.6.1 During each site inspection, you must at a minimum:

a. Check whether all stormwater controls *(*i.e.*, erosion and sediment controls and pollution prevention controls)* are properly installed, appear to be operational, and are working as intended to minimize pollutant discharges.

b. Check for the presence of conditions that could lead to spills, leaks, or other accumulations of pollutants on the site.

c. Identify any locations where new or modified stormwater controls are necessary to meet the requirements of Parts 2 and/or 3.

d. Check for signs of visible erosion and sedimentation *(*i.e.*, sediment deposits)* that have occurred and are attributable to your discharge at points of discharge and, if applicable, on the banks of any receiving waters flowing within or immediately adjacent to the site;

e. Check for signs of sediment deposition that are visible from your site and attributable to your discharge (e.g., sand bars with no vegetation growing on top in receiving waters or in other constructed or natural site drainage features, or the buildup of sediment deposits on nearby streets, curbs, or open conveyance channels).

f. Identify any incidents of noncompliance observed.

4.6.2 If a discharge is occurring during your inspection:

a. Identify all discharge points at the site; and

b. Observe and document the visual quality of the discharge, and take note of the characteristics of the stormwater discharge, including color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indicators of stormwater pollutants. Check also for signs of these same pollutant characteristics that are visible from your site and attributable to your discharge in receiving waters or in other constructed or natural site drainage features.

4.6.3 For dewatering inspections conducted pursuant to Parts 4.3.2, record the following in a report within 24 hours of completing the inspection:

a. The inspection date;

b. Names and titles of personnel making the inspection;

c. Approximate times that the dewatering discharge began and ended on the day of inspection;[74]

d. Estimates of the rate (in gallons per day) of discharge on the day of inspection;

[74] If the dewatering discharge is a continuous discharge that continues after normal business hours, indicate that the discharge is continuous.

e. Whether or not any of the following indications of pollutant discharge were observed at the point of discharge to any receiving waters flowing through or immediately adjacent to the site and/or to constructed or natural site drainage features or storm drain inlets:[75]

i. a sediment plume, suspended solids, unusual color, presence of odor, decreased clarity, or presence of foam; and/or

ii. a visible sheen on the water surface or visible oily deposits on the bottom or shoreline of the receiving water; and

f. Photographs of (1) the dewatering water prior to treatment by a dewatering control(s) and the final discharge after treatment; (2) the dewatering control(s); and (3) the point of discharge to any receiving waters flowing through or immediately adjacent to the site and/or to constructed or natural site drainage features, storm drain inlets, and other conveyances to receiving waters.

You must also comply with the Part 4.7.2, 4.7.3, and 4.7.4 requirements for signing the reports, keeping them available on site, and retaining copies.

4.6.4 Based on the results of your inspection:

a. Complete any necessary maintenance repairs or replacements under Part 2.1.4 or under Part 5, whichever applies; and

b. Modify your SWPPP site map in accordance with Part 7.4.1 to reflect changes to your stormwater controls that are no longer accurately reflected on the current site map.

4.7 INSPECTION REPORT

4.7.1 You must complete an inspection report within 24 hours of completing any site inspection. Each inspection report (except for dewatering inspection reports, which are covered in Part 4.6.3) must include the following:

a. The inspection date;

b. Names and titles of personnel making the inspection;

c. A summary of your inspection findings, covering at a minimum the observations you made in accordance with Part 4.6, including any problems found during your inspection that make it necessary to perform routine maintenance pursuant to Part 2.1.4b or corrective action pursuant to Part 5. Include also any documentation as to why the corrective action procedures under Part 5 are unnecessary to fix a problem that repeatedly occurs as described in Part 2.1.4c;

d. If you are inspecting your site at the frequency specified in Part 4.2.2, Part 4.3, or Part 4.4.1b, and you conducted an inspection because of a storm event that produced rainfall measuring 0.25 inches or more within a 24-hour period, you must include the applicable rain gauge or weather station readings that triggered the inspection. Similarly, if you conducted an inspection because of a snowmelt discharge from a storm event that produced 3.25 inches or more of snow within a 24-hour period, you must include any measurements taken of snowfall at your site, or weather station information you relied on; and

[75] If the operator observes any of these indicators of pollutant discharge, corrective action is required consistent with Parts 5.1.5b and 5.2.2.

e. If you determined that it is unsafe to inspect a portion of your site, you must describe the reason you found it to be unsafe and specify the locations to which this condition applies.

4.7.2 Each inspection report must be signed by the operator's signatory in accordance with Appendix G, Part G.11 of this permit.

4.7.3 You must keep a copy of all inspection reports at the site or at an easily accessible location, so that it can be made immediately available at the time of an on-site inspection or upon request by EPA.[76]

4.7.4 You must retain all inspection reports completed for this Part for at least three (3) years from the date that your permit coverage expires or is terminated.

4.8 INSPECTIONS BY EPA

You must allow EPA, or an authorized representative of EPA, to conduct the following activities at reasonable times. To the extent that you are utilizing shared controls, that are not on site, to comply with this permit, you must make arrangements for EPA to have access at all reasonable times to those areas where the shared controls are located.

4.8.1 Enter onto all areas of the site, including any construction support activity areas covered by this permit, any off-site areas where shared controls are utilized to comply with this permit, discharge locations, adjoining waterbodies, and locations where records are kept under the conditions of this permit;

4.8.2 Access and copy any records that must be kept under the conditions of this permit;

4.8.3 Inspect your construction site, including any construction support activity areas covered by this permit (see Part 1.2.1c), any stormwater controls installed and maintained at the site, and any off-site shared controls utilized to comply with this permit; and

4.8.4 Sample or monitor for the purpose of ensuring compliance.

5 CORRECTIVE ACTIONS

5.1 CONDITIONS TRIGGERING CORRECTIVE ACTION.

You must take corrective action to address any of the following conditions identified at your site:

5.1.1 A stormwater control needs a significant repair or a new or replacement control is needed, or, in accordance with Part 2.1.4c, you find it necessary to repeatedly (i.e., three (3) or more times) conduct the same routine maintenance fix to the same control at the same location (unless you document in your inspection report under Part 4.7.1c that the specific reoccurrence of this same problem should still be addressed as a routine maintenance fix under Part 2.1.4); or

5.1.2 A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly; or

[76] Inspection reports may be prepared, signed, and kept electronically, rather than in paper form, if the records are: (a) in a format that can be read in a similar manner as a paper record; (b) legally dependable with no less evidentiary value than their paper equivalent; and (c) immediately accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be, if the records were stored in paper form. For additional guidance on the proper practices to follow for the electronic retention of inspection report records, refer to the Fact Sheet discussion related to Part 4.7.3.

5.1.3 Your discharges are not meeting applicable water quality standards;

5.1.4 A prohibited discharge has occurred (see Part 1.3); or

5.1.5 During discharge from site dewatering activities:

a. The weekly average of your turbidity monitoring results exceeds the 50 NTU benchmark (or alternate benchmark if approved by EPA pursuant to Part 3.3.2b); or

b. You observe or you are informed by EPA, State, or local authorities of the presence of the conditions specified in Part 4.6.3e.

5.2 CORRECTIVE ACTION DEADLINES

5.2.1 If responding to any of the Part 5.1.1, 5.1.2, 5.1.3, or 5.1.4 triggering conditions, you must:

a. Immediately take all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events; and

b. When the problem does not require a new or replacement control or significant repair, the corrective action must be completed by the close of the next business day; or

c. When the problem requires a new or replacement control or significant repair, install the new or modified control and make it operational, or complete the repair, by no later than seven (7) calendar days from the time of discovery. If it is infeasible to complete the installation or repair within seven (7) calendar days, you must document in your records why it is infeasible to complete the installation or repair within the 7-day timeframe and document your schedule for installing the stormwater control(s) and making it operational as soon as feasible after the 7-day timeframe. Where these actions result in changes to any of the stormwater controls or procedures documented in your SWPPP, you must modify your SWPPP accordingly within seven (7) calendar days of completing this work.

5.2.2 If responding to either of the Part 5.1.5 triggering conditions related to site dewatering activities, you must:

a. Immediately take all reasonable steps to minimize or prevent the discharge of pollutants until you can implement a solution, including shutting off the dewatering discharge as soon as possible depending on the severity of the condition[77] taking safety considerations into account;

b. Determine whether the dewatering controls are operating effectively and whether they are causing the conditions; and

c. Make any necessary adjustments, repairs, or replacements to the dewatering controls to lower the turbidity levels below the benchmark or remove the visible plume or sheen.

[77] For instance, if the weekly average of your turbidity monitoring results or a single sample is extremely high (e.g., a single turbidity sample results in 355 NTUs or higher), you should take action to safely shut off the discharge so that you can evaluate the cause of the high turbidity. Note: A single turbidity sample of 355 NTUs or higher means that the weekly average turbidity value will exceed 50 NTU regardless of the turbidity values the other days during the week.

When you have completed these steps and made any changes deemed necessary, you may resume discharging from your dewatering activities.

5.3 CORRECTIVE ACTION REQUIRED BY EPA

You must comply with any corrective actions required by EPA as a result of permit violations found during an inspection carried out under Part 4.8.

5.4 CORRECTIVE ACTION LOG

5.4.1 For each corrective action taken in accordance with this Part, you must record the following in a corrective action log:

- **a.** Within 24 hours of identifying the corrective action condition, document the specific condition and the date and time it was identified.
- **b.** Within 24 hours of completing the corrective action (in accordance with the deadlines in Part 5.2), document the actions taken to address the condition, including whether any SWPPP modifications are required.

5.4.2 Each entry into the corrective action log, consisting of the information required by both Parts 5.4.1a and 5.4.1b, must be signed by the operator's signatory in accordance with Appendix G, Part G.11.2 of this permit.

5.4.3 You must keep a copy of the corrective action log at the site or at an easily accessible location, so that it can be made immediately available at the time of an on-site inspection or upon request by EPA.[78]

5.4.4 You must retain the corrective action log for at least three (3) years from the date that your permit coverage expires or is terminated.

6 STORMWATER TEAM FORMATION/STAFF TRAINING REQUIREMENTS

6.1 STORMWATER TEAM

Each operator, or group of multiple operators, must assemble a "stormwater team" that will be responsible for carrying out activities necessary to comply with this permit. The stormwater team must include the following people:

- **a.** Personnel who are responsible for the design, installation, maintenance, and/or repair of stormwater controls (including pollution prevention controls);
- **b.** Personnel responsible for the application and storage of treatment chemicals (if applicable);
- **c.** Personnel who are responsible for conducting inspections as required in Part 4.1; and
- **d.** Personnel who are responsible for taking corrective actions as required in Part 5.

Members of the stormwater team must be identified in the SWPPP pursuant to Part 7.2.2.

[78] The corrective action log may be prepared, signed, and kept electronically, rather than in paper form, if the records are: (a) in a format that can be read in a similar manner as a paper record; (b) legally dependable with no less evidentiary value than their paper equivalent; and (c) immediately accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be, if the records were stored in paper form. For additional guidance on the proper practices to follow for the electronic retention of corrective action log records, refer to the Fact Sheet discussion related to Part 4.7.3.

6.2 GENERAL TRAINING REQUIREMENTS FOR STORMWATER TEAM MEMBERS

Prior to the commencement of construction activities, you must ensure that all persons[79] assigned to the stormwater team understand the requirements of this permit and their specific responsibilities with respect to those requirements, including the following related to the scope of their job duties:

a. The permit requirements and deadlines associated with installation, maintenance, and removal of stormwater controls, as well as site stabilization**;**

b. The location of all stormwater controls on the site required by this permit and how they are to be maintained;

c. The proper procedures to follow with respect to the permit's pollution prevention requirements; and

d. When and how to conduct inspections, record applicable findings, and take corrective actions. Specific training requirements for persons conducting site inspections are included in Part 6.3.

You are responsible for ensuring that all activities on the site comply with the requirements of this permit. You are not required to provide or document formal training for subcontractors or other outside service providers (unless the subcontractors or outside service providers are responsible for conducting the inspections required in Part 4, in which case you must provide such documentation consistent with Part 7.2.2), but you must ensure that such personnel understand any requirements of this permit that may be affected by the work they are subcontracted to perform.

6.3 TRAINING REQUIREMENTS FOR PERSONS CONDUCTING INSPECTIONS

For projects that receive coverage under this permit on or after February 17, 2023, to be considered a qualified person under Part 4.1 for conducting inspections under Part 4, you must, at a minimum, either:

a. Have completed the EPA construction inspection course developed for this permit and have passed the exam; or

b. Hold a current valid construction inspection certification or license from a program that, at a minimum, covers the following:[80]

i. Principles and practices of erosion and sediment control and pollution prevention practices at construction sites;

ii. Proper installation and maintenance of erosion and sediment controls and pollution prevention practices used at construction sites; and

iii. Performance of inspections, including the proper completion of required reports and documentation, consistent with the requirements of Part 4.

[79] If the person requiring training is a new employee who starts after you commence construction activities, you must ensure that this person has the proper understanding as required above prior to assuming particular responsibilities related to compliance with this permit. For emergency-related projects, the requirement to train personnel prior to commencement of construction activities does not apply, however, such personnel must have the required training prior to NOI submission.

[80] If one of the following topics (e.g., installation and maintenance of pollution prevention practices) is not covered by the non-EPA training program, you may consider supplementing the training with the analogous module of the EPA course (e.g., Module 4) that covers the missing topic.

For projects that receive coverage under this permit prior to February 17, 2023, any personnel conducting site inspections pursuant to Part 4 on your site must, at a minimum, be a person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality, and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.[81]

6.4 STORMWATER TEAM'S ACCESS TO PERMIT DOCUMENTS

Each member of the stormwater team must have easy access to an electronic or paper copy of applicable portions of this permit, the most updated copy of your SWPPP, and other relevant documents or information that must be kept with the SWPPP.

7 STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

7.1 GENERAL REQUIREMENTS

All operators associated with a construction site under this permit must develop a SWPPP consistent with the requirements in Part 7 prior to their submittal of the NOI.[82, 83, 84] The SWPPP must be kept up-to-date throughout coverage under this permit.

If a SWPPP was prepared under a previous version of this permit, the operator must review and update the SWPPP to ensure that this permit's requirements are addressed prior to submitting an NOI for coverage under this permit.

7.2 SWPPP CONTENTS

At a minimum, the SWPPP must include the information specified in this Part and as specified in other parts of this permit.

7.2.1 All Site Operators. Include a list of all other operators who will be engaged in construction activities at the site, and the areas of the site over which each operator has control.

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[81] If you receive coverage for a project prior to February 17, 2023, and construction activities for the same project will continue after February 17, 2023, the personnel conducting inspections do not need to take the additional training specified in Parts 6.3a and 6.3b for inspections conducted on the project site. If the same operator obtains coverage for a different project on or after February 17, 2023, personnel conducting inspections would be required to meet the requirements for a qualified person by completing the training in either Part 6.3a or Part 6.3b.

[82] The SWPPP does not establish the effluent limits and/or other permit terms and conditions that apply to your site's discharges; these limits, terms, and conditions are established in this permit.

[83] Where there are multiple operators associated with the same site, they may develop a group SWPPP instead of multiple individual SWPPPs. Regardless of whether there is a group SWPPP or multiple individual SWPPPs, each operator is responsible for compliance with the permit's terms and conditions. In other words, if Operator A relies on Operator B to satisfy its permit obligations, Operator A does not have to duplicate those permit-related functions if Operator B is implementing them such that both operators are in compliance with the permit. However, Operator A remains responsible for permit compliance if Operator B fails to take actions necessary for Operator A to comply with the permit. In addition, all operators must ensure, either directly or through coordination with other operators, that their activities do not cause a violation or compromise any other operators' controls and/or any shared controls. See also footnote 60.

[84] There are a number of commercially available products to assist operators in developing the SWPPP, as well as companies that can be hired to help develop a site-specific SWPPP. The permit does not state which are recommended, nor does EPA endorse any specific products or vendors. Where operators choose to rely on these products or services, the choice of which ones to use to comply with the requirements of this Part is a decision for the operator alone.

7.2.2 Stormwater Team. Identify the personnel (by name and position) that you have made part of the stormwater team pursuant to Part 6.1, as well as their individual responsibilities, including which members are responsible for conducting inspections.

Include verification that each member of the stormwater team has received the training required by Part 6.2. Include documentation that members of the stormwater team responsible for conducting inspections pursuant to Part 4 have received the training required by Part 6.3. If personnel on your team elect to complete the EPA inspector training program pursuant to Part 6.3a, you must include copies of the certificate showing that the relevant personnel have completed the training and passed the exam. If personnel on your team elect to complete a non-EPA inspector training program pursuant to Part 6.3b, you must include documentation showing that these persons have successfully completed the program and their certification or license is still current. You must also confirm that the non-EPA inspector training program satisfies the minimum elements for such programs in Part 6.3b.

7.2.3 Nature of Construction Activities. Include the following:

- **a.** A description of the nature of your construction activities, including the age or dates of past renovations for structures that are undergoing demolition;
- **b.** The size of the property (in acres or length in miles if a linear construction site);
- **c.** The total area expected to be disturbed by the construction activities (to the nearest quarter acre or nearest quarter mile if a linear construction site);
- **d.** A description of any on-site and off-site construction support activity areas covered by this permit (see Part 1.2.1c);
- **e.** The maximum area expected to be disturbed at any one time, including on-site and off-site construction support activity areas;
- **f.** A description and projected schedule for the following:[85]
  - **i.** Commencement of construction activities in each portion of the site, including clearing and grubbing, mass grading, demolition activities, site preparation (i.e., excavating, cutting and filling), final grading, and creation of soil and vegetation stockpiles requiring stabilization;
  - **ii.** Temporary or permanent cessation of construction activities in each portion of the site;
  - **iii.** Temporary or final stabilization of exposed areas for each portion of the site; and
  - **iv.** Removal of temporary stormwater controls and construction equipment or vehicles, and the cessation of construction-related pollutant-generating activities.

[85] If plans change due to unforeseen circumstances or for other reasons, the requirement to describe the sequence and estimated dates of construction activities is not meant to "lock in" the operator to meeting these dates. When departures from initial projections are necessary, this should be documented in the SWPPP itself, or in associated records, as appropriate.

g. A list and description of all pollutant-generating activities[86] on the site. For each pollutant-generating activity, include an inventory of pollutants or pollutant constituents (e.g., *sediment, fertilizers, pesticides, paints, caulks, sealants, fluorescent light ballasts, contaminated substrates, solvents, fuels*) associated with that activity, which could be discharged in stormwater from your construction site. You must take into account where potential spills and leaks could occur that contribute pollutants to stormwater discharges, and any known hazardous or toxic substances, such as PCBs and asbestos, that will be disturbed or removed during construction;

h. Business days and hours for the project;

i. If you are conducting construction activities in response to a public emergency (see Part 1.4), a description of the cause of the public emergency *(*e.g.*, mud slides, earthquake, extreme flooding conditions, widespread disruption in essential public services)*, information substantiating its occurrence *(*e.g.*, State disaster declaration or similar State or local declaration)*, and a description of the construction necessary to reestablish affected public services.

7.2.4 Site Map. Include a legible map, or series of maps, showing the following features of the site:

a. Boundaries of the property;

b. Locations where construction activities will occur, including:

i. Locations where earth-disturbing activities will occur (note any phasing), including any demolition activities;

ii. Approximate slopes before and after major grading activities (note any steep slopes (as defined in Appendix A));

iii. Locations where sediment, soil, or other construction materials will be stockpiled;

iv. Any receiving water crossings;

v. Designated points where vehicles will exit onto paved roads;

vi. Locations of structures and other impervious surfaces upon completion of construction; and

vii. Locations of on-site and off-site construction support activity areas covered by this permit (see Part 1.2.1c).

c. Locations of any receiving waters within the site and all receiving waters within one mile downstream of the site's discharge point(s). Also identify if any of these receiving waters are listed as impaired or are identified as a Tier 2, Tier 2.5, or Tier 3 water;

d. Any areas of Federally listed critical habitat within the action area of the site as defined in Appendix A;

e. Type and extent of pre-construction cover on the site (e.g., vegetative cover, forest, pasture, pavement, structures);

f. Drainage patterns of stormwater and authorized non-stormwater before and after major grading activities;

[86] Examples of pollutant-generating activities include paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal; and dewatering activities.

g. Stormwater and authorized non-stormwater discharge locations, including:

i. Locations where stormwater and/or authorized non-stormwater will be discharged to storm drain inlets, including a notation of whether the inlet conveys stormwater to a sediment basin, sediment trap, or similarly effective control;[87]

ii. Locations where stormwater or authorized non-stormwater will be discharged directly to receiving waters (i.e., not via a storm drain inlet); and

iii. Locations where turbidity benchmark monitoring will take place to comply with Part 3.3, if applicable to your site.

h. Locations of all potential pollutant-generating activities identified in Part 7.2.3g;

i. Designated areas where construction wastes that are covered by the exception in Part 2.3.3e.ii because they are not pollutant-generating will be stored;

j. Locations of stormwater controls, including natural buffer areas and any shared controls utilized to comply with this permit; and

k. Locations where polymers, flocculants, or other treatment chemicals will be used and stored.

7.2.5 Non-Stormwater Discharges. Identify all authorized non-stormwater discharges in Part 1.2.2 that will or may occur.

7.2.6 Description of Stormwater Controls.

a. For each of the Part 2.2 erosion and sediment control requirements, Part 2.3 pollution prevention requirements, and Part 2.4 construction dewatering requirements, as applicable to your site, you must include the following:

i. A description of the specific control(s) to be implemented to meet these requirements;

ii. The design specifications for controls described in Part 7.2.6a.i (including references to any manufacturer specifications and/or erosion and sediment control manuals/ordinances relied upon);[88]

iii. Routine stormwater control maintenance specifications; and

iv. The projected schedule for stormwater control installation/implementation.

b. You must also include any of the following additional information as applicable.

i. Natural buffers and/or equivalent sediment controls (see Part 2.2.1 and Appendix F). You must include the following:

(a) The compliance alternative to be implemented;

(b) If complying with alternative 2, the width of natural buffer retained;

[87] The requirement to show storm drain inlets in the immediate vicinity of the site on your site map only applies to those inlets that are easily identifiable from your site or from a publicly accessible area immediately adjacent to your site.

[88] Design specifications may be found in manufacturer specifications and/or in applicable erosion and sediment control manuals or ordinances. Any departures from such specifications must reflect good engineering practice and must be explained in the SWPPP.

(c) If complying with alternative 2 or 3, the erosion and sediment control(s) you will use to achieve an equivalent sediment reduction, and any information you relied upon to demonstrate the equivalency;

(d) If complying with alternative 3, a description of why it is infeasible for you to provide and maintain an undisturbed natural buffer of any size;

(e) For "linear construction sites" where it is infeasible to implement compliance alternative 1, 2, or 3, a rationale for this determination, and a description of any buffer width retained and/or supplemental erosion and sediment controls installed; and

(f) A description of any disturbances that are exempt under Part 2.2.1 that occur within 50 feet of a receiving water.

ii. Perimeter controls for a "linear construction site" (see Part 2.2.3d). For areas where perimeter controls are not feasible, include documentation to support this determination and a description of the other practices that will be implemented to minimize discharges of pollutants in stormwater associated with construction activities.

Note: Routine maintenance specifications for perimeter controls documented in the SWPPP must include the Part 2.2.3c.i requirement that sediment be removed before it has accumulated to one-half of the above-ground height of any perimeter control.

iii. Sediment track-out controls (see Parts 2.2.4b and 2.2.4c)**.** Document the specific stabilization techniques and/or controls that will be implemented to remove sediment prior to vehicle exit.

iv. Inlet protection measures (see Part 2.2.10a). Where inlet protection measures are not required because the storm drain inlets to which your site discharges are conveyed to a sediment basin, sediment trap, or similarly effective control, include a short description of the control that receives the stormwater flow from the site.

v. Sediment basins (see Part 2.2.12). In circumstances where it is infeasible to utilize outlet structures that withdraw water from the surface, include documentation to support this determination, including the specific conditions or time periods when this exception will apply.

vi. Treatment chemicals (see Part 2.2.13), you must include the following:

(a) A listing of the soil types that are expected to be exposed during construction in areas of the project that will drain to chemical treatment systems. Also include a listing of soil types expected to be found in fill material to be used in these same areas, to the extent you have this information prior to construction;

(b) A listing of all treatment chemicals to be used at the site and why the selection of these chemicals is suited to the soil characteristics of your site;

(c) If the applicable EPA Regional Office authorized you to use cationic treatment chemicals for sediment control, include the specific controls and implementation procedures designed to ensure that your use of cationic

treatment chemicals will not lead to a discharge that does not meet water quality standards;

(d) The dosage of all treatment chemicals to be used at the site or the methodology to be used to determine dosage;

(e) Information from any applicable Safety Data Sheet (SDS);

(f) Schematic drawings of any chemically enhanced stormwater controls or chemical treatment systems to be used for application of the treatment chemicals;

(g) A description of how chemicals will be stored consistent with Part 2.2.13c;

(h) References to applicable State or local requirements affecting the use of treatment chemicals, and copies of applicable manufacturer's specifications regarding the use of your specific treatment chemicals and/or chemical treatment systems; and

(i) A description of the training that personnel who handle and apply chemicals have received prior to permit coverage, or will receive prior to use of the treatment chemicals at your site.

vii. Stabilization measures (see Part 2.2.14). You must include the following:

(a) The specific vegetative and/or non-vegetative practices that will be used;

(b) The stabilization deadline that will be met in accordance with Part 2.2.14;

(c) If complying with the deadlines for sites in arid, semi-arid, or drought-stricken areas, the beginning and ending dates of the seasonally dry period (as defined in Appendix A)[89] and the schedule you will follow for initiating and completing vegetative stabilization; and

(d) If complying with deadlines for sites affected by unforeseen circumstances that delay the initiation and/or completion of vegetative stabilization, document the circumstances and the schedule for initiating and completing stabilization.

viii. Spill prevention and response procedures (see Parts 1.3.5, 2.3.3c, 2.3.3d, and 2.3.6). You must include the following:

(a) Procedures for expeditiously stopping, containing, and cleaning up spills, leaks, and other releases. Identify the name or position of the employee(s) responsible for detection and response of spills or leaks; and

(b) Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity consistent with Part 2.3.6 and established under either 40 CFR part 110, 40 CFR part 117, or 40 CFR part 302, occurs

[89] See footnote 44.

during a 24-hour period. Contact information must be in locations that are readily accessible and available to all employees.

You may also reference the existence of SPCC plans developed for the construction activity under Section 311 of the CWA, or spill control programs otherwise required by an NPDES permit for the construction activity, provided that you keep a copy of that other plan on site.[90]

ix. **Waste management procedures** (see Part 2.3.3). Describe the procedures you will follow for handling, storing, and disposing of all wastes generated at your site consistent with all applicable Federal, State, Tribal, and local requirements, including clearing and demolition debris, sediment removed from the site, construction and domestic waste, hazardous or toxic waste, and sanitary waste. You must also include the following additional information:

(a) If site constraints prevent you from storing chemical containers 50 feet away from receiving waters or the other site drainage features as required in Part 2.3.3c.ii(b), document in your SWPPP the specific reasons why the 50-foot setback is not feasible, and how you will store containers as far away as the site permits; and

(b) If there are construction wastes that are subject to the exception in Part 2.3.3e.ii, describe the specific wastes that will be stored on your site.

x. **Application of fertilizers** (see Part 2.3.5). Document any departures from the manufacturer specifications where appropriate.

7.2.7 Procedures for Inspection, Maintenance, and Corrective Action. Describe the procedures you will follow for maintaining your stormwater controls, conducting site inspections, and, where necessary, taking corrective actions, in accordance with Part 2.1.4, Part 4, and Part 5 of this permit, accordingly. Also include:

a. The inspection schedule you will follow, which is based on whether your site is subject to Part 4.2 or Part 4.3, or whether your site qualifies for any of the reduced inspection frequencies in Part 4.4;

b. If you will be conducting inspections in accordance with the inspection schedule in Part 4.2.2, Part 4.3, or Part 4.4.1b, the location of the rain gauge or the address of the weather station you will be using to obtain rainfall data;

c. If you will be reducing your inspection frequency in accordance with Part 4.4.1b, the beginning and ending dates of the seasonally defined arid period for your area or the valid period of drought;

d. If you will be reducing your inspection frequency in accordance with Part 4.4.3, the beginning and ending dates of frozen conditions on your site; and

e. Any maintenance or inspection checklists or other forms that will be used.

7.2.8 Procedures for Turbidity Benchmark Monitoring from Dewatering Discharges (if applicable). If you are required to comply with the Part 3.3 turbidity benchmark

[90] Even if you already have an SPCC or other spill prevention plan in existence, your plans will only be considered adequate if they meet all of the requirements of this Part, either as part of your existing plan or supplemented as part of the SWPPP.

monitoring requirements, describe the procedures you will follow to collect and evaluate samples, report results to EPA and keep records of monitoring information, and take corrective action when necessary. Include the specific type of turbidity meter you will use for monitoring, as well as any manuals or manufacturer instructions on how to operate and calibrate the meter. Describe any coordinating arrangement you may have with any other permitted operators on the same site with respect to compliance with the turbidity monitoring requirements, including which parties are tasked with specific responsibilities. If EPA has approved of an alternate turbidity benchmark pursuant to Part 3.3.2b, include any data and other documentation you relied on to request use of the specific alternative benchmark.

7.2.9 Compliance with Other Requirements.

a. **Threatened and Endangered Species Protection.** Include documentation required in the Endangered Species Protection section of the NOI in NeT, or the ESA worksheet in Appendix D, supporting your eligibility with regard to the protection of threatened and endangered species and designated critical habitat.

b. **Historic Properties.** Include documentation required in Appendix E supporting your eligibility with regard to the protection of historic properties.

c. **Safe Drinking Water Act Underground Injection Control (UIC) Requirements for Certain Subsurface Stormwater Controls.** If you are using any of the following stormwater controls at your site, document any contact you have had with the applicable State agency[91] or EPA Regional Office responsible for implementing the requirements for underground injection wells in the Safe Drinking Water Act and EPA's implementing regulations at 40 CFR § 144 -147. Such controls would generally be considered Class V UIC wells:

   i. Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system);

   ii. Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow; and

   iii. Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system).

7.2.10 SWPPP Certification. Your signatory must sign and date your SWPPP in accordance with Appendix G, Part G.11.

7.2.11 Post-Authorization Additions to the SWPPP. Once you are authorized for coverage under this permit, you must include the following documents as part of your SWPPP:

a. A copy of your NOI submitted to EPA along with any correspondence exchanged between you and EPA related to coverage under this permit;

b. A copy of the acknowledgment letter you receive from NeT assigning your NPDES ID (i.e., *permit tracking number*);

[91] For State UIC program contacts, refer to the following EPA website: https://www.epa.gov/uic.

c. A copy of this permit (an electronic copy easily available to the stormwater team is also acceptable).

7.3 ON-SITE AVAILABILITY OF YOUR SWPPP

You must keep a current copy of your SWPPP at the site or at an easily accessible location so that it can be made available at the time of an on-site inspection or upon request by EPA; a State, Tribal, or local agency approving stormwater management plans; the operator of a storm sewer system receiving discharges from the site; or representatives of the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS).[92]

EPA may provide access to portions of your SWPPP to a member of the public upon request. Confidential Business Information (CBI) will be withheld from the public, but may not be withheld from EPA, USFWS, or NMFS.[93]

If an on-site location is unavailable to keep the SWPPP when no personnel are present, notice of the plan's location must be posted near the main entrance of your construction site.

7.4 SWPPP MODIFICATIONS

7.4.1 You must modify your SWPPP, including the site map(s), within seven (7) days of any of the following conditions:

a. Whenever new operators become active in construction activities on your site, or you make changes to your construction plans, stormwater controls, or other activities at your site that are no longer accurately reflected in your SWPPP. This includes changes made in response to corrective actions triggered under Part 5. You do not need to modify your SWPPP if the estimated dates in Part 7.2.3f change during the course of construction;

b. To reflect areas on your site map where operational control has been transferred (and the date of transfer) since initiating permit coverage;

c. If inspections or investigations by EPA or its authorized representatives determine that SWPPP modifications are necessary for compliance with this permit;

d. Where EPA determines it is necessary to install and/or implement additional controls at your site in order to meet the requirements of this permit, the following must be included in your SWPPP:

i. A copy of any correspondence describing such measures and requirements; and

[92] The SWPPP may be prepared, signed, and kept electronically, rather than in paper form, if the records are: (a) in a format that can be read in a similar manner as a paper record; (b) legally dependable with no less evidentiary value than their paper equivalent; and (c) immediately accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be, if the records were stored in paper form. For additional guidance on the proper practices to follow for the electronic retention of the SWPPP, refer to the Fact Sheet discussion related to Part 4.7.3.

[93] Information covered by a claim of confidentiality will be disclosed by EPA only to the extent of, and by means of, the procedures set forth in 40 CFR part 2, Subpart B. In general, submitted information protected by a business confidentiality claim may be disclosed to other employees, officers, or authorized representatives of the United States concerned with implementing the CWA. The authorized representatives, including employees of other executive branch agencies, may review CBI during the course of reviewing draft regulations.

ii. A description of the controls that will be used to meet such requirements.

e. To reflect any revisions to applicable Federal, State, Tribal, or local requirements that affect the stormwater controls implemented at the site; and

f. If applicable, if a change in chemical treatment systems or chemically enhanced stormwater control is made, including use of a different treatment chemical, different dosage rate, or different area of application.

7.4.2 You must maintain records showing the dates of all SWPPP modifications. The records must include the name of the person authorizing each change (see Part 7.2.9 above) and a brief summary of all changes.

7.4.3 All modifications made to the SWPPP consistent with Part 7.4 must be authorized by a person identified in Appendix G, Part G.11.b.

7.4.4 Upon determining that a modification to your SWPPP is required, if there are multiple operators covered under this permit, you must immediately notify any operators who may be impacted by the change to the SWPPP.

8 HOW TO TERMINATE COVERAGE

Until you terminate coverage under this permit, you must comply with all conditions and effluent limitations in the permit. To terminate permit coverage, you must submit to EPA a complete and accurate Notice of Termination (NOT), which certifies that you have met the requirements for terminating in Part 8.

8.1 MINIMUM INFORMATION REQUIRED IN NOT

8.1.1 NPDES ID (i.e., *permit tracking number)* provided by EPA when you received coverage under this permit;

8.1.2 Basis for submission of the NOT (see Part 8.2);

8.1.3 Operator contact information;

8.1.4 Name of site and address (or a description of location if no street address is available); and

8.1.5 NOT certification.

8.2 CONDITIONS FOR TERMINATING CGP COVERAGE

You may terminate CGP coverage only if one or more of the conditions in Parts 8.2.1, 8.2.2, or 8.2.3 has occurred. Until your termination is effective consistent with Part 8.5, you must continue to comply with the conditions of this permit.

8.2.1 You have completed all construction activities at your site and, if applicable, construction support activities covered by this permit (see Part 1.2.1c), and you have met all of the following requirements:

a. For any areas that (1) were disturbed during construction, (2) are not covered by permanent structures, and (3) over which you had control during the construction activities, you have met the requirements for final vegetative or non-vegetative stabilization in Part 2.2.14c.

To document that you have met these stabilization requirements, you must take either ground or aerial photographs that show your site's compliance with the Part 2.2.14 stabilization requirements and submit them with your NOT. If any portion of your

site is covered by one of the exceptions in Part 2.2.14c.iii, indicate which exception applies and include a supplementary explanation with your photographs that provides the necessary context for why this portion of the site is in compliance with the final stabilization criteria even though it appears to be unstabilized. You are not required to take photographs of every distinct part of your site that is being stabilized, however, the conditions of the site portrayed in any photographs that are submitted must be substantially similar[94] to those of the areas that are not photographed. You must also comply with the following related to these photographs:

i. Take photographs both before and after the site has met the final stabilization criteria in Part 2.2.14c;

ii. All photographs must be clear and in focus, and in the original format and resolution; and

iii. Include the date each photograph was taken, and a brief description of the area of the site captured by the photograph (e.g., photo shows application of seed and erosion control mats to remaining exposed surfaces on northeast corner of site).

b. You have removed and properly disposed of all construction materials, waste and waste handling devices, and have removed all equipment and vehicles that were used during construction, unless intended for long-term use following your termination of permit coverage;

c. You have removed all stormwater controls that were installed and maintained during construction, except those that are intended for long-term use following your termination of permit coverage or those that are biodegradable (as defined in Appendix A); and

d. You have removed all potential pollutants and pollutant-generating activities associated with construction, unless needed for long-term use following your termination of permit coverage; or

8.2.2 You have transferred control of all areas of the site for which you are responsible under this permit to another operator, and that operator has submitted an NOI and obtained coverage under this permit; or

8.2.3 Coverage under an individual or alternative general NPDES permit has been obtained.

8.3 HOW TO SUBMIT YOUR NOT

You must use EPA's NPDES eReporting Tool (NeT) to electronically prepare and submit an NOT for the 2022 CGP.

To access NeT, go to https://cdx.epa.gov/cdx.

Waivers from electronic reporting may be granted as specified in Part 1.4.2. If the EPA Regional Office grants you approval to use a paper NOT, and you elect to use it, you must complete the form in Appendix I.

[94] Stabilization conditions that are substantially similar would include areas that are using the same type of stabilization measures and that have similar slopes, soils, and topography, and have achieved the same level of stabilization.

8.4 DEADLINE FOR SUBMITTING THE NOT

You must submit an NOT within 30 calendar days after any one of the conditions in Part 8.2 occurs.

8.5 EFFECTIVE DATE OF TERMINATION OF COVERAGE

Your authorization to discharge under this permit terminates at midnight of the calendar day that a complete NOT is submitted to EPA.

9 PERMIT CONDITIONS APPLICABLE TO SPECIFIC STATES, INDIAN COUNTRY LANDS, OR TERRITORIES

The provisions in this Part provide additions to the applicable conditions of this permit to reflect specific additional conditions required as part of the State or Tribal CWA Section 401 certification process, or the Coastal Zone Management Act (CZMA) certification process, or as otherwise established by the permitting authority. The specific additional revisions and requirements only apply to activities in those specific States, Indian country, and areas in certain States with Federal Facilities or areas subject to construction projects by Federal Operators. States, Indian country, and other areas not included in this Part do not have any additions to the applicable conditions of this permit.

9.1 EPA REGION 1

9.1.1 NHR100000 State of New Hampshire

a. Should the permit coverage for an individual applicant be insufficient to achieve water quality standards, the New Hampshire Department of Environmental Services (NHDES) may prepare additional 401 certification conditions for that applicant. Any additional 401 certification conditions will follow all required NHDES public participation requirements.

b. If you disturb 100,000 square feet or more of contiguous area, you must also comply with RSA 485-A:17 and Env-Wq 1500, and, unless exempt, apply for an Alteration of Terrain (AoT) permit from NHDES. This requirement also applies to a lower disturbance threshold of 50,000 square feet or more when construction occurs within the protected shoreline under the Shoreland Water Quality Protection Act (see RSA 483-B and Env-Wq 1400). A permit application must also be filed if your project disturbs an area of greater than 2,500 square feet, is within 50 feet of any surface water, and has a flow path of 50 feet or longer disturbing a grade of 25 percent or greater. Project sites with disturbances smaller than those discussed above, that have the potential to adversely affect state surface waters, are subject to the conditions of an AoT General Permit by Rule (Env-Wq 1503.03).

c. You must determine that any excavation dewatering discharges are not contaminated before they will be authorized as an allowable non-stormwater discharge under this permit (see Part 1.2.2 of the Construction General Permit or CGP). In the absence of information demonstrating otherwise, the water is considered uncontaminated if there is no groundwater contamination within 1,000 feet of the groundwater dewatering location. Information on groundwater contamination can be generated over the Internet via the NHDES web site http:// des.nh.gov/ by using the One Stop Data Mapper. For a toxic substance included in the New Hampshire surface water quality standards, see Env-Wq 1703.21 (see https://www.des.nh.gov/sites/g/fi1es/ehbemt 341/files/documents/2020-01/Env-Wg

1700.pdf). If it is determined that the groundwater to be dewatered is near a remediation or other waste site, you must apply for the Remediation General Permit (see https://www3.epa.gov/region1/npdes/rgp.html)

d. As a minimum, you must treat any uncontaminated excavation "dewatering" discharges and "stormwater" discharges, as those terms are defined in Appendix A of the CGP, as necessary, to remove suspended solids and turbidity so that the surface waters receiving the construction discharges[95] meet New Hampshire surface water quality standards for turbidity (Env-Wq 1703.11 and Env-Wq 1703.03(c)(1)c), benthic deposits (Env-Wq 1703.03(c)(1)a), and Env-Wq 1703.08) and foam, debris, scum or other visible substances (i.e., plumes or visual turbidity)[96] (Env-Wq 1703.03(c)(1)b).

i. For all Construction Activities covered under this CGP, the following shall apply to ensure compliance with the aforementioned regulations for turbidity, benthic deposits and visible substances:

Unless otherwise specified, site inspection requirements shall comply with Part 4 of the CGP. As a minimum site inspection frequency shall be in accordance with Part 4.2.2 of the CGP (and Part 4.3.2 of the CGP for sites discharging dewatering water). Site inspection frequency may be reduced in accordance with Part 4.4 of the CGP (Reductions in Inspection Frequency). Monitoring of the receiving water for visible turbidity and benthic sediment deposits shall be conducted each site inspection and results reported in the Inspection Report required in Part 4.7 of the CGP. Should visible turbidity or benthic sediment deposits attributable or partly attributable to your construction activities be present in the receiving water, the "Corrective Actions" specified in Part 5 shall be immediately implemented to correct the water quality standard violations. In addition, daily monitoring (including photographs) of the receiving water shall be conducted until there is no visible turbidity or benthic deposits. Inspection Reports required in Part 4.7 of the CGP shall include, but not be limited to, the distance downstream and the percent of the river width[97] where visible turbidity was observed, and the period of time that the visible turbidity persisted. A copy of the Inspection Report(s) shall be made available to NHDES within 24 hours of receiving a written request from NHDES.

ii. For Construction Activities, disturbing 5 acres or more of land at any one time (excluding areas that have been completely stabilized in accordance with the final stabilization criteria specified in Part 2.2.14.c of the CGP), the following shall

[95] Construction Discharges include uncontaminated "dewatering" and "stormwater" discharges as those terms are defined in Appendix A of the CGP. Controlled construction discharges are construction discharges where the rate of flow can be regulated such as from a construction settling basin or NHDES approved flocculation system.

[96] For the definition of visual turbidity, see the definition for "Non-Turbid" in Appendix A of the CGP, which states the following:" "Non-Turbid" - a discharge that is free from visual turbidity. For the purposes of this permit, visual turbidity refers to a sediment plume or other cloudiness in the water caused by sediment that can be identified by an observer." *[EPA interprets the text of this footnote as intending to reference the Appendix A definitions of "visual turbidity" and "non-turbid" in the final permit.]*

[97] The distance downstream and the percent of river width where visible turbidity (i.e., plume) is observed is required to determine the extent of the river affected and to determine if there was a "zone of passage" (i.e., a portion of the receiving water where there was no visible turbidity where mobile organisms could pass without being adversely impacted). The percent of river width affected is equal 100 multiplied by the width of the plume (in feet) divided by the width of the receiving water (in feet).

apply to ensure compliance with the aforementioned regulations for turbidity, benthic deposits and visible substances.

Item 9.1.1.d.i) above shall apply to all construction discharges and the minimum site inspection frequency shall comply with Part 4.3.1 of the CGP (and Part 4.3.2 of the CGP for sites discharging dewatering water). Site inspection frequency may be reduced in accordance with Part 4.4 of the CGP (Reductions in Inspection Frequency).

With regards to controlled construction discharges, if there is no visible turbidity (i.e., plumes) or benthic deposits, and, in the absence of information demonstrating otherwise, turbidity measurements of less than or equal to 50 nephelometric turbidity units (NTU) in the controlled construction discharges at the outlet prior to mixing with the receiving surface waters, shall be presumed to meet New Hampshire surface water quality standards for the parameters listed above. As a minimum, the controlled construction discharges must be sampled at each site inspection.

If any controlled construction discharge exceeds 50 NTU, or if visible turbidity or benthic sediment deposits attributable or partly attributable to any construction discharge are observed in the receiving water, then the "Corrective Actions" specified in Part 5 of the CGP shall be immediately implemented.

In addition, should such violation occur, and, in order to determine compliance with surface water quality standards for turbidity (Env-Wq 1703.11 and Env-Wq 1703.03(c)(1)c), benthic deposits (Env-Wq 1703.03(c)(1)a), and Env-Wq 1703.08) and foam, debris, scum or other visible substances (Env-Wq 1703.03(c)(1)b)), turbidity monitoring shall be immediately implemented as specified below:

Turbidity samples of the receiving water shall be immediately taken in the receiving water upstream and beyond the influence of the construction activity, and, unless a mixing zone[98] is approved by NHDES, no more than 75 feet downstream of each controlled construction discharge that exceeded 50 NTU and no more than 75 feet downstream of each construction discharge that caused visible turbidity.

Downstream samples shall be taken at locations in the receiving water that are most likely influenced by the discharge (e.g., if visible turbidity (i.e., a plume) is present, the sample shall be taken in the plume). Samples shall be collected a minimum of 2 times per day during the daylight hours at times when construction activities are most likely to cause turbidity in the receiving water and shall continue until the turbidity water quality standards are met in the receiving water (i.e., the difference between the upstream and downstream turbidity level is no greater than 10 NTU).

[98] Permittees may request a distance greater than 75 feet downstream of a construction discharge for determining compliance with turbidity standards in Class B surface waters, by submitting a mixing zone request to NHDES that complies with Env-Wq 1707.02. If a mixing zone is approved, NHDES is required to include conditions to ensure that the criteria on which the approval is based are met (Env-Wq 1707.03).

If water quality standards are not met during daylight hours on any day, sampling shall resume the next day and continue no fewer than 2 times per day until water quality standards are met. The date, time, location and results of turbidity measurements, as well as a summary identifying the cause of the violations, corrective actions that were implemented, the period of time that the receiving water exceeded turbidity standards and the distance downstream and the percent of the river width where visible turbidity was observed, and the period of time that the visible turbidity persisted, shall be recorded and included in the Inspection Report required in Part 4.7 of the CGP. Turbidity measurements shall be conducted via a field meter in accordance with the requirements for turbidity specified in Table 1B in 40 CFR 136.3 (see 40 CFR §136.3 Identification of test procedures - Code of Federal Regulations ecfr.io). Field meters shall be calibrated every day sampling is conducted and prior to the first sample.

e. Construction site owners and operators are encouraged to consider opportunities for post- construction groundwater recharge using infiltration best management practices (BMPs) during site design and preparation of the SWPPP in order to assure compliance with Env-Wq 1703.03 and Env-Wq 1703.11. If your construction site is in a town that is required to obtain coverage under the NPDES General Permit for discharges from Municipal Separate Storm Sewer Systems (MS4) you may be required to use such practices. The SWPPP must include a description of any on-site infiltration that will be installed as a post-construction stormwater management measure or reasons for not employing such measures such as 1) The facility is located in a wellhead protection area as defined in RSA 485- C:2; or 2) The facility is located in an area where groundwater has been reclassified to GAA, GA1 or GA2 pursuant to RSA 485-C and Env-DW 901; or 3) Any areas that would be exempt from the groundwater recharge requirements contained in Env-Wq 1507.04, including all land uses or activities considered to be a "High-load Area" (see Env-Wq 1502.30). For design considerations for infiltration measures see Env-Wq 1508.06. Note that there may be additional local requirements that fall under the NH MS4 permittee's Authorization to Discharge Permit for those regulated areas.

f. Appendix F of the CGP contains information regarding Tier 2, or high quality waters in the various states. ***[EPA notes that this information has now been moved to https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates]*** Although there is no official list of tier 2 waters for New Hampshire, it can be assumed that all New Hampshire surface waters are tier 2 for turbidity unless 1) the surface water that you are proposing to discharge into is listed as impaired for turbidity in the states listing of impaired waters (see https://nhdes-surface-water-quality-assessment-site-nhdes.hub.arcgis.com/) or 2) sampling upstream of the proposed discharge location shows turbidity values greater than 10 NTU (Env-Wq 1703.11). A single grab sample collected during dry weather (no precipitation within 48 hours) is acceptable.

g. To ensure compliance with RSA 485-C, RSA 485-A, RSA 485-A:13, I(a), Env-Wq 1700 and Env-Wq 302, the following information may be requested by NHDES. This information must be kept on site unless you receive a written request from NHDES that it be sent to the address shown below in 9.1.1.h.

i. A list of all non-stormwater discharges that occur at the facility, including their source locations and the control measures being used (see Part 1.2.2 of the CGP).

ii. Records of sampling and analysis required for construction dewatering and stormwater discharges (see 9.1.1.d above).

h. All required or requested documents must be sent to: NH Department of Environmental Services, Watershed Management Bureau, P.O. Box 95 Concord, NH 03302-0095.

9.1.2 MAR100000 Commonwealth of Massachusetts (except Indian country)

a. All discharges covered by the Construction General Permit shall comply with the provisions pursuant to 314 CMR 3.00, 314 CMR 4.00, 314 CMR 9.00, including applicable construction stormwater standards and 310 CMR 10.00.

b. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05(5)(e) to maintain surface waters free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife, permittees are prohibited from discharging dewatering water under the CGP from sites that are designated as Superfund/CERCLA or RCRA, and must make accommodations to dispose of the dewatering discharges appropriately, such as coverage under the Remediation General Permit (RGP).

c. Pursuant to 314 CMR 3.11 (2)(a), and in accordance with MassDEP's obligation to protect Outstanding Resource Waters under 314 CMR 4.04(3), applicants seeking coverage under the 2022 CGP that propose to carry out construction activities near Outstanding Resource Waters as identified in 314 CMR 4.06, shall submit to MassDEP for review:

i. a copy of the Stormwater Pollution Prevention Plan (SWPPP),

ii. a copy of the EPA NOI, and

iii. MassDEP's Stormwater BMP Checklist.

For purposes of this review, the permittee shall submit these documents to MassDEP at the same time they are submitted to EPA. Instructions on how to submit these documents to MassDEP and where to find the MassDEP Stormwater BMP Checklist and obtain authorization to discharge can be found here: https://www.mass.gov/how-to/wm-15-npdes-general-permit-notice-of- intent.

d. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05(5)(e) to maintain surface waters free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife, applicants that propose to dewater under the 2022 CGP and plan to discharge to certain waters as described below, shall determine that any dewatering discharges are not contaminated by testing the proposed discharge as described below as part of the application for WM15 authorization. Unless otherwise specified, testing described in this section should be conducted using the methods in 40 CFR 136.

i. Applicants for sites that plan to discharge to Outstanding Resource Waters as identified in 314 CMR 4.06 shall test one sample of the proposed dewatering discharge water for pH, E. Coli (for discharges to freshwater), fecal coliform (for

discharges to salt water), Enterococci (for discharges to salt water), total suspended solids, oil and grease, total nitrogen, total phosphorus, and all parameters with numeric criteria listed in the Massachusetts Surface Water Quality Standards at 314 CMR 4.05(e). Results shall be reported to MassDEP as part of the WM15 application. To determine if the dewatering discharge could be covered under the 2022 CGP, the effluent at zero dilution must meet numeric water quality criteria. If the effluent does not meet numeric water quality criteria, the applicant shall contact EPA Region 1 to discuss coverage under the Remediation General Permit.

ii. Applicants for sites that propose to discharge to Public Water Supplies (314 CMR 4.06(1)(d)1) shall also test one sample of the proposed dewatering discharge water for per- and polyfluoroalkyl substances (PFAS), as outlined in the table below. Results shall be reported to MassDEP as part of the WM15 application. If any PFAS compounds are detected, the applicant shall apply for coverage under the NPDES Remediation General Permit for Massachusetts if required.

PFAS Testing Parameters for Discharges to Public Drinking Water Supplies[99]	
Perfluorohexanesulfonic acid (PFHxS), grab	Report ng/L
Perfluoroheptanoic acid (PFHpA), grab	Report ng/L
Perfluorononanoic acid (PFNA), grab	Report ng/L
Perfluorooctanesulfonic acid (PFOS), grab	Report ng/L
Perfluorooctanoic acid (PFOA), grab	Report ng/L
Perfluorodecanoic acid (PFDA), grab	Report ng/L

iii. Applicants for sites that propose to discharge to an impaired water as identified in the most recent final Massachusetts Integrated List of Waters,shall test one sample of the proposed dewatering discharge water for the parameter(s) for which the waterbody is impaired. To determine if the dewatering discharge could be covered under the 2022 CGP, the effluent at zero dilution must meet numeric water quality criteria. If the effluent does not meet numeric water quality criteria, the applicant shall contact EPA Region 1 to discuss coverage under the Remediation GeneralPermit and shall apply for RGP coverage if required.

iv. For dewatering discharges to all other waters, if any pollutants are knownor believed present in the proposed dewatering discharge water, the applicant shall apply for coverage under the NPDES Remediation General Permit for Massachusetts if required. For the purposes of this condition, a pollutant is "known present" if measured above the analytical detection limit using a sufficiently sensitive test method in an environmental sample, and "believed present" if a pollutant has not been measured in an environmental sample but will be added or generated prior to discharge, such as through a treatment process. Consequently, a pollutant is "known absent" if measured as non-detect relative to the analytical detection limit using a sufficiently sensitive test method in an environmental sample, and "believed absent" if a pollutant has not been measured in an environmentalsample but will not be added or generated prior to discharge and is not a parameter that applies to the applicable activity category for a site. If any pollutants are known or believed present in the

[99] PFAS testing shall follow established EPA methods 537 or 537.1 for drinking water until EPA Method 3512 for non-potable water becomes available.

proposed dewatering discharge water, the applicant shall test one sample of the proposed dewatering discharge water for the pollutants known or believed to be present. To determine if the dewatering discharge could be covered under the 2022 CGP, the effluent at zero dilution must meet numeric water quality criteria. If the effluent does not meet numeric water quality criteria, the applicant shall contact EPA Region 1 to discuss coverage under the Remediation General Permit.

e. Pursuant to 314 CMR 3.11 (2)(a), and in accordance with MassDEP's obligation to protect Outstanding Resource Waters under 314 CMR 4.04(3), applicants that propose to dewater under the 2022 CGP and discharge to Outstanding Resource Waters as identified in 314 CMR 4.06, shall submit the SWPPP and associated documents to MassDEP to review. MassDEP shall complete review within 30 daysof receipt.

f. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05 to maintain surface waters free from color and turbidity in concentrations or combinations that are aesthetically objectionable or would impair any use assigned to the waterbody, permittees that have been authorized to dewater under the 2022 CGP and that discharge to Outstanding Resource Waters as identified in 314 CMR 4.06 shall carry out daily benchmark monitoring for turbidity[100] for the duration of dewatering. Permittees shall compare the weekly average of the turbidity monitoring results with the established benchmark turbidity value of 25 Nephelometric Turbidity Units (NTU). If a permittee's weekly average turbidity results exceed the benchmark, the operator shall conduct follow-up corrective action to determine the source of the problem and to make any necessary repairs or upgrades to the dewatering controls to lower the turbidity levels. The permittee shall document any corrective action taken in its corrective action log. Furthermore, permittees at these sites shall carry out inspections at higher frequency, specifically, daily inspections of the dewatering discharge treatment for the duration of the discharge. The permittee shall inspect the site for sediment plume or whether a hydrocarbon sheen is visible at the point of discharge, estimate the flow rate at the point of discharge, and inspect the site downstream to assess whether sedimentation is attributable to the dewatering discharges.

g. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05 to maintain surface waters free from color and turbidity in concentrations or combinations that are aesthetically objectionable or would impair any use assigned to the waterbody, permittees shall store materials outside the Base Flood Elevation[101] when feasible to prevent displacing runoff and erosion.

h. Pursuant to 314 CMR 3.11 (2)(a), and in accordance with MassDEP's obligation to maintain surface waters free from nutrients in concentrations that would cause or contribute to impairment of existing or designated uses under 314 CMR 4.05(5)(c), all applicants who apply for coverage under the 2022 CGP shall follow guidelines on fertilizer application, including use of fertilizer containing no phosphorus, in accordance with 330 CMR 31.00 Plant Nutrient Application Requirements for

[100] Applicants shall follow EPA Method 180.1 to monitor for turbidity

[101] Base Flood Elevation (BFE) is the elevation of surface water resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year. The BFE is shown on the Flood Insurance Rate Map (FIRM) for zones AE, AH, A1–A30, AR, AR/A, AR/AE, AR/A1– A30, AR/AH, AR/AO, V1–V30 and VE. (Source: https://www.fema.gov/node/404233).

Agricultural Land and Non-Agricultural Turf and Lawns. Further, fertilizer shall never be applied to a site when a rain event greater than 0.5 inches is forecast in the next 48 hours.

i. Pursuant to 314 CMR 3.11 (2)(a), all applicants who apply for coverage under the 2022 CGP and elect to carry out site inspections every 14 days shall also inspect sites within 24 hours of 0.25 inches of precipitation events or greater over 24 hours,or within 24 hours of a discharge that occurred due to snowmelt from 3.25 inches or greater of snow accumulation.[102] During the high flow periods in spring (i.e., months of April to June), inspection frequency shall be increased to once per week for all sites.

  i. To determine whether 3.25 inches or greater of snow accumulation has occurred at a site, snowfall measurements can be taken at the site,[103] or theoperator can rely on similar information from a local weather forecast.

j. Implementing structural improvements, enhanced/resilient pollution prevention measures, and other mitigation measures can help to minimize impacts from stormwater discharges from major storm events such as hurricanes, storm surge, extreme/heavy precipitation,[104] and flood events. Pursuant to 314 CMR 3.11 (2)(a), if such stormwater control measures are already in place due to existing requirements mandated by other state, local or federal agencies, the SWPPP shall include a brief description of the controls and a reference to the existing requirement(s). If the site may be exposed to or has previously experienced suchmajor storm events[105], additional stormwater control measures that may be considered, and implemented as necessary, include, but are not limited to:

  i. Reinforce materials storage structures to withstand flooding and additional exertion of force;

  ii. Prevent floating of semi-stationary structures by elevating to the Base Flood Elevation (BFE) level or securing with non-corrosive device;

  iii. When a delivery of exposed materials is expected, and a storm is anticipated within 48 hours, delay delivery until after the storm or storematerials as appropriate (refer to emergency procedures);

[102] This is the amount of snow that is equivalent to 0.25 inches of rain, based on information from the National Oceanic and Atmospheric Administration (NOAA) indicating that 13 inches of snow is, on average, equivalent to 1 inch of rain. See https://www.nssl.noaa.gov/education/svrwx101/winter/faq/.

[103] NOAA's National Weather Service has guidelines on snowfall measurements at https://www.weather.gov/jkl/snow_measurement. These guidelines recommend use of a "snowboard" (a piece of wood about 16 inches by 16 inches) that is placed in an unobstructed part of the site on a hard surface.

[104] Heavy precipitation refers to instances during which the amount of rain or snow experienced in a location substantially exceeds what is normal. What constitutes a period of heavy precipitation varies according to location and season. Heavy precipitation does not necessarily mean the total amount of precipitation at a location has increased— just that precipitation is occurring in more intense or more frequent events.

[105] To determine if your facility is susceptible to an increased frequency of major storm events that could impact the discharge of pollutants in stormwater, you may reference FEMA, NOAA, or USGS flood map products at https://www.usgs.gov/faqs/where-can-i-find-flood-maps?qt-news_science_products=0#qtnews_science_products.

iv. Temporarily store materials and waste above the Base Flood Elevation ***[EPA notes that it has deleted a footnote reference to the term "Base Flood Elevation" since the same footnote is already included in Part 9.1.2.g, above.]*** level;

v. Temporarily reduce or eliminate outdoor storage;

vi. Temporarily relocate any mobile vehicles and equipment to higher ground;

vii. Develop scenario-based emergency procedures for major storms that are complementary to regular stormwater pollution prevention planning andidentify emergency contacts for staff and contractors; and

viii. Conduct staff training for implementing your emergency procedures atregular intervals.

k. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05(5)(e) to maintain surface waters free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife, permittees who seek coverage under the 2022 CGP and anticipate to carry out dust control shall limit their dust control methodology to using water only and specifically avoid using other techniques, such as solutions containing calcium chloride.

l. If MassDEP requests a copy of the Stormwater Pollution Prevention Plan (SWPPP) for any construction site at any time, the permittee shall submit the SWPPP to MassDEP within 14 days of such a request. MassDEP may conduct an inspection of any site covered by this permit to ensure compliance with state lawrequirements, including state water quality standards.

9.1.3 MTR10F000 Areas in the State of Vermont located at a federal facility

a. Earth disturbance at any one time is limited to five acres.

b. All areas of earth disturbance must have temporary or final stabilization within 14 days of the initial disturbance. After this time, disturbed areas must be temporarily or permanently stabilized in advance of any runoff producing event. A runoff producing event is an event that produces runoff from the construction site. Temporary stabilization is not required if precipitation is not forecast and work is to continue in the next 24-hours or if the work is occurring in a self-contained excavation (i.e. no outlet) with a depth of two feet or greater (e.g. house foundation excavation, utility trenches). Areas of a construction site that drain to sediment basins are not considered eligible for this exemption, and the exemption applies only to the excavated area itself.

c. Site inspections on active construction sites shall be conducted daily during the period from October 15 through April 15.

d. The use of chemical treatments (e.g. polymers, flocculants, and coagulants) for the settling and/or removal of sediment from stormwater runoff associated with construction and construction-related activities requires prior written approval and an approved site and project-specific plan, from the Vermont Agency of Natural Resources. In addition, the use of cationic polymers is prohibited unless approved by the Vermont Agency of Natural Resources under a site and project-specific plan.

e. Any applicant under EPA's CGP shall allow authorized Vermont Agency of Natural Resources representatives, at reasonable times and upon presentation of credentials, to enter upon the project site for purposes of inspecting the project and determining

compliance with this Certification.

f. The Vermont Agency of Natural Resources may reopen and alter or amend the conditions of this Certification over the life of the EPA 2022 Construction General Permit when such action is necessary to assure compliance with the VWQS.

9.2 EPA REGION 2

9.2.1 NYR10I000 Indian country within the State of New York

a. Saint Regis Mohawk Tribe

i. Any Responsible-Person/Decision-Maker required under the CGP to submit a Notice of Intent (NOI) to EPA for coverage under the CGP, must concurrently submit an electronic copy of the NOI to the SRMT Environmental Division, Water Resource Program Manager. Additionally, an electronic copy of the Notice of Termination (NOT) must be provided within three business days after electronic confirmation is received from EPA that the NOT has been accepted. The NOI and NOT must be electronically provided to the following addresses:

Mr. Tieman W. Smith
Water Resources Program Manager Saint Regis Mohawk Tribe
449 Frogtown Road
Akwesasne, NY 13655 Tiernan.Smith@srmt-nsn.gov 518.358.2272 ext. 5073

ii. Any Responsible-Person/Decision-Maker that is required as part of the CGP to prepare a Discharge Management Plan (OMP) or Storm Water Management Plan (SWMP) and/or Storm Water Pollution Prevention Plan (SWPPP) must submit an electronic copy of the DMP, SWMP and/or SWPPP to the SRMT Environment Division, Water Resources Program Manager IO business days prior to the start of construction of any work to be conducted under the CGP. The applicable documents must be provided to the electronic address listed above.

iii. Any Responsible-Person/Decision-Maker that is required under the CGP to submit an annual report to EPA must submit an electronic copy of the annual report concurrently to the SRMT Water Resource Program. Additionally, any correspondences between the applicant and EPA related to analytical data, written reports, corrective action, enforcement, monitoring, or an adverse incident must likewise be routed to the SRMT Water Resources Program at the above electronic address.

iv. An "Authorization to Proceed Letter" with site-specific mitigation requirements may be sent out to the permittee when a review of the NOI and OMP, SWMP and /or SWPPP on a case-by-case basis, is completed by the SRMT Environment Division, Water Resource Program. This approval will allow the application to proceed if all mitigation requirements are met.

b. Seneca Nation

i. Under Part 1.1.5 of the CGP, the Seneca Nation requests that an applicant must demonstrate that they meet the eligibility criteria listed in Appendix D (certify in your Notice of Intent (NOI) that you meet one of the eligibility criteria [Criterion A-F]) as well as species and critical habitats that are listed under the Seneca Nation's "Fishing and Conservation Laws" and the "Seneca Nation of Indians Comprehensive Conservation Law".

ii. The Tribal Historic Preservation Office (THPO) was established in 2000 after the Seneca Nation received a recognition letter from the National Park Service (NPS); therefore under Part 1.1.6 of the CGP (Appendix E) and prior to submitting a Notice of Intent (NOI) operators must complete the Nation's TPHO, Project Review Form (https://sni.org/media/246603/sni-thpo-project-review-form.pdf) and submit the completed form with associated information to the Tribal Historic Preservation Officer at 90 Ohi:yo' Way, Salamanca, NY 14779. Federal agencies engaging in construction activities must provide for construction review by a certified construction reviewer in accordance with 7 Del. C. §§4010 & 4013 and 7 DE Admin. Code 5101, subsection 6.1.6.

iii. Under Part 1.2 of the CGP, discharges must also follow the Section 13 of the Guide for Construction (Seneca Nation of Indians Source Water Code) and respectively, Council Resolution, dated April 13, 2013 (CN: R-04-13-13-11) to ensure that the health, safety and welfare of the citizens of the Seneca Nation, and all other within the Lands and Territories of the Seneca Nation of Indians, and to facilitate the adequate provisions of water through the elimination or prevention of ground water contamination in the vicinity of wells that supply drinking water for the Nation. The area is known as the Source Water Protection Area (SWPA) and specified activities are regulated within this SWPA, as cited in Section 13 of the Guide for Construction and Section VI, of CN: R-04-13-13-11.

iv. Under Part 1.4, any operator who seeks coverage of the CGP, and is required to submit a notice of intent NOI and Notice of Termination (NOT) (as necessary) to the EPA for coverage, under Part 1.4.2 must also submit a copy of the NOI to the Seneca Nation's Environmental Protection Department (EPD) within three business days of submittal to the EPA, (address shown below). Respectively, a copy of the NOT (as described under Part 8.3 of the CGP), which certifies that you have met the requirements of Part 8, must be provided within three business days after electronic confirmation is received from the EPA that the NOT has been accepted. In addition to a NOI and NOT, the Seneca Nation (Environmental Protection Department [EPD]) would require an Environmental Impact Assessment (EA) (Long Form), as shown in Section 2 of the Seneca Nation of Indians Laws, Ordinances & Policies (Guide for Construction), to be completed and submitted to the EPD prior to any project to determine whether the impacts from a project would create significant and detrimental effects to the Nation's lands, water (violate WQS), and environment. The NOI, NOT, and EA must be submitted electronically to epd@sni.org and provided to the following address:

Seneca Nation
Environmental Protection Department (EPD) Attn: Director of EPD
12837 Route 438
Irving, NY 14081

v. Under Part 3.0 of the CGP, discharges must be controlled as necessary to meet applicable WQS. The Seneca Nation is working actively towards finalizing and implementing the; therefore, the EPD would require an applicant to submit or grant access to the permit to obtain information on the impact of effluents on receiving waters, including the capability of receiving waters to support future designated uses and achieve the WQS of the Nation; and to advise prospective dischargers of discharge requirements, and coordinate with the appropriate

permitting agencies. As stated in the Decision Document, under Section 303(c) of the CWA, 33 U.S.C. § 1313(c), states develop, review, and revise (as appropriate) water quality standards for surface waters of the United States. At a minimum, such standards are to include designated water uses, water quality criteria to protect such uses, and an antidegradation policy. 40 C.F.R. § 131.6. In addition, under Section 401 of the CWA states may grant, condition, or deny "certification" for federally permitted or licensed activities that may result in a discharge to the waters of the United States 33 U.S.C. § 1341.

vi. Under Part 7.2.8(a)(b)(c) and for Part 9 of the CGP, the following Sections of the Seneca Nation's Guide for Construction shall be considered, in conjunction with the CGP:

(a) Section 1. Executive Order - To Establish a Policy for Governing Access to Nation Territories and Facilities by Officials of Foreign Government, dated March 31, 2011

(b) Section 3. Natural Resources Committee, Sand and Gravel Law (CN: R-06-24-05-08)

(c) Section 4. Fishing and Conservation Laws - Part 1.1.5 of the CGP

(d) Section 5. Seneca Nation of Indians Comprehensive Conservation Law, adopted January 14, 2012

(e) Section 9. Food is Our Medicine (FIOM) Program/Native Planting Policy (CN: R-03- 08-14-14)

(f) Section 10. Forestry Management Plan (CN: R-08-14-10-23)

(g) Section 11. Timber Ordinance #411-092, dated May 8, 1982

(h) Section 14. Flood Damage Prevention Local Law, dated September 27, 1988

(i) Section 16. Utilities Ordinance No. 87-100

(j) Authorizing Emergency Action and Contingency Plan to Restrain Pollution of Nations Waters, (Council Resolution: R-03-01-18-10), dated March 10, 2018 Seneca Nation of Indians Permit Application for Construction within Waterways Permit, Form NR98-01.00

9.3 EPA REGION 3

9.3.1 DCR100000 District of Columbia

a. Discharges authorized by this permit shall comply with the District of Columbia Water Pollution Control Act of 1984, as amended (DC Official Code § 8-103.01 and § 8-103.06, et seq.) to ensure that District of Columbia waters, waters in adjacent and downstream states, and the beneficial uses of these waters will not be harmed or degraded by the discharges.

b. Discharges authorized by this permit must comply with §§ 1104.1 and 1104.8 of Chapter 11 and the provisions of Chapter 19 of Title 21of District of Columbia Municipal Regulations in order to attain and maintain designated uses of the District of Columbia waters.

c. The permittee shall comply with the District of Columbia Stormwater Management and Soil Erosion and Sediment Control regulations in Chapter 5 of Title 21 of the District of Columbia Municipal Regulations.

d. The permittee shall comply with the District of Columbia Flood Management Control regulations in Chapter 31 of Title 20 of the District of Columbia Municipal Regulations.

e. The permittee shall submit a copy of the Stormwater Pollution Prevention Plan (SWPPP) to the Regulatory Review Division, Department of Energy & Environment, Government of the District of Columbia, 1200 First Street, NE, 5th Floor, Washington, DC 20002, during the review and approval of the permittee's DOEE Erosion and Sediment Control Plan in accordance with the provisions of Chapter 542 of Title 21 of the District of Columbia Municipal Regulations.

f. Upon request, the permittee shall submit all inspection and monitoring reports as required by this permit and 40 CFR § 122.41 to the Associate Director, Inspection and Enforcement Division, Department of Energy & Environment, Government of the District of Columbia, 1200 First Street, NE, 5th Floor, Washington, DC 20002; telephone (202) 535-2226, or by email at Joshua.Rodriguez@dc.gov.

g. In the event the permittee intends to discharge dewatering water, groundwater, or groundwater comingled with stormwater from a known contaminated site, the permittee shall contact the Regulatory Review Division, Department of Energy & Environment, Government of the District of Columbia, 1200 First Street, NE, 5th Floor, Washington, DC 20002; telephone (202) 535-2600, or by email at MS4DischargeAuthorization@dc.gov to request authorization to discharge dewatering water, groundwater, or groundwater comingled with stormwater to the District's Municipal Separate Storm Sewer System (MS4) or to a surface water body pursuant to §§ 8-103.02, 8-103.06, and 8-103.07 of the District of Columbia Water Pollution Control Act of 1984, as amended.

9.3.2 DER10F000 Areas in the State of Delaware located at a federal facility (as defined in Appendix A)

a. Federal agencies must submit a sediment and stormwater management plan (SSMP) and receive Department approval prior to undertaking any land clearing, soil movement or construction activity unless conducting an exempt activity.

b. Federal construction activities are required to have a third-party Certified Construction Reviewer (CCR) perform weekly reviews to ensure the adequacy of construction activities pursuant to the approved SSMP and regulations.

Implementation of approved SSMPs requires the daily oversight of construction activity by certified responsible personnel.

c. Implementation of approved SSMPs requires the daily oversight of construction activity by certified responsible personnel.

d. A current copy of the SSMP must be maintained at the construction site.

e. Unless authorized by the Department, not more than 20 acres may be disturbed at any one time.

9.4 EPA REGION 4

No additional conditions

9.5 EPA REGION 5

9.5.1 MIR10I000 Indian country within the State of Minnesota

a. Fond du Lac Reservation

i. New dischargers wishing to discharge to an Outstanding Reservation Resource Water (ORRW)[106] must obtain an individual permit from EPA for storm water discharges from large and small construction activities.

ii. A copy of the Storm Water Pollution Prevention Plan (SWPPP) must be submitted to the Office of Water Protection at least fifteen (15) days in advance of sending the Notice of Intent to EPA. The SWPPP can be submitted electronically to richardgitar@FDLREZ.com or by hardcopy sent to:

Fond du Lac Reservation
Office of Water Protection
1720 Big Lake Road
Cloquet, MN 55720

iii. Copies of the Notice of Intent (NOI) and the Notice of Termination (NOT) must be sent to the Fond du Lac Office of Water Protection at the same time they are submitted to EPA. [The condition helps the Office of Water Protection keep track of when a project is about to start and when it has ended. FDL Water Quality Certification Ordinance, Section 204 (a) (2)).

iv. If the project will entail a discharge to any watercourse or open water body, the turbidity limit shall NOT exceed 10% of natural background within the receiving water(s) as determined by Office of Water Protection staff. For such discharges, turbidity sampling must take place within 24 hours of a ½-inch or greater rainfall event. The results of the sampling must be reported to the Office of Water Protection within 7 days of the sample collection. All sample reporting must include the date and time, location (GPS: UTM/Zone 15), and NTU. CGP applicants are encouraged to work with the Office of Water Protection in determining the most appropriate location(s) for sampling. [This condition helps both the Office of Water Protection and the project proponent in knowing whether or not their erosion control efforts are effective. FDL Water Quality Certification, Section 204 (b) (1)).

v. Receiving waters with open water must be sampled for turbidity prior to any authorized discharge as determined by Office of Water Protection staff. This requirement only applies to receiving waters which no ambient turbidity data exists. [This condition allows the Office of Water Protection to obtain a baseline turbidity sample in which to compare to other samples. FDL Water Quality Certification Ordinance, Section 204 (b) (2)].

vi. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in the Water Quality Standards of the Fond du Lac Reservation, Ordinance #12/98, as amended. This includes, but is not limited to, the prevention of any discharge that causes a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of water of the Fond du Lac

[106] Although additional waters may be designated in the future, currently Perch Lake, Rice Portage Lake, Miller Lake, Deadfish Lake, and Jaskari Lake are designated as ORRWs.

Reservation for any of the uses designated in the Water Quality Standards of the Fond du Lac Reservation. These uses include wildlife, aquatic life, warm water fisheries, cold water fisheries, subsistence fishing (netting), primary contact recreation, secondary contact recreation, cultural, wild rice areas, aesthetic waters, agriculture, navigation, commercial and wetlands. It also includes the designated uses of wetlands including, but not limited to, baseflow discharge, cultural opportunities, flood flow attenuation, groundwater recharge, indigenous floral and fauna) diversity and abundance, nutrient cycling, organic carbon export/cycling, protection of downstream water quality, recreation, resilience against climactic effects, sediment/shoreline stabilization, surface water storage, wild rice, and water dependent wildlife. [In addition to listing the designated uses of waters of the Fond du Lac Reservation, this condition also limits the project proponent to discharges that will not violate our Water Quality Standards. FDL Water Quality Certification Ordinance, Section 204 (a) (7)).

vii. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the Fond du Lac Reservation. All spills must be reported to the appropriate emergency management Agency (National Response Center AND the State Duty Officer), and measures shall be taken immediately to prevent the pollution of waters of the Fond du Lac Reservation, including groundwater. The Fond du Lac Office of Water Protection must also be notified immediately of any spill regardless of size. [This condition helps protect water quality and also reminds project proponents of their responsibility in reporting spill events. FDL Water Quality Certification Ordinance, Section 204 (b) (3)).

viii. All seed mixes, whether used for temporary stabilization or permanent seeding, shall NOT contain any annual ryegrass (Lolium species). Wild rye (Elymus species) or Oats (Avena species) may be used as a replacement in seed mixes. [This condition prevents the use of annual ryegrass on the Reservation. Annual ryegrass is allelopathic, which means it produces biochemical in its roots that inhibit the growth of native plants. If used in seed mixes, annual ryegrass could contribute to erosion, especially on slopes. However, the condition also specifies substitute grasses that germinate almost as fast as annual ryegrass for use as a cover crop to help prevent erosion. FDL Water Quality Certification Ordinance, Section 204 (t) (1)).

ix. To prevent the introduction of invasive species, ALL contractors and subcontractors MUST disclose information stating prior equipment location(s) and ALL known invasive species potentially being transported from said location(s). All equipment MUST undergo a high pressure wash (including any equipment mats) BEFORE ENTERING the Fond du Lac Reservation. Personal equipment such as work boots, gloves, vest, etc. MUST be clean of debris, dirt and plant and animal material BEFORE ENTERING the Fond du Lac Reservation. Equipment being transported from known infested areas MUST undergo a high pressure wash as soon as possible after leaving the infested site and again BEFORE ENTERING the Fond du Lac Reservation, to avoid transport of invasive species into areas surrounding the Reservation. Written certification of equipment cleaning MUST be provided to the Fond du Lac Office of Water Protection. Upon arrival, ALL contractor and subcontractor equipment will be inspected by appointed Fond du Lac staff. If equipment is deemed unsatisfactory, the equipment MUST

undergo a high pressure washing until the equipment is cleared by the inspector, until such time, minimal travel will be allowed through the Reservation. The contractor shall be held responsible for the control of any invasive species introduced as a result of their project. [This condition requires the project proponent to prevent the inadvertent introduction of invasive species by taking an active role in cleaning all vehicles, equipment, and equipment mats before entering the Reservation. This condition has been placed in certifications since 2012, due to the introduction of Wild Parsnip in 2011 from a pipeline contractor. It is much easier to prevent the introduction of an invasive species than it is to eradicate it once it has been introduced. Many invasive plant species form monocultures, preventing native plants from growing. This situation often leads to cases of erosion, which in turn effects water quality. FOL Water Quality Certification Ordinance, Section 204 (g) (1)].

x. A copy of this certification MUST be kept by the contractor on-site at all times and be available for viewing by all personnel, including inspectors. [This condition ensures that the information contained in the certification, especially the conditions, is readily available onsite for reference. FOL Water Quality Certification Ordinance, Section 204 (a) (9)].

b. The Grand Portage Band of Lake Superior Chippewa

i. The CGP authorization is for construction activities that may occur within the exterior boundaries of the Grand Portage Reservation in accordance to the Grand Portage Land Use Ordinance. The CGP regulates stormwater discharges associated with construction sites of one acre or more in size. Only those activities specifically authorized by the CGP are authorized by this certification (the "Certification").

ii. All construction stormwater discharges authorized by the CGP must comply with the Water Quality Standards and Water Resources Ordinance, as well as Applicable Federal Standards (as defined in the Water Resources Ordinance).

iii. All appropriate steps must be taken to ensure that petroleum products or other chemical pollutants are prevented from entering the Waters of the Reservation. All spills must be reported to the appropriate emergency-management agency, and measures must be taken to prevent the pollution of the Waters of the Reservation, including groundwater.

iv. The 2022 CGP requires inspections and monitoring reports of the construction site stormwater discharges by a qualified person. Monitoring and inspection reports must comply with the minimum requirements contained in the 2022 CGP. The monitoring plan must be prepared and incorporated into the Storm Water Pollution Prevention Plan (the "SWPP"). A copy of the SWPP must be submitted to the Board at least 30 days in advance of sending the requisite Notice of Intent to EPA. The SWPP should be sent to:

Grand Portage Environmental Resources Board

P.O. Box 428

Grand Portage, MN 55605

Copies of the Notice of Intent and Notice of Termination required under the General Permit must be submitted to the Board at the address above at the same time they are submitted to the EPA.

v. If requested by the Grand Portage Environmental Department, the permittee must provide additional information necessary for a case-by-case eligibility determination to assure compliance with the Water Quality Standards and any Applicable Federal Standards. The burden is on the applicant to demonstrate compliance with the Water Quality Standards, the Water Resources Ordinance, and Applicable Federal Standards whether or not the application is ultimately eligible for the CGP.

vi. CGP discharges must not cause nuisance conditions as defined in Grand Portage Water Quality Standards.

vii. The Board retains full authority to ensure compliance with and to enforce the provisions of the Water Resource Ordinance and Water Quality Standards, Applicable Federal Standards, and these Certification conditions. Nothing herein affects the scope or applicability of other controlling tribal or federal requirements, including but not limited to impacts to cultural, historical, or archeological features or sites, or properties that may be eligible for listing on the National Register of Historic Places under the National Historic Preservation Act, 54 U.S.C. §§ 300101 et seq.

viii. Appeals related to Board actions taken in accordance with any of the preceding conditions may be heard by the Grand Portage Tribal Court.

c. Leech Lake Band of Ojibwe

i. The water quality standards that apply to the construction site are the standards at the time the operator submits its Notice of Intent (NOI) to EPA and the LLBO WRP (see conditions # 2 and # 3).

ii. A copy of the Stormwater Pollution Prevention Plan (SWPPP) must be submitted to the LLBO WRP at least 30 days in advance of sending the NOI for the project to EPA. See attached LLBO 401 Water Quality Certification Ordinance. Section 304(a)(1). The SWPPP should be submitted electronically to Jeff.Harper@llojibwe.net and by hardcopy sent to:

Leech Lake Band of Ojibwe
ATTN: Water Resources Program - 401 Cert
Division of Resource Management
190 Sailstar Drive NW
Cass Lake, Minnesota 56633

iii. Copies of the NOI and the Notice of Termination (NOT) must be submitted to the LLBO WRP at the same time they are submitted to EPA. See attached LLBO 401 Water Quality Certification Ordinance, Section 304(a)(2). The NOI and NOT should be submitted electronically to Jeff.Harper@llojibwe.net and sent by hardcopy to the address cited in condition # 2.

iv. Any and all other conditions listed in Section 304 of the attached LLBO 401 Water Quality Certification Ordinance shall be observed unless the LLBO WRP deems that certain conditions therein are not applicable to the project in need of a permit under this certification.

v. A copy of this certification MUST be kept by the contractor on-site at all times and be available for viewing by all personnel, including inspectors.

vi. Upon consideration of the NOI, if the LLBO WRP finds that the discharge will not be controlled as necessary to meet applicable water quality standards, the LLBO WRP may insist, consistent with Part 3.1 of the CGP, that additional controls are installed to meet applicable water quality standards, or recommend to EPA that the operator obtain coverage under an individual permit.

9.5.2 WIR10I000 Indian country within the State of Wisconsin

a. Bad River Band of Lake Superior Tribe of Chippewa Indians

i. Only those activities specifically authorized by the CGP are authorized by this Certification. This Certification does not authorize impacts to cultural properties, orhistorical sites, or properties that may be eligible for listing as such.

ii. All projects which are eligible for coverage under the CGP and are located within the exterior boundaries of the Bad River Reservation shall be implemented in such a manner that is consistent with the Tribe's Water Quality Standards (WQS). The Tribe's WQS can be viewed at: http://www.badriver-nsn.gov/wp-content/uploads/2020/01/NRD_WaterQualityStandards_2011.pdf

iii. Operators are not eligible to obtain authorization under the CGP for all new discharges to an Outstanding Tribal Resource Water (OTRW or Tier 3 water). OTRWs, or Tier 3 waters, include the following: Kakagon Slough and the lower wetland reaches of its tributaries that support wild rice, Kakagon River, Bad River Slough, Honest John Lake, Bog Lake, a portion of Bad River, from where it enters the Reservation through the confluence with the White River, and Potato River. OTRWs can be viewed at: https://www.arcgis.com/apps/View/index.html?appid=6f44c371217e4ee8b5f1c2c705c 7c7c5

iv. An operator proposing to discharge to an Outstanding Resource Water (ORW or Tier 2.5 water) under the CGP must comply with the antidegradation provisions of the Tribe's WQS. ORWs, or Tier 2.5 waters, include the following: a portion of Bad River, from downstream the confluence with the White River to Lake Superior, White River, Marengo River, Graveyard Creek, Bear Trap Creek, Wood Creek, Brunsweiler River, Tyler Forks, Bell Creek, and Vaughn Creek. ORWs can be viewed at: https://www.arcgis.com/apps/View/index.html?appid=6f44c371217e4ee8b5f1c2c705c 7c7c5. The antidegradation demonstration materials described in provision E.4.iii., and included on the antidegradation demonstration template found at: https://www.badriver-nsn.gov/natural-resources/projectreviews/, must be submitted to the following address:

Bad River Tribe's Natural Resources Department

Attn: Water Regulatory Specialist

P.O. Box 39 Odanah, WI 54861

WaterReg@badriver-nsn.gov

v. An operator proposing to discharge to an Exceptional Resource Water (ERW or Tier 2 water) under the CGP must comply with the antidegradation provisions of the Tribe's WQS. ERWs, or Tier 2 waters, include the following: any surface water within the exterior boundaries of the Reservation that is not specifically classified as an Outstanding Resource Water (Tier 2.5 water) or an Outstanding Tribal Resource Water (Tier 3 water). ERWs can be viewed at:

https://www.arcgis.com/apps/View/index.html?appid=6f44c371217e4ee8b5f1c2c705c7c7c5. The antidegradation demonstration materials described in provision E.4.ii., and included on the antidegradation demonstration template found at: https://www.badriver-nsn.gov/natural-resources/projectreviews/, must be submitted to the following address:

Bad River Tribe's Natural Resources Department
Attn: Water Regulatory Specialist
P.O. Box 39 Odanah, WI 54861
WaterReg@badriver-nsn.gov

vi. Projects utilizing cationic treatment chemicals within the Bad River Reservation boundaries are not eligible for coverage under the CGP.

vii. A discharge to a surface water within the Bad River Reservation boundaries shall not cause or contribute to an exceedance of the turbidity criterion included in the Tribe's WQS, which states: Turbidity shall not exceed 5 NTU over natural background turbidity when the background turbidity is 50 NTU or less, or turbidity shall not increase more than 10% when the background turbidity is more than 50 NTU.

viii. All projects which are eligible for coverage under the CGP within the exterior boundaries of the Bad River Reservation must comply with the Bad River Reservation Wetland and Watercourse Protection Ordinance, or Chapter 323 of the Bad River Tribal Ordinances, including the erosion and sedimentation control, natural buffer, and stabilization requirements. Questions regarding Chapter 323 and requests for permit applications can be directed to the Wetlands Specialist in the Tribe's Natural Resources Department at (715) 682-7123 or wetlands@badriver-nsn.gov.

ix. An operator of a project, which is eligible for coverage under the CGP, that would result in an allowable discharge under the CGP occurring within the exterior boundaries of the Bad River Reservation must notify the Tribe prior to the commencing earth-disturbing activities. The operator must submit a copy of the Notice of Intent (NOI) to the following addresses at the same time it is submitted to the U.S. EPA:

Bad River Tribe's Natural Resources Department
Attn: Water Regulatory Specialist
P.O. Box 39 Odanah, WI 54861
WaterReg@badriver-nsn.gov

Bad River Tribe's Natural Resources Department
Attn: Tribal Historic Preservation Officer (THPO)
P.O. Box 39 Odanah, WI 54861
THPO@badriver-nsn.gov

The operator must also submit a copy of the Notice of Termination (NOT) to the above addresses at the same time it is submitted to the U.S. EPA. Photographs showing the current site conditions must be included as part of the NOT to document the stabilization requirements have been met.

x. The THPO must be provided 30 days to comment on the project.

xi. The operator must obtain THPO concurrence in writing. This written concurrence will outline measures to be taken to prevent or mitigate effects to historic properties. For more information regarding the specifics of the cultural resources process, see 36 CFR Part 800. A best practice for an operator is to consult with the THPO during the planning stages of an undertaking.

xii. An operator of a project, which is eligible for coverage under the CGP, that would result in an allowable discharge under the CGP occurring within the exterior boundaries of the Bad River Reservation must submit a copy of the Stormwater Pollution Prevention Plan (SWPPP) to the following address at the same time as submitting the NOI:

Bad River Tribe's Natural Resources Department

Attn: Water Regulatory Specialist

P.O. Box 39 Odanah, WI 54861

WaterReg@badriver-nsn.gov

xiii. Any corrective action reports that are required under the CGP must be submitted to the following address within one (1) working day of the report completion:

Bad River Tribe's Natural Resources Department

P.O. Box 39 Odanah, WI 54861

WaterReg@badriver-nsn.gov

xiv. An operator of a project, which is eligible for coverage under the CGP, that would result in an allowable discharge under the CGP occurring within the exterior boundaries of the Bad River Reservation must submit a copies of the inspection reports (including photographs) to the following address within 24 hours of completing any site inspection required:

Bad River Tribe's Natural Resources Department Attn: Water Regulatory Specialist

P.O. Box 39 Odanah, WI 54861

WaterReg@badriver-nsn.gov

xv. An operator shall be responsible for meeting any additional permit requirements imposed by the U.S. EPA necessary to comply with the Tribe's antidegradation policies if the discharge point is located upstream of waters designated by the Tribe.

9.6 EPA REGION 6

9.6.1 NMR100000 State of New Mexico, except Indian country

a. In Outstanding National Resource Waters (ONRWs) in New Mexico, no degradation is permitted except in limited, specifically defined instances. Therefore, Operators are not eligible to obtain authorization under this general permit for stormwater discharges to waters classified as ONRWs listed in Paragraph D of 20.6.4.9 New Mexico Administrative Code (NMAC), also referred to as "Tier 3 waters" as defined in Appendix A of this permit. Exception: When construction activities are in response to a public emergency (e.g., wildfire, extreme flooding, etc.) and the related work requires immediate authorization to avoid a threat to public health or safety.

i. Operators who conduct construction activities in response to a public emergency to mitigate an immediate threat to public health or safety shall

adhere to the requirements in 20.6.4.8(A)(3)(c) NMAC, including notifying the New Mexico Environment Department (NMED) within seven days of initiation of the emergency action and providing NMED with a summary of the action taken within 30 days of initiation of the emergency action.

ii. For all other scenarios, Operators with proposed discharges to ONRWs in New Mexico shall obtain coverage from EPA under an NPDES Individual Permit and will comply with the additional standards and regulations related to discharges to ONRWs in 20.6.4.8(A) NMAC. Additional information is available from:

New Mexico Environment Department Surface Water Quality Bureau

P.O. Box 5469

Santa Fe, NM 87502-5469 Telephone: 505-827-0187

https://www.env.nm.gov/surface-water-quality/wqs/
https://gis.web.env.nm.gov/oem/?map=swqb

b. If construction dewatering activities are anticipated at a construction site and non-stormwater discharges of groundwater, subsurface water, spring water, and/or other dewatering water are anticipated, the Operators/Permittees must complete the following steps:

1. Review the state's Ground Water Quality Bureau Mapper (https://gis.web.env.nm.gov/GWQB/) and Petroleum Storage Tank Bureau Mapper (https://gis.web.env.nm.gov/GWQB/).

   Check if the following sources are located within the noted distance from the anticipated construction dewatering activity. At a minimum, a list of the following potential sources of contaminants and pollutants at the noted distance is to be kept in the SWPPP.

Source of Potential Contamination or Pollutants*	Constituents likely to be required for testing*
Within 0.5 mile of an open Leaking Underground Storage Tank (LUST) site	BTEX (Benzene, Toluene, Ethylbenzene, and Xylene) plus additional parameters depending on site conditions**
Within 0.5 mile of an open Voluntary Remediation site	All applicable parameters or pollutants listed in 20.6.4.13, 20.6.4.52, 20.6.4.54, 20.6.4.97 thru 20.6.4.99, 20.6.4.101 through 20.6.4.899, and 20.6.4.900 NMAC (or an alternate list approved by the NMED-SWQB)*
Within 0.5 mile of an open RCRA Corrective Action Site	
Within 0.5 mile of an open Abatement Site	
Within 0.5 mile of an open Brownfield Site	
Within 1.0 mile or more of a Superfund site or National Priorities List (NPL) site with associated groundwater contamination.	
Construction activity contaminants and/or natural water pollutants	Additional parameters depending on site activities and conditions (Contact NMED- SWQB for an alternate list)*

*For further assistance determining whether dewatering may encounter contaminated sources, please contact the NMED Ground Water Quality Bureau at 505-827-2965 or NMED Surface Water Quality Bureau (SWQB) at 505-827-0187.

** EPA approved sufficiently sensitive methods must be used. For known PCB sources and analysis, EPA Method 1668C must be used (see https://www.epa.gov/cwa-methods).

2. If dewatering activities are anticipated, information on the flow rate and potential to encounter contaminated groundwater, subsurface water, spring water, or dewatering water must be provideddirectly to NMED at the following address:

   NMED Surface Water Quality Bureau

   Program Manager, Point Source Regulation
   SectionPO Box 5469, Santa Fe, NM 87502

   Please call the SWQB to obtain the appropriate email address (505-827-0187).

3. In addition, the Operator/Permittee must characterize the quality of the groundwater and subsurface water, spring water, or dewatering water being considered for discharge according to the table above and including dissolved hardness and pH. Considering the contaminant sources listed in the table above, water quality data may already be available. For further assistance, contactthe

NMED Surface Water Quality Bureau (505-827-0187), Ground Water Quality Bureau (505-827- 2965), Petroleum Storage Tank Bureau (505-476-4397), or Hazardous Waste Bureau (505-476- 6000).

i. The Operator/Permittee must submit recent analytical test results (i.e., within the past 5 years) according to the table above, and including dissolved hardness and pH, to the EPA Region 6 Stormwater Permit Contact and the NMED Surface Water Quality Bureau (see contact information in #2 above). If the test data exceed applicable water quality standards, then the groundwater, subsurface water, spring water, or dewatering water cannot be discharged into surface waters under this general permit. Operators/Permittees may submit an NPDES Individual Permit application to treat and discharge to waters of the U.S. or find alternative disposal measures. No discharges to surface waters are allowed until authorized.

ii. If the discharge has the potential to affect groundwater (e.g., land application), the Operator/Permittee must submit an NOI to the NMED Ground Water Quality Bureau (see 20.6.2.1201 NMAC – Notice of Intent to Discharge).

4. The Operator/Permittee must document any findings and all correspondence with NMED and EPA in the SWPPP.

c. Operators who intend to obtain authorization under this permit for new and existing storm water dischargesfrom construction sites must satisfy the following condition:

i. The SWPPP must include site-specific interim and permanent stabilization, managerial, and structural solids, erosion and sediment control best management practices (BMPs) and/or other controls that are designed to prevent to the maximum extent practicable an increase in the sediment yield and flow velocity from pre-construction, pre-development conditions to assure thatapplicable standards in 20.6.4 NMAC, including the antidegradation policy, and TMDL waste load allocations (WLAs) are met. This requirement applies to discharges both during construction and after construction operations have been completed. The SWPPP must identify and document the rationale for selecting these BMPs and/or other controls. The SWPPP must also describe design specifications, construction specifications, maintenance schedules (including a long-term maintenance plan), criteria for inspections, and expected performance and longevity of these BMPs.For sites greater than 5 acres in size, BMP selection must be made based on the use of appropriatesoil loss prediction models (i.e. SEDCAD, RUSLE, SEDIMOT, MULTISED, etc.) OR equivalent generallyaccepted (by professional erosion control specialists) soil loss prediction tools.

ii. For all sites, the Operator(s) must demonstrate, and include documentation in the SWPPP, that implementation of the site-specific practices will ensure that the applicable standards and TMDL WLAs are met, and will result in sediment yields and flow velocities that, to the maximum extent practicable, will not be greater than the sediment yield levels and flow velocities from preconstruction, pre-development conditions.

iii. All SWPPPs must be prepared in accordance with good engineering practices by qualified (e.g., CPESC certified, engineers with appropriate training) erosion control specialists familiar with the use of soil loss prediction models and design of erosion and sediment control systems based on these models (or equivalent soil

loss prediction tools). Qualifications of the preparer (e.g., professional certifications, description of appropriate training) must be documented in the SWPPP.The Operator(s) must design, implement, and maintain BMPs in the manner specified in the SWPPP.

NMED supports the use of EPA's small residential lot template if a site qualifies to use it as explained inthe permit, as long as it is consistent with the above requirements. NMED's requirement does not preclude small residential sites from using the template, but it may require an additional short paragraphto justify the selection of specific BMPs for the site.

d. Operators must notify NMED when discharges of toxic or hazardous substances or oil from a spill or other release occurs - see Emergency Spill Notification Requirements, Part 2.3.6 of the permit. For emergencies, Operators can call 505-827-9329 at any time. For non-emergencies, Operators can call 866-428-6535 (voice mail 24-hours per day) or 505-476-6000 during business hours from 8am-5pm, Monday through Friday. Operators can also call the NMED Surface Water Quality Bureau directly at 505-827-0187.

e. Operators of small construction activities (i.e., 1-5 acres) are not eligible to qualify for a waiver in lieu of needing to obtain coverage under this general permit based on Item C.3 of Appendix C (Equivalent Analysis Waiver) in the State of New Mexico.

9.6.2 NMR10I000 Indian country within the State of New Mexico, except Navajo Reservation Lands that are covered under Arizona permit AZR10000I and Ute Mountain Reservation Lands that are covered under Colorado permit COR10000I.

a. Nambe Pueblo

i. The operator must provide a copy of the Notice of Intent (NOI) and Notice of Termination (NOT) to the Nambe Pueblo Governor's Office at the same time it is provided to the US Environmental Protection Agency. The NOI and NOT should be provided to the following address:

Office of the Governor Nambe Pueblo

!SA NPI02 WEST

Nambe Pueblo, New Mexico 87506

ii. The operator must provide a copy of the Storm Water Pollution Prevention Plan (SWPPP) to Nambe Pueblo at the same time it is submitted to the EPA, either by email to governor@nambepueblo.org or mailed to the above address.

iii. The operator must provide copies of inspection reports, a copy of the corrective action log, and modifications made to the SWPPP as a result of inspection findings, upon request by the Nambe Pueblo Department of Environmental and Natural Resources or Nam be Governor.

b. Ohkay Owingeh Tribe

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOI) to the Ohkay Owingeh Office of Environmental Affairs, a copy of NOI modifications and the Notice of Termination (NOT), must be provided within three business days after EPA provides electronic confirmation that the submission has been received. The NOI and NOT must be provided to the following address:

Naomi L. Archuleta - Environmental Programs Manager Ohkay Owingeh Office of Environmental Affairs
P.O. Box 717
Ohkay Owingeh, NM 87566
naomi.archuleta@ohkay.org

Noah Kaniatobe - Environmental Specialist Ohkay Owingeh, Office of Environmental Affairs
P.O. Box 717
Ohkay Owingeh, NM 87566
noah.kaniatohe@ohkay.org

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copy of the Storm Water Pollution Prevention Plan (SWPPP) to Ohkay Owingeh Office of Environmental Affairsat the same time that the NOI is submitted to the tribe (see contact information listed above).

iii. Following each incident where the operator takes a corrective action the operator must provide thecorrective action log to the Ohkay Owingeh Office of Environmental Affairs.

iv. The operator must notify Ohkay Owingeh Office of Environmental Affairs within 24 hours, in the event of an emergency spill in addition to the notification requirements at Part 2.3.6 of the CGP. Please contact: Ohkay Owingeh Tribal Police Department at 505.852.2757.

Please contact:
Ohkay Owingeh
Tribal Police Department
505.852.2757

c. Pueblo of Isleta

i. All operators obtaining permit coverage under the EPA CGP must submit a copy of the certified Notice ofIntent (NOI) to the Pueblo of Isleta at the same time it is submitted to EPA for projects occurring within the exterior boundaries of the Pueblo of Isleta. Additionally, a copy of NOI modifications and the Notice of Termination (NOT), must be provided within three business days after EPA provides electronic confirmation that the submission has been received. The Notices must be provided to the following address:

Water Quality Control OfficerPueblo of Isleta
Environment DepartmentPO Box 1270
Isleta NM 87022
505-869-7565
WQCO@isletapueblo.com

ii. The operator must notify the Pueblo of Isleta's Dispatch at 505-869-3030 as soon as possible and thePueblo of Isleta Water Quality Control Officer within 10 hours, in the event of a spill of hazardous ortoxic substances or if health or the

environment become endangered in addition to the notification requirements at Part 2.3.6 and at I.12.6.1 of the CGP.

iii. All operators obtaining permit coverage under the EPA CGP must submit an electronic copy of the Stormwater Pollution Prevention Plan (SWPPP) to the Pueblo of Isleta Water Quality Control Officer atthe above address, 30 days prior to submitting the certified NOI to EPA. If the electronic file is too largeto send through e-mail, a zip file or flash drive may be submitted.

iv. All operators obtaining permit coverage under the EPA CGP must give 2 days advance notice to the Pueblo of Isleta Water Quality Control Officer of any planned changes in the permitted activity whichmay result in noncompliance with permit requirements.

v. All operators obtaining permit coverage under the EPA CGP must post a sign or other notice of permit coverage at a safe, publicly accessible location in close proximity to the construction site. The notice mustbe located so that it is visible from the public road or tribal road that is nearest to the active part of the construction site. The sign must be maintained on-site from the time construction activities begin until final stabilization is met.

vi. Erosion and sediment controls shall be designed to retain sediment on-site and project-generatedwaste materials that have the potential to discharge pollutants shall not be placed on open soil oron a surface that is not stabilized. Volumes of sediment over five (5) cubic yards must be removed from the active construction site; additionally, if sediment is placed for disposal withinthe exterior boundaries of the Pueblo of Isleta, disposal must be within a tribally approved sediment disposal site.

d. Pueblo of Laguna

i. All operators obtaining permit coverage under the EPA CGP must submit an electronic copy of the certified (signed) Notice of Intent (NOI) to the Pueblo of Laguna's Environmental & Natural Resources Department (ENRD) within three business days of submittal to the EPA. Additionally, a copy of NOI modifications and the Notice of Termination (NOT), must be provided within three business days after the EPA provides electronic confirmation that the submission has been received. The NOI and NOT must be electronically submitted to info.environmental@pol-nsn.gov.

ii. All operators obtaining permit coverage under the EPA CGP must submit an electronic copy of the Stormwater Pollution Prevention Plan (SWPPP) to the Pueblo of Laguna's ENRD 14 days prior to the submittal of the NOI (see contact information listed above).

iii. The operator must provide copies of corrective actions logs and modifications made to the SWPPP as a result of inspection findings to the Pueblo of Laguna ENRD (see contact information above).

iv. In addition to the notification requirements of Part 2.3.6 of the CPG ***[EPA interprets this intending to refer to the CGP]***, the operator must notify the Pueblo of Laguna ENRD at 505-552-7512 in the event of an emergency spill as soon as possible.

e. Pueblo of Sandia. The following conditions apply only to discharges on the Pueblo of Sandia Reservation:

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOI) to the Pueblo of Sandia Environment Department concurrently with submittal to the EPA. Additionally, a copy of NOI modifications and the Notice of Termination (NOT), must be provided concurrently with submittal to the EPA. The NOI and NOT must be provided electronically to the following addresses:

Electronic Addresses:

Amy Rosebrough (Water Quality Manager): rosebrough@sanidapueblo.nsn.us
Greg Kaufman (Environment Director):gkaufman@sandiapueblo.nsn.us

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copy of the Stormwater Pollution Prevention Plan (SWPPP) to the Pueblo of Sandia Environment. Department at least 14 days prior to submittal of the NOI to the Pueblo (see contact information listed above).

iii. If requested by the Pueblo of Sandia Environment Department, the permittee must provide additional information necessary on a case-by-case basis to assure compliance with the Pueblo of Sandia Water Quality Standards and/or applicable Federal Standards.

iv. An "Authorization to Proceed Letter" with site specific mitigation requirements may be sent out to the permittee when a review of the NOI and SWPPP, on a case-by-case basis, is completed by the Pueblo of Sandia Environment Department. This approval will allow the application to proceed if all mitigation requirements are met.

v. The Pueblo of Sandia will not allow Small Construction Waivers (Appendix C) to be granted for any small construction activities.

vi. The operator must provide copies of inspection reports, a copy of the corrective action log, and modifications made to the SWPPP as a result of inspection findings to the Pueblo of Sandia Environment Department upon request. An inspection report and corrective action log must be submitted to the Pueblo within 3 days of any inspection that results in corrective action (see contact information listed above).

vii. The operator must notify the Pueblo of Sandia within 24 hours in the event of an emergency spill, in addition to the notification requirements at Part 2.3.6 of the COP (see contact information listed above).

viii. Before submitting a Notice of Termination (NOT) to the EPA, permittees must clearly demonstrate to the Pueblo of Sandia Environment Department through a site visit or documentation that requirements for site stabilization have been met and any temporary erosion control structures have been removed. A short letter stating that the NOT is acceptable and all requirements have been met will be sent to the permittee to add to the permittee's NOT submission to the EPA.

f. **Pueblo of Santa Ana. The following conditions apply only to discharges on the Pueblo of Santa Ana Reservation:**

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOI) to the Pueblo's Department of Natural Resources within three business days of submittal to EPA. Additionally, a copy of NOI modifications and the Notice of Termination (NOT), must be

provided within three business days after EPA provides electronic confirmation that the submission has been received. The NOI and NOT must be provided to the following address:

Regular U.S. Delivery Mail:

Pueblo of Santa Ana

Department of Natural Resources Water Resources Division

Attn: Andrew Sweetman 02 Dove Rd

Santa Ana Pueblo, NM 87004

Electronically:

Andrew Sweetman

Water Resources Division Manager Andrew.Sweetman@santaana-nsn.gov

Tammy Montoya Hydrologist

Tammy.Montoya@santaana-nsn.gov

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copyof the Stormwater Pollution Prevention Plan (SWPPP) to the to the Pueblo's Department of Natural Resources at the same time that the NO! is submitted to the tribe (see contact information listed above).

iii. The operator must provide copies of inspection reports, a copy of the corrective action log, and modifications made to the SWPPP as a result of inspection findings, upon request by the Pueblo's Department of Natural Resources.

iv. The operator must notify the Pueblo's Department of Natural Resources within 24 hours in the event of an emergency spill, in addition to the notification requirements at Part 2.3.6 of the CGP.

g. Pueblo of Taos

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOi) to the Taos Pueblo Environmental Office and Taos Pueblo Governor's Office within three business days of submittal to EPA. Additionally, a copy of NOi modifications and the Notice of Termination (NOT), must be provided within three business days after EPA provides electronic confirmation that the submission has been received. The NOi and NOTmust be provided to the following addresses:

Honorable Governor of Taos Pueblo PO Box 1846

Taos, New Mexico 87571

Taos Pueblo Environmental Office PO Box 1846

Taos, New Mexico 87571

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copy of theStormwater Pollution Prevention Plan (SWPPP) to the Taos Pueblo Environmental Office when the NOI is submitted to the tribe. Electronic copy of SWPPP downloaded on flash drive may be sent to the above address for the Taos Pueblo Environmental Office.

iii. The operator must provide a copy of the corrective action log following each corrective action undertaken and modifications made to the SWPPP as a result of

a corrective action to the Taos Pueblo Environmental Office at address listed above.

h. Pueblo of Tesuque.

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOI) to the Pueblo of Tesuque Department of Environment and Natural Resources (DENR) and the Pueblo's Governor within three business days of submittal to EPA. Additionally, a copy of any NOi modifications and the Notice of Termination (NOT), must be provided within three business days after EPA provides electronic confirmation that the submission has been received. The NOI and NOT must be provided to the following address:

Governor Mark Mitchell Pueblo of Tesuque
20 TP 828
Santa Fe, NM 87506 governor@puebloftesuque.org

Sage Mountain.flower Pueblo of Tesuque
Department of Environment and Natural Resources Director
20 TP 828

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copyof the Stormwater Pollution Prevention Plan (SWPPP) to Pueblo of Tesuque DENR and the Pueblo's Governor at the same time that the NO! is submitted to the EPA (see contact information listed above).

iii. The operator must provide a copy of the corrective action log, and any modifications made tothe SWPPP as a result of inspection findings, or upon request by the Pueblo of Tesuque DENR.

iv. The operator must notify the Pueblo of Tesuque DENR within 24 hours in the event of an emergency spill, in addition to the notification requirements at Part 2.3.6 of the CGP (seecontact information listed above).

i. Santa Clara Indian Pueblo.

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOI) to the Santa Clara Pueblo Office of Environmental Affairs at the same time the NOI is submitted to the U.S. EPA. Additionally, a copy of the NOI modifications and the Notice of Termination (NOT), must be provided at the same time after electronic confirmation is received from EPA that the NOT has been accepted. The NOI and NOT shall be provided to the following address in electronic format:

Dino Chavarria,
Santa Clara Pueblo
Office of Environmental Affairs
dinoc@santaclarapueblo.org

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copy of the Stormwater Pollution Prevention Plan to the Santa Clara Pueblo Office of Environmental Affairs at the same time the NOI is submitted to the U.S. EPA (see contact information listed above).

iii. The operator must notify the Santa Clara Pueblo Office of Environmental Affairs at the address above within 24 hours, in the event of an emergency spill, in addition to the notification requirements at Part 2.3.6 of the CGP

9.6.3 OKR10I000 Indian country within the State of Oklahoma, except areas of Indian country covered by an extension of state program authority pursuant to Section 10211 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA).

a. Pawnee Nation. The following conditions apply only to discharges within Pawnee Indian country:

i. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be provided to the Pawnee Nation at the same time it is submitted to the Environmental Protection Agency to the following address:

Pawnee Nation Department of Environmental Conservation and Safety
P.O. Box 470
Pawnee, OK 74058
Or email to dnrs@pawneenation.org

ii. An electronic copy of the Storm Water Pollution Prevention Plan (SWPPP) must be submitted to the Pawnee Nation Department of Environmental Conservation and Safety at the same time the NOI is submitted.

iii. The operator must provide access to the site for inspections and for copies of inspection reports, copy of the corrective action log and modifications, made to the SWPPP because of inspection findings, upon request by the Pawnee Nation DECS.

iv. The Pawnee Nation Department of Environmental Conservation and Safety must be notified at 918.762.3655 immediately upon discovery of any noncompliance with any provision of the permit conditions.

9.6.4 OKR10F000 Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, or the Oklahoma Department of Agriculture and Forestry including activities associated with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).

a. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Lee Creek or any water or watershed designated "ORW" in Oklahoma's Water Quality Standards, this permit may only be used to authorize discharges from temporary construction activities. Certification is denied for any on-going activities such as sand and gravel mining or any other mineral mining.

b. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Lee Creek or any water or watershed designated "ORW" in Oklahoma's Water Quality Standards, certification is denied for any discharges originating from support activities, including, but not limited to, concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, or borrow areas.

c. Dewatering discharges into sediment or nutrient-impaired waters, and waters identified as Tier 2, Tier 2.5, or Tier 3 (OAC 785:46-13) shall be controlled to meet water quality standards for turbidity in those waters as follows:

i. Cool Water Aquatic Community/Trout Fisheries: 10 NTUs (OAC 785: 45-5-12(f)(7)(A)(i)

ii. Lakes: 25 NTUs (OAC 785: 45-5-12(f)(7)(A)(ii)

iii. In waters where background turbidity exceeds these values, turbidity from dewatering discharges should be restricted to not exceed ambient levels (OAC 785: 45-5-12(f)(7)(B)

9.7 EPA REGION 7

No additional conditions.

9.8 EPA REGION 8

9.8.1 MTR10I000 Indian country within the State of Montana

a. Blackfeet Nation.

i. The Applicant and applicants for projects authorized under the NWPs should obtain all other permits, licenses, and certifications that may be required by federal, state, or tribal authority. Primary relevant tribal permit will be ALPO (Ordinance 117). Others may apply. It is the applicant's responsibility to know the tribal and local ordinances and complete all necessary permissions before they can commence work.

ii. If a project is unable to meet the enclosed conditions, or if certification is denied for an applicable NWP, the Applicant may request an individual certification from Blackfeet. An individual certification request must follow the requirements outlined in 40 CFR 121.5 of EPA's CWA § 401 Certification Rule, effective September 11, 2020.

iii. Copies of this certification should be kept on the job site and readily available for reference.

iv. If the project is constructed and/or operated in a manner not consistent with the applicable NWP, general conditions, or regional conditions, the permittee may be in violation of this certification.

v. Blackfeet and EPA representatives may inspect the authorized activity and any mitigation areas to determine compliance with the terms and conditions of the NWP.

vi. This NWP Reissuance does not reduce Tribal authority under any other rule.

vii. The project, including any stream relocations and restoration, must be built as shown and as otherwise described in the application, the construction plans, cross sections, mitigation plans and other supporting documents submitted to this office. Impacts to aquatic systems and restoration efforts will be monitored by an appropriate aquatic resource professional to ensure that disturbed areas are restored to at least their original condition.

viii. All existing water uses will be fully maintained during and after the completion of the project. (If applicable)

ix. Where practicable, perform all in-channel and wetland work during periods of low flow or drawn—down or when dry

x. Equipment staging areas must be located out of all delineated wetlands

xi. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during and immediately after construction, and all exposed soil and other fills, as well as any work below the ordinary high-water mark or in a wetland, must be permanently stabilized as soon as possible

xii. Materials such as piling, culverts, sandbags, fabric, mats, timbers used for temporary facilities in wetlands or below the high- water mark of Waters of the US must be free from oil, gas, excess dirt, loose paint and other pollutants.

xiii. Equipment staging areas in wetlands or in stream or river channels must be placed on mats, or other measures must be taken to minimize soil disturbance and compaction.

xiv. Clearing of riparian or wetland vegetation for the sole purpose of constructing work bridges, detours, staging areas or other temporary facilities must be limited to the absolute minimum necessary. When temporary impacts to native riparian or wetland vegetation are unavoidable, it must be mowed or cut above ground with the topsoil and root mass left intact.

xv. Remove all temporary fills and structures in the entirety when they are no longer needed. Restore affected areas to the appropriate original and planned contours where possible. Re-vegetate disturbed areas with appropriate native species when native species are impacted.

xvi. Construction methods and best management practices (BMPs) must minimize aquatic resource impacts to the maximum extent possible. Any BMPs described in the Joint Application must be followed. BMPs should include installation and maintenance of sediment control measures; separation, storage and reuse of any topsoil; and recovery of all disturbed areas where possible. All best management practices must in place prior to the onset of construction or as soon as practicable during the construction process.

xvii. Best available technology and/or best management practices must be utilized to protect existing water uses and maintain turbidity and sedimentation at the lowest practical level.

xviii. Applicant/contractor should manage disturbed streambank topsoil in a manner that optimizes plant establishment for the site.

xix. When operating equipment or otherwise undertaking construction in wetlands and water bodies the following conditions apply:

(a) Work should be done in dry conditions if possible.

(b) All equipment is to be inspected for oil, gas, diesel, anti-freeze, hydraulic fluid or other petroleum leaks. All such leaks will be properly repaired and equipment cleaned prior to being allowed on the project site. Leaks that occur after the equipment is moved to the project site will be fixed the same day or the next day or removed from the project area. The equipment is not allowed to continue operation once a leak is discovered.

(c) All equipment is to be inspected and cleaned before and after use to minimize the spread or introduction of invasive or undesirable species.

(d) Construction equipment shall not operate below the existing water surface except as follows:

- Impacts from construction should be minimized through the use of best management practices submitted in the permit application.
- Essential work below the waterline shall be done in a manner to minimize impacts to aquatic system and water quality.

(e) Containment booms and/or absorbent material must be available onsite. Any spills of petroleum products must be reported to the Army Corps, Blackfeet Nation BEO Office and the US EPA within 24 hours.

xx. Upland, riparian and in-stream vegetation should be protected except where its removal is necessary for completion of work. Revegetation should be completed as soon as possible. Applicant/contractor should revegetate disturbed soil in a manner that optimizes plant establishment for the site. Revegetation must include topsoil replacement, planting, seeding, fertilization, liming and weed-free mulching as necessary. Applicant must use native plant material and soils where appropriate and feasible. This certification does not allow for the introduction of non-native flora and fauna. All disturbed surface areas must be restored to pre-construction contours and elevation.

xxi. Spoils piles should not be placed or stored within the delineated wetlands or streams unless protected by a temporary structure designed to divert and handle high flows that can be anticipated during permit activity. Spoils piles should be placed on landscaping fabric or some other material to separate spoils material and allow retrieval of spoils material with minimal impact.

xxii. Impacts to wetlands shall not exceed 4.92 acres.

xxiii. Any unexpected and additional impacts to waters of the US should be reported to the

xxiv. Army Corps, Blackfeet Environmental Office Water Quality Coordinator and the US EPA.

xxv. All instream and stream channel reconstruction work must be completed before the stream is diverted into the new channel.

xxvi. Any temporary crossings, bridge supports, cofferdams, or other structures that are necessary during permit activity should be designed to handle high flows that can be anticipated during permit activity. All temporary structures should be completely removed from the water body at the conclusion of the permitted activity and the area restored to a natural function and appearance.

xxvii. The certification does not authorize any unconfined discharge of liquid cement into the waters of the United States. Grouting riprap must occur under dry conditions with no exposure of wet concrete to the water body.

xxviii. BMPs shall include application of certified weed-free straw or hay across all disturbed wetland areas that are temporarily impacted; installation and maintenance of sediment control measures during construction and if necessary, after construction is completed; use of heavy mud mats if necessary; separation,

storage and reuse of all streambank topsoil and wetland topsoil, as appropriate; and recovery of all disturbed wetland and streambank areas where possible. All conditions set by the Blackfeet Tribe and US Army Corps must be followed.

xxix. All applicants, including federal agencies, must notify EPA and the Blackfeet Environmental Office of the use of all NWPs for which certification has been granted prior to commencing work on the project. Notifications must include:

(a) project location (lat. Long., exact point on map);

(b) NWP that will be used and the specific activity that will be authorized under the NWP;

(c) amount of permanent and temporary fills;

(d) a short summary of the proposed activity, and all other federal, state, tribal or local permits or licenses required for the project;

(e) complete contact information of both the applicant and contractor (name, name of the company or property if applicable, telephone, mobile, and email); and,

(f) Summary of best management practices that will be used.

(g) A summary of communications with the affected Tribe's water quality staff regarding the project, including any concerns or issues.

(h) Notify Blackfeet and EPA at least 7 days before the completion of construction and operations begin.

xxx. Point source discharges may not occur: (1) in fens, bogs or other peatlands; (2) within 100 feet of the point of discharge of a known natural spring source; or (3) hanging gardens.

xxxi. Except as specified in the application, no debris, silt, sand, cement, concrete, oil or petroleum, organic material, or other construction related materials or wastes shall be allowed to enter into or be stored where it may enter into waters of the U.S.

xxxii. Silt fences, straw wattles, and other techniques shall be employed as appropriate to protect waters of the U.S. from sedimentation and other pollutants.

xxxiii. Water used in dust suppression shall not contain contaminants that could violate water quality standards.

xxxiv. Erosion control matting that is either biodegradable blankets or loose-weave mesh must be used to the maximum extent practicable.

xxxv. All equipment used in waters of the U.S. must be inspected for fluid leaks and invasive species prior to use on a project. All fluid leaks shall be repaired and cleaned prior to use or when discovered, or if the fluid leak can't be repaired, the equipment shall not be used on site. Equipment used in waters with the possibility of aquatic nuisance species infestation must be thoroughly cleaned and effectively decontaminated before they are used on the project.

xxxvi. Vegetation should be protected except where its removal is necessary for completion of the work. Locations disturbed by construction activities should be revegetated with appropriate native vegetation in a manner that optimizes plant establishment for the specific site.

xxxvii. Revegetation may include topsoil replacement, planting, seeding, fertilization, liming, and weed-free mulching, as necessary. Where practical, stockpile weed- seed-free topsoil and replace it on disturbed areas. All revegetation materials, including plants and plant seed shall be on site or scheduled for delivery prior to or upon completion of the earth moving activities.

xxxviii. Activities may not result in any unconfined discharge of liquid cement into waters of the U.S. Grouting riprap must occur under dry conditions with no exposure of wet concrete to the waterbody.

xxxix. Activities that may result in a point source discharge shall occur during seasonal low flow or no flow periods to the extent practicable.

xl. The placement of material (discharge) for the construction of new dams is not certified, except for stream restoration projects.

xli. Any decision-maker that is required under 7.0 of the CGP to prepare a Stormwater Pollution Prevention Plan (SWPPP), must submit an electronic copy of the SWPPP to the Blackfeet Environmental Office at least 30 days before construction starts for review and approval. Any modifications to the SWPPP should be submitted to the Blackfeet Environmental Office.

xlii. Any Decision-maker required under Part 1.4 of the CGP to submit a Notice of Intent (NOI) to EPA for coverage under the CGP, must submit a copy of the NOI to the Blackfeet Environmental Office within three business days of submittal to EPA. Additionally, a copy of the Notice of Termination (NOT) must be provided within three business days after electronic confirmation is received from EPA that the NOT has been accepted. The NOI and NOT must be provided to the following address Gerald Wagner, Blackfeet Environmental Office Director.

62 Hospital Drive, Browning, MT 59417

beo.director@gmail.com

b. Fort Peck Tribes.

i. Any Decision-maker required under Part 1.4 of the CGP to submit a Notice of Intent (NOI) to EPA for coverage under the CGP, must submit a copy of the NOI to the Fort Peck Tribes Office of Environmental Protection within three business days of submittal to EPA. Additionally, a copy of the Notice of Termination (NOT) must be provided within three business days after electronic confirmation is received from EPA that the NOT has been accepted. The NOI and NOT must be provided to the following address:

Martina Wilson, Office of Environmental Protection Director

501 Medicine Bear Rd Poplar, MT 59255

martinawilson@fortpecktribes.net

ii. Any Decision-maker that is required under Part 7.0 of the CGP to prepare a Stormwater Pollution Prevention Plan (SWPPP), must submit an electronic copy of the SWPPP to the Fort Peck Tribes Office of Environmental Protection at least 30 days before construction starts for review and approval. Any modifications to the

SWPPP should be submitted to the Fort Peck Tribes Office of Environmental Protection.

iii. Any Decision-maker that is required under Part 8.0 of the CGP to submit a weekly, bi-weekly, and/or annual report to EPA, must submit an electronic copy of the annual report to the Fort Peck Tribes Office of Environmental Protection within three business days after submittal to EPA.

9.9 EPA REGION 9

9.9.1 CAR10I000 Indian country within the State of California

a. Morongo Band of Mission Indians

i. A copy of the Stormwater Pollution Prevention Plan (SWPPP) must be submitted (either mailed or electronically) to the MEPD no less than thirty (30) days before commencing construction activities:

Morongo Band of Mission Indians
Environmental Protection Department
12700 Pumarra Road
Banning, CA 92220
Email: epd@morongo-nsn.gov

ii. Copies of the Notice of Intent (NOI) and the Notice of Termination (NOT) must be sent to the MEPD at the same time they are submitted to EPA.

iii. Operators of an "emergency-related project" must submit notice to the MEPD within twenty- four (24) hours after commencing construction activities.

iv. Spills, leaks, or unpermitted discharges must be reported to the MEPD within twenty-four (24) hours of the incident, in addition to the reporting requirements of the CGP.

v. Projects utilizing cationic treatment chemicals (as defined in Appendix A of the CGP) within the Morongo Reservation are not eligible for coverage under this certification of the CGP.

vi. Facilities covered under the CGP will be subject to compliance inspections by MEPD staff, including compliance with final site stabilization criteria prior to submitting an NOI ***[EPA assumes this intended to refer to an NOT]***.

9.9.2 GUR100000 Island of Guam

a. For purposes of this Order, the term "Project Proponent" shall mean U.S. Environmental Protection Agency, and its agents, assignees, and contractors.

b. For purposes of this Order, the permit "Operator" shall mean any party associated with a construction project that meets either of the following two criteria:

i. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications (e.g. in most cases this is the owner of the site); or

ii. The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the permit; in most cases this is the general contractor of the project).

Subcontractors generally are not considered operators for the purposes of this permit.

c. The Project Proponent shall enforce the proposed 2022 CGP and ensure that the Operator complies with the conditions of the permit at all times.[107] (40 CFR §121.11(c))

d. All submittals required by this Order shall be sent to the Guam Environmental Protection Agency Attn: 401 Federal Permit Manager, Non-Point Source Program, EMAS Division, 3304 Mariner Avenue, Bldg. 17-3304, Barrigada, Guam 96913, AND via email to jesse.cruz@epa.guam.gov. The submittals shall be identified with WQC Order #2021- 04 and include the COP Permit Number, certifying representative's name, title, mailing address and phone number. (§51060)(4) 2017 GWQS)

e. A copy of the Operator's signed Stormwater Pollution Prevention Plan (SWPPP) and signed Notice of Intent (NOI) and Notice of Termination (NOT) submitted to EPA for review and approval, shall concurrently be submitted to Guam EPA, consistent with condition A4. Coordination with Guam EPA is encouraged when the receiving water(s) for the proposed discharge is/are being identified. (§10105.B.5.d.) GSESCR; (§51060)(4) 2017 GWQS)

f. The Operator must comply with the conditions and requirements set forth in 22 GAR 10, Guam Soil Erosion and Sediment Control Regulations (GSESCR).

g. Before submitting the NOT to EPA, Operators shall comply with GSESC regulations at §10105.B10. (Stabilization of Affected Areas) and §10107.B. {Final Inspection and Approval)

h. All operators/owners shall comply with the general design criteria for best management practices (BMPs) acceptable for meeting the Construction and Post-construction stormwater criteria in the 2006 CNMI and Guam Stormwater Management Manual. (E.O. 2012-02)

i. Operating reports and monitoring and analytical data (e.g. Discharge Monitoring Reports (DMRs), follow-up monitoring reports, Exceedance Reports for Numerical Effluent Limits, etc.) submitted to EPA shall be concurrently submitted to Guam EPA, consistent with condition A4. §51060)(4) 2017 GWQS

j. The Operators who install a sediment basin or similar impoundment shall maintain the storage capacity of five thousand cubic feet {5,000 cu. ft.) per acre of project area tributary to the basin. (§10105.B.5.i.) GSESCR

k. (1) This Order does not authorize EPA to qualify Rainfall Erosivity Waivers to stormwater discharges associated with small construction activities (i.e. 1-5 acres). Operators are required to apply for an NOI for those projects eligible for coverage under the proposed 2022 CGP. An Erosion and Sediment Control Plan is required for every site that would be covered by the proposed 2022 CGP. (22 GAR §10104) The average annual rainfall for Guam and the CNMI exceeds l00 inches per year in many locations. These climatic conditions combined with the region's unique limestone, volcanic geologic formations, sensitive water resources and significant land

[107] By incorporating this condition into the permit, EPA acknowledges receipt of Guam's certification conditions.

development forces make stormwater discharges a very significant environmental and economic issue. (2006 CNMJ/Guam Stormwater Management Manual) E.O. 2012-02

(2) This Order does not authorize EPA to approve a Sediment TMDL Waiver for the Ugum River. Operators of construction activities eligible for a TMDL Waiver in lieu of coverage under the proposed 2022 CGP, shall submit a complete and accurate waiver certification as described in C.2., Appendix C - (Small Construction Waivers) to Guam EPA per condition A4., prior to notifying EPA of its intention to obtain a waiver. §51060)(4) 2017 GWQS

l. The Project Proponent shall submit to Guam EPA a signed Statement of Understanding of Water Quality Certification Conditions.[108] (see Attachment A for an example) per condition A4. §51060)(4) 2017 GWQS

m. The Operator shall comply with applicable provisions of the Guam Pesticides Act of2007 (10 GCA Chapter 50) and implementing regulations at Title 22 GAR Chapter 15 for any use and application of pesticides.

n. Point source discharge(s) to waterbodies under the jurisdiction of Guam EPA must be consistent with the antidegradation policy in 22 GAR §510l(b).

o. The operator shall carry out construction activities in such a manner that will not violate Guam Water Quality Standards (GWQS). Proposed 2022 CGP discharges are prohibited as follows:

- **i.** In Marine Waters, Category M-1 Excellent 22 GAR Chapter 5 §5102(b)(l); and
- **ii.** In Surface Waters, Category S-1 High 22 GAR Chapter 5 §5102(c)(l)

p. In addition to complying with construction dewatering requirements in Part 2.4 and site inspection requirements for all areas where construction dewatering is taking place in Part 4 of the proposed 2022 CGP, Operators shall comply with all dewatering conditions and requirements set forth in 22 GAR 7, Water Resources Development and Operating Regulations, to include securing Guam EPA permits prior to any dewatering activities.

q. The Operator shall develop and implement a Spill Prevention and Containment Plan.

r. The Operator shall have adequate and appropriate spill response materials on hand to respond to emergency release of oil, petroleum or any other material into waters of the territory.

s. Any unpermitted discharge into territorial waters or onto land with a potential for entry into territorial waters, is prohibited. If this occurs, the Operator shall immediately take the following actions:

- **i.** Cease operations at the location of the violation or spill.
- **ii.** Assess the cause of the water quality problem and take appropriate measures to correct the problem and/or prevent further environmental damage.
- **iii.** Notify Guam EPA of the failure to comply. All petroleum spills shall be reported immediately to:

[108] By incorporating this condition into the permit, EPA acknowledges receipt of Guam's certification conditions.

(a) Guam's Emergency 911 system

(b) Guam EPA's 24-Hour Spill Response Team at (671) 888-6488 or during working hours (671) 300-4751

(c) US Coast Guard Sector Guam (671) 355-4824

(d) National Response Center 1-800-424-8802

iv. Submit a detailed written report to Guam EPA within five days of noncompliance that describes the nature of the event corrective action taken and/or planned, steps to be taken to prevent a recurrence, results of any samples taken, and any other pertinent information.

t. Compliance with this condition does not relieve the Operator from responsibility to maintain continuous compliance with the terms and conditions of this Order or the resulting liability from failure to comply.

u. Submittal or reporting of any of this information does not provide relief from any subsequent enforcement actions for unpermitted discharges to waters of the United States.

v. This Order is valid for five (5) Years from Date of Certification, unless otherwise approved by the Guam EPA Administrator.

w. The Operator shall be required to adhere to the current Guam Coral Spawning Moratorium dates for both hard and soft corals where in-water activities and/or construction activity in close proximity with marine waters may impair water quality. These dates can be obtained from the Guam Department of Agriculture, Division of Aquatic and Wildlife Resources, or the NOAA NMFS Pacific Islands Regional Office Habitat Conservation Division.

x. The Operator shall provide notice to Guam EPA consistent with Condition A4:

(a) Immediately upon discovery of noncompliance with the provisions of this Order.

y. A Notice of Violation/Work Stop Order will be issued if certification conditions are not adhered to or when significant or sustained water quality degradation occurs. Work or discharge shall be suspended or halted until the Operator addresses environmental problems/concerns to Guam EPA's satisfaction. Guam EPA may also levy penalties and fines (10 GCA §47111). Invalidity or enforceability of one or more provisions of this certification shall not affect any other provision of this certification.

9.10 EPA REGION 10

9.10.1 IDR10I000 Indian country within the State of Idaho, except Duck Valley Reservation lands (see Region 9)

a. Shoshone-Bannock Tribes

i. Copies of the following information must be sent to the SBT-WRD:

(a) Notice of Intents (NOI)

The Notice of Intent shall be forwarded to the SBT-WRD within thirty (30) days of receipt of submitting NOI to the USEPA.

Shoshone-Bannock Tribes Water Resources Department
PO Box 306 Pima Drive
Fort Hall, ID 83203 Phone: (208) 239-4582
Fax: (208) 239-4592
Or Email ctanaka@sbtribes.com

b. If requested by the SBT-WRD, the permittee must submit a copy of the SWPPP to SBT-WRD within fourteen (14) days of the request.

9.10.2 ORR10I000 Indian country within the State of Oregon, except Fort McDermitt Reservation lands (see Region 9)

a. Confederated Tribes of Coos, Lower Umpqua, and Siuslaw

i. No activities allowed under the CGP shall result in the degradation of any Tribal waters or affect resident aquatic communities or resident or migratory wildlife species at any life stage.

ii. The operator shall be responsible for achieving compliance with CTCLUSI Water Quality Standards and all other tribal codes, regulations, and laws as they exist at the time that the permit is submitted.

iii. The operator shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to the CTCLUSI Water Quality Program before, or at the same time as, it is submitted to EPA.

iv. The operator shall be responsible for submitting all Stormwater Pollution Prevention Plans (SWPPP) required under this general permit to the CTCLUSI Water Quality Program for review and determination that the SWPPP is sufficient to meet Tribal Water Quality Standards, prior to the beginning of any discharge activities taking place.

v. The operator shall be responsible for reporting an exceedance to Tribal Water Quality Standards to the CTCLUSI Water Quality Program at the same time it is reported to EPA.

vi. The THPO will be provided 30 days to comment on the APE as defined in the permit application.

vii. If the project is an undertaking, a cultural resource assessment must occur. All fieldwork must be permitted by the THPO (as appropriate), conducted by qualified personnel (as outlined by the Secretary of Interior's Standards and Guidelines; http://www.nps.gov/history/local-law/arch_stnds_O.htm) and documented according to Oregon Reporting Standards (Reporting_Guidelines.pdf) (oregon.gov). The resulting report must be submitted to the THPO and the THPO must concur with the finding of effect and recommendations before any ground disturbing work can occur. The THPO requires 30 days to review all reports.

viii. The operator must obtain THPO concurrence in writing. If historic properties are present, this written concurrence will outline measures to be taken to prevent or mitigate adverse effects to historic properties.

b. Confederated Tribes of the Umatilla Indian Reservation

i. The operator shall be responsible for achieving compliance with the

Confederated Tribes of the Umatilla Indian Reservation's (CTUIR) Water Quality Standards.

ii. The operator shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to the CTUIR Water Resources Program at the address below, at the same time it is submitted to EPA.

iii. The operator shall be responsible for submitting all Stormwater Pollution Prevention Plans (SWPPP) required under this general permit to the CTUIR Water Resources Program for review and determination that the SWPPP is sufficient to meet Tribal Water Quality Standards, prior to the beginning of any discharge activities taking place.

iv. The operator shall be responsible for reporting an exceedance to Tribal Water QualityStandards to the CTUIR Water Resources Program at the same time it is reported to EPA.

Confederated Tribes of the Umatilla Indian Reservation
Water Resources Program
46411 Timíne Way
Pendleton, OR 97801
(541) 429-7200

v. The THPO will be provided 30 days to comment on the APE as defined in the permit application.

vi. If the project is an undertaking, a cultural resource assessment must occur. All fieldwork must be permitted by the Tribal Historic Preservation Office (as appropriate), conducted by qualified personnel (as outlined by the Secretary of Interior's Standards and Guidelines; http://www.nps.gov/history/local-law/arch_stnds_0.htm) and documented according to Oregon Reporting Standards (Reporting_Guidelines.pdf (oregon.gov). The resulting report must be submitted to the THPO and the THPO must concur with the finding of effect and recommendations before any ground disturbing work can occur. The THPO requires 30 days to review all reports.

vii. The operator must obtain THPO concurrence in writing. If historic properties are present, this written concurrence will outline measures to be taken to prevent or mitigate adverse effects to historic properties.

9.10.3 WAR10F000 Areas in the State of Washington, except those located on Indian country, subject to construction activity by a Federal Operator

a. For purposes of this Order, the term "Project Proponent" shall mean those that are seeking coverage under this permit, and its agents, assignees and contractors.

b. The Federal Agency shall mean the US Environmental Protection Agency. The Federal Agency shall enforce the permit and ensure that the Project Proponent complies with the conditions of the permits at all times.

c. Failure of any person or entity to comply with this Certification may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the terms of this Certification.

d. The Certification conditions within this Order must be incorporated into EPA's final NPDES permit. Per 40 CFR 121.10(a), all certification conditions herein that satisfy the

requirements of 40 CFR 121.7(d) must be incorporated into the permit. Per 40 CFR 121.10(b), the permit must clearly identify all certification conditions.

e. This Certification does not authorize exceedances of water quality standards established in chapter 173-201A WAC.

f. Discharges from construction activity must not cause or contribute to violations of the Water Quality Standards for Surface Water of the State of Washington (chapter 173-201A WAC), Ground Water Quality Standards (chapter 173- 200 WAC), Sediment Management Standards (chapter 173-204 WAC), and standards in the EPA's Revision of certain Federal water quality criteria applicable to Washington (40 CFR 131.45). Discharges that do not comply with these standards are prohibited.

g. Prior to discharge of stormwater and non-stormwater to waters of the State, the Permittee must apply all known, available, and reasonable methods of prevention, control, and treatment (AKART). This includes the preparation and implementation of an adequate Stormwater Pollution Prevention Plan (SWPPP), with all appropriate Best Management Practices (BMPs) installed and maintained in accordance with the SWPPP and the terms and conditions of the permit.

i. BMPs must be consistent with:

(a) The Stormwater Management Manual for Western Washington (most current approved edition at the time this permit was issued), for sites west of the crest of the Cascade Mountains; or

(b) The Stormwater Management Manual for Eastern Washington (most current approved edition at the time this permit was issued), for sites east of the crest of the Cascade Mountains; or

(c) Revisions to either manual, or other stormwater management guidance documents or manuals which provide equivalent level of pollution prevention, that are approved by Ecology and incorporated into this permit in accordance with the permit modification requirements of WAC 173-226-230. (For purposes of this section, the stormwater manuals listed in Appendix 10 of the Phase I Municipal Stormwater Permit are approved by Ecology); or

(d) Documentation in the SWPPP that the BMPs selected provided an equivalent level of pollution prevention, compared to the applicable stormwater management manuals, including:

- The technical basis for the selection of all stormwater BMPs (scientific, technical studies, and/or modeling) that support the performance claims for the BMPs being selected.
- An assessment of how the selected BMP will satisfy AKART requirements and the applicable federal technology-based treatment requirements under 40 CFR part 125.3.

The Stormwater Management Manuals for Eastern and Western Washington can be found at: https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Stormwater-manuals.

ii. An adequate SWPPP must include a narrative and drawings. All BMPs must be clearly referenced in the narrative and marked on the drawings. The SWPPP

narrative must include documentation to explain and justify the pollution prevention decisions made for the project. Documentation must include:

(a) Information about existing site conditions (topography, drainage, soils, vegetation, etc.).

(b) Potential erosion problem areas.

(c) The 13 elements of a SWPPP, including BMPs used to address each element. Unless site conditions render the element unnecessary and the exemption is clearly justified in the SWPPP, the 13 elements are as follows:

- Preserve Vegetation/Mark Clearing Limits
- Establish Construction Access
- Control Flow Rates
- Install Sediment Controls
- Stabilize Soils
- Protect Slopes
- Protect Drain Inlets
- Stabilize Channels and Outlets
- Control Pollutants
- Control Dewatering
- Maintain BMPs
- Manage the Project
- Protect Low Impact Development (LID) BMPs

h. Discharges of stormwater and authorized non-stormwater must be monitored for turbidity (or transparency) and, in the event of significant concrete work or engineered soils, pH must also be monitored. As applicable based on project specifics, monitoring, benchmarks, and reporting requirements contained in Condition S.4. (pp.10-16) of the Washington State Construction Stormwater General Permit, effective January 1, 2021, shall apply.

i. Discharges to segments of waterbodies listed as impaired by the State of Washington under Section 303(d) of the Clean Water Act for turbidity, fine sediment, phosphorus, or pH must comply with the following numeric effluent limits:

Parameter identified in 303(d) listing	Parameter Sampled	Unit	Analytical Method	Numeric Effluent Limit
• Turbidity • Fine Sediment • Phosphorus	Turbidity	NTU	SM2130	25 NTUs at the point where the stormwater is discharged from the site.
High pH	pH	su	pH meter	In the range of 6.5 – 8.5

All references and requirements associated with Section 303(d) of the Clean Water Act mean the most current EPA-approved listing of impaired waters that exists on the

effective date of the permit, or the date when the operator's complete permit application is received by EPA, whichever is later.

The EPA approved WQ Assessment can be found at: https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-improvement/Assessment-of-state-waters-303d

j. Discharges to a waterbody that is subject to a Total Maximum Daily Load (TMDL) for turbidity, fine sediment, high pH, or phosphorus must be consistent with the TMDL.

- **i.** Where an applicable TMDL sets specific waste load allocations or requirements for discharges covered by this permit, discharges shall be consistent with any specific waste load allocations or requirements established by the applicable TMDL.
- **ii.** Where an applicable TMDL has established a general waste load allocation for construction stormwater discharges, but no specific requirements have been identified, compliance with this permit will be assumed to be consistent with the approved TMDL.
- **iii.** Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharges, but has not excluded these discharges, compliance with this permit will be assumed to be consistent with the approved TMDL.
- **iv.** Where an applicable TMDL specifically precludes or prohibits discharges from construction activity, the operator is not eligible for coverage under this permit.

Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus which has been completed and approved by EPA as of the effective date of the permit, or prior to the date of the operator's complete application for permit coverage is received by EPA, whichever is later.

k. Discharges to waters of the state from the following activities are prohibited:

- **i.** Concrete wastewater.
- **ii.** Wastewater from washout and clean-up of stucco, paint, form release oils, curing compounds and other construction materials.
- **iii.** Process wastewater as defined by 40 Code of Federal Regulations (CFR) 122.2.
- **iv.** Slurry materials and waste from shaft drilling, including process wastewater from shaft drilling for construction of building, road, and bridge foundations unless managed to prevent discharge to surface water.
- **v.** Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance.
- **vi.** Soaps or solvents used in vehicle and equipment washing.
- **vii.** Wheel wash wastewater, unless managed to prevent discharge to surface water.
- **viii.** Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, unless managed according to appropriate controls described within the permit.

l. This Certification is valid until the expiration date including any administrative extension or termination date of the NPDES 2022 Construction General Permit. (40 CFR § 122.46)

m. The Federal Agency shall enforce and the Project Proponent must comply with all the reporting and notification conditions of the NPDES 2022 Construction General Permit in order to comply with this Order and the certification conditions herein (40 CFR § 121.11).

n. You have a right to appeal this Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do all of the following within 30 days of the date of receipt of this Order:

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order on Ecology in paper form - by mail or in person (see addresses below). E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 **Pollution Control Hearings Board** 1111 Israel RD SW STE 301 Tumwater, WA 98501	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 **Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

CONTACT INFORMATION

Please direct all questions about this Order to:

Noel Tamboer
Department of Ecology
P.O. Box 47600
Olympia, WA 98503-7600

(360) 701-6171
noel.tamboer@ecy.wa.gov

9.10.4 WAR10I000 Indian country within the State of Washington

a. Lummi Nation

i. This certification does not exempt and is provisional upon compliance with other applicable statutes and codes administered by federal and Lummi tribal agencies. Pursuant to Lummi Code of Laws (LCL) 17.05.020(a), the operator must also obtaina land use permit from the Lummi Planning Department as provided in Title 15 of theLummi Code of Laws and regulations adopted thereunder.

ii. Pursuant to LCL 17.05.020(a), each operator shall develop and submit a Storm WaterPollution Prevention Plan to the Lummi Water Resources Division for review and approval by the Water Resources Manager prior to beginning any discharge activities.

iii. Pursuant to LCL Title 17, each operator shall be responsible for achieving compliance with the Water Quality Standards for Surface Waters of the Lummi

iv. Indian Reservation (Lummi Administrative Regulations [LAR] 17 LAR 07.010 through 17 LAR 07.210 together with supplements and amendments thereto).

v. Each operator shall submit a signed copy of the Notice of Intent (NOI) to the Lummi Water Resources Division at the same time it is submitted electronically to the Environmental Protection Agency (EPA) and shall provide the Lummi Water Resources Division the acknowledgement of receipt of the NOI from the EPA and the associated NPDES tracking number provided by the EPA within 7 calendar days of receipt from the EPA.

vi. Each operator shall submit a signed copy of the Notice of Termination (NOT) to the Lummi Water Resources Division at the same time it is submitted electronically to the EPA and shall provide the Lummi Water Resources Division the EPA acknowledgement of receipt of the NOT.

vii. Storm Water Pollution Prevention Plans, Notice of Intent, Notice of Termination and associated correspondence with the EPA shall be submitted to:

Lummi Natural Resources Department
ATTN: Water Resources Manager 2665 Kwina Road
Bellingham, WA 98226-9298

b. Port Gamble S'Klallam Tribe

i. No discharge from the project site shall cause exceedances of Port Gamble S'KlallamSurface Water Quality Standards narrative or numeric criteria in Tribal waters. This includes activities outside of Tribal lands that occur upstream of Tribal waters.

(a) If any exceedance of these water quality standards occurred, the Natural Resources Department shall be notified immediately.

- The Department shall additionally be provided a complete draft of the proposed corrective action within a reasonable timeframe and its approval will be required before any corrective action may be taken.

ii. Operators performing activities under the CGP that may affect Tribal waters will requirea permit and shall submit their plans to the Port Gamble S'Klallam Natural Resources Department for review.

- The Department has the right to require conditions outside of this Water QualityCertification prior to permit approval.

iii. No activities allowed under the CGP shall result in the degradation of any Tribal watersor change in designated uses.

iv. No activities allowed under the CGP shall affect resident aquatic communities or resident/migratory wildlife species at any life stage.

- Biological assessment methods used to determine the effect of an activity allowedunder the CGP shall be approved by the PGST Natural Resources Department.

v. No activities allowed under the CGP shall be conducted within wetland and stream bufferzones, nor shall said activities affect in any way wetland or stream buffers, as defined by *PGST Law and Order Code 24.08.01(c).*

vi. Concentrations for substances listed within the table in *Water Quality Standards for Surface Waters* sec. 7(7) shall not be exceeded by activities allowed under the CGP.

c. Spokane Tribe of Indians

i. Pursuant to Tribal Law and Order Code (TLOC) Chapter 30 each operator shall be responsible for achieving compliance with the Surface Water Quality Standards of the Spokane Tribe. The operator shall notify the Spokane Tribe, Water Control Board (WCB) of any spills of hazardous material and;

ii. Each operator shall submit a signed hard copy of the Notice of Intent (NOI) to the WCB at the same time it is submitted to EPA.

iii. The permittee shall allow the Tribal Water Control Board or its designee to inspect and sample at the construction site as needed.

iv. Each operator shall submit a signed copy of the Notice of Termination (NOT) to the WCB at the same time it is submitted to EPA

The correspondence address for the Spokane Tribe Water Control Board is:

Water Control Board c/o Brian Crossley PO Box480
Wellpinit WA 99040
(509)626-4409
crossley@spokanetribe.com

d. Swinomish Tribe

i. Owners and operators seeking coverage under this permit must submit a copy of the Notice of Intent (NOI) to the DEP at the same time the NOI is submitted to EPA.

ii. Owners and operators must also submit to the DEP changes in NOI and/or Notices of Termination at the same time they are submitted to EPA.

iii. Owners and operators seeking coverage under this permit must also submit a Stormwater Pollution Prevention Plan to the DEP for review and approval by DEP prior to beginning any discharge activities.

e. Tulalip Tribes

i. Submission of NOI: Copies of the Notice of Intent (NOI),) Certification shall be submitted to the Tribe's Natural Resources Department to notify the Tribes of the

pending project and in order for the Tribes to review the projects potential impacts to endangered or threatened species.

ii. Submission of SWPPP: A copy of the Stormwater Pollution Plans (SWPPPs) shall be submitted to the Tribe's Natural Resources Department along with the NOI during the 30 day waiting period.

iii. Submission of Monitoring Data and Reports: The results of any monitoring required by this permit and reports must be sent to the Tribe's Natural Resources Depa1tment,

iv. The Tulalip Tribes are federally recognized successors in the interest to the Snohomish, Snoqualmie, Skykomish, and other allied tribes and bands signatory to the Treaty of Point Elliott.

v. including a description of the corrective actions required and undertaken to meet effluent limits or benchmarks (as applicable).

vi. Authorization to Inspect: The Tribe's Natural Resources Department may conduct an inspection of any facility covered by this permit to ensure compliance with tribal water quality standards. The Department may enforce its certification conditions.

vii. Submission of Inspection Reports: Inspection reports must be sent to the Tribe's Natural Resources Department, including a description of the corrective actions required and undertaken to meet effluent limits or benchmarks (as applicable).

viii. Permits on-site: A copy of the pe1mit shall be kept on the job site and readily available for reference by the construction supervisor, construction managers and foreman, and Tribal inspectors.

ix. Project Management: The applicant shall ensure that project managers, construction managers and foreman, and other responsible parties have read and understand conditions of the permit, this certification, and other relevant documents, to avoid violations or noncompliance with this certification.

x. Emergency Spill Notification Requirements: In the event of a spill or the contractor shall immediately take action to stop the violation and correct the problem, and immediately repo1t spill to the Tulalip Tribes Police Department (425) 508-1565. Compliance with this condition does not relieve the applicant from responsibility to maintain continuous compliance with the tem1S and conditions of this certification or the resulting liability from failure to comply.

xi. Discharges to CERCLA Sites: This permit does not autho1ize direct stormwater discharges to certain sites undergoing remedial cleanup actions pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) unless first approved by the appropriate EPA Regional office. In the case of the Tulalip Landfill site (WAD980639256), the Tulalip Tribes also requests notification by the facility and consultation with EPA prior to discharge. Contaminants at this site may include but are not limited to: dioxins, furans, arsenic, copper, lead, zinc, 4- methyl-phenol, Hex-CB, HPAHs, PCBs, PCE, cadmium, mercury, and LPAHs.

xii. Discharge-related Activities that have Potential to Cause an Adverse Effect on Historic Properties: Installation of stormwater controls that involve subsurface disturbances may potentially have an adverse impact on historic properties.

xiii. Procedures detailed in the permit shall be completed. Richard Young, of the Tulalip Tribe's Cultural Resources Department shall be contacted prior to initiating discharge- related activities that may have an impact on historic properties. His contact information is (360) 716-2652, ryoung@tulaliptribes-nsn.gov.

xiv. Invalidation: This certification will cease to be valid if the project is constructed and/or operated in a manner not consistent with the project description contained in

xv. the permit. This certification will also cease to be valid and the applicant must reapply with an updated application if info1mation contained in the permit is voided by subsequent submittals.

xvi. Modification: Nothing in this certification waives the Tulalip Tribes of Washington's authority to issue modifications to this ce1iification if additional impacts due to operational changes are identified, or if additional conditions are necessary to protect water quality or further protect the Tribal Communities interest.

xvii. incorporation by reference: TI1is certification does not exempt the applicant from compliance with other statues and codes administered by the Tribes, county, state and federal agencies.

xviii. Compliance with Tribe's I996 Water Quality Standards: Each permittee shall be responsible for controlling discharges and achieving compliance with the T1ibe's Water Quality Standards.

xix. Compliant with Tulalip Tribes Tidelands Management Policy: Permittee shall be responsible for achieving compliance with applicable sections of the Tulalip Tribe's Tidelands Management Policy. (Tulalip Tribal Code Title 8 Chapter 8.30).

xx. Compliant with Tulalip Tribes Environmental Infractions: Permittee shall be responsible for achieving compliance with applicable sections of the Tulalip Tribe's Environmental Infractions. (Tulalip Tribal Code Title 8 Chapter 8.20).

xxi. Where to Submit information and for further Coordination: All requested documents should be sent to the: Tulalip Tribes Natural Resources Environmental Department c/o Kurt Nelson and Valerie Streeter, 6704 Marine Drive, Tulalip, Washington 98271. For further 40 I Certification coordination with the Tulalip Tribes Natural Resources Department, please contact Mr. Kurt Nelson (360) 716-4617 knelson@tu1aliptribes- nsn.gov. 6406 Marine Dr., Tulalip WA 98271.

f. Makah Tribe

i. The permittee shall be responsible for meeting any additional permit requirements imposed by EPA necessary to comply with the Makah Tribe's Water Quality Standards if the discharge point is located within the Makah's U&A treaty reserved areas.

ii. Each permittee shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to Makah Fisheries Management, Water Quality Department at the address listed below at the same time it is submitted to the EPA.

Makah Water Quality
Makah Fisheries Management (MFM)
ray.colby@makah.com

PO Box 115

Neah bay, WA 98357

iii. All supporting documentation and certifications in the NOI related to coverage under the general permit for Endangered Species Act purposes shall be submitted to the Tribe's Habitat programs for their review.

iv. If EPA requires coverage under an individual or alternative permit, the permittee shall submit a copy of the permit to Assistant Fisheries Director, ray.colby@makah.com.

v. The permittee shall submit all Stormwater Pollution Prevention plan (SWPP) to MFM for review and approval prior to beginning any activities resulting in a discharge to Makah tribal waters.

vi. The permittee shall notify Ray Colby, ray.colby@makah.com (360) 645-3150 prior to conducting inspections at construction sites generating stormwater discharges to tribal waters.

vii. The operator shall treat dewatering discharges with controls necessary to minimize discharges of pollutants to surface waters, or ground waters, and from stormwater runoff onsite from excavations, trenches, foundations, or storage areas. To the extent feasible, at all points where dewatering is discharged, comply with the velocity dissipation using check dams, sediment traps, and grouted outlets.

g. Puyallup Tribe of Indians

i. The permittee shall be responsible for meeting any additional permit requirements imposed by EPA necessary to comply with the Puyallup Tribe's antidegradation procedures.

ii. Each permittee shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to Char Naylor, Tribal Water Quality Manager at the following e-mail address: (char.naylor@puyalluptribe-nsn.gov) at the same time it is submitted to EPA.

iii. All supporting documentation and certifications in the NOI related to coverage under the general permit for Endangered Species Act purposes shall be submitted to Char Naylor, Tribal Water Quality Manager/Assistant Fisheries Director (char.naylor@puyalluptribe-nsn.gov) for review.

iv. If EPA requires coverage under an individual or alternative permit, the permittee shall submit a copy of the permit to Char Naylor at the email address listed above.

v. The permittee shall submit all stormwater pollution prevention plans to Char Naylor for review and approval prior to beginning any activities resulting in a discharge to Puyallup tribal waters.

vi. The permittee shall contact Brandon Reynon (Brandon.reynon@puyalluptribe-nsn-gov), Tribe's Historic Preservation Officer or Jennifer Keating (Jennifer.keating@puyalluptribe-nsn.gov), Tribe's Assistant Historic Preservation Officer regarding historic properties and cultural resources.

vii. To minimize the discharge of pollutants to groundwater or surface waters from stormwater that is removed from excavations, trenches, foundations, vaults, or

other storage areas, treat dewatering discharges with controls necessary to minimize discharges of pollutants. Examples of appropriate controls include sediment basins or sediment traps, sediment socks, dewatering tanks, tube settlers, weir tanks, and filtration systems (e.g., bag or sand filters) that are designed to remove sediment.

To the extent feasible, utilize vegetated, upland areas of the site to infiltrate dewatering water before discharge. At all points where dewatering water is discharged, utilize velocity dissipation controls. Examples of velocity dissipation devices include check dams, sediment traps, riprap, and grouted riprap at outlets.

viii. The permittee shall provide and maintain natural buffers to the maximum extent possible (and/or equivalent erosion and sediment controls) when tribal waters are located within 100 feet of the boundaries. If infeasible to provide and maintain an undisturbed 100 foot natural buffer, erosion and sediment controls to achieve the sediment load reduction equivalent to a 100-foot undisturbed natural buffer shall be required.

Attachment B

Certifications

Sudbury-Hudson Transmission Reliability Project
(Sudbury, Marlborough, Stow, Hudson, Massachusetts)

Delegation of Authority

I, _____ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Construction General Permit, at the _____ construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

Name of person/position: _____

Company: _____

Address: _____

City, State, zip: _____

Phone: _____

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in Appendix I of EPA's Construction General Permit (CGP), and that the designee above meets the definition of a "duly authorized representative" as set forth in Appendix I.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Name: _____

Company: _____

Title: _____

Signature: _____

Date: _____

Sudbury-Hudson Transmission Reliability Project
(Sudbury, Marlborough, Stow, Hudson, Massachusetts)

Signatories to the SWPPP

The signatories identified on this sheet are considered Operators of the project described in this SWPPP and will use, update, and maintain this SWPPP to comply with the terms of the 2022 EPA NPDES CGP.

Subcontractors who are not operators may sign the Subcontractor Certification Form.

OWNER	CONTRACTOR	SUBCONTRACTOR (Operator status)
Signature and Date	Signature and Date	Signature and Date
Title	Title	Title
Michael Hagar Eversource 247 Station Drive Westwood, MA 02090 T: (508) 341-5815 Michael.Hager@eversource.com	Matt Stock Bond 10 Cabot Road, Suite 300 Medford, MA 02155 T: (617) 512-6766 mstock@bond-civilutility.com	Daren Ducharme E.T.&L. Corp. 873 Great Rd Stow, MA 01775 T: 978-793-1287 dducharme@etlcorp.com

Add additional sheets as necessary.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Sudbury-Hudson Transmission Reliability Project
(Sudbury, Marlborough, Stow, Hudson, Massachusetts)

Signatories to the SWPPP

The signatories identified on this sheet are considered Operators of the project described in this SWPPP and will use, update, and maintain this SWPPP to comply with the terms of the 2022 EPA NPDES CGP.

Subcontractors who are not operators may sign the Subcontractor Certification Form.

SUBCONTRACTOR (Operator status)	SUBCONTRACTOR (Operator status)	SUBCONTRACTOR (Operator status)
Signature and Date	Signature and Date	Signature and Date
Title	Title	Title
Contractor Contact Contractor Company Address Town, State Zip T: (###) ###-#### name@address.com	Contractor Contact Contractor Company Address Town, State Zip T: (###) ###-#### name@address.com	Contractor Contact Contractor Company Address Town, State Zip T: (###) ###-#### name@address.com

Add additional sheets as necessary.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Sudbury-Hudson Transmission Reliability Project
(Sudbury, Marlborough, Stow, Hudson, Massachusetts)

Subcontractor Certification (Non-Operator Status)

Stormwater Pollution Prevention Plan

Project Number: _____

Project Title: _____

Operator(s): _____

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

"I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP."

This certification is hereby signed in reference to the above named project:

Company: _____

Address: _____

Telephone Number: _____

Type of construction service to be provided: _____

Signature: _____

Title: _____

Date: _____

Attachment C

EPA NOI and NOT

NPDES FORM 3510-9	EPA	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON, DC 20460 NOTICE OF INTENT (NOI) FOR THE 2022 NPDES CONSTRUCTION PERMIT	FORM Approved OMB No. 2040-0305

Submission of this Notice of Intent (NOI) constitutes notice that the operator identified in Section III of this form requests authorization to discharge pursuant to the NPDES Construction General Permit (CGP) permit number identified in Section II of this form. Submission of this NOI also constitutes notice that the operator identified in Section III of this form meets the eligibility requirements of Part 1.1 CGP for the project identified in Section IV of this form. Permit coverage is required prior to commencement of construction activity until you are eligible to terminate coverage as detailed in Part 8 of the CGP. To obtain authorization, you must submit a complete and accurate NOI form. Discharges are not authorized if your NOI is incomplete or inaccurate or if you were never eligible for permit coverage. Refer to the instructions at the end of this form.

Permit Information

NPDES ID: MAR1003UW

State/Territory to which your project/site is discharging: MA

Is your project/site located on federally recognized Indian Country lands? No

Are you requesting coverage under this NOI as a *"Federal Operator"* or a *"Federal Facility"* as defined in Appendix A (https://www.epa.gov/system/files/documents/2022-01/2022-cgp-final-appendix-a-definitions.pdf)? No

Have stormwater discharges from your current construction site been covered previously under an NPDES permit? No

Will you use polymers, flocculants, or other treatment chemicals at your construction site? No

Has a Stormwater Pollution Prevention Plan (SWPPP) been prepared in advance of filling this NOI, as required? Yes

Are you able to demonstrate that you meet one of the criteria listed in Appendix D (https://www.epa.gov/system/files/documents/2022-01/2022-cgp-final-appendix-d-endangered-species-protection.pdf) with respect to protection of threatened or endangered species listed under the Endangered Species Act (ESA) and federally designated critical habitat?

Yes

Have you completed the screening process in Appendix E (https://www.epa.gov/system/files/documents/2022-01/2022-cgp-final-appendix-e-historic-properties.pdf) relating to the protection of historic properties? Yes

Indicating "Yes" below, I confirm that I understand that CGP only authorized the allowable stormwater discharges in Part 1.2.1 and the allowable non-stormwater discharges listed in Part 1.2.2. Any discharges not expressly authorized in this permit cannot become authorized or shielded from liability under CWA section 402(k) by disclosure to EPA, state or local authorities after issuance of this permit via any means, Including the Notice of Intent (NOI) to be covered by the permit, the Stormwater Pollution Prevention Plan (SWPPP), during an Inspection, etc. If any discharges requiring NPDES permit coverage other than the allowable stormwater and non-stormwater discharges listed in Parts 1.2.1 and 1.2.2 will be discharged, they must be covered under another NPDES permit.

Yes

Operator Information

Operator Information

Operator Name: NSTAR Electric d/b/a Eversource Energy

Operator Mailing Address:

Address Line 1: 247 Station Drive

Address Line 2:

City: Westwood

ZIP/Postal Code: 02090

State: MA

County or Similar Division: Norfolk

Operator Point of Contact Information

First Name Middle Initial Last Name: Denise Bartone

Title: Project Manager

Phone: 781-441-8174

Ext.:

Email: denise.bartone@eversource.com

NOI Preparer Information

☑ **This NOI is being prepared by someone other than the certifier.**

First Name Middle Initial Last Name: Joshua M Surette

Organization: Epsilon Associates Inc.

Phone: (978) 897-7100

Ext.:

Email: jsurette@epsilonassociates.com

Project/Site Information

Project/Site Name: Sudbury to Hudson Transmission Reliability Project

Project/Site Address

Address Line 1: 163 Boston Post Rd

Address Line 2:

City: Sudbury

ZIP/Postal Code: 01776

State: MA

County or Similar Division: Middlesex

Latitude/Longitude: 42.361777°N, 71.401557°W

Latitude/Longitude Data Source: Google maps

Horizontal Reference Datum: WGS 84

Project Start Date: 05/01/2022

Project End Date: 05/30/2024

Estimated Area to be Disturbed: 40

Types of Construction Sites:

- Utility

Will there be demolition of any structure built or renovated before January 1, 1980? No

Will you be discharging dewatering water from your site? Yes

Was the pre-development land use used for agriculture? No

Are there other operators that are covered under this permit for the same project site? No

Have earth-disturbing activities commenced on your project/site? No

Is your project/site located on federally recognized Indian Country lands? No

Is your project/site located on a property of religious or cultural significance to an Indian tribe? No

Discharge Information

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? Yes

Are there any waters of the U.S. within 50 feet of your project's earth disturbances? Yes

Are any of the waters of the U.S. to which you discharge designated by the state or tribal authority under its antidegradation policy as a Tier 2 (or Tier 2.5) water (water quality exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water) or as a Tier 3 water (Outstanding National Resource Water)? See Resources, Tools and Templates (https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates)

Yes

001: Hop Brook Hop Brook

Latitude/Longitude: 42.358065°N, 71.413166°W

Tier Designation: Tier 2

Is this receiving water impaired (on the CWA 303(d) list)? Yes

Impaired Pollutants:

- Turbidity
- Dissolved oxygen
- Phosphorus
- E. coli

Has a TMDL been completed for this receiving waterbody? No

002: Assabet River Assabet River

Latitude/Longitude: 42.358061°N, 71.410977°W

Tier Designation: Tier 2

Is this receiving water impaired (on the CWA 303(d) list)? Yes

Impaired Pollutants:

- E. coli
- Coliform, fecal general
- Nutrient/Eutrophication
- Dissolved oxygen
- Phosphorus

Has a TMDL been completed for this receiving waterbody? Yes

TMDL ID: CN201 **Name:** Assabet River Total Maximum Daily Load for Total Phosphorus

TMDL Pollutants:

- Phosphorus

Stormwater Pollution Prevention Plan (SWPPP)

Will all required personnel, including those conducting inspections at your site, meet the training requirements in Part 6 of this permit? Yes

First Name Middle Initial Last Name: Joshua Surette

Organization:

Title: Senior Scientist-CPESC

Phone: 413-687-2383 **Ext.:**

Email: Jsurette@epsilonassociates.com

Endangered Species Protection Worksheet: Criterion E

Determine ESA Eligibility Criterion

Are your discharges and discharge-related activities already addressed in another operator's valid certification of eligibility for your "action area" under the current 2022 CGP? No

Has consultation between you, a Federal Agency, and the USFWS and/or the NMFS under section 7 of the Endangered Species Act (ESA) concluded? Yes

➜ **The result of the consultation was:**

Option ii. Written concurrence (e.g., letter of concurrence) from the applicable Service(s) with a determination that your site's discharges and discharge-related activities are not likely to adversely affect ESA-listed species and/or designated critical habitat. The concurrence letter must have included the effects of your site's discharges and discharge-related activities on all the ESA-listed species and/or designated critical habitat on your species list(s) acquired from USFWS and/or NMFS as part of this worksheet.

➜ **The consultation does not warrant reinitiation under 50 CFR §402.16; or, if reinitiation of consultation is required (e.g., due to a new species listing, critical habitat designation, or new information), the federal action agency has reinitiated the consultation and the result of the consultation is consistent with the statements above. Include any reinitiation documentation from the Services or consulting federal agency with your NOI.**

True

You are eligible under **Criterion E**.

Identify the federal action agency or agencies involved (i.e. the federal agencies seeking coverage):

New underground electric utility project

Identify the Service(s) field or regional offices providing the consultation:

U.S. Fish and Wildlife

Identify any tracking numbers associated with the consultation (e.g., IPaC number, ECO number):

Project code: 2022-0027061

Provide the date the consultation was completed: 2022-04-01

Attach correspondence with USFWS and/or NMFS documenting the Biological Opinion, conference opinion (IPaC or ECO tracking number) or concurrence.

Name	Uploaded Date	Size
20220401 MA Verification Letter_ Northern Long-Eared Bat (NLEB) Consultation and 4(d) Rule Consistency.pdf (attachment/1499193)	04/12/2022	255.45 KB

Historic Preservation

Are you installing any stormwater controls as described in Appendix E (https://www.epa.gov/system/files/documents/2022-01/2022-cgp-final-appendix-e-historic-properties.pdf) that require subsurface earth disturbances? (Appendix E (https://www.epa.gov/system/files/documents/2022-01/2022-cgp-final-appendix-e-historic-properties.pdf), Step 1)

Yes

➜ **Have prior surveys or evaluations conducted on the site already determined historic properties do not exist, or that prior disturbances have precluded the existence of historic properties? (Appendix E (https://www.epa.gov/system/files/documents/2022-01/2022-cgp-final-appendix-e-historic-properties.pdf), Step 2):**

Yes

Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Signing an electronic document on behalf of another person is subject to criminal, civil, administrative, or other lawful action.

Certified By: Denise Bartone

Certifier Title: Sr. Environmental Engineer

Certifier Email: denise.bartone@eversource.com

Certified On: 04/15/2022 8:16 AM ET

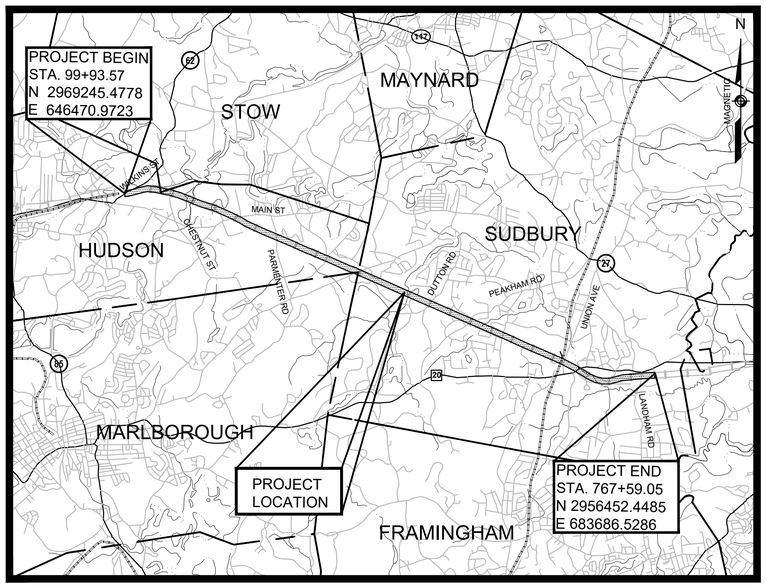
Attachment D

Project Plans

EVERSOURCE

SUDBURY-HUDSON
TRANSMISSION RELIABILITY PROJECT

INDEX



REFERENCE MANUALS
THESE PLANS ARE SUPPLEMENTED BY THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK.

COMMONWEALTH OF MASSACHUSETTS
JOSHUA C CONE-RODDY
CIVIL
No. 54514
REGISTERED PROFESSIONAL ENGINEER

Joshua Cone-Roddy 12-20-2021
ENGINEER DATE

COMMONWEALTH OF MASSACHUSETTS
MARK A COSTA
CIVIL
No. 49941
REGISTERED PROFESSIONAL ENGINEER

Mark Costa 12/21/2021
ENGINEER DATE
SHEETS 167-168

COMMONWEALTH OF MASSACHUSETTS
SHANTA B. KELLER
STRUCTURAL
No. 51381
REGISTERED PROFESSIONAL ENGINEER

12/20/21
ENGINEER DATE
SHEETS 164-166, 169-201

Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

VANASSE HANGEN BRUSTLIN, INC.
WATERTOWN, MASSACHUSETTS

0 5000 10000 15000 20000
SCALE: 1" = 5000'

NO.	DESCRIPTION	BY	DATE	APPR.
1	HISTORIC FEATURE DISPOSITIONS		02/03/2022	

REVISION

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
TITLE SHEET & INDEX
PLAN 1 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=5000'	DEC 2021	MS	SK	MS	.	.

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		TRAFFIC SIGNAL
CB		CATCH BASIN / DROP INLET
		CATCH BASIN CURB INLET
GP		GAS PUMP
MB		MAIL BOX
		POST SQUARE
		POST CIRCULAR
GAS VENT		GAS VENT
EHH		ELECTRIC HANDHOLE
		FENCE GATE POST
GG		GAS GATE
BM		BENCHMARK
		HYDRANT
		LIGHT POLE
CO.BD.		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
MHB		MASSACHUSETTS HIGHWAY BOUND
MON		MONUMENT
SBDH		STONE BOUND
TB		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
TPL or GUY		TROLLEY POLE OR GUY POLE
HTP		TRANSMISSION POLE
UFB		UTILITY POLE W/ FIREBOX
UPDL		UTILITY POLE WITH DOUBLE LIGHT
ULT		UTILITY POLE W / 1 LIGHT
UPL		UTILITY POLE
		BUSH
SIZE & TYPE		TREE
		STUMP
		WATER GATE
		OVERHEAD CABLE/WIRE
		STEEL SHEETING
100 99	99	CONTOURS (ON-THE-GROUND SURVEY DATA)
100 99	99	CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
CATV		UNDERGROUND CATV CONDUIT
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
SEWER		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
X		CHAIN LINK OR METAL FENCE
		WOOD FENCE
		CONSTRUCTION FENCE
		EROSION CONTROL BARRIER
		CHECK DAM
		TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLANE AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		LIMIT OF NHESP PRIORITY & ESTIMATED HABITAT
AWL		APPROXIMATE WETLAND LINE
100'BZ		100 FT WETLAND BUFFER
100' BLDF BZ		100 FT BORDERING LAND SUBJECT TO FLOODING BUFFER
200'RA		200 FT RIVERFRONT AREA BUFFER
APX 200'RA		APPROX 200 FT RIVERFRONT AREA BUFFER
100'RA		100 FT RIVERFRONT AREA BUFFER
APX 100'RA		APPROX 100 FT RIVERFRONT AREA BUFFER
AURA		AURA BUFFER
100BZ~AURA		100 FT AURA BUFFER
100VPBZ		100 FT VERNAL POOL AREA BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		CONSTRUCTION BASELINE

GENERAL SYMBOLS (cont.)

EXISTING	PROPOSED	DESCRIPTION
		EXISTING WALKING TRAIL
		LIMIT OF GRADING
		TRAFFIC SIGNAL CONDUIT
		EASEMENT
		PERMANENT EASEMENT ON MBTA PROPERTY
		SUPPLEMENTAL PLANTING AREA
		FLOODWAY
		PERMANENT DISTURBANCE TO VEGETATED WETLAND
		TEMPORARY DISTURBANCE TO VEGETATED WETLAND
		100-YEAR FLOOD
		500-YEAR FLOOD

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		CROSSWALK - 12" WHITE
	CW	
		SOLID WHITE LINE - 4" (UNLESS OTHERWISE NOTED)
	SWL	
		DOUBLE YELLOW LINE - 4" (UNLESS OTHERWISE NOTED)
	DBYL	

TRAFFIC SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PULL BOX 12"x12"
		TRAFFIC SIGNAL CONDUIT

ABBREVIATIONS

GENERAL	
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
AURA	ADJACENT UPLAND RESOURCE AREA
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BLSF	BORDERING LAND SUBJECT TO FLOODING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
BVW	BORDERING VEGETATED WETLAND
BZ	BUFFER ZONE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DW	STEADY DON'T WALK - PORTLAND ORANGE
DWY	DRIVEWAY
ECB	EROSION CONTROL BARRIER
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (or EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FAC	FACULTATIVE
FACU	FACULTATIVE UPLAND
FACW	FACULTATIVE WETLAND
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
GD	GROUND
GG	GAS GATE
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT
ILSF	ISOLATED LAND SUBJECT TO FLOODING
IVW	ISOLATED VEGETATED WETLAND
JCT	JUNCTION

ABBREVIATIONS (cont.)

GENERAL	
L	LENGTH OF CURVE
LP	LIGHT POLE
LT	LEFT
LUW	LAND UNDER WATER
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO.	NUMBER
NTS	NOT TO SCALE
OBL	OBLIGATE WETLAND
PB	PULL BOX
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
R	RADIUS OF CURVATURE
RA	RIVERFRONT AREA
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT OF WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/TRUCK %
TAN	TANGENT
TEMP	TEMPORARY
TYP	TYPICAL
UP	UTILITY POLE
UPL	OBLIGATE UPLAND
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
VP	VERNAL POOL
WCR	WHEEL CHAIR RAMP
WG	WATER GATE
WM	WATER METER/WATER MAIN

GENERAL NOTES:

1. THE PROPERTY LINES SHOWN ON THIS PLAN OF THE PARCELS AT 44 FOREST AVENUE IN HUDSON, 163 BOSTON POST ROAD IN SUDBURY AND THE FORMER RAILROAD RIGHT-OF-WAY ARE BASED UPON AN ACTUAL FIELD SURVEY CONDUCTED BY VHB, INC. IN 2015 AND FROM DEEDS AND PLANS OF RECORD.
2. THE EXISTING CONDITIONS SHOWN ON THIS PLAN WERE DEVELOPED FROM A COMBINED EFFORT OF AERIAL PHOTOGRAMMETRIC MAPPING BY EASTERN TOPOGRAPHICS, INC., BASED ON AERIAL PHOTOGRAPHS TAKEN ON FEBRUARY 22, 2013, AND AUGMENTED BY AN ON-THE-GROUND SURVEY PERFORMED BY VHB DURING 2015 AND 2017.
3. THE HORIZONTAL CONTROL IS BASED ON THE MASSACHUSETTS MAINLAND STATE PLANE COORDINATE SYSTEM AND THE NATIONAL GEODETIC SURVEY (NAD83). ALL ELEVATION IS US FEET, REFERENCED TO THE NORTH AMERICA VERTICAL DATUM OF 1988 (NAVD88).
4. THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND GRADES IN THE FIELD BEFORE COMMENCING WORK AND PROMPTLY NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
5. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN ON THIS PLAN ARE BASED ON FIELD OBSERVATIONS AND INFORMATION OF RECORD. THEY HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
6. THE DELINEATED WETLANDS SHOWN ON THIS PLAN WERE FLAGGED BY THE VHB ENVIRONMENTAL DEPARTMENT AND FIELD SURVEYED BY THE VHB SURVEY DEPARTMENT IN SEPTEMBER AND OCTOBER 2017 AND WERE UPDATED IN MAY 2018 (SUDBURY ONLY).
7. THE APPROXIMATE WETLANDS AND STREAMS, AND THEIR ASSOCIATED BUFFERS AND RIVERFRONT AREAS, WHERE APPLICABLE, WERE TAKEN FROM AVAILABLE MASSGIS DATA. THESE WERE NOT FIELD DELINEATED OR FIELD VERIFIED.
8. THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES THAT MAY CONFLICT WITH PROPOSED TRANSMISSION LINE. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR DIRECTED BY THE ENGINEER.
9. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
10. THE CONTRACTOR SHALL ALTER THE MASONRY OF THE TOP SECTION OF ALL EXISTING DRAINAGE AND SEWER STRUCTURES AS NECESSARY FOR CHANGES IN GRADE, AND RESET ALL WATER AND DRAINAGE FRAMES, GRATES AND BOXES TO THE PROPOSED FINISH SURFACE GRADE. REQUIRED NEW MASONRY SHALL BE CLAY BRICK.
11. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
12. EXISTING UTILITY POLES WILL BE RELOCATED BY OTHERS IF REQUIRED.
13. TREES AND SHRUBS WITHIN THE LIMITS OF GRADING SHALL BE REMOVED ONLY UPON APPROVAL OF THE ENGINEER.
14. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT NO EXPENSE TO THE OWNER.
15. THE TERM "PROPOSED" (PROP) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R).
16. ALL PROP LOAM AND SEED CALLED OUT ON THE CONSTRUCTION PLANS TO ADHERE TO PLANTING SCHEDULE A PROVIDED ON DETAIL SHEET 161 UNLESS NOTED OTHERWISE.
17. JOINTS BETWEEN NEW ASPHALT CONCRETE ROADWAY PAVEMENT AND SAWCUT EXISTING PAVEMENT SHALL BE SEALED WITH BITUMEN AND BACKSANDED.
18. EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
19. IF SUITABLE, ALL EXISTING GRANITE CURB & EDGING SHALL BE RE-USED IN THE PROPOSED WORK, EXCEPT CURVED STONES OF A DIFFERENT RADIUS THAN PROPOSED CURB.
20. ALL PROPOSED HOT MIX ASPHALT CURB SHALL BE MASSDOT TYPE 2.
21. ALL EXISTING STATE, COUNTY, CITY, AND TOWN LOCATION LINES AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATIONS ARE NOT GUARANTEED.
22. ALL PROPOSED BOUNDS SHALL BE PLACED BY A LICENSED PROFESSIONAL SURVEYOR. THE CONTRACTOR SHALL EXERCISE DUE CARE WHEN WORKING AROUND ALL PROPERTY BOUNDS WHICH ARE TO REMAIN. SHOULD ANY DAMAGE TO A BOUND RESULT FROM THE ACTIONS OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE THE BOUND REPLACED AND/OR REALIGNED BY A LICENSED PROFESSIONAL SURVEYOR AS DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST.
23. DISPOSAL OF ALL SURPLUS MATERIAL SHALL BE AS APPROVED BY THE ENGINEER AND OWNER AND IN ACCORDANCE WITH ALL PERMITS AND LAWS REGULATING SOIL DISPOSAL.
24. LATERAL DRAIN PIPES SHALL BE INSTALLED WITH A PITCH OF 0.01 FOOT PER FOOT (MINIMUM) UNLESS NOTED OTHERWISE ON THE PLANS.
25. WHERE DEWATERING IS REQUIRED, CONTRACTOR SHALL TREAT WATER WITH DEWATERING BASIN OR DEWATERING FILTER BAGS BASED ON INPUT FROM LOCAL CONSERVATION COMMISSIONS.
26. SYNCOPATED SILT FENCE TO BE USED AS AN EROSION CONTROL BARRIER WITHIN 450' OF VERNAL POOLS AND PRIORITY HABITAT AREAS.
27. THE LOCATIONS OF ALL EROSION CONTROL BARRIER SHALL BE ESTABLISHED BY SURVEY-GRADE EQUIPMENT AND ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS.
28. ALL HISTORIC RAILROAD FEATURES LOCATED WITHIN THE LIMIT OF WORK AND OUTSIDE THE LIMITS OF THE 14' GRAVEL SUB-BASE SHALL BE RETAINED AND PROTECTED UNLESS OTHERWISE NOTED. CONSTRUCTION FENCING AND SIGNAGE SHALL BE INSTALLED AROUND THE FEATURE IN CONSULTATION WITH THE CULTURAL RESOURCES CONSULTANT. 24 HOURS ADVANCED NOTICE SHALL BE GIVEN TO THE CULTURAL RESOURCES CONSULTANT BEFORE ANY CONSTRUCTION WITHIN THE IMMEDIATE VICINITY OF THE FEATURE OCCURS. IF IT IS NOT POSSIBLE TO RETAIN THE FEATURE, IT SHALL BE CAREFULLY REMOVED AND RESET AS CLOSE AS POSSIBLE TO THE ORIGINAL LOCATION. THE REMOVAL AND RESETTING OF ANY HISTORIC RAILROAD FEATURE SHALL ONLY BE DONE WITH CONSULTATION OF THE CULTURAL RESOURCES CONSULTANT.

1

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			
1	HISTORIC FEATURE DISPOSITIONS		02/03/2022	

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LEGEND, ABBREVIATIONS, & GENERAL NOTES

PLAN 2 OF 349

Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

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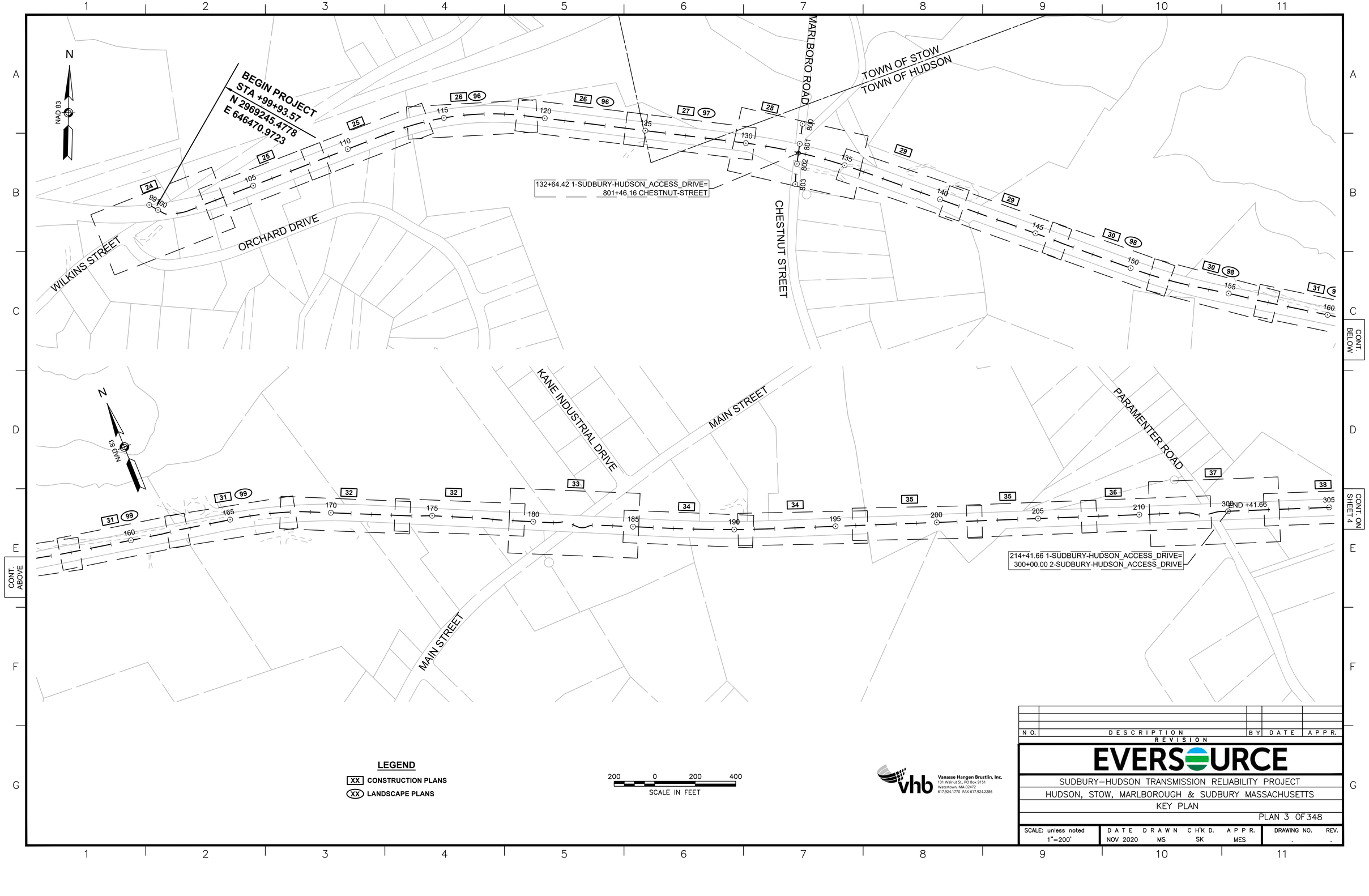
NTS	DEC 2021	MS	SK	MS	.	.



LEGEND

XX CONSTRUCTION PLANS

XX LANDSCAPE PLANS

200 0 200 400
SCALE IN FEET

Vanasse Hangen Brustlin, Inc.
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Watertown, MA 02472
617.924.1770 FAX 617.924.2286

NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

EVERSOURCE

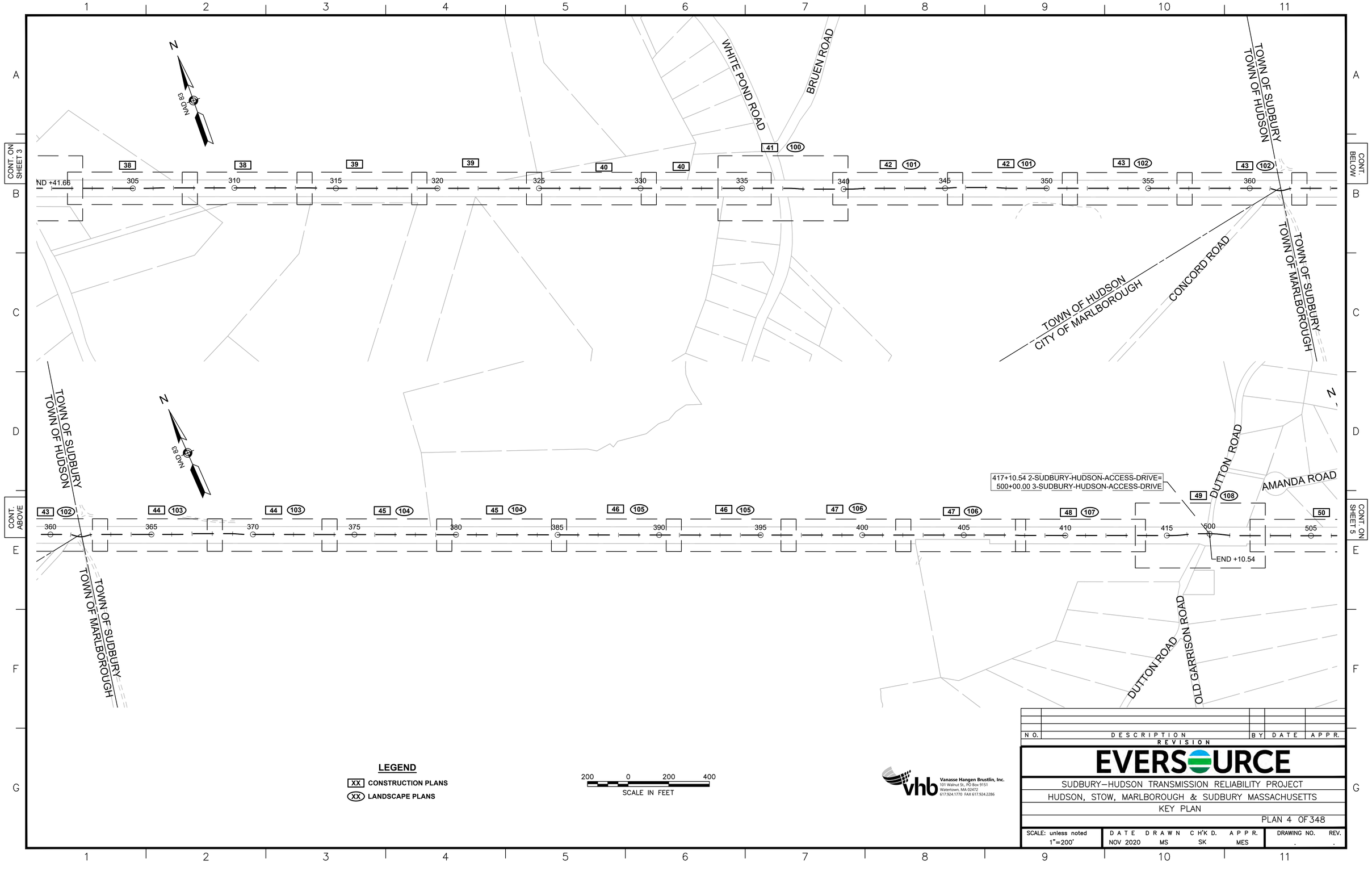
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

KEY PLAN

PLAN 3 OF 348

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=200'	NOV 2020	MS	SK	MES	.	.



LEGEND

XX CONSTRUCTION PLANS

XX LANDSCAPE PLANS

200 0 200 400
SCALE IN FEET

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Watertown, MA 02472
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NO.	DESCRIPTION	BY	DATE	APPR.

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

KEY PLAN

PLAN 4 OF 348

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=200'	NOV 2020	MS	SK	MES	.	.

AMANDA ROAD
BULKLEY ROAD
AUSTIN ROAD
WHISPERING PINE ROAD
STONEBROOK ROAD
BRIDLE PATH
COLBURN CIRCLE
ROBERT BEST ROAD
PEAKHAM ROAD
JARMAN ROAD
HORSE POND ROAD
CONCORD ROAD
UNION STREET
TRAILSIDE CIRCLE
BRIDLE PATH
STATION ROAD
MAPLE AVE
BOSTON POST ROAD
RAYMOND ROAD
NAD 83
CONT. ON SHEET 4
CONT. BELOW
CONT. ABOVE
CONT. ON SHEET 6
-10.54
END +00.31
603+00.31 3-SUDBURY-HUDSON_ACCESS_DRIVE=
700+00.00 4-SUDBURY-HUDSON_ACCESS_DRIVE

LEGEND

XX CONSTRUCTION PLANS
(XX) LANDSCAPE PLANS

200 0 200 400
SCALE IN FEET

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
KEY PLAN
PLAN 5 OF 348

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=200'	NOV 2020	MS	SK	MES	.	.

LEGEND

- XX CONSTRUCTION PLANS
- (XX) LANDSCAPE PLANS

200 0 200 400
SCALE IN FEET

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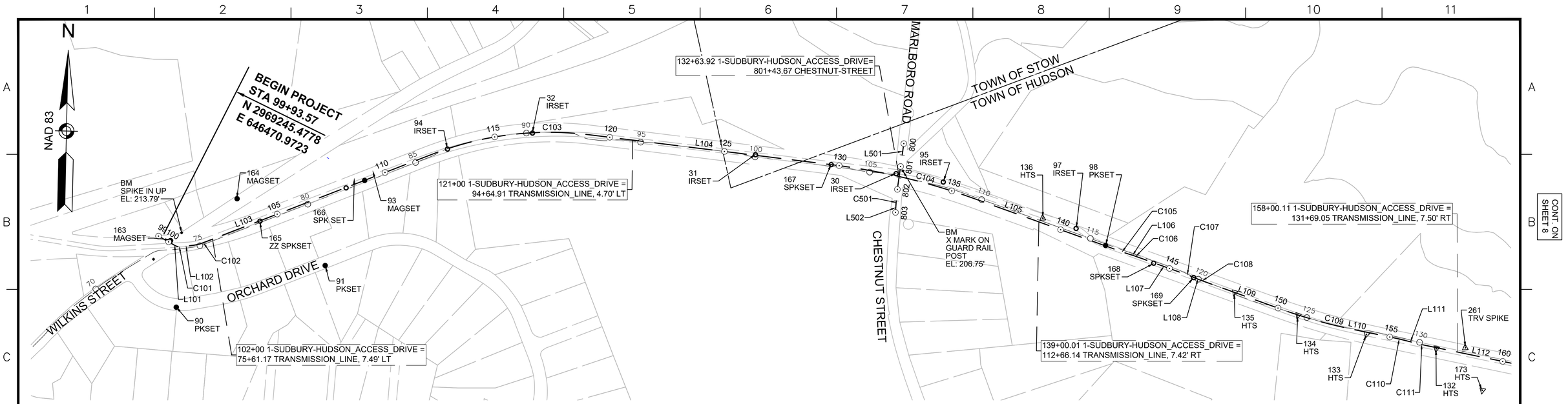
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
KEY PLAN
PLAN 6 OF 348

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=200'	NOV 2020	MS	SK	MES	.	.



1-SUDBURY-HUDSON_ACCESS_DRIVE CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L101	99+50.00	2969274.969	646438.132		S57°19'07"E 81.72'	100+31.72	2969230.845	646506.912
C101	100+31.72	2969230.845	646506.912	R=40.00' Δ=35°52'18" L=25.04' T=12.95'		100+56.76	2969224.574	646530.737
L102	100+56.76	2969224.574	646530.737		N86°48'34"E 48.81'	101+05.57	2969227.291	646579.472
C102	101+05.57	2969227.291	646579.472	R=200.00' Δ=15°02'47" L=52.52' T=26.41'		101+58.09	2969237.027	646630.930
L103	101+58.09	2969237.027	646630.930		N71°45'47"E 1063.15'	112+21.25	2969569.737	647640.682
C103	112+21.25	2969569.737	647640.682	R=1400.00' Δ=28°11'56" L=689.03' T=351.64'		119+10.28	2969618.950	648321.003
L104	119+10.28	2969618.950	648321.003		S80°02'16"E 1065.88'	129+76.16	2969434.556	649370.812
C104	129+76.16	2969434.556	649370.812	R=2800.00' Δ=12°47'24" L=625.04' T=313.83'		136+01.20	2969258.894	649969.313
L105	136+01.20	2969258.894	649969.313		S67°14'52"E 680.66'	142+81.86	2968995.652	650597.005
C105	142+81.86	2968995.652	650597.005	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		143+01.85	2968988.291	650615.589
L106	143+01.85	2968988.291	650615.589		S69°32'18"E 30.05'	143+31.90	2968977.787	650643.741
C106	143+31.90	2968977.787	650643.741	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		143+51.89	2968970.427	650662.324
L107	143+51.89	2968970.427	650662.324		S67°14'52"E 230.01'	145+81.89	2968881.472	650874.434
C107	145+81.89	2968881.472	650874.434	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		146+01.88	2968873.375	650892.709
L108	146+01.88	2968873.375	650892.709		S64°57'26"E 30.05'	146+31.93	2968860.656	650919.932
C108	146+31.93	2968860.656	650919.932	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		146+51.92	2968852.559	650938.207
L109	146+51.92	2968852.559	650938.207		S67°14'52"E 358.25'	150+10.17	2968714.005	651268.583
C109	150+10.17	2968714.005	651268.583	R=2300.00' Δ=8°06'43" L=325.63' T=163.09'		153+35.80	2968609.711	651576.773
L110	153+35.80	2968609.711	651576.773		S75°21'35"E 196.11'	155+31.91	2968560.145	651766.511
C110	155+31.91	2968560.145	651766.511	R=500.00' Δ=2°17'05" L=19.94' T=9.97'		155+51.85	2968554.722	651785.695
L111	155+51.85	2968554.722	651785.695		S73°04'30"E 80.40'	156+32.25	2968531.316	651862.614
C111	156+32.25	2968531.316	651862.614	R=500.00' Δ=2°17'05" L=19.94' T=9.97'		156+52.19	2968525.894	651881.798
L112	156+52.19	2968525.894	651881.798		S75°21'35"E 494.94'	161+47.12	2968400.798	652360.665

CHESTNUT-STREET CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L501	800+00.00	2969511.351	649678.545		S10°58'48"W 181.91'	801+81.91	2969332.767	649643.897
C501	801+81.91	2969332.767	649643.897	R=1000.00' Δ=4°22'21" L=76.32' T=38.18'		802+58.23	2969257.368	649632.233
L502	802+58.23	2969257.368	649632.233		S6°36'27"W 41.77'	803+00.00	2969215.874	649627.426

BENCHMARK TABLE

NORTHING	EASTING	ELEV	DESCRIPTION
2969284.465	646538.668	213.79	SPIKE IN UP
2969393.797	649668.675	206.75	X MARK ON GUARD RAIL

SURVEY TRAVERSE TABLE

POINT #	NORTHING	EASTING	ELEV	RAW DESCRIPTION	STATION CONSTR ℄	OFFSET CONSTR ℄
30	2969383.123	649638.659	207.19	IRSET	132+48.42	8.95 LT
31	2969495.867	649035.098	201.05	IRSET	126+34.90	2.31 LT
32	2969638.584	648076.375	210.48	IRSET	116+64.42	1.47 RT
90	2968963.680	646499.149	216.98	PKSET	100+50.64	262.26 RT
91	2969111.213	647151.661	215.67	PKSET	106+13.29	282.46 RT
93	2969470.486	647340.975	217.16	MAGSET	109+05.53	0.47 RT
94	2969587.905	647705.522	213.86	IRSET	112+88.61	1.42 RT
95	2969336.631	649840.683	190.48	IRSET	134+53.81	25.86 LT
97	2969106.552	650404.209	184.67	IRSET	140+61.17	27.71 LT
98	2969026.596	650528.120	186.44	PKSET	142+06.37	1.89 LT
132	2968507.785	651933.720	182.93	HTS	157+07.00	4.40 RT
133	2968584.874	651635.344	182.80	HTS	153+98.75	9.23 RT
134	2968682.452	651343.328	181.85	HTS	150+91.27	1.62 RT
135	2968795.126	651074.622	182.33	HTS	147+99.93	0.21 RT
136	2969158.609	650262.853	186.14	HTS	139+10.69	21.04 LT
138	2968498.335	646029.886	221.73	MAGSET	100+25.74	874.12 RT
163	2969252.795	646488.992	212.74	MAGSET	100+04.78	8.80 LT
164	2969419.359	646785.783	210.55	MAGSET	103+62.23	124.71 LT
165	2969317.327	646879.836	222.40	ZZ SPKSET	104+19.63	1.63 RT
166	2969442.345	647259.123	218.01	SPKSET	108+18.99	1.59 RT
167	2969436.517	649360.132	197.07	SPKSET	129+65.30	0.08 LT
168	2968939.346	650731.741	182.59	SPKSET	144+27.92	1.82 RT
169	2968868.325	650900.999	182.20	SPKSET	146+11.53	1.07 RT
172	2968243.951	652229.807	182.24	SPKSET	160+60.16	184.83 RT
173	2968317.552	652123.483	180.88	HTS	159+38.68	140.49 RT
261	2968504.964	652060.065	184.37	TRV SPIKE	158+29.95	24.81 LT

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SCALE IN FEET

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Watertown, MA 02472
617.924.1770 FAX 617.924.2286

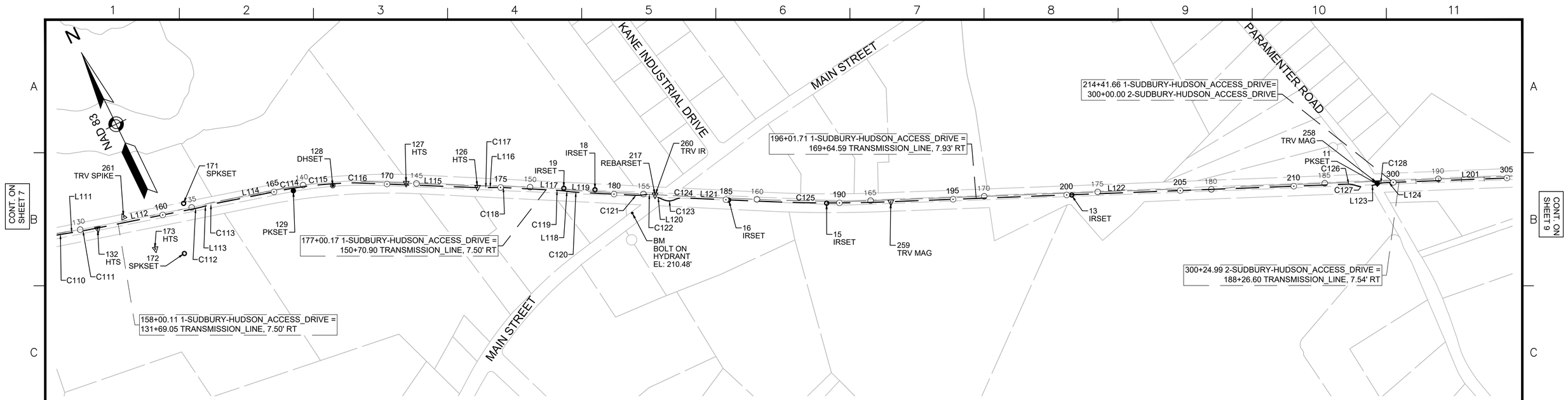
NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
SURVEY TIE–IN PLANS
PLAN 7 OF 348

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=200'	FEB 2021	MS	SK	MES	.	.



1-SUDBURY-HUDSON_ACCESS_DRIVE CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C110	155+31.91	2968560.145	651766.511	R=500.00' Δ=2°17'05" L=19.94' T=9.97'		155+51.85	2968554.722	651785.695
L111	155+51.85	2968554.722	651785.695		S73°04'30"E 80.40'	156+32.25	2968531.316	651862.614
C111	156+32.25	2968531.316	651862.614	R=500.00' Δ=2°17'05" L=19.94' T=9.97'		156+52.19	2968525.894	651881.798
L112	156+52.19	2968525.894	651881.798		S75°21'35"E 494.94'	161+47.12	2968400.798	652360.665
C112	161+47.12	2968400.798	652360.665	R=500.00' Δ=4°34'26" L=39.91' T=19.97'		161+87.04	2968392.260	652399.645
L113	161+87.04	2968392.260	652399.645		S79°56'01"E 10.22'	161+97.26	2968390.473	652409.711
C113	161+97.26	2968390.473	652409.711	R=500.00' Δ=4°34'26" L=39.91' T=19.97'		162+37.18	2968381.936	652448.692
L114	162+37.18	2968381.936	652448.692		S75°21'35"E 325.80'	165+62.97	2968299.591	652763.911
C114	165+62.97	2968299.591	652763.911	R=500.00' Δ=2°17'07" L=19.94' T=9.97'		165+82.92	2968294.166	652783.101
C115	165+82.92	2968294.166	652783.101	R=2000.00' Δ=7°17'45" L=254.67' T=127.51'		168+37.59	2968204.731	653021.372
C116	168+37.59	2968204.731	653021.372	R=500.00' Δ=3°55'20" L=34.23' T=17.12'		168+71.82	2968189.631	653052.082
L115	168+71.82	2968189.631	653052.082		S61°51'22"E 529.98'	174+01.80	2967939.647	653519.398
C117	174+01.80	2967939.647	653519.398	R=500.00' Δ=3°54'19" L=34.08' T=17.05'		174+35.88	2967924.608	653549.974
L116	174+35.88	2967924.608	653549.974		S65°45'41"E 36.37'	174+72.25	2967909.677	653583.135
C118	174+72.25	2967909.677	653583.135	R=500.00' Δ=4°35'46" L=40.11' T=20.07'		175+12.35	2967891.763	653619.009
L117	175+12.35	2967891.763	653619.009		S61°09'55"E 234.86'	177+47.22	2967778.491	653824.754
C119	177+47.22	2967778.491	653824.754	R=500.00' Δ=4°34'29" L=39.92' T=19.97'		177+87.14	2967757.862	653858.921
L118	177+87.14	2967757.862	653858.921		S56°35'26"E 10.72'	177+97.86	2967751.962	653867.866
C120	177+97.86	2967751.962	653867.866	R=500.00' Δ=4°35'18" L=40.04' T=20.03'		178+37.90	2967731.276	653902.137
L119	178+37.90	2967731.276	653902.137		S61°10'44"E 255.16'	180+93.06	2967608.269	654125.690
C121	180+93.06	2967608.269	654125.690	R=200.00' Δ=13°48'39" L=48.21' T=24.22'		181+41.27	2967590.318	654170.307
C122	181+41.27	2967590.318	654170.307	R=50.00' Δ=33°35'20" L=29.31' T=15.09'		181+70.58	2967575.091	654194.862
L120	181+70.58	2967575.091	654194.862		S41°24'03"E 53.66'	182+24.24	2967534.839	654230.350

1-SUDBURY-HUDSON_ACCESS_DRIVE CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C123	182+24.24	2967534.839	654230.350	R=60.00' Δ=47°56'15" L=50.20' T=26.67'		182+74.44	2967514.523	654274.663
C124	182+74.44	2967514.523	654274.663	R=80.00' Δ=27°43'21" L=38.71' T=19.74'		183+13.15	2967504.910	654311.769
L121	183+13.15	2967504.910	654311.769		S61°36'57"E 368.60'	186+81.74	2967329.686	654636.052
C125	186+81.74	2967329.686	654636.052	R=6500.00' Δ=4°41'05" L=531.46' T=265.88'		192+13.21	2967096.424	655113.425
L122	192+13.21	2967096.424	655113.425		S66°18'02"E 2021.93'	212+35.14	2966283.729	656964.841
C126	212+35.14	2966283.729	656964.841	R=100.00' Δ=22°30'52" L=39.30' T=19.90'		212+74.44	2966261.359	656996.840
C127	212+74.44	2966261.359	656996.840	R=100.00' Δ=35°52'08" L=62.60' T=32.37'		213+37.04	2966232.181	657051.075
L123	213+37.04	2966232.181	657051.075		S79°39'18"E 42.56'	213+79.60	2966224.538	657092.945
C128	213+79.60	2966224.538	657092.945	R=100.00' Δ=13°22'03" L=23.33' T=11.72'		214+02.93	2966217.721	657115.202
L124	214+02.93	2966217.721	657115.202		S66°17'15"E 38.73'	214+41.66	2966202.144	657150.666

2-SUDBURY-HUDSON_ACCESS_DRIVE CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L201	300+00.00	2966202.144	657150.666		S66°17'15"E 569.94'	305+69.94	2965972.944	657672.488

SURVEY TRAVERSE TABLE

POINT #	NORTHING	EASTING	ELEV	RAW DESCRIPTION	STATION CONSTR ℄	OFFSET CONSTR ℄
11	2966228.778	657085.109	211.30	PKSET	213+69.42	8.35 RT
13	2966770.040	655853.843	210.87	IRSET	200+22.37	1.26 RT
15	2967208.662	654868.078	210.94	IRSET	189+43.42	1.44 RT
16	2967409.645	654485.745	208.26	IRSET	185+11.50	1.11 RT
18	2967707.243	653977.303	201.79	IRSET	179+15.34	15.18 LT
19	2967772.642	653856.653	200.61	IRSET	177+77.33	11.19 LT
126	2967942.886	653516.846	197.05	HTS	173+98.02	1.65 LT
127	2968096.028	653242.036	194.38	HTS	170+83.47	7.06 LT
128	2968227.438	652947.502	191.56	DHSET	167+60.58	8.12 RT
129	2968282.714	652781.651	190.10	PKSET	165+84.87	11.38 RT
132	2968507.785	651933.720	182.93	HTS	157+07.00	4.40 RT
171	2968443.448	652323.126	185.42	SPKSET	161+00.02	31.78 LT
172	2968243.951	652229.807	182.24	SPKSET	160+60.16	184.83 RT
173	2968317.552	652123.483	180.88	HTS	159+38.68	140.49 RT
217	2967571.162	654204.653	206.60	REBARSET	181+80.00	4.75 LT
258	2966231.436	657085.443	210.53	TRV MAG	213+69.97	5.73 RT
259	2967090.494	655124.057	211.25	TRV MAG	192+25.33	1.16 RT
260	2967571.196	654204.425	206.63	TRV IR	181+79.82	4.60 LT
261	2968504.964	652060.065	184.37	TRV SPIKE	158+29.95	24.81 LT

BENCHMARK TABLE

NORTHING	EASTING	ELEV	DESCRIPTION
2967543.215	654080.038	210.48	BOLT ON HYDRANT

200 0 200 400
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vhb Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

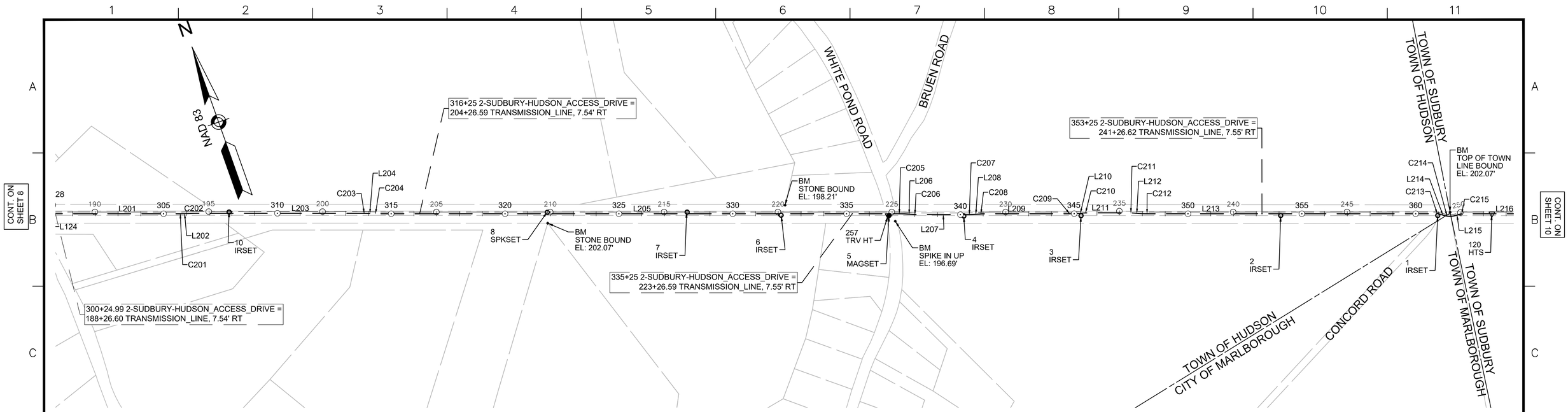
NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
SURVEY TIE–IN PLANS
PLAN 8 OF 348

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=200'	FEB 2021	MS	SK	MES	.	.



2-SUDBURY-HUDSON_ACCESS_DRIVE CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L201	300+00.00	2966202.144	657150.666		S66°17'15"E 569.94'	305+69.94	2965972.944	657672.488
C201	305+69.94	2965972.944	657672.488	R=500.00' Δ=2°19'14" L=20.25' T=10.13'		305+90.19	2965965.177	657691.189
L202	305+90.19	2965965.177	657691.189		S68°36'29"E 31.19'	306+21.38	2965953.800	657720.233
C202	306+21.38	2965953.800	657720.233	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		306+41.37	2965946.138	657738.695
L203	306+41.37	2965946.138	657738.695		S66°19'03"E 730.01'	313+71.38	2965652.916	658407.225
C203	313+71.38	2965652.916	658407.225	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		313+91.37	2965644.523	658425.365
L204	313+91.37	2965644.523	658425.365		S64°01'36"E 29.68'	314+21.05	2965631.525	658452.047
C204	314+21.05	2965631.525	658452.047	R=500.00' Δ=2°17'04" L=19.94' T=9.97'		314+40.99	2965623.153	658470.139
L205	314+40.99	2965623.153	658470.139		S66°18'41"E 2288.82'	337+29.81	2964703.581	660566.109
C205	337+29.81	2964703.581	660566.109	R=500.00' Δ=4°31'29" L=39.49' T=19.75'		337+69.29	2964686.306	660601.604
L206	337+69.29	2964686.306	660601.604		S61°47'12"E 11.20'	337+80.49	2964681.012	660611.471
C206	337+80.49	2964681.012	660611.471	R=500.00' Δ=4°31'29" L=39.49' T=19.75'		338+19.98	2964663.738	660646.966
L207	338+19.98	2964663.738	660646.966		S66°18'41"E 209.72'	340+29.70	2964579.477	660839.020
C207	340+29.70	2964579.477	660839.020	R=500.00' Δ=4°17'58" L=37.52' T=18.77'		340+67.22	2964565.706	660873.911
L208	340+67.22	2964565.706	660873.911		S70°36'39"E 15.82'	340+83.04	2964560.454	660888.833
C208	340+83.04	2964560.454	660888.833	R=500.00' Δ=4°17'58" L=37.52' T=18.77'		341+20.56	2964546.683	660923.724
L209	341+20.56	2964546.683	660923.724		S66°18'41"E 359.47'	344+80.03	2964402.259	661252.908
C209	344+80.03	2964402.259	661252.908	R=500.00' Δ=4°34'26" L=39.91' T=19.97'		345+19.95	2964387.697	661290.061
L210	345+19.95	2964387.697	661290.061		S70°53'07"E 10.12'	345+30.07	2964384.383	661299.625
C210	345+30.07	2964384.383	661299.625	R=500.00' Δ=4°34'16" L=39.89' T=19.96'		345+69.96	2964369.832	661336.754
L211	345+69.96	2964369.832	661336.754		S66°18'51"E 159.98'	347+29.94	2964305.565	661483.256
C211	347+29.94	2964305.565	661483.256	R=500.00' Δ=4°23'59" L=38.39' T=19.21'		347+68.33	2964288.808	661517.789

2-SUDBURY-HUDSON_ACCESS_DRIVE CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L212	347+68.33	2964288.808	661517.789		S61°54'53"E 13.79'	347+82.12	2964282.316	661529.955
C212	347+82.12	2964282.316	661529.955	R=500.00' Δ=4°23'48" L=38.37' T=19.19'		348+20.49	2964265.568	661564.465
L213	348+20.49	2964265.568	661564.465		S66°18'41"E 1267.77'	360+88.26	2963756.220	662725.416
C213	360+88.26	2963756.220	662725.416	R=80.00' Δ=16°41'57" L=23.32' T=11.74'		361+11.58	2963743.895	662745.111
L214	361+11.58	2963743.895	662745.111		S49°36'43"E 16.84'	361+28.41	2963732.985	662757.935
C214	361+28.41	2963732.985	662757.935	R=80.00' Δ=32°54'10" L=45.94' T=23.62'		361+74.35	2963714.601	662799.350
L215	361+74.35	2963714.601	662799.350		S82°30'53"E 18.74'	361+93.10	2963712.159	662817.933
C215	361+93.10	2963712.159	662817.933	R=80.00' Δ=16°12'13" L=22.62' T=11.39'		362+15.72	2963706.100	662839.653
L216	362+15.72	2963706.100	662839.653		S66°18'41"E 417.03'	366+32.74	2963538.553	663221.540

SURVEY TRAVERSE TABLE						
POINT #	NORTHING	EASTING	ELEV	RAW DESCRIPTION	STATION CONSTR ℄	OFFSET CONSTR ℄
1	2963745.726	662730.239	198.48	IRSET	360+96.89	7.67 RT
2	2964022.713	662098.499	192.67	IRSET	354+07.10	7.84 RT
3	2964374.403	661295.377	190.95	IRSET	345+29.32	10.82 RT
4	2964579.876	660823.257	192.72	IRSET	340+15.11	5.97 RT
5	2964714.175	660523.283	194.29	MAGSET	336+86.33	7.50 RT
6	2964905.564	660089.787	194.56	IRSET	332+12.47	6.41 RT
7	2965083.764	659717.177	195.49	IRSET	327+99.66	7.08 LT
8	2965329.485	659154.249	203.44	SPKSET	321+85.44	5.93 LT
10	2965892.249	657875.010	214.54	IRSET	307+87.85	5.40 LT
120	2963656.875	662950.210	197.18	HTS	363+34.03	0.66 RT
257	2964715.397	660518.603	194.24	TRV HT	336+81.56	8.27 RT

BENCHMARK TABLE			
NORTHING	EASTING	ELEV	DESCRIPTION
2965285.239	659136.888	202.07	STONE BOUND
2964938.646	660123.237	198.21	STONE BOUND
2964679.970	660538.355	196.69	SPIKE IN UP
2963737.068	662785.722	202.07	TOP OF TOWN LINE BOUND

200 0 200 400
SCALE IN FEET

Vanasse Hangen Brustlin, Inc.
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Watertown, MA 02472
617.924.1770 FAX 617.924.2286

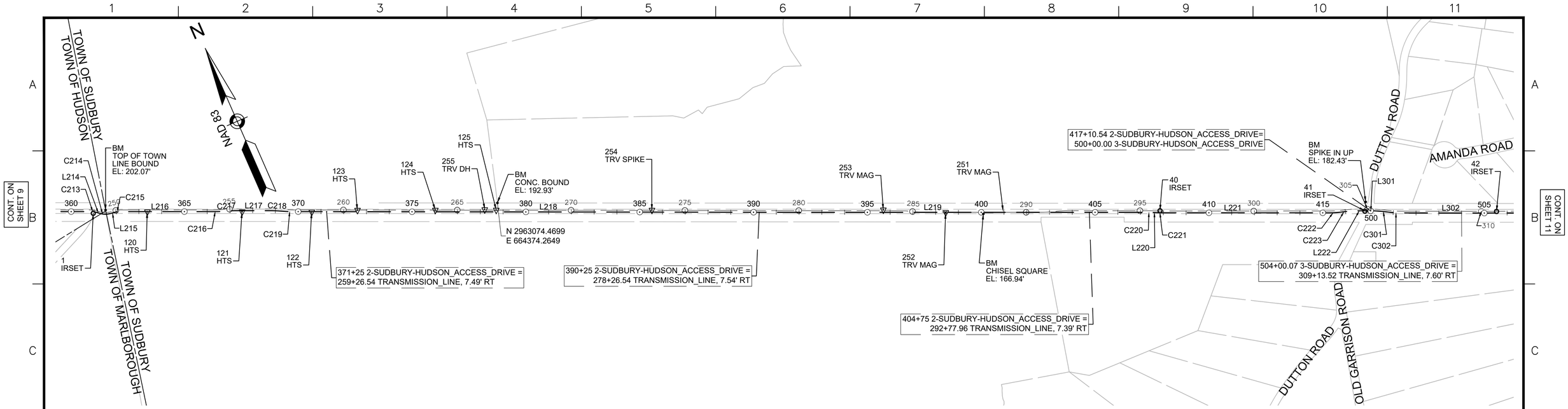
NO.	DESCRIPTION	BY	DATE	APP'R.

REVISION

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
SURVEY TIE–IN PLANS
PLAN 9 OF 348

SCALE: unless noted	DATE	DRAWN	CH'K D.	APP'R.	DRAWING NO.	REV.
1"=200'	FEB 2021	MS	SK	MES	.	.



2-SUDBURY-HUDSON_ACCESS_DRIVE CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C213	360+88.26	2963756.220	662725.416	R=80.00' Δ=16°41'57" L=23.32' T=11.74'		361+11.58	2963743.895	662745.111
L214	361+11.58	2963743.895	662745.111		S49°36'43"E 16.84'	361+28.41	2963732.985	662757.935
C214	361+28.41	2963732.985	662757.935	R=80.00' Δ=32°54'10" L=45.94' T=23.62'		361+74.35	2963714.601	662799.350
L215	361+74.35	2963714.601	662799.350		S82°30'53"E 18.74'	361+93.10	2963712.159	662817.933
C215	361+93.10	2963712.159	662817.933	R=80.00' Δ=16°12'13" L=22.62' T=11.39'		362+15.72	2963706.100	662839.653
L216	362+15.72	2963706.100	662839.653		S66°18'41"E 417.03'	366+32.74	2963538.553	663221.540
C216	366+32.74	2963538.553	663221.540	R=500.00' Δ=5°07'35" L=44.74' T=22.38'		366+77.48	2963522.435	663263.256
C217	366+77.48	2963522.435	663263.256	R=500.00' Δ=5°07'35" L=44.74' T=22.38'		367+22.22	2963506.317	663304.972
L217	367+22.22	2963506.317	663304.972		S66°18'41"E 162.17'	368+84.39	2963441.162	663453.479
C218	368+84.39	2963441.162	663453.479	R=500.00' Δ=5°03'10" L=44.09' T=22.06'		369+28.48	2963421.691	663493.024
C219	369+28.48	2963421.691	663493.024	R=500.00' Δ=4°58'12" L=43.37' T=21.70'		369+71.85	2963402.510	663531.908
L218	369+71.85	2963402.510	663531.908		S66°13'43"E 2255.15'	392+27.00	2962493.483	665595.730
L219	392+27.00	2962493.483	665595.730		S66°18'55"E 1499.60'	407+26.60	2961891.088	666969.015
C220	407+26.60	2961891.088	666969.015	R=500.00' Δ=2°19'04" L=20.23' T=10.11'		407+46.82	2961882.591	666987.368
L220	407+46.82	2961882.591	666987.368		S63°59'51"E 27.94'	407+74.76	2961870.342	667012.481
C221	407+74.76	2961870.342	667012.481	R=500.00' Δ=2°17'42" L=20.03' T=10.01'		407+94.79	2961861.924	667030.651
L221	407+94.79	2961861.924	667030.651		S66°17'33"E 730.94'	415+25.73	2961568.037	667699.907
C222	415+25.73	2961568.037	667699.907	R=499.59' Δ=7°40'18" L=66.89' T=33.50'		415+92.62	2961545.316	667762.771
C223	415+92.62	2961545.316	667762.771	R=500.00' Δ=7°45'40" L=67.73' T=33.92'		416+60.35	2961522.262	667826.400
L222	416+60.35	2961522.262	667826.400		S66°12'11"E 50.19'	417+10.54	2961502.012	667872.321

3-SUDBURY-HUDSON_ACCESS_DRIVE CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L301	500+00.00	2961502.012	667872.321		S66°12'11"E 2.28'	500+02.28	2961501.092	667874.407
C301	500+02.28	2961501.092	667874.407	R=500.00' Δ=7°41'35" L=67.14' T=33.62'		500+69.41	2961469.967	667933.834
C302	500+69.41	2961469.967	667933.834	R=500.00' Δ=7°41'34" L=67.13' T=33.62'		501+36.55	2961438.842	667993.259
L302	501+36.55	2961438.842	667993.259		S66°12'10"E 352.24'	504+88.78	2961296.716	668315.548

BENCHMARK TABLE			
NORTHING	EASTING	ELEV	DESCRIPTION
2963737.068	662785.722	202.07	TOP OF TOWN LINE BOUND
2963074.470	664374.265	192.93	CONC. BOUND
2962172.866	666309.477	166.94	CHISEL SQUARE
2961546.450	667868.173	182.43	SPIKE IN UP

SURVEY TRAVERSE TABLE						
POINT #	NORTHING	EASTING	ELEV	RAW DESCRIPTION	STATION CONSTR ℄	OFFSET CONSTR ℄
1	2963745.726	662730.239	198.48	IRSET	360+96.89	7.67 RT
40	2961873.800	667025.482	171.31	IRSET	407+82.40	8.70 LT
41	2961510.586	667848.645	181.70	IRSET	416+82.29	7.29 LT
42	2961276.984	668377.806	188.16	IRSET	505+53.68	6.74 LT
120	2963656.875	662950.210	197.18	HTS	363+34.03	0.66 RT
121	2963489.402	663331.297	194.65	HTS	367+50.41	4.91 RT
122	2963365.831	663611.237	193.31	HTS	370+56.52	1.59 RT
123	2963292.393	663798.336	191.85	HTS	372+57.35	6.62 LT
124	2963155.264	664111.471	190.70	HTS	375+99.20	7.35 LT
125	2963048.085	664356.309	188.72	HTS	378+66.46	7.95 LT
252	2962245.033	666160.019	168.98	TRV MAG	398+40.85	0.85 RT
253	2962365.661	665913.641	171.64	TRV MAG	395+66.77	10.65 LT
254	2962773.106	664982.657	181.84	TRV SPIKE	385+50.51	8.78 LT
255	2963070.212	664310.860	189.64	TRV DH	378+15.95	9.88 LT
18000	2962245.042	666159.997	169.01	ZZ	398+40.83	0.85 RT
18044	2962245.028	666160.012	168.98	ZZ	398+40.85	0.85 RT
18045	2962245.041	666159.998	168.99	ZZ	398+40.83	0.85 RT
18115	2962244.993	666159.978	169.01	ZZ	398+40.83	0.90 RT

200 0 200 400
SCALE IN FEET

Vanasse Hangen Brustlin, Inc.
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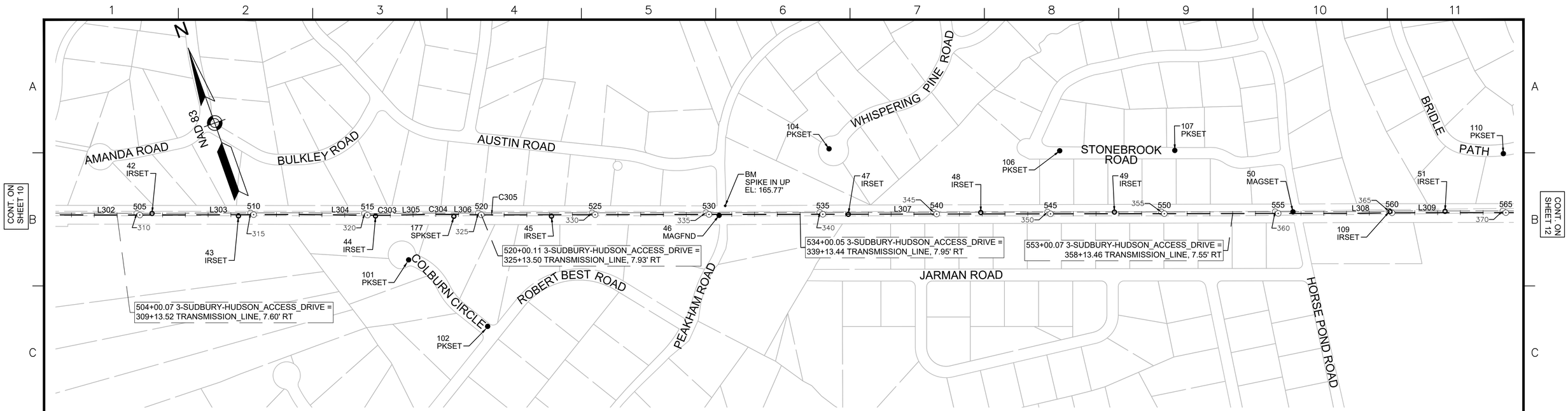
NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
SURVEY TIE–IN PLANS
PLAN 10 OF 348

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=200'	FEB 2021	MS	SK	MES	.	.



3-SUDBURY-HUDSON_ACCESS_DRIVE CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L302	501+36.55	2961438.842	667993.259		S66°12'10"E 352.24'	504+88.78	2961296.716	668315.548
L303	504+88.78	2961296.716	668315.548		S66°29'41"E 714.53'	512+03.31	2961011.736	668970.789
L304	512+03.31	2961011.736	668970.789		S65°47'36"E 355.56'	515+58.87	2960865.948	669295.083
C303	515+58.87	2960865.948	669295.083	R=2000.00' Δ=2°02'02" L=70.99' T=35.50'		516+29.86	2960837.994	669360.337
L305	516+29.86	2960837.994	669360.337		S67°49'38"E 62.53'	516+92.40	2960814.394	669418.247
C304	516+92.40	2960814.394	669418.247	R=5000.00' Δ=2°28'08" L=215.46' T=107.75'		519+07.86	2960728.805	669615.962
L306	519+07.86	2960728.805	669615.962		S65°21'30"E 56.37'	519+64.23	2960705.304	669667.194
C305	519+64.23	2960705.304	669667.194	R=5000.00' Δ=1°03'24" L=92.20' T=46.10'		520+56.43	2960667.637	669751.349
L307	520+56.43	2960667.637	669751.349		S66°24'53"E 3804.53'	558+60.96	2959145.398	673238.076
L308	558+60.96	2959145.398	673238.076		S67°25'05"E 114.60'	559+75.56	2959101.392	673343.887
L309	559+75.56	2959101.392	673343.887		S66°25'05"E 324.74'	563+00.30	2958971.476	673641.508

SURVEY TRAVERSE TABLE

POINT #	NORTHING	EASTING	ELEV	RAW DESCRIPTION	STATION CONSTR ℄	OFFSET CONSTR ℄
42	2961276.984	668377.806	188.16	IRSET	505+53.68	6.74 LT
43	2961114.242	668720.884	186.90	IRSET	509+33.20	5.67 RT
44	2960872.290	669272.068	179.54	IRSET	515+35.16	5.71 RT
45	2960561.109	669979.507	170.77	IRSET	523+08.08	6.11 RT
46	2960268.559	670655.156	164.98	MAGFND	530+44.34	3.24 RT
47	2960044.841	671176.622	158.38	IRSET	536+11.75	0.17 LT
48	2959818.439	671712.628	158.76	IRSET	541+93.58	6.87 LT
49	2959584.190	672250.787	164.97	IRSET	547+80.51	7.26 LT
50	2959270.319	672969.429	166.74	MAGSET	555+64.70	7.01 LT
51	2959003.971	673581.771	161.78	IRSET	562+32.47	5.88 LT
101	2960637.452	669327.889	173.64	PKSET	516+80.03	200.80 RT
102	2960230.460	669528.351	161.76	PKSET	520+29.54	489.96 RT
104	2960342.456	671214.805	164.66	PKSET	535+27.81	288.24 LT
106	2959927.516	672139.020	156.93	PKSET	545+40.82	277.29 LT
107	2959725.836	672602.609	167.23	PKSET	550+46.28	277.74 LT
109	2959100.366	673360.157	163.15	IRSET	559+90.81	5.57 LT
110	2959133.231	673918.507	165.88	PKSET	564+88.88	259.43 LT
177	2960732.743	669586.484	175.07	SPKSET	518+79.35	8.71 RT

BENCHMARK TABLE

NORTHING	EASTING	ELEV	DESCRIPTION
2960296.323	670696.507	165.77	SPIKE IN UP

200 0 200 400
SCALE IN FEET

vhb
Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

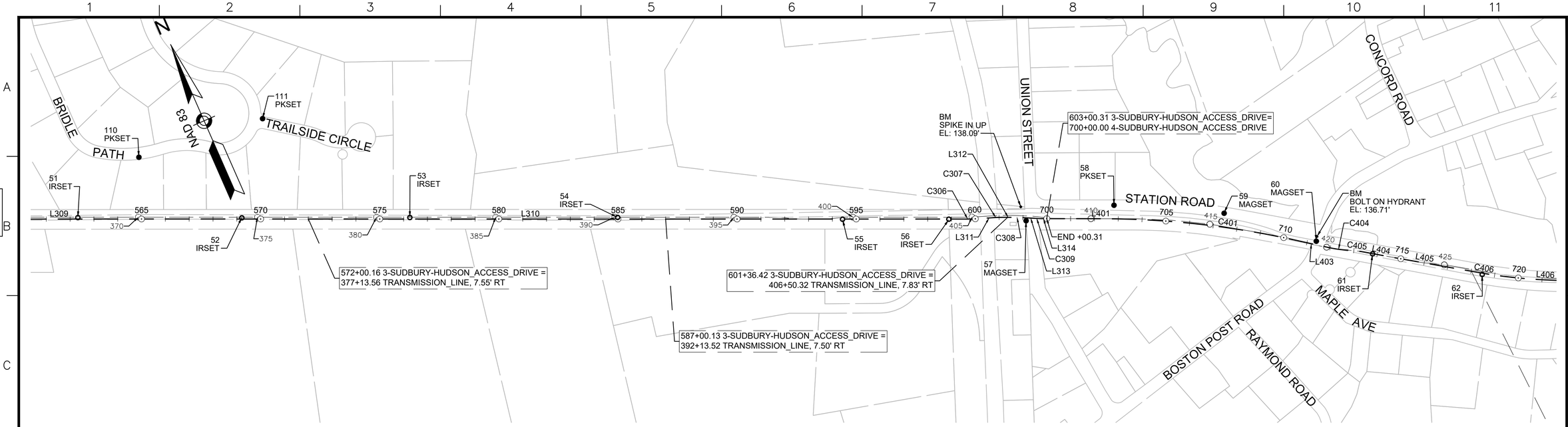
NO.	DESCRIPTION	BY	DATE	APP'R.

REVISION

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
SURVEY TIE–IN PLANS
PLAN 11 OF 348

SCALE: unless noted	DATE	DRAWN	CH'K D.	APP'R.	DRAWING NO.	REV.
1"=200'	FEB 2021	MS	SK	MES	.	.



3-SUDBURY-HUDSON_ACCESS_DRIVE CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L309	559+75.56	2959101.392	673343.887		S66°25'05"E 324.74'	563+00.30	2958971.476	673641.508
L310	563+00.30	2958971.476	673641.508		S66°18'26"E 3665.57'	599+65.87	2957498.529	676998.123
C306	599+65.87	2957498.529	676998.123	R=500.00' Δ=3°38'00" L=31.71' T=15.86'		599+97.58	2957486.717	677027.541
L311	599+97.58	2957486.717	677027.541		S69°56'26"E 84.99'	600+82.57	2957457.567	677107.371
C307	600+82.57	2957457.567	677107.371	R=500.00' Δ=3°38'42" L=31.81' T=15.91'		601+14.37	2957445.714	677136.884
L312	601+14.37	2957445.714	677136.884		S66°17'43"E 47.14'	601+61.52	2957426.761	677180.049
C308	601+61.52	2957426.761	677180.049	R=500.00' Δ=3°13'05" L=28.08' T=14.05'		601+89.60	2957414.756	677205.432
L313	601+89.60	2957414.756	677205.432		S63°04'38"E 68.56'	602+58.16	2957383.711	677266.565
C309	602+58.16	2957383.711	677266.565	R=500.00' Δ=3°13'05" L=28.08' T=14.05'		602+86.25	2957371.705	677291.948
L314	602+86.25	2957371.705	677291.948		S66°17'43"E 14.06'	603+00.31	2957366.053	677304.821

4-SUDBURY-HUDSON_ACCESS_DRIVE CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L401	700+00.00	2957366.053	677304.821		S66°14'03"E 231.13'	702+31.13	2957272.909	677516.349
C401	702+31.13	2957272.909	677516.349	R=3750.00' Δ=12°25'19" L=813.02' T=408.11'		710+44.14	2956867.482	678219.228
L403	710+44.14	2956867.482	678219.228		S53°48'44"E 149.49'	711+93.63	2956779.221	678339.877
C404	711+93.63	2956779.221	678339.877	R=500.00' Δ=9°37'46" L=84.03' T=42.12'		712+77.66	2956735.524	678411.539
C405	712+77.66	2956735.524	678411.539	R=500.00' Δ=7°39'17" L=66.80' T=33.45'		713+44.46	2956701.760	678469.121
L404	713+44.46	2956701.760	678469.121		S55°47'13"E 137.37'	714+81.84	2956624.519	678582.722
L405	714+81.84	2956624.519	678582.722		S56°18'15"E 352.06'	718+33.90	2956429.201	678875.635
C406	718+33.90	2956429.201	678875.635	R=2150.00' Δ=7°27'00" L=279.56' T=139.98'		721+13.46	2956289.642	679117.643
L406	721+13.46	2956289.642	679117.643		S63°45'15"E 104.16'	722+17.62	2956243.579	679211.069

SURVEY TRAVERSE TABLE

POINT #	NORTHING	EASTING	ELEV	RAW DESCRIPTION	STATION CONSTR ℄	OFFSET CONSTR ℄
51	2959003.971	673581.771	161.78	IRSET	562+32.47	5.88 LT
52	2958726.419	674211.952	162.45	IRSET	569+21.06	4.82 LT
53	2958444.371	674858.194	159.51	IRSET	576+26.17	6.23 LT
54	2958094.408	675657.138	150.43	IRSET	584+98.40	6.80 LT
55	2957707.933	676518.674	141.46	IRSET	594+42.61	0.90 RT
56	2957528.922	676927.440	137.87	IRSET	598+88.86	0.57 RT
57	2957392.601	677221.786	136.73	MAGSET	602+14.14	12.35 RT
58	2957304.172	677585.894	133.06	PKSET	702+82.18	56.64 LT
59	2957087.530	677995.592	132.68	MAGSET	707+37.83	54.69 LT
60	2956824.551	678302.748	134.41	MAGSET	711+37.94	8.24 LT
61	2956680.926	678497.843	132.30	IRSET	713+80.00	1.09 RT
62	2956416.645	678884.311	130.43	IRSET	718+48.12	5.68 RT
110	2959133.231	673918.507	165.88	PKSET	564+88.88	259.43 LT
111	2959073.271	674459.148	167.27	PKSET	570+08.04	421.77 LT

BENCHMARK TABLE

NORTHING	EASTING	ELEV	DESCRIPTION
2957455.231	677224.797	138.09	SPIKE IN UP
2956841.239	678313.243	136.71	BOLT ON HYDRANT

200 0 200 400
SCALE IN FEET

vhb Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

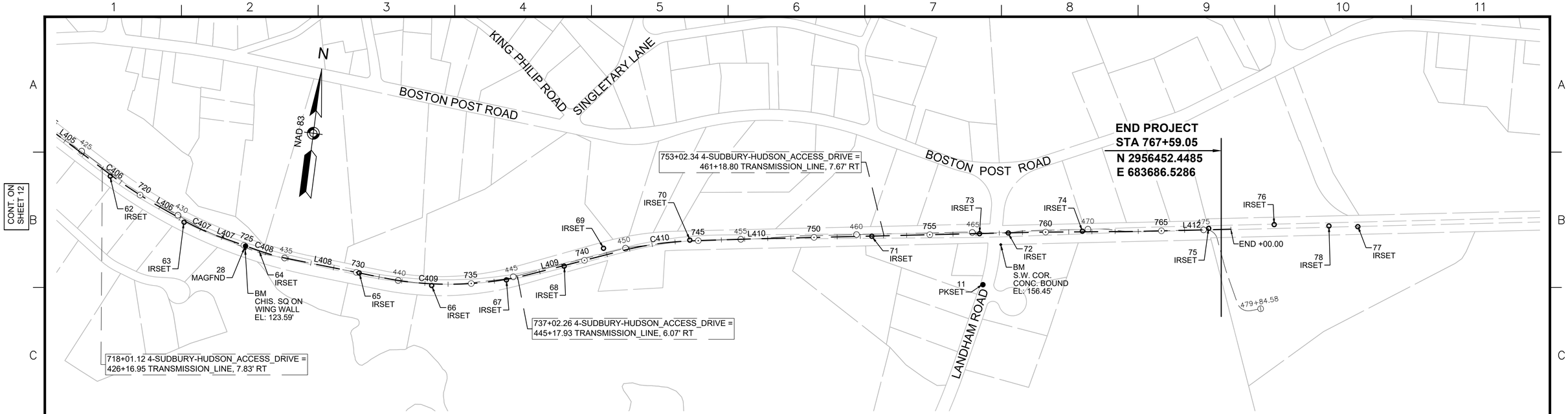
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

SURVEY TIE–IN PLANS

PLAN 12 OF 348

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=200'	FEB 2021	MS	SK	MES	.	.



4-SUDBURY-HUDSON_ACCESS_DRIVE CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L405	714+81.84	2956624.519	678582.722		S56°18'15"E 352.06'	718+33.90	2956429.201	678875.635
C406	718+33.90	2956429.201	678875.635	R=2150.00' Δ=7°27'00" L=279.56' T=139.98'		721+13.46	2956289.642	679117.643
L406	721+13.46	2956289.642	679117.643		S63°45'15"E 104.16'	722+17.62	2956243.579	679211.069
C407	722+17.62	2956243.579	679211.069	R=1000.00' Δ=9°53'27" L=172.63' T=86.53'		723+90.25	2956180.949	679371.703
L407	723+90.25	2956180.949	679371.703		S73°38'42"E 171.77'	725+62.02	2956132.580	679536.524
C408	725+62.02	2956132.580	679536.524	R=975.00' Δ=8°08'34" L=138.56' T=69.40'		727+00.58	2956103.125	679671.802
L408	727+00.58	2956103.125	679671.802		S81°47'16"E 414.21'	731+14.79	2956043.959	680081.760
C409	731+14.79	2956043.959	680081.760	R=1450.00' Δ=25°44'54" L=651.62' T=331.41'		737+66.41	2956096.475	680725.774
L409	737+66.41	2956096.475	680725.774		N72°27'50"E 398.71'	741+65.12	2956216.609	681105.957
C410	741+65.12	2956216.609	681105.957	R=1400.00' Δ=12°28'35" L=304.86' T=153.03'		744+69.98	2956276.216	681404.316
L410	744+69.98	2956276.216	681404.316		N84°56'25"E 284.93'	747+54.91	2956301.344	681688.134
L412	763+88.36	2956423.284	683316.984		N85°29'15"E 411.64'	768+00.00	2956455.670	683727.352

SURVEY TRAVERSE TABLE						
POINT #	NORTHING	EASTING	ELEV	RAW DESCRIPTION	STATION CONSTR ℄	OFFSET CONSTR ℄
28	2956147.431	679484.162		MAGFND	725+07.67	0.49 RT
62	2956416.645	678884.311	130.43	IRSET	718+48.12	5.68 RT
63	2956235.685	679213.375	127.74	IRSET	722+23.22	6.08 RT
65	2956058.540	679980.234	127.40	IRSET	730+12.41	0.07 RT
66	2956021.600	680295.859	127.83	IRSET	733+29.75	7.51 RT
67	2956063.791	680616.525	128.45	IRSET	736+52.67	2.73 RT
68	2956136.912	680862.069	128.00	IRSET	739+08.74	2.51 RT
69	2956223.381	681027.685	126.87	IRSET	740+92.72	30.04 LT
70	2956279.196	681397.664	129.15	IRSET	744+63.82	3.57 LT
71	2956339.379	682181.246	134.16	IRSET	752+49.67	0.88 RT
72	2956386.005	682768.909	139.33	IRSET	758+39.18	0.63 RT
73	2956376.175	682645.008	138.67	IRSET	757+14.89	0.68 RT
74	2956411.369	683087.697	139.08	IRSET	761+58.97	0.43 RT
75	2956454.066	683631.453	134.33	IRSET	767+04.66	5.95 LT
76	2956485.859	683912.993	130.20	IRSET		
77	2956496.909	684274.024	126.21	IRSET		
78	2956493.088	684149.188	128.48	IRSET		
115	2956157.017	682671.760	146.93	PKSET	757+24.32	221.27 RT
18116	2956182.184	679384.347	126.53	ZZ		
18212	2956182.152	679384.358	126.52	ZZ		

BENCHMARK TABLE			
NORTHING	EASTING	ELEV	DESCRIPTION
2956134.680	679483.085	123.59	CHIS. SQ ON WING WALL
2956334.172	682739.230	156.45	S.W. COR. CONC. BOUND

200 0 200 400
SCALE IN FEET

Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

EVERSOURCE

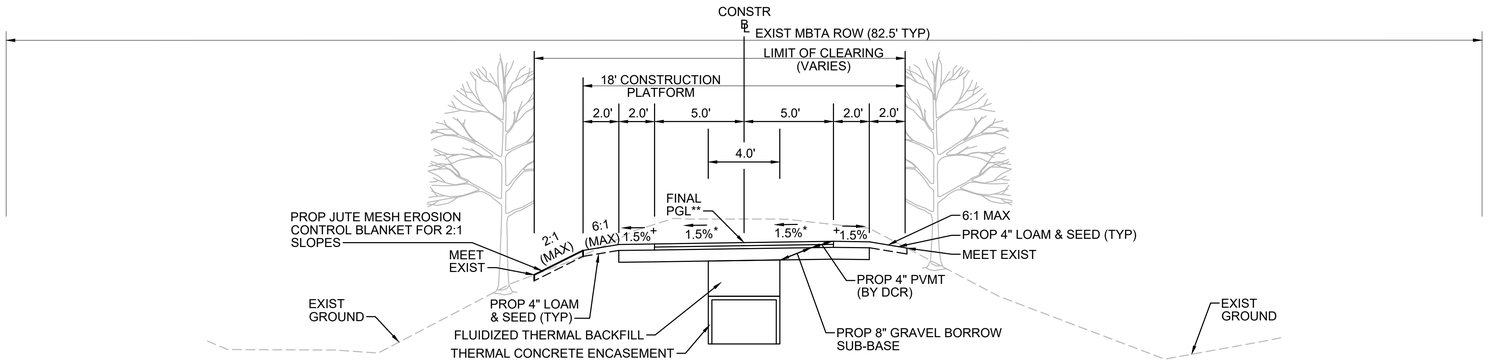
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

SURVEY TIE–IN PLANS

PLAN 13 OF 348

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=200'	FEB 2021	MS	SK	MES	.	.



TYPICAL SECTION - CUT INTO EMBANKMENT - TRANSMISSION LINE IN CENTER

STA 112+50± TO STA 113+00±, STA 131+50± TO STA 131+75±, STA 145+75± TO STA 148+25±, STA 149+50± TO STA 153+00±, STA 397+25± TO STA 400+09±, STA 400+56± TO STA 402+50±, STA 592+00± TO STA 593+25±, STA 712+00± TO STA 715+75±, STA 723+25± TO STA 724+95±, STA 725+76± TO STA 730+00±, STA 732+00± TO STA 733+00±, STA 743+75± TO STA 747+16±, STA 747+50± TO STA 748+25±

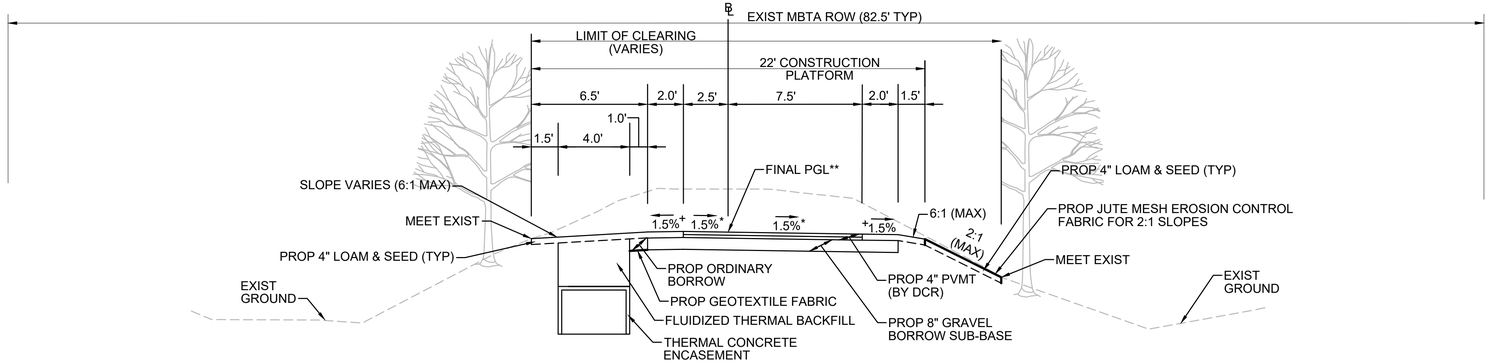
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

+ SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES

SEE CROSS SECTIONS FOR MORE INFORMATION



TYPICAL SECTION - CUT INTO EMBANKMENT - TRANSMISSION LINE ON LEFT

STA 142+25± TO STA 145+75±, STA 168+25± TO STA 171+00±, STA 350+25 TO STA 353+00±, STA 353+50± TO STA 357+00±, STA 368+00± TO STA 371+00±, STA 407+75± TO STA 409+25±, STA 409+75± TO STA 415+25±, STA 516+25± TO STA 519+75±, STA 520+25± TO STA 530+48±, STA 533+87± TO STA 534+00±, STA 534+00± TO STA 544+25±, STA 558+50± TO STA 563+75±, STA 576+75± TO STA 578+25±, STA 718+00± TO STA 721+25±, STA 748+25± TO STA 752+75±

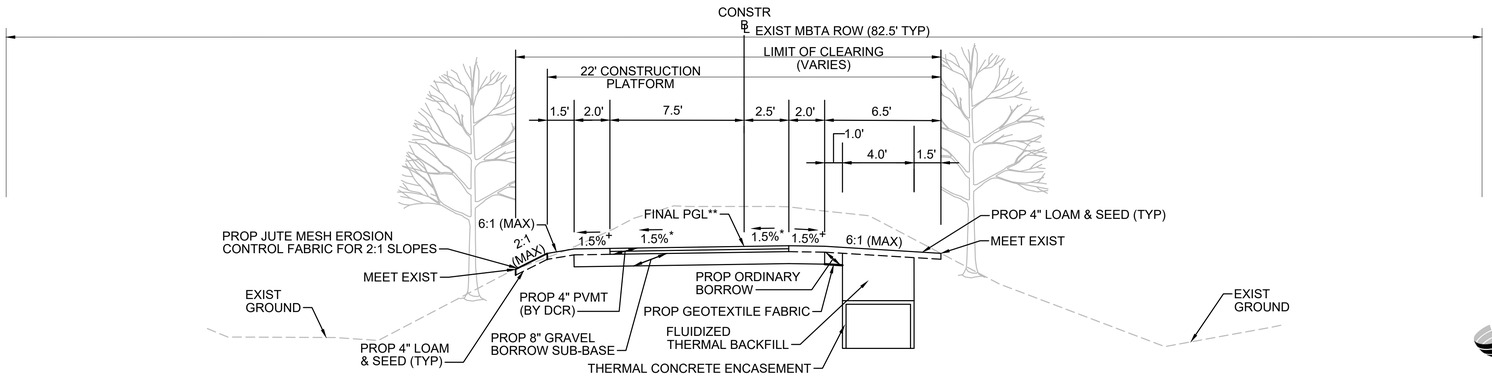
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

+ SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES

SEE CROSS SECTIONS FOR MORE INFORMATION



TYPICAL SECTION - CUT INTO EMBANKMENT - TRANSMISSION LINE ON RIGHT

STA 102+25± TO STA 112+50±, STA 128+50± TO STA 131+50±, STA 148+25± TO STA 148+43±, STA 149+20± TO STA 149+50±

NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

+ SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES

SEE CROSS SECTIONS FOR MORE INFORMATION

NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

EVERSOURCE

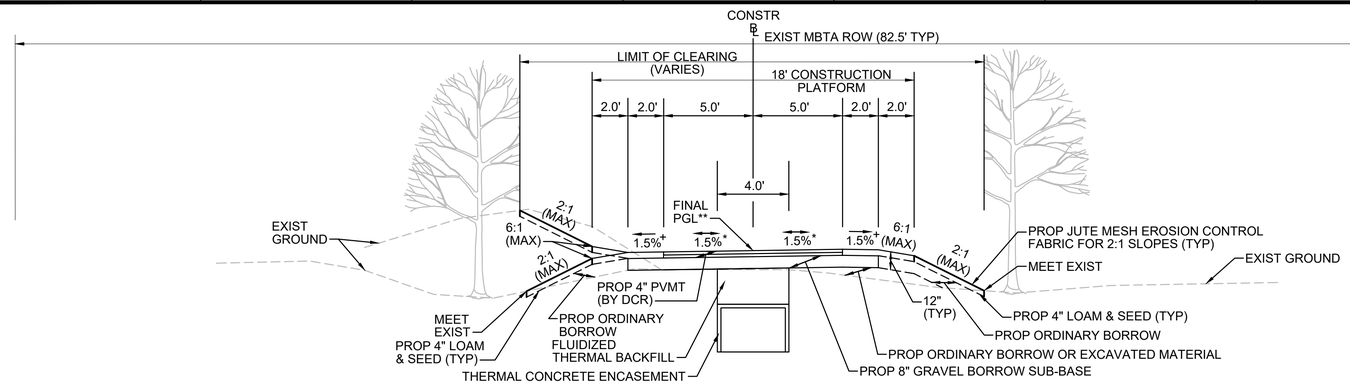
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TYPICAL SECTIONS

PLAN 14 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
NTS	FEB 2021	MS	SK	MES	.	.



TYPICAL SECTION - TRANSMISSION LINE IN CENTER

STA 131+75± TO STA 132+44±, STA 132+84± TO STA 134+25±, STA 153+00± TO STA 153+50±, STA 204+75± TO STA 207+25±, STA 213+68± TO STA 214+00±, STA 397+00± TO STA 397+25±, STA 402+50± TO STA 403+25±, STA 516+00± TO STA 516+25±, STA 593+25± TO STA 594+00±, STA 700+25± TO STA 711+41±, STA 711+67± TO STA 712+00±, STA 715+75± TO STA 717+75±, STA 742+25± TO STA 743+75±, STA 757+50± TO STA 758+13±, STA 763+20± TO STA 767+21±

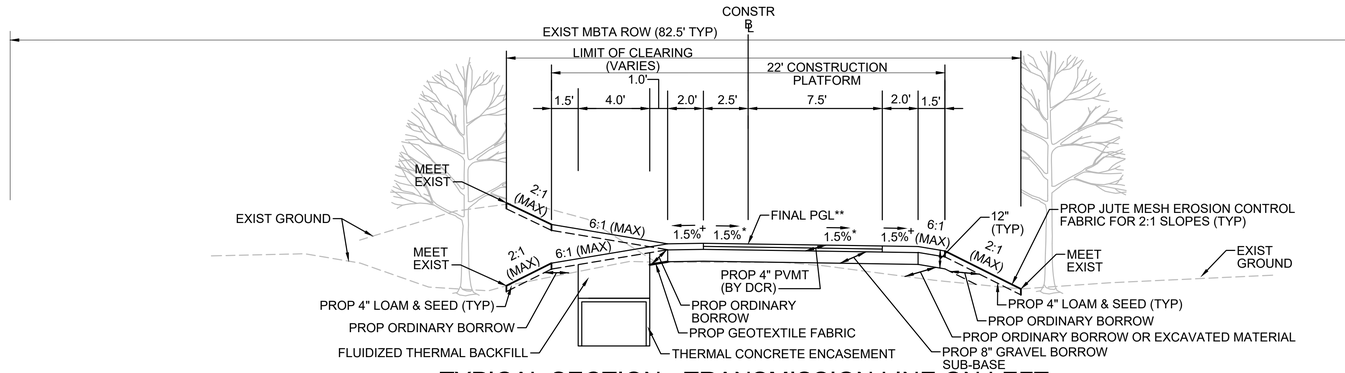
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

\+ SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES

SEE CROSS SECTIONS FOR MORE INFORMATION



TYPICAL SECTION - TRANSMISSION LINE ON LEFT

STA 134+75± TO STA 142+25±, STA 153+50± TO STA 157+75±, STA 158+25± TO STA 168+25±, STA 171+00± TO STA 175+00±, STA 180+25± TO STA 181+86±, STA 182+19± TO STA 182+50±, STA 185+00± TO STA 195+75±, STA 196+25± TO STA 204+75±, STA 207+25± TO STA 213+49±, STA 214+00± TO STA 300+00±, STA 300+50± TO STA 304+00±, STA 316+50± TO STA 335+00±, STA 335+50± TO STA 336+86±, STA 337+08± TO STA 348+75±, STA 357+00± TO STA 360+25±, STA 365+00± TO STA 368+00, STA 371+50± TO STA 375+50±, STA 378+75± TO STA 390+00±, STA 390+50± TO STA 393+00±, STA 403+25± TO STA 404+50±, STA 407+50± TO STA 407+75±, STA 409+25± TO STA 409+75±, STA 415+25± TO STA 416+83±, STA 417+08± TO STA 500+21±, STA 533+00± TO STA 533+48±, STA 544+25± TO STA 552+75±, STA 553+25± TO STA 555+77±, STA 555+96± TO STA 558+50±, STA 563+75± TO STA 565+00±,STA 578+25± TO STA 579+00±, STA 588+25± TO STA 592+00±, STA 594+00± TO STA 601+09±, STA 601+59± TO STA 602+18±, STA 602+47± TO STA 700+25±, STA 722+25± TO STA 723+25±, STA 738+25± TO STA 742+25±, STA 753+00± TO STA 753+48±

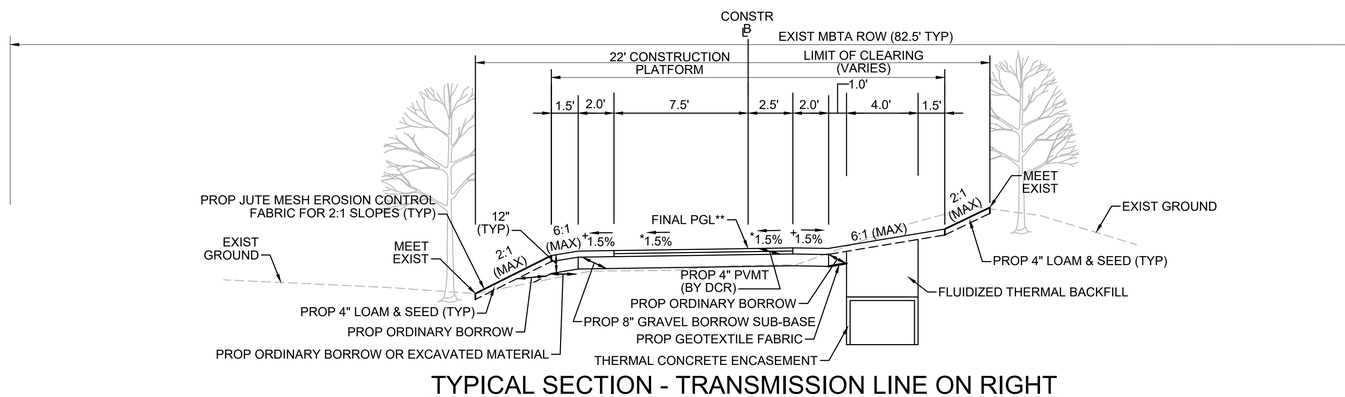
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

\+ SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES

SEE CROSS SECTIONS FOR MORE INFORMATION



TYPICAL SECTION - TRANSMISSION LINE ON RIGHT

STA 100+31.46± TO STA 101+00±

NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

\+ SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES

SEE CROSS SECTIONS FOR MORE INFORMATION

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

vhb
Vanasse Hangen Brustlin, Inc.
101 Walnut St, PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

EVERSOURCE

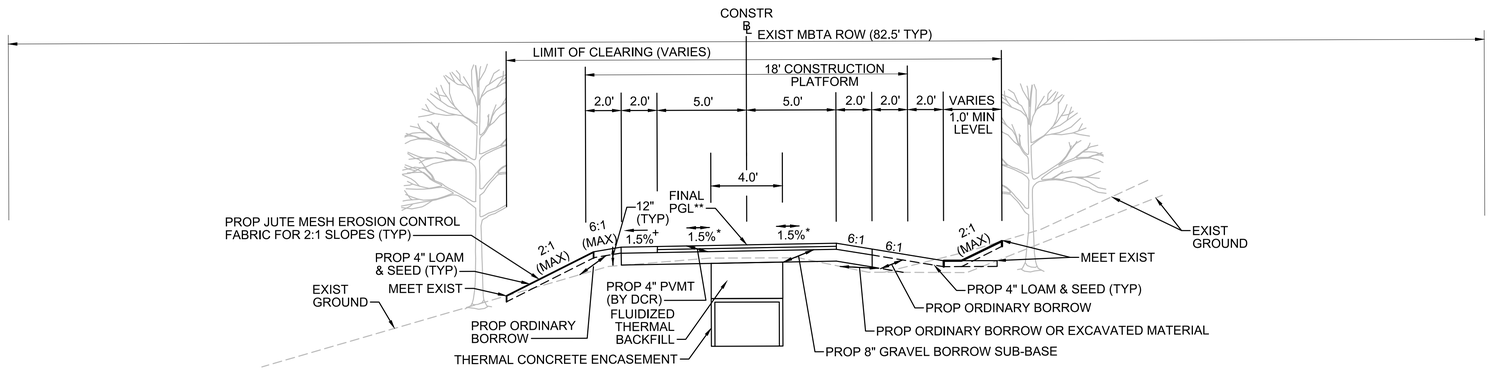
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TYPICAL SECTIONS

PLAN 15 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
NTS	FEB 2021	MS	SK	MES	.	.



TYPICAL SECTION - SWALE RIGHT SIDE - TRANSMISSION LINE IN CENTER

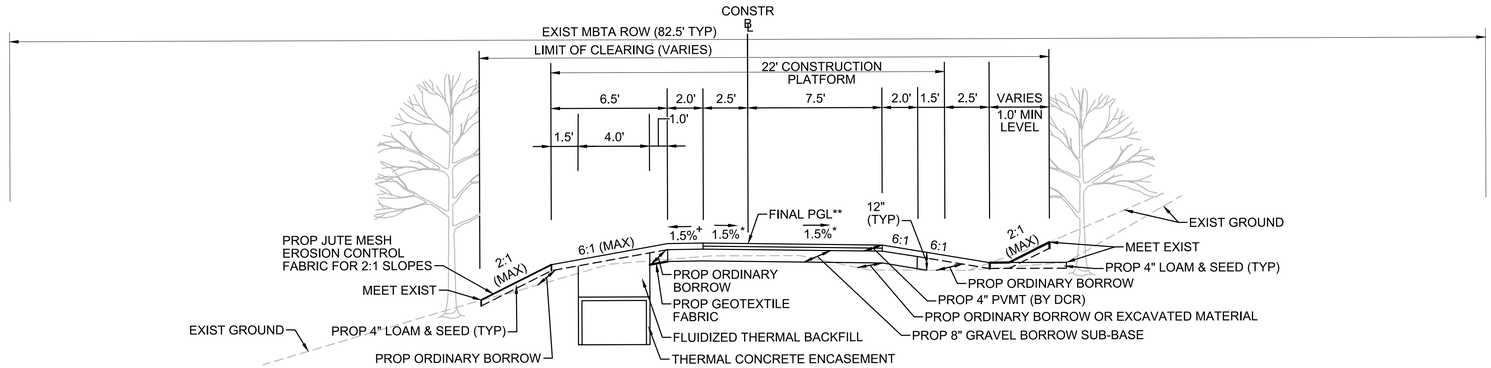
STA 113+00± TO STA 118+50±, STA 121+50± TO STA 126+25±
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

\+ SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES

SEE CROSS SECTIONS FOR MORE INFORMATION



TYPICAL SECTION - SWALE RIGHT SIDE - TRANSMISSION LINE ON LEFT

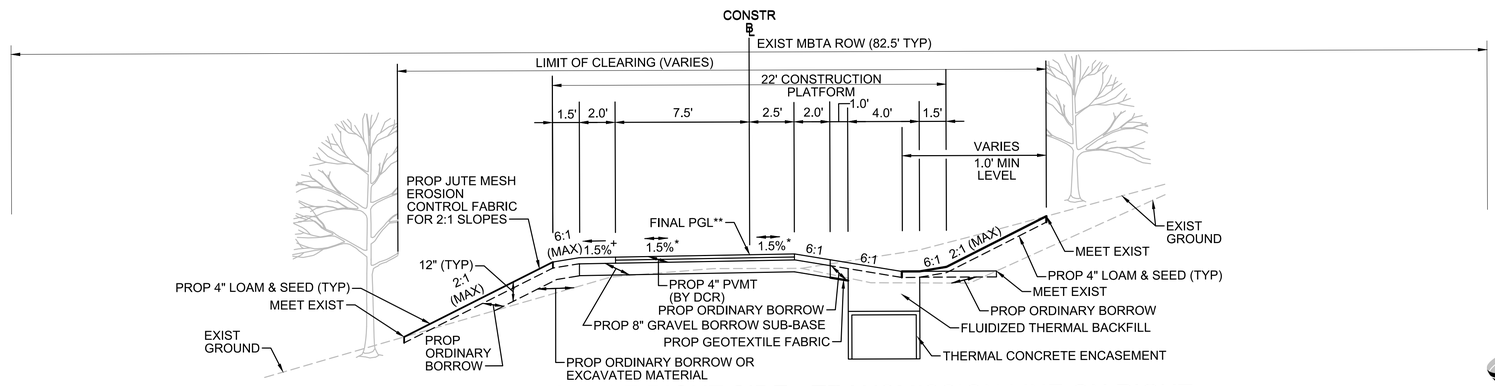
STA 134+25± TO STA 134+75±, STA 175+00± TO STA 175+50±, STA 304+00± TO STA 305+50±, STA 350+25± TO STA 350+50±,
STA 360+25± TO STA 362+50±, STA 405+00± TO STA 407+50±, STA 500+21± TO STA 500+25±, STA 512+50± TO STA 513+25±,
STA 533+48± TO STA 533+75±, STA 565+00± TO STA 569+00±, STA 579+00± TO STA 586+75±,
STA 587+25± TO STA 588+25±, STA 721+25± TO STA 722+25±
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

\+ SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES

SEE CROSS SECTIONS FOR MORE INFORMATION



TYPICAL SECTION - SWALE RIGHT SIDE - TRANSMISSION LINE ON RIGHT

STA 118+50± TO STA 120+75±, STA 121+25± TO STA 121+50±, STA 126+25± TO STA 128+50±
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

\+ SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES

SEE CROSS SECTIONS FOR MORE INFORMATION

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

EVERSOURCE

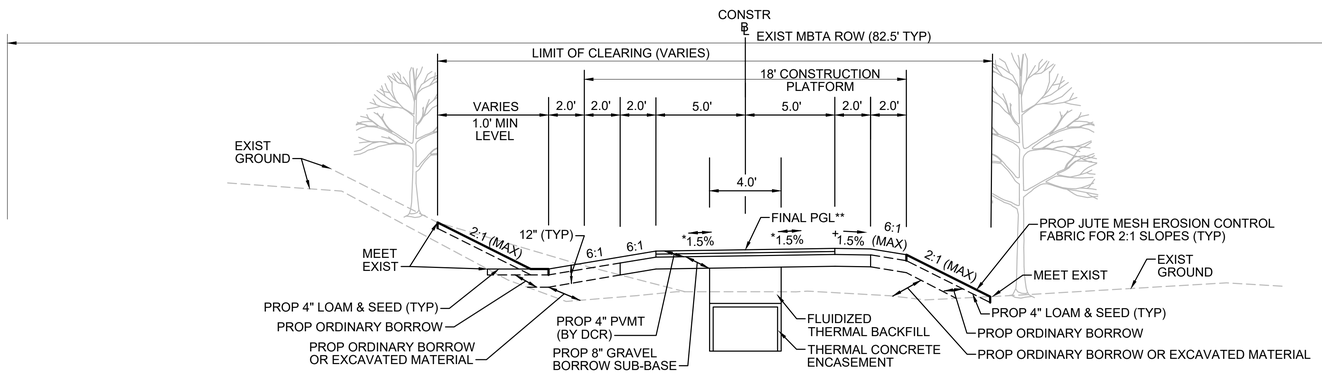
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TYPICAL SECTIONS

PLAN 16 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
NTS	FEB 2021	MS	SK	MES	.	.



TYPICAL SECTION - SWALE LEFT SIDE - TRANSMISSION LINE IN CENTER

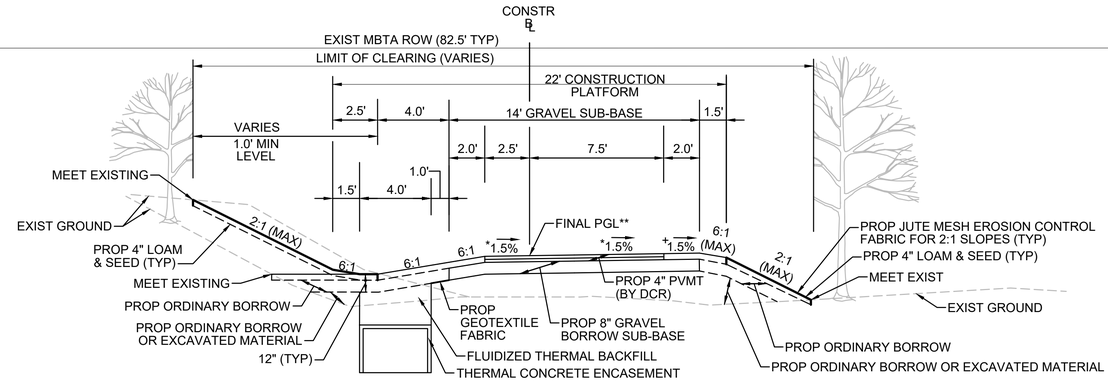
STA 730+00± TO STA 732+00±, STA 733+00± TO STA 735+00±, STA 758+13± TO STA 558+50±, STA 762+75± TO STA 763+20±
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

\+ SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES

SEE CROSS SECTIONS FOR MORE INFORMATION



TYPICAL SECTION - SWALE LEFT SIDE - TRANSMISSION LINE ON LEFT

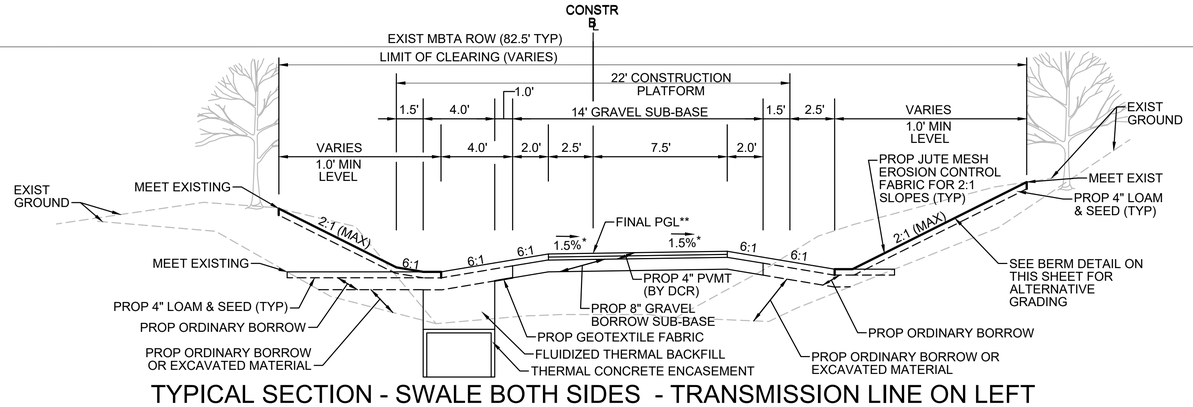
STA 179+75± TO STA 180+25±, STA 184+50± TO STA 185+00±, STA 315+75± TO STA 316+14±, STA 375+50± TO STA 378+75±, STA 395+50± TO STA 397+00±, STA 530+71± TO STA 533+00±, STA 576+50± TO STA 576+75±, STA 735+00± TO STA 736+90±, STA 737+13± TO STA 738+25±, STA 758+50± TO STA 762+75±
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

\+ SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES

SEE CROSS SECTIONS FOR MORE INFORMATION



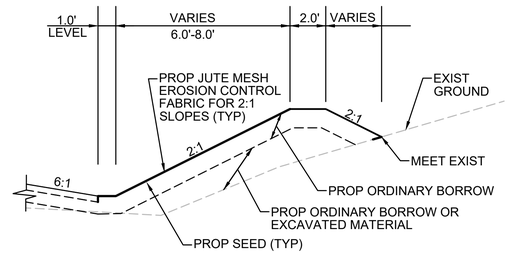
TYPICAL SECTION - SWALE BOTH SIDES - TRANSMISSION LINE ON LEFT

STA 175+50± TO STA 176+75±, STA 177+25± TO STA 179+75±, STA 182+50± TO STA 184+50±, STA 305+50± TO STA 315+75±, STA 348+75± TO STA 350+25±, STA 362+50± TO STA 365+00±, STA 393+00± TO STA 395+50±, STA 500+25± TO STA 503+75±, STA 504+25± TO STA 512+50±, STA 513+25± TO STA 516+00±, STA 569+00± TO STA 571+75±, STA 572+25± TO STA 576+50±, STA 753+48± TO STA 757+50±
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

SEE CROSS SECTIONS FOR MORE INFORMATION



BERM DETAIL

STA 394+50 TO STA 395+50

vhb
Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
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617.924.1770 FAX 617.924.2286

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

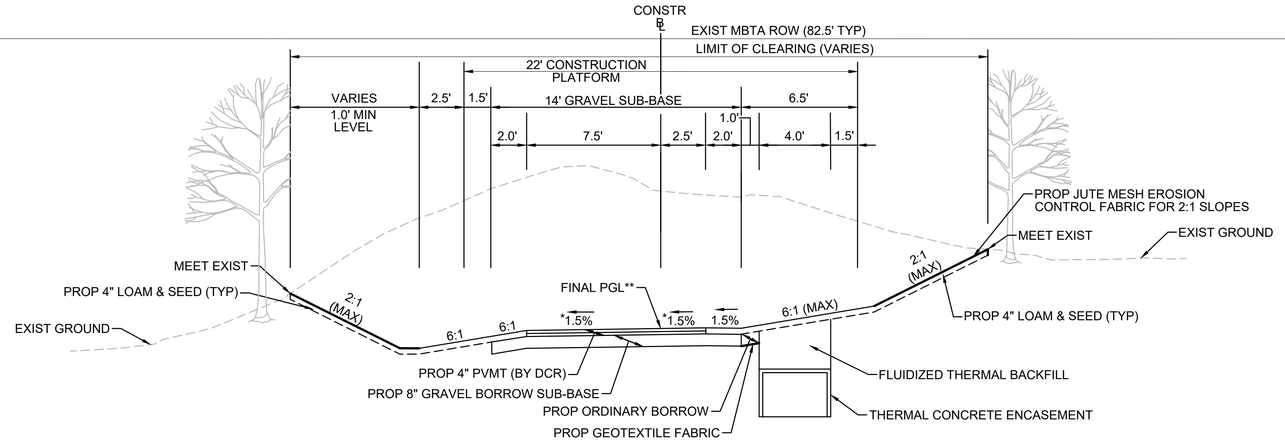
SUDBURY—HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TYPICAL SECTIONS

PLAN 17 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
NTS	FEB 2021	MS	SK	MES	.	.



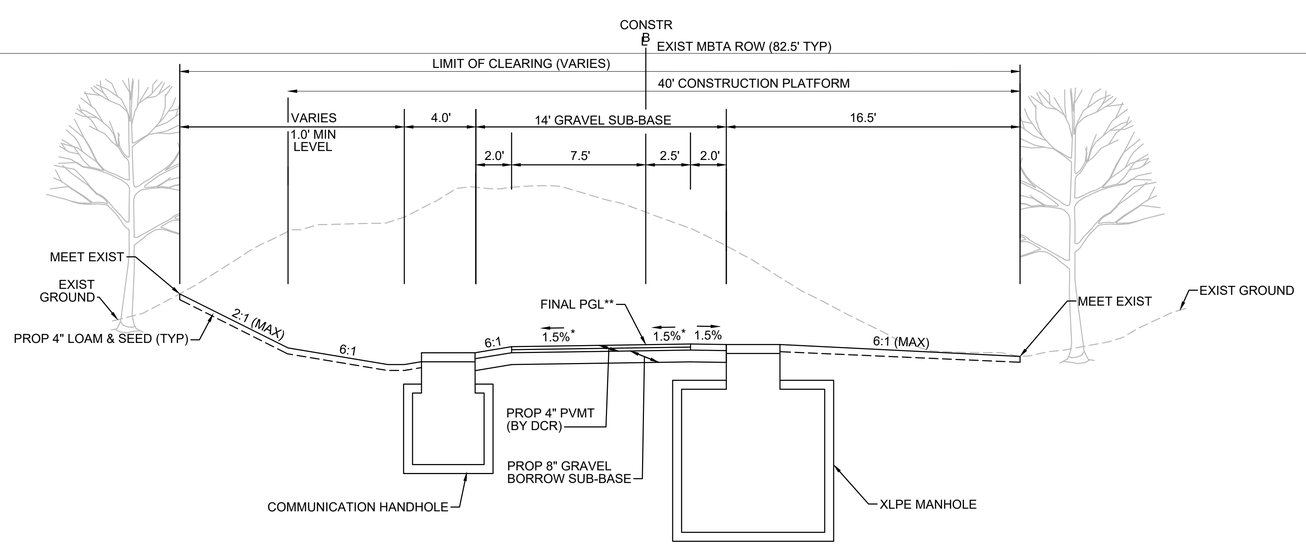
TYPICAL SECTION - SWALE LEFT SIDE - TRANSMISSION LINE ON RIGHT

STA 101+00± TO STA 101+75±
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

SEE CROSS SECTIONS FOR MORE INFORMATION



TYPICAL SECTION - SWALE LEFT SIDE - MANHOLE ON RIGHT

STA 101+75± TO STA 102+25±
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

SEE CROSS SECTIONS FOR MORE INFORMATION

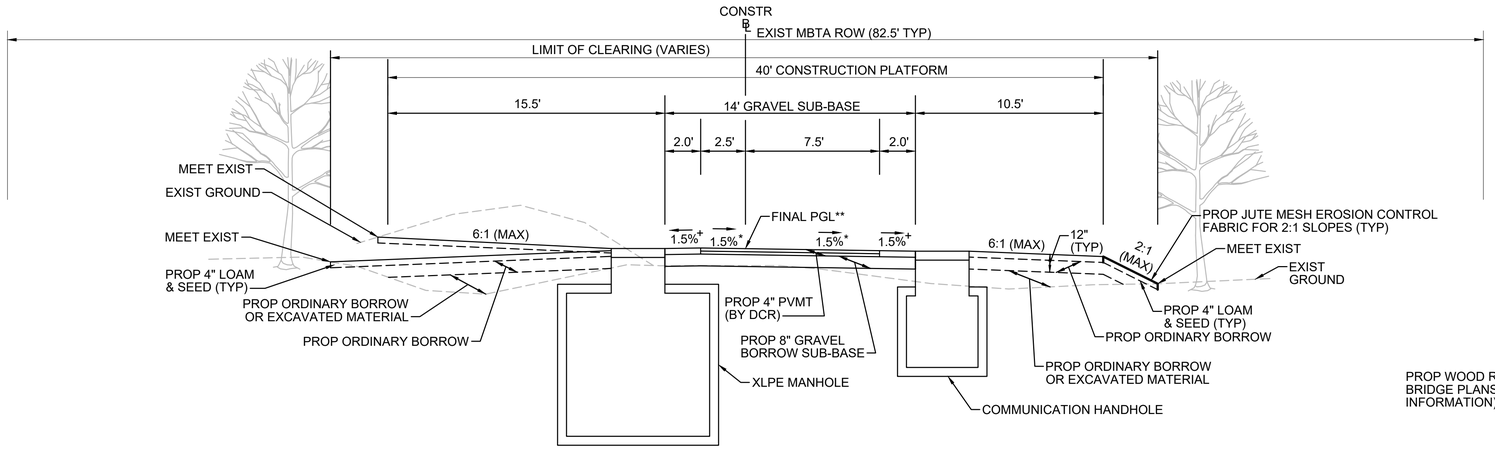
NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

Vanasse Hangen Brustlin, Inc.
101 Walnut St, PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
TYPICAL SECTIONS
PLAN 18 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
NTS	FEB 2021	MS	SK	MES	.	.



TYPICAL SECTION - MANHOLE ON LEFT

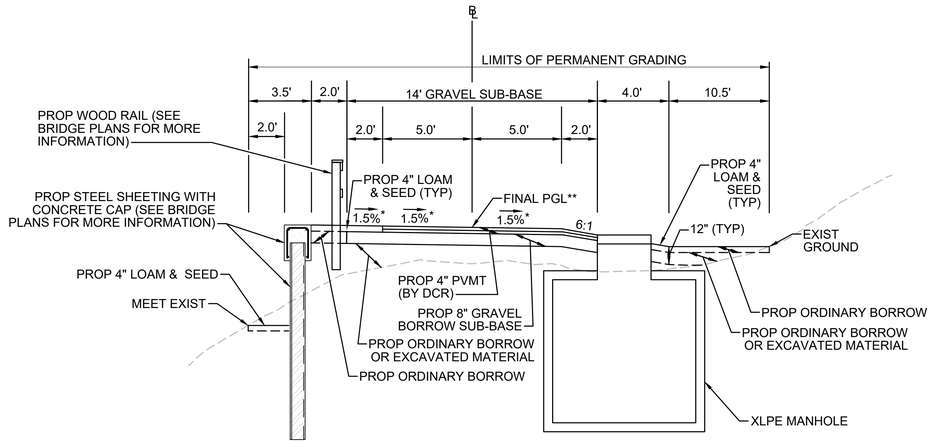
STA 157+75± TO STA 158+25±, STA 195+75± TO STA 196+25±, STA 300+00± TO STA 300+50±, STA 335+00± TO STA 335+50±, STA 353+00± TO STA 353+50±, STA 371+00± TO STA 371+50±, STA 390+00± TO STA 390+50±, STA 519+75± TO STA 520+25±, STA 533+75± TO STA 534+25±, STA 552+75± TO STA 553+25±, STA 717+75± TO STA 718+25±, STA 752+75± TO STA 753+25±
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

\+ SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES

SEE CROSS SECTIONS FOR MORE INFORMATION



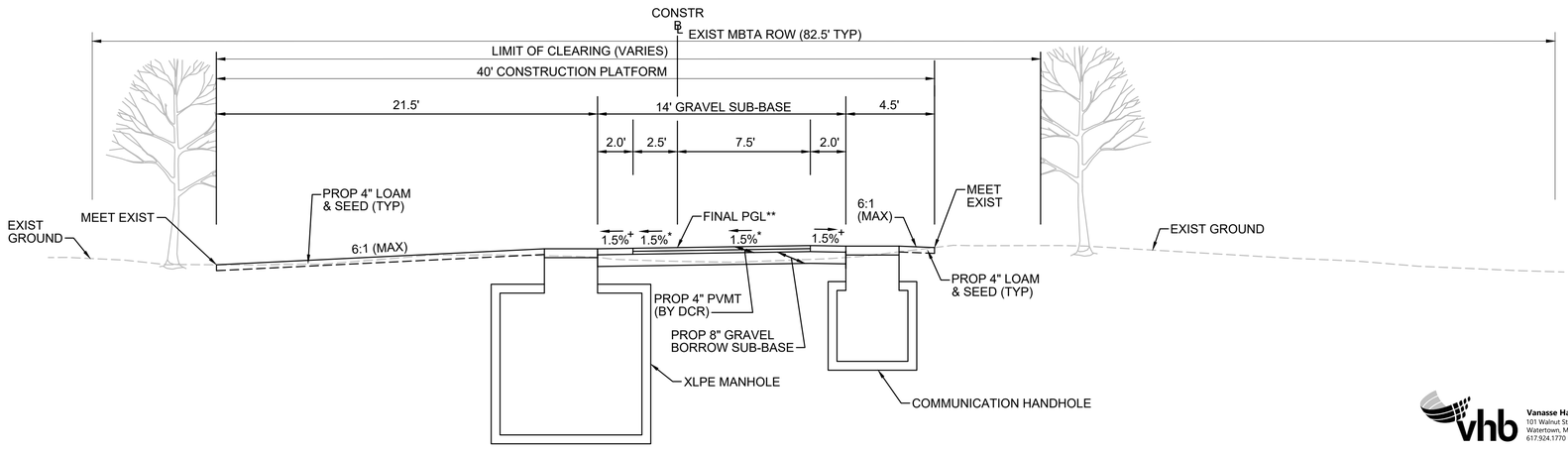
* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

\+ SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES
SEE CROSS SECTIONS FOR MORE INFORMATION
SEE SHEET 157 FOR TEMPORARY GRADING CONSTRUCTION DETAIL

TYPICAL SECTION - SWALE RIGHT SIDE - MANHOLE ON RIGHT

STA 120+75± TO STA 121+25±
NTS



TYPICAL SECTION - MANHOLE ON LEFT - OFF-CENTER CONSTRUCTION PLATFORM

STA 601+09± TO STA 601+59±
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

\+ SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES

SEE CROSS SECTIONS FOR MORE INFORMATION

NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

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101 Walnut St., PO Box 9151
Watertown, MA 02472
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EVERSOURCE

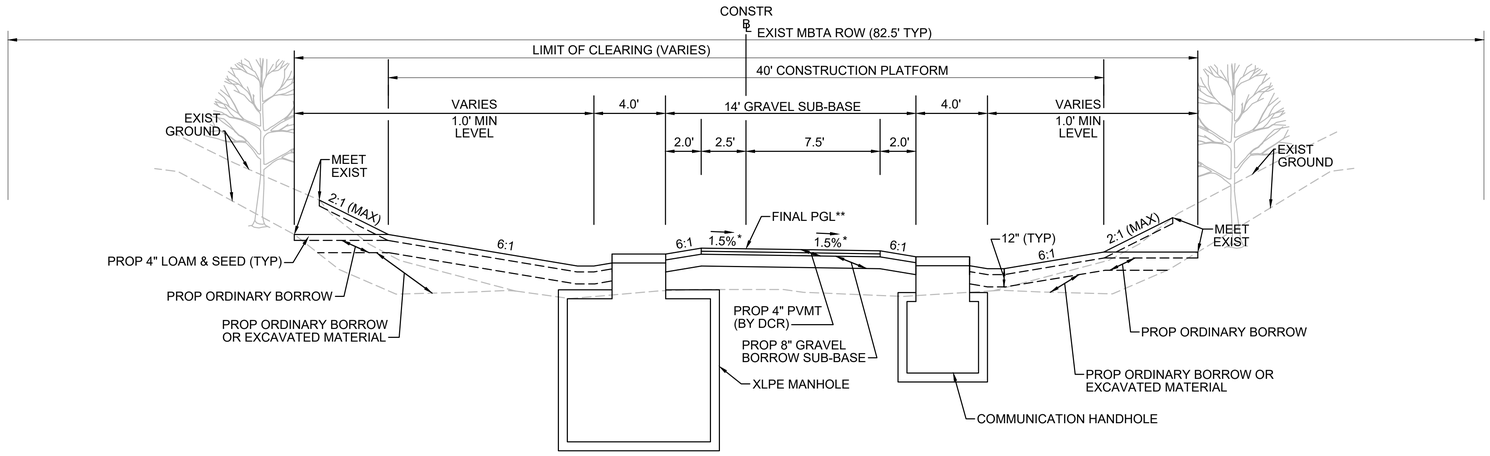
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TYPICAL SECTIONS

PLAN 19 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
NTS	FEB 2021	MS	SK	MES	.	.



TYPICAL SECTION - SWALE BOTH SIDES - MANHOLE ON LEFT

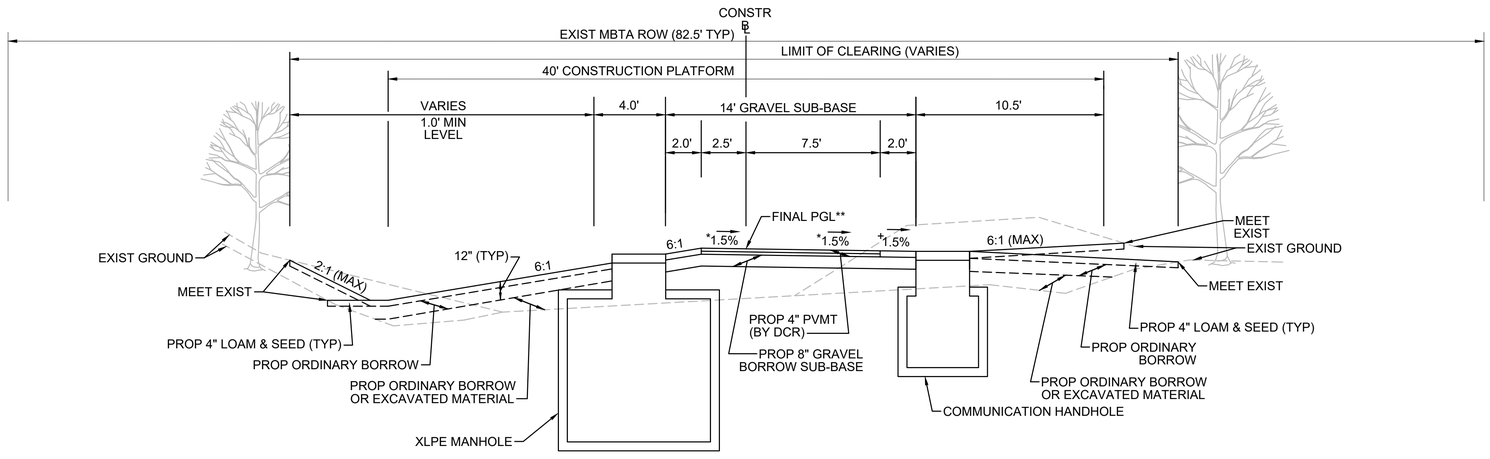
STA 176+75± TO STA 177+25±, STA 503+75± TO STA 504+25±, STA 571+75± TO STA 572+25±
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

+ SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES

SEE CROSS SECTIONS FOR MORE INFORMATION



TYPICAL SECTION - SWALE LEFT SIDE - MANHOLE ON LEFT

STA 316+00± TO STA 316+50±, STA 736+75± TO STA 737+25±
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

+ SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES

SEE CROSS SECTIONS FOR MORE INFORMATION

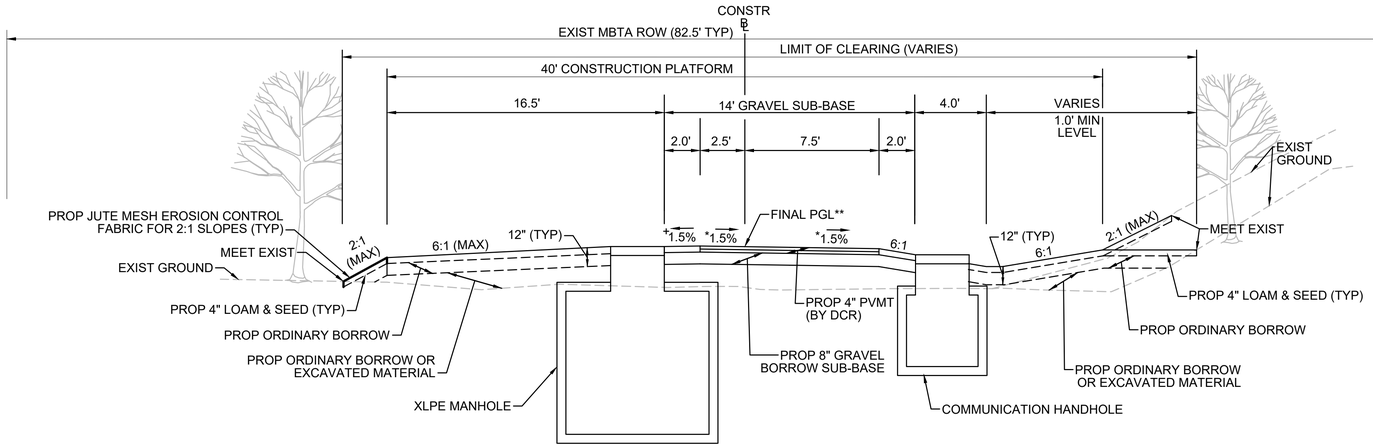
NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

vhb
Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
TYPICAL SECTIONS
PLAN 20 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
NTS	FEB 2021	MS	SK	MES	.	.



TYPICAL SECTION - SWALE RIGHT SIDE - MANHOLE ON LEFT

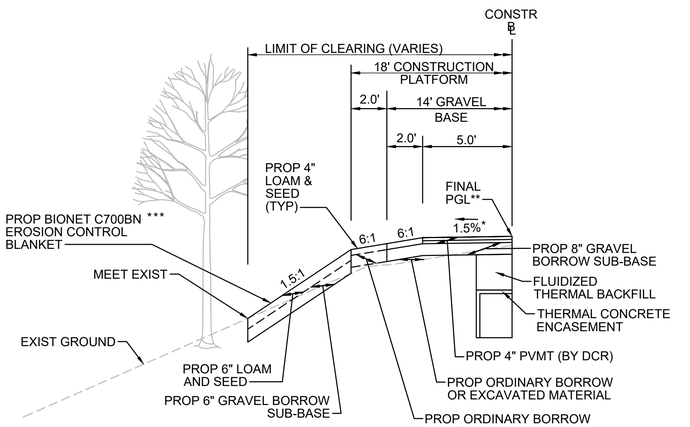
STA 404+50± TO STA 405+00±, STA 586+75± TO STA 587+25±
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

+ SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES

SEE CROSS SECTIONS FOR MORE INFORMATION



STEEP SLOPE SECTION LT - TRANSMISSION LINE IN CENTER

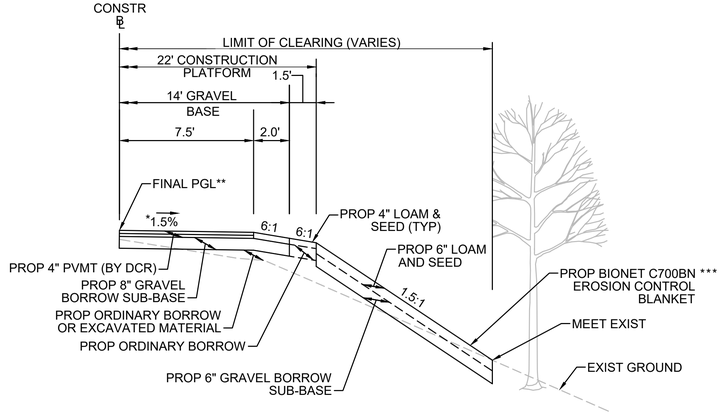
STA 142+37± TO STA 142+75±, STA 747+16± TO STA 747+50±
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

*** ENGINEER TO VERIFY THAT INSTALLED EROSION CONTROL MEASURES ARE ADEQUATE FOR SLOPE STABILIZATION PRIOR TO PLACEMENT OF LOAM & SEED.

SEE CROSS SECTIONS FOR MORE INFORMATION



STEEP SLOPE SECTION RT - TRANSMISSION LINE ON LEFT

STA 135+50± TO STA 138+25±
NTS

* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

*** ENGINEER TO VERIFY THAT INSTALLED EROSION CONTROL MEASURES ARE ADEQUATE FOR SLOPE STABILIZATION PRIOR TO PLACEMENT OF LOAM & SEED.

SEE CROSS SECTIONS FOR MORE INFORMATION

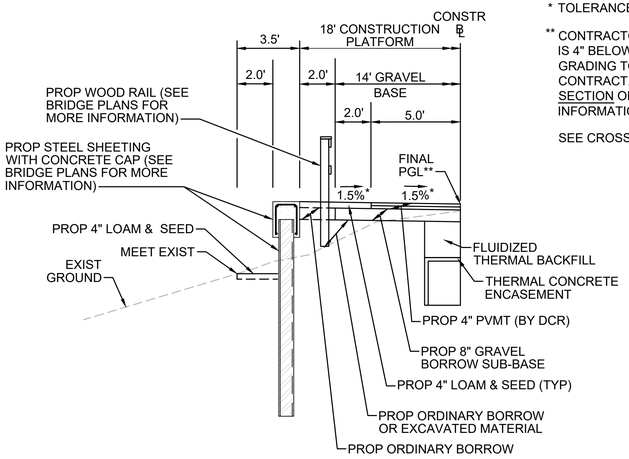
Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

NO.	DESCRIPTION	BY	DATE	APP'R.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
TYPICAL SECTIONS
PLAN 21 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APP'R.	DRAWING NO.	REV.
NTS	DEC 2021	MS	SK	MES	.	.



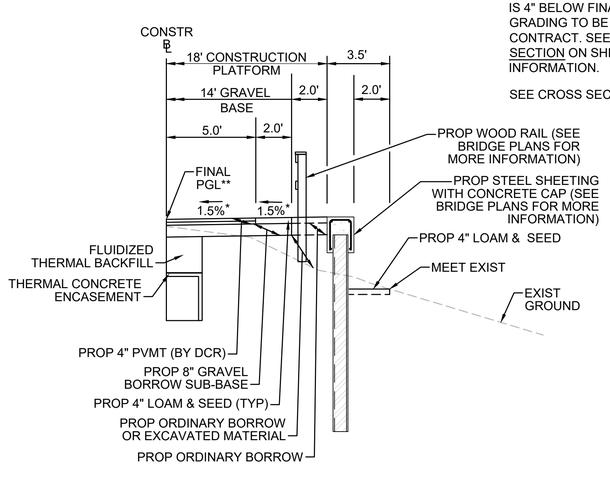
* TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

SEE CROSS SECTIONS FOR MORE INFORMATION

SHEETING SECTION LT

STA 119+00± TO STA 119+38±, STA 119+52± TO STA 125+00±, STA 148+25± TO STA 148+49±, STA 149+13± TO STA 149+75±, STA 300+50± TO STA 400+07±, STA 400+58± TO STA 401+25±, STA 724+73± TO STA 725+03±, STA 725+59± TO STA 725+96±
NTS



* TOLERANCE FOR CONSTRUCTION ±0.5%

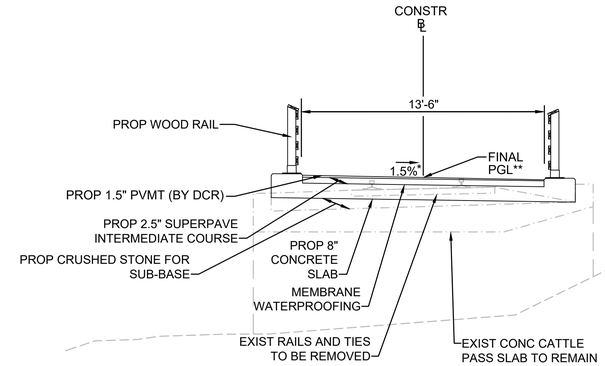
** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

SEE CROSS SECTIONS FOR MORE INFORMATION

SHEETING SECTION RT

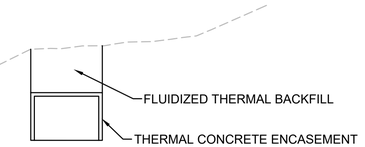
STA 148+25± TO STA 148+49±, STA 149+13± TO STA 149+75±, STA 399+91± TO STA 400+07±, STA 400+58± TO STA 401+25±, STA 724+73± TO STA 725+03±, STA 725+59± TO STA 725+96±, STA 731+00± TO STA 734+25±
NTS

*TOLERANCE FOR CONSTRUCTION ±0.5%



CATTLE CROSSING

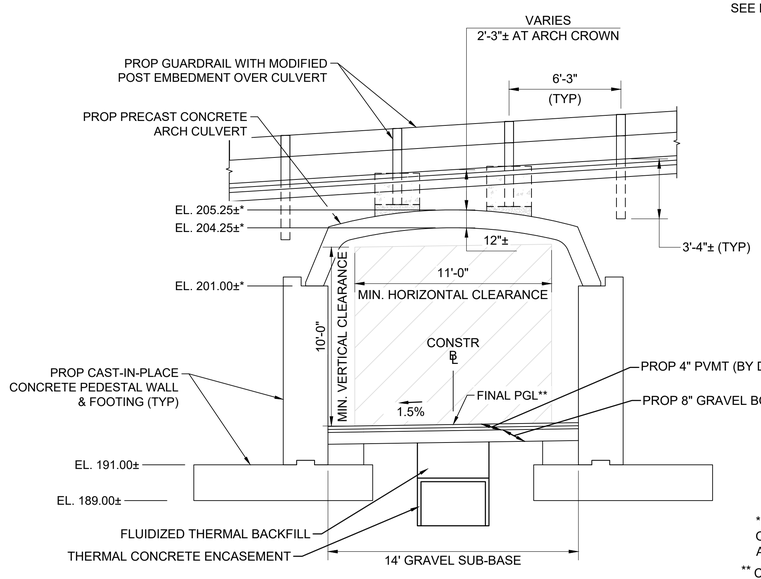
STA 119+38± TO STA 119+52±
NTS



*TOLERANCE FOR CONSTRUCTION ±0.5%

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 1.5" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL ON SHEET 158 FOR ADDITIONAL INFORMATION.

SEE BRIDGE PLANS FOR MORE INFORMATION



CHESTNUT STREET CULVERT

STA 132+44± TO STA 132+84±
NTS

*ELEVATIONS MAY VARY DEPENDING ON DESIGN OF PRECAST CONCRETE ARCH CULVERT BY OTHERS.

** CONTRACTOR TO BUILD TO INTERIM PGL, WHICH IS 4" BELOW FINAL PGL SHOWN HERE. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE DETAIL FOR INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION.

SEE BRIDGE PLANS FOR MORE INFORMATION

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

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EVERSOURCE

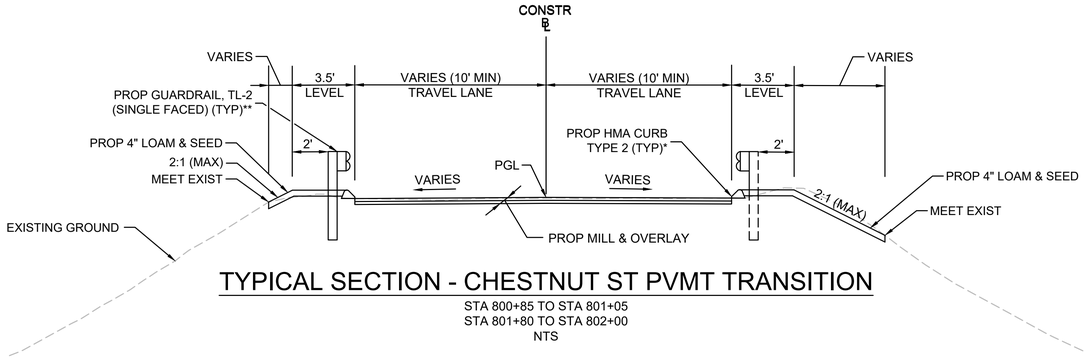
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
TYPICAL SECTIONS
PLAN 22 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
NTS	DEC 2021	MS	SK	MES	.	.

* FULL-DEPTH BERM PAD REQUIRED IF EXISTING PAVEMENT NOT SUITABLE

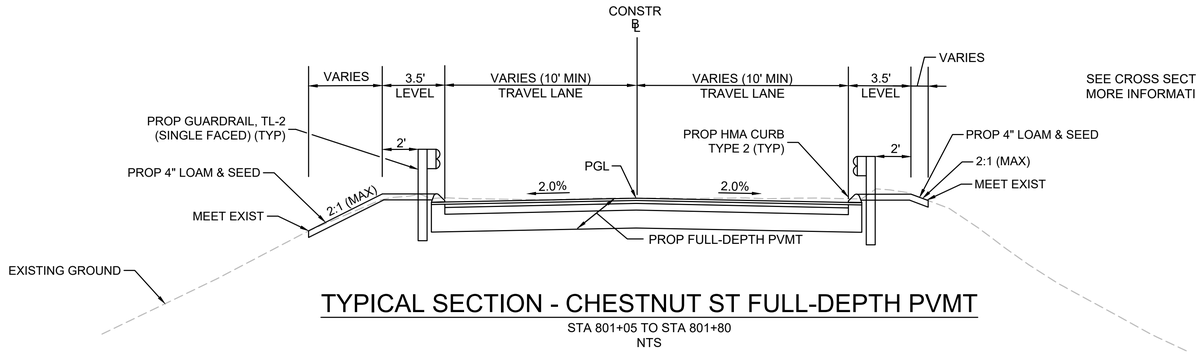
** TL-2 GUARDRAIL PROPOSED FROM STA 800+99 TO STA 802+12 (LT) AND STA 801+06 TO STA 802+24 (RT)

SEE CROSS SECTIONS FOR MORE INFORMATION



TYPICAL SECTION - CHESTNUT ST PVMT TRANSITION

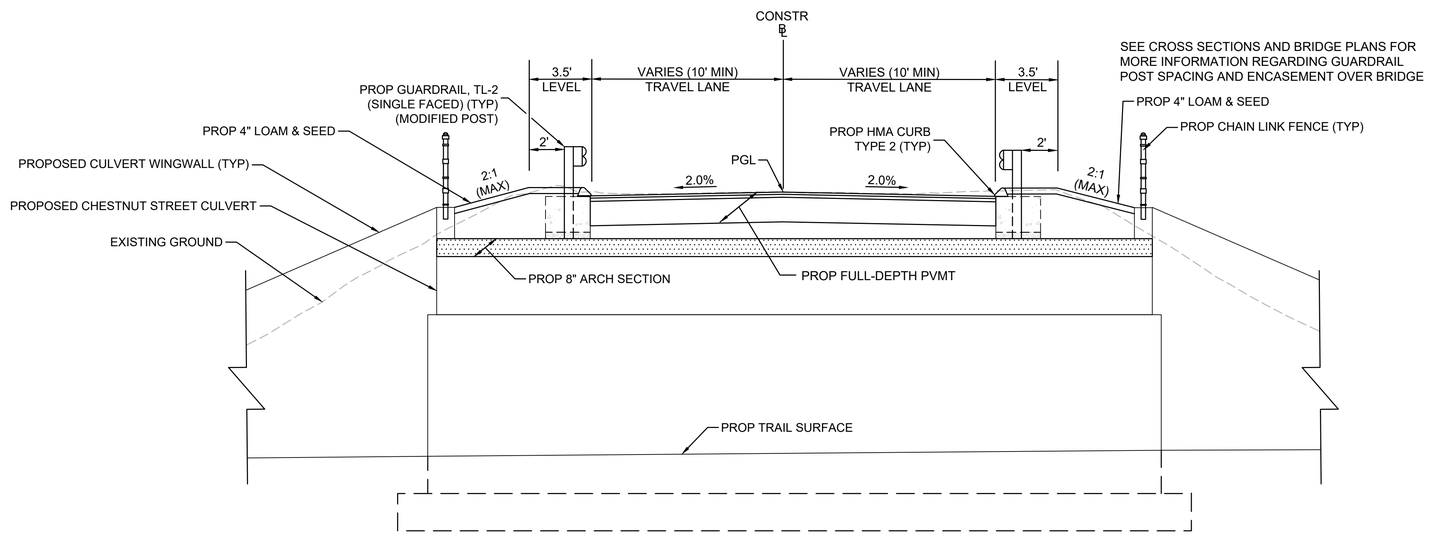
STA 800+85 TO STA 801+05
STA 801+80 TO STA 802+00
NTS



SEE CROSS SECTIONS FOR MORE INFORMATION

TYPICAL SECTION - CHESTNUT ST FULL-DEPTH PVMT

STA 801+05 TO STA 801+80
NTS



TYPICAL SECTION - CHESTNUT ST FULL-DEPTH PVMT OVER CHESTNUT STREET CULVERT

STA 801+28 TO STA 801+58
NTS

PAVEMENT NOTES

PROPOSED FULL-DEPTH PAVEMENT

SURFACE:		1.75" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5) OVER 1.75" SUPERPAVE INTERMEDIATE COURSE 12.5 (SIC-12.5) OVER
BASE:	4.5"	SUPERPAVE BASE COURSE 37.5 (SBC-37.5) OVER
SUBBASE:	4" 8"	DENSE GRADED CRUSHED STONE OVER GRAVEL BORROW (TYPE b)

PROPOSED PAVEMENT MILLING & OVERLAY

SURFACE:		1.75" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5) OVER 1.75" PAVEMENT MICROMILLING

PROPOSED HOT MIX ASPHALT WALK

SURFACE:		1.25" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER 1.5" SUPERPAVE INTERMEDIATE COURSE 12.5 (SIC-12.5) OVER
FOUNDATION:	8"	GRAVEL BORROW (TYPE b)

PROPOSED HOT MIX ASPHALT DRIVEWAY/WALK AT DRIVEWAY

SURFACE:		1.5" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER 2" SUPERPAVE INTERMEDIATE COURSE 12.5 (SIC-12.5) OVER
FOUNDATION:	8"	GRAVEL BORROW (TYPE b)

PROPOSED CEMENT CONCRETE WALK

SURFACE:	6"	CEMENT CONCRETE AIR ENTRAINED 4000 PSI, 3/4", 610 OVER
FOUNDATION:	8"	GRAVEL BORROW (TYPE b)

NOTES:

1. TACK COAT TO BE APPLIED AT 0.05 GAL/SY OVER SMOOTH PAVEMENT (BASE AND INTERMEDIATE COURSES) AND 0.07 GAL/SY OVER MILLED SURFACE.
2. ASPHALT EMULSION FOR TACK COAT SHALL BE (RS-1H) TO RESIST TRACKING BY HAUL VEHICLES AND BOND HMA LAYERS FOR FLEXURAL STRENGTH.
3. HMA WALKS AND DRIVEWAYS SHALL BE IN ACCORDANCE WITH SECTION 702. AND 703. AND SHALL BE 50 GYRATION MIXTURES.

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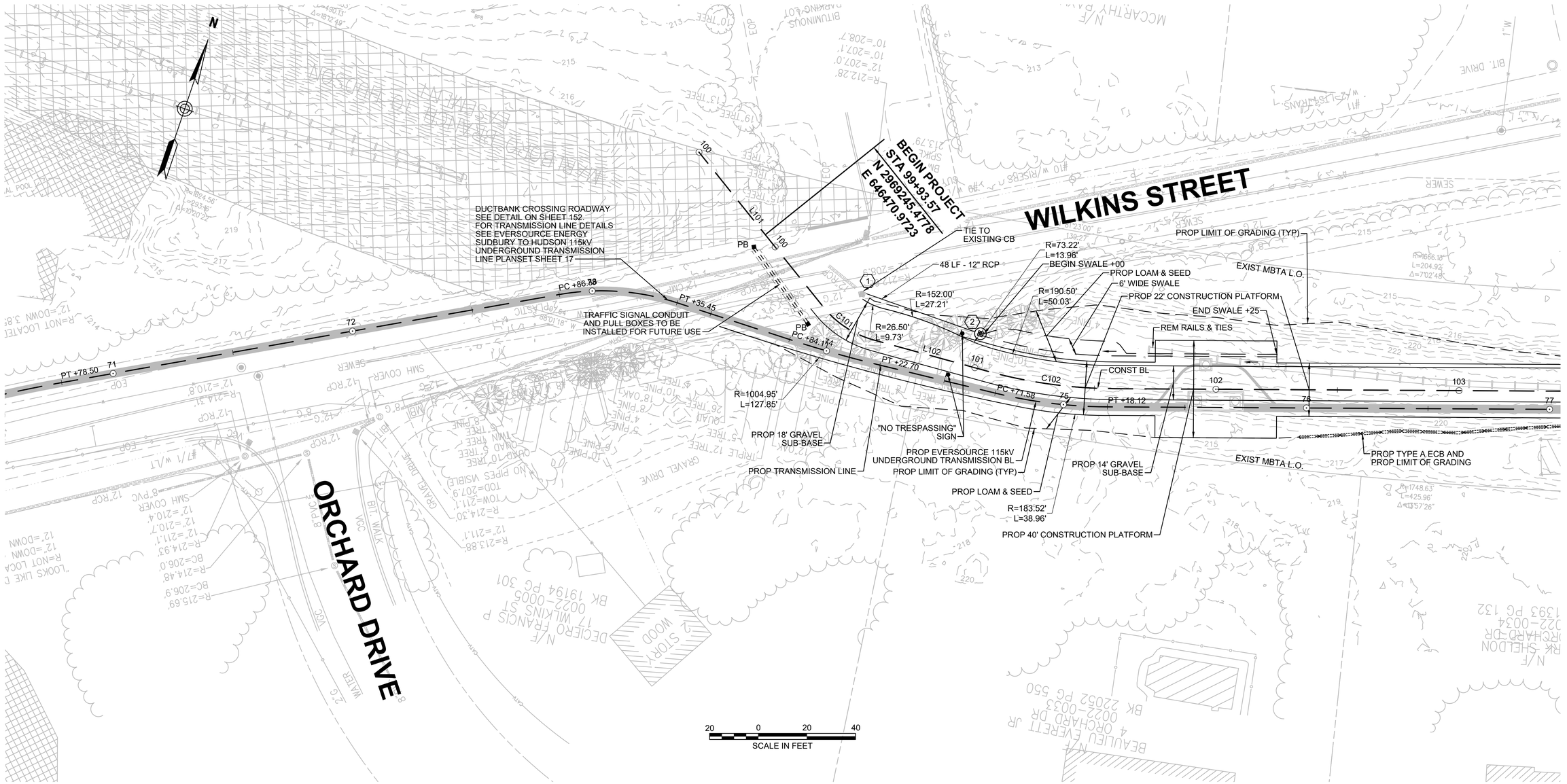
NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
TYPICAL SECTIONS

PLAN 23 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
NTS	DEC 2021	MS	SK	MES	.	.



DRAINAGE STRUCTURE TABLE						
NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
1	EX CB	STA 100+39, 15.5' LT	212.68 (EX)	209.00' (2)	208.9' (EX)	
2	SHALLOW CB	STA 100+99, 14.1' LT	212.55		209.60'	SEE CONSTRUCTION DETAIL ON SHEET 156

NOTE:
1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED FEBRUARY 5, 2018 (MADEP FILE NO.190-0611).

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

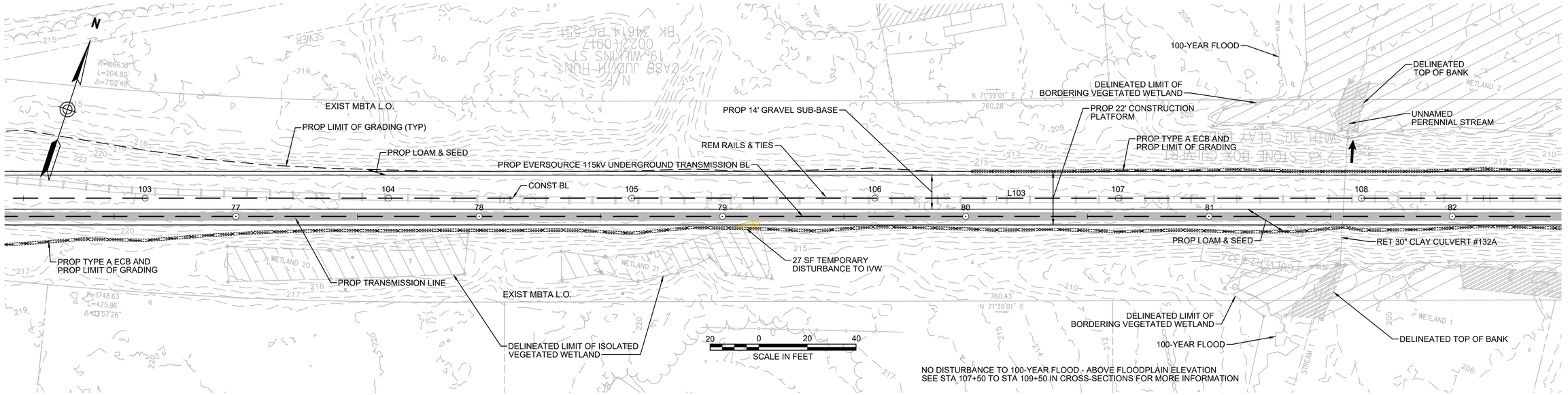
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

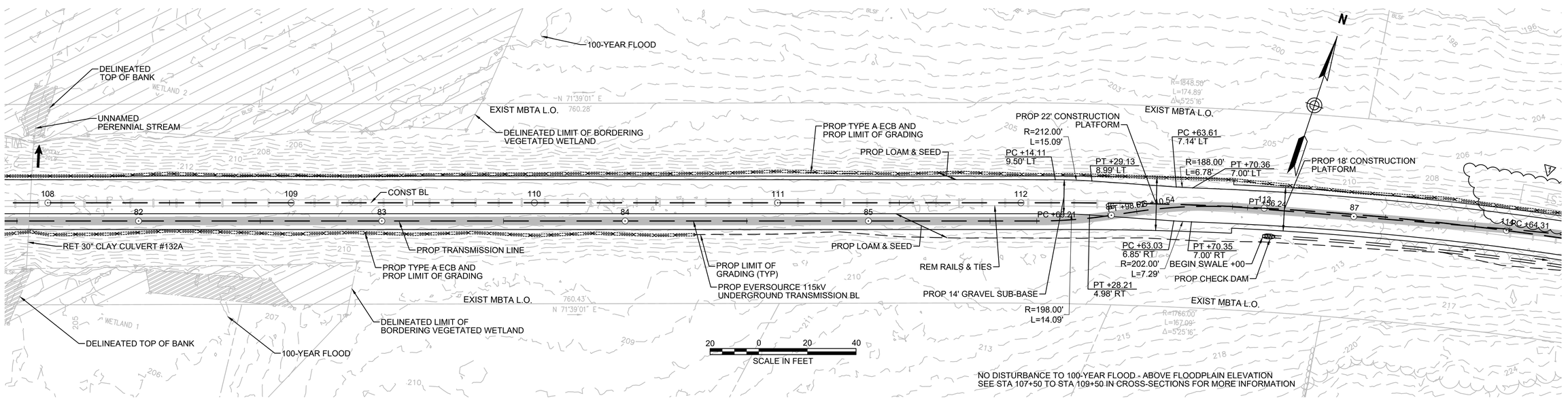
CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 24 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.





NOTE:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED FEBRUARY 5, 2018 (MADEP FILE NO.190-0611).

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 25 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	SB	SK	MES	.	.

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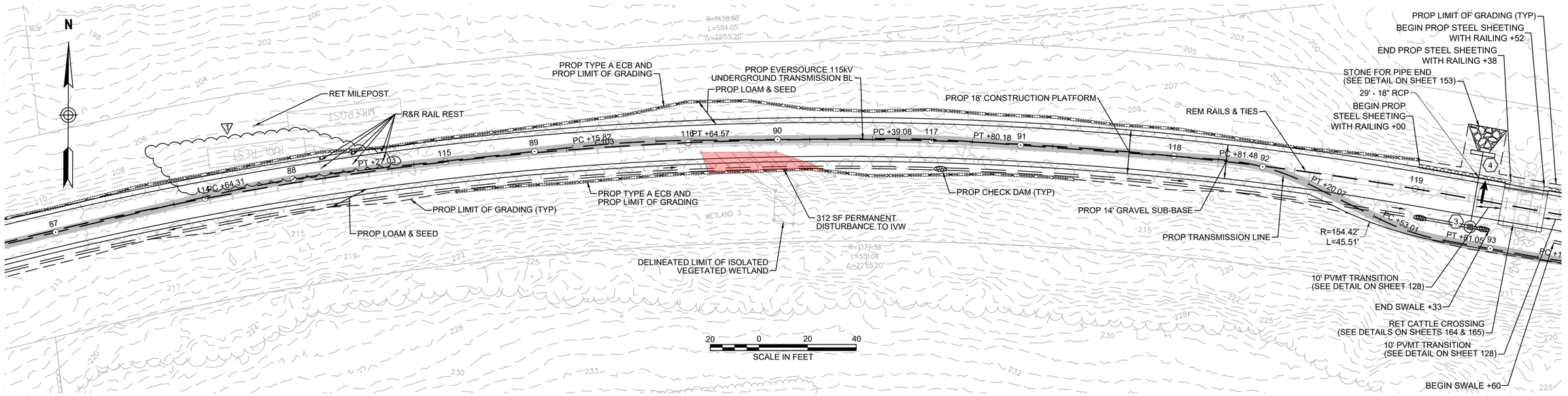

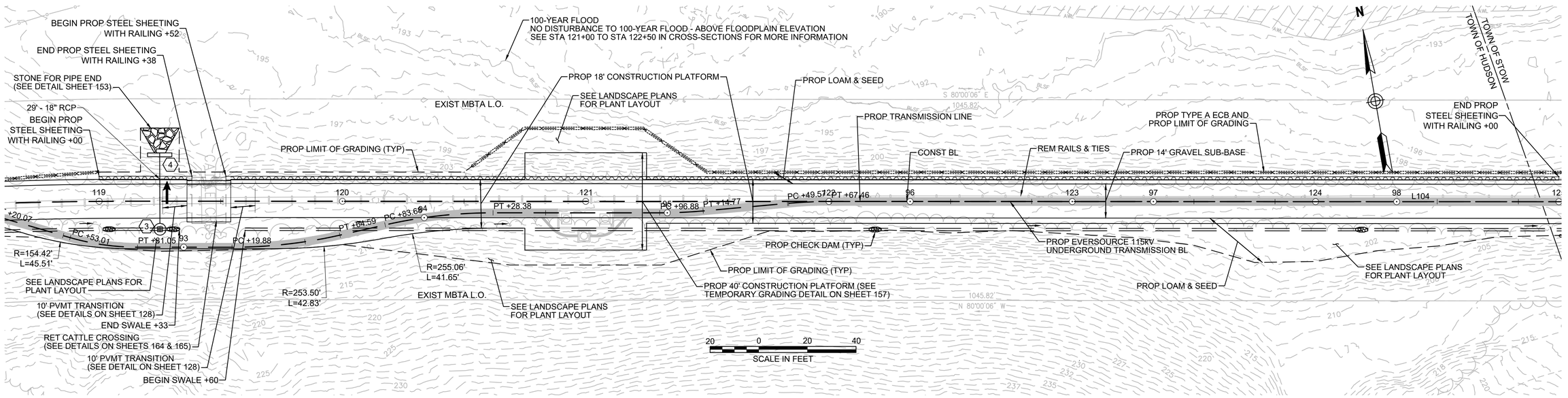

DRAINAGE STRUCTURE TABLE						
NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
3	Leaching Catch Basin	STA 119+25, 11.5' RT	207.24		199.17'	CONTRACTOR TO PROVIDE
4	Concrete Headwall	STA 119+25, 19.1' LT			197.91'	12" REVEAL

NOTE:
1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED FEBRUARY 5, 2018 (MADEP FILE NO.190-0611).

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NO.	DESCRIPTION	BY	DATE	APPR.
1	HISTORIC FEATURE DISPOSITIONS		02/03/2022	

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

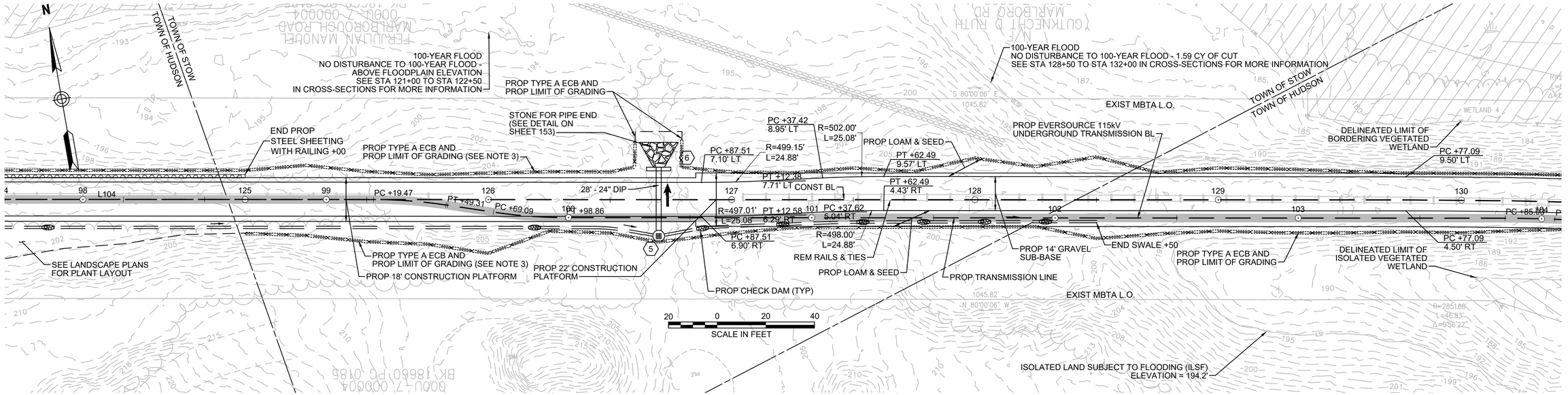
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 26 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	SB	SK	MES	.	.



DRAINAGE STRUCTURE TABLE						
NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
5	SHALLOW CB	STA 126+70, 15.0' RT	201.58		198.10'	SEE CONSTRUCTION DETAIL ON SHEET 156
6	Concrete Headwall	STA 126+70, 13.3' LT			197.61'	12" REVEAL

NOTE:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED FEBRUARY 5, 2018 (MADEP FILE NO.190-0611).
2. NO SOIL STOCKPILES SHALL BE ALLOWED WITHIN THE TOWN OF STOW.
3. ALL LIMITS OF GRADING WITHIN THE TOWN OF STOW SHALL BE DEMARCATED BY TYPE A EROSION CONTROL BARRIER OR TEMPORARY CONSTRUCTION FENCING.
4. THE STOW CONSERVATION COMMISSION SHALL BE NOTIFIED IN THE EVENT THAT ANY DUST CONTROL BEYOND WATER SPRAYING IS REQUIRED WITHIN THE TOWN OF STOW.

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

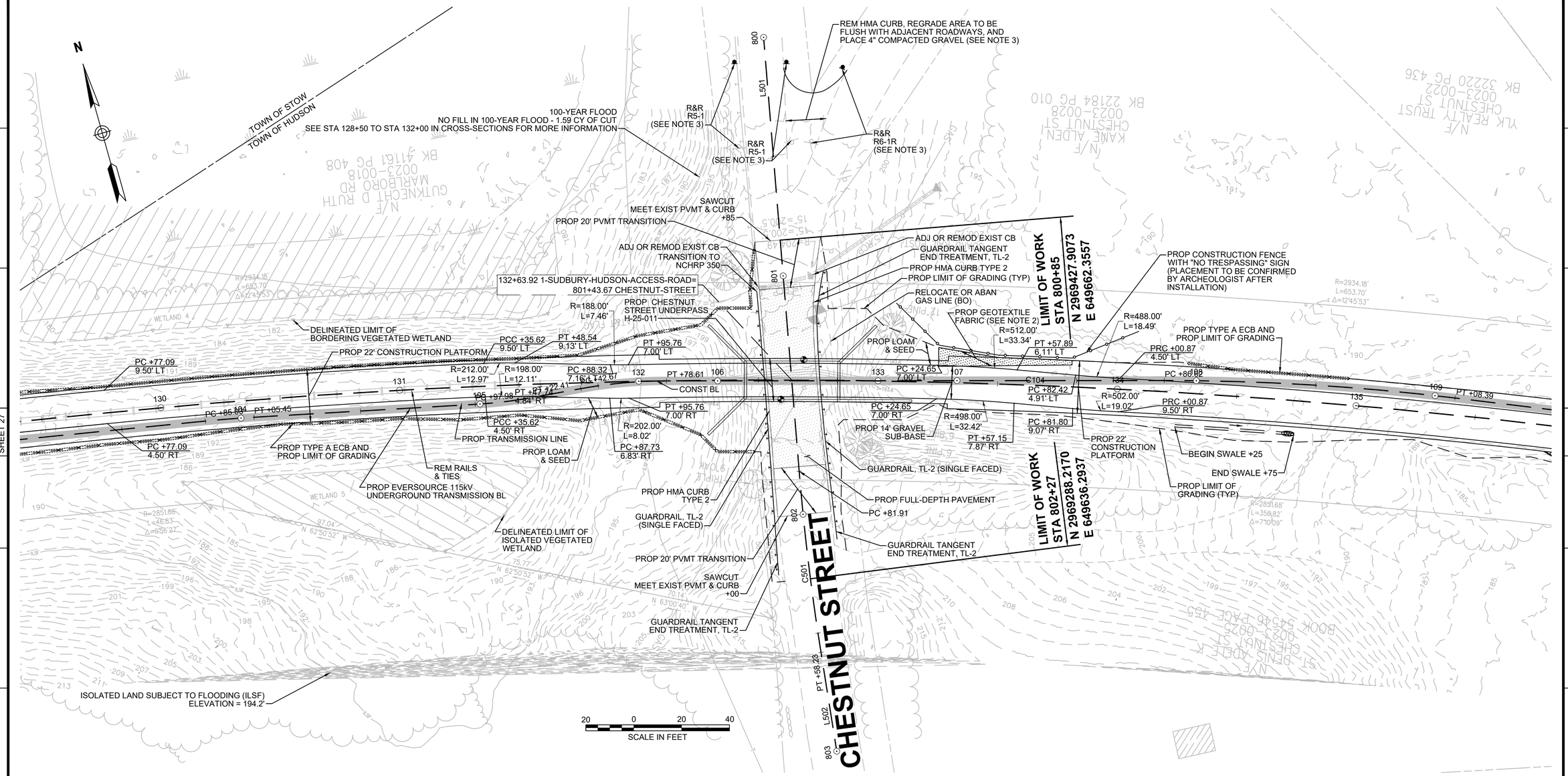
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 27 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	SB	SK	MES	.	.



NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED FEBRUARY 5, 2018 (MADEP FILE NO. 190-0611).
2. CONTRACTOR TO INSTALL GEOTEXTILE FABRIC UNDERNEATH 4" LOAM & SEED WITHIN LIMITS SHOWN.
3. CONTRACTOR TO HAVE COMPACTED GRAVEL IN PLACE AND SIGNS REMOVED AND RESET BEFORE CHESTNUT STREET IS CLOSED TO TRAFFIC. CONTRACTOR TO RESTORE AREA TO ORIGINAL CONDITIONS AFTER CHESTNUT STREET UNDERPASS IS CONSTRUCTED AND CHESTNUT STREET IS REOPENED TO TRAFFIC.
4. FOR CHESTNUT STREET PROFILE, SEE SHEET 95.

NO.	DESCRIPTION	BY	DATE	APPR.
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CONSTRUCTION PLANS

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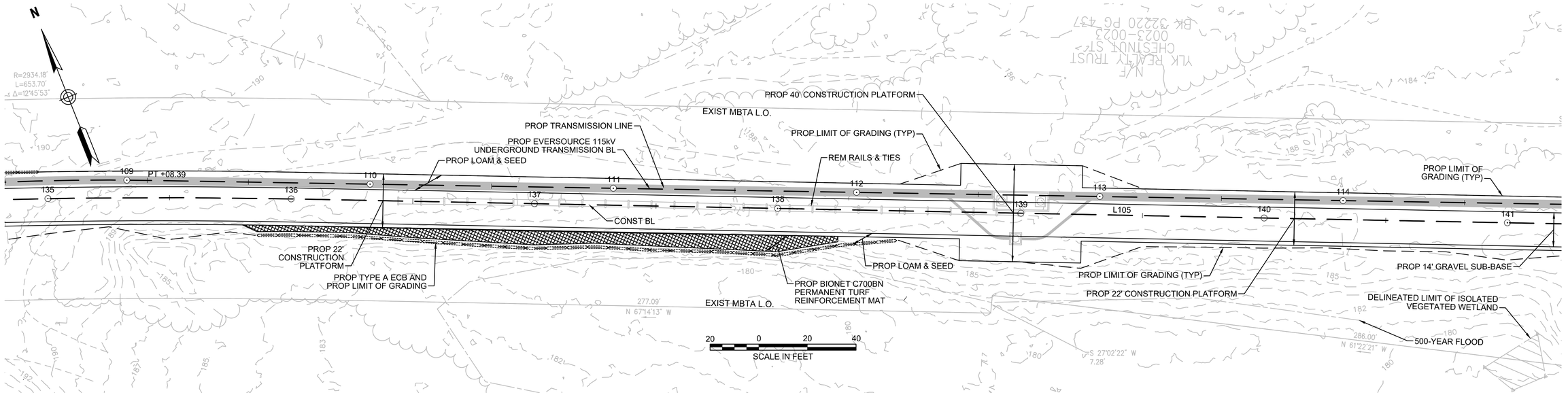
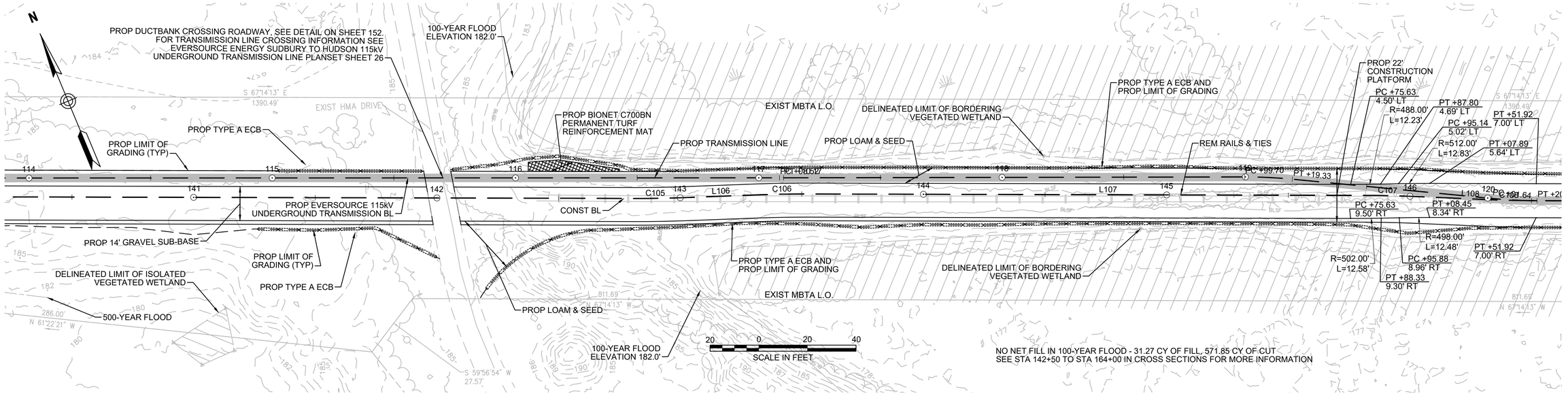
PLAN 28 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.

CONT. ON SHEET 28

CONT. BELOW





NO NET FILL IN 100-YEAR FLOOD - 31.27 CY OF FILL, 571.85 CY OF CUT
SEE STA 142+50 TO STA 164+00 IN CROSS SECTIONS FOR MORE INFORMATION

CONT. ABOVE

CONT. ON SHEET 30

NOTE:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED FEBRUARY 5, 2018 (MADEP FILE NO.190-0611).

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

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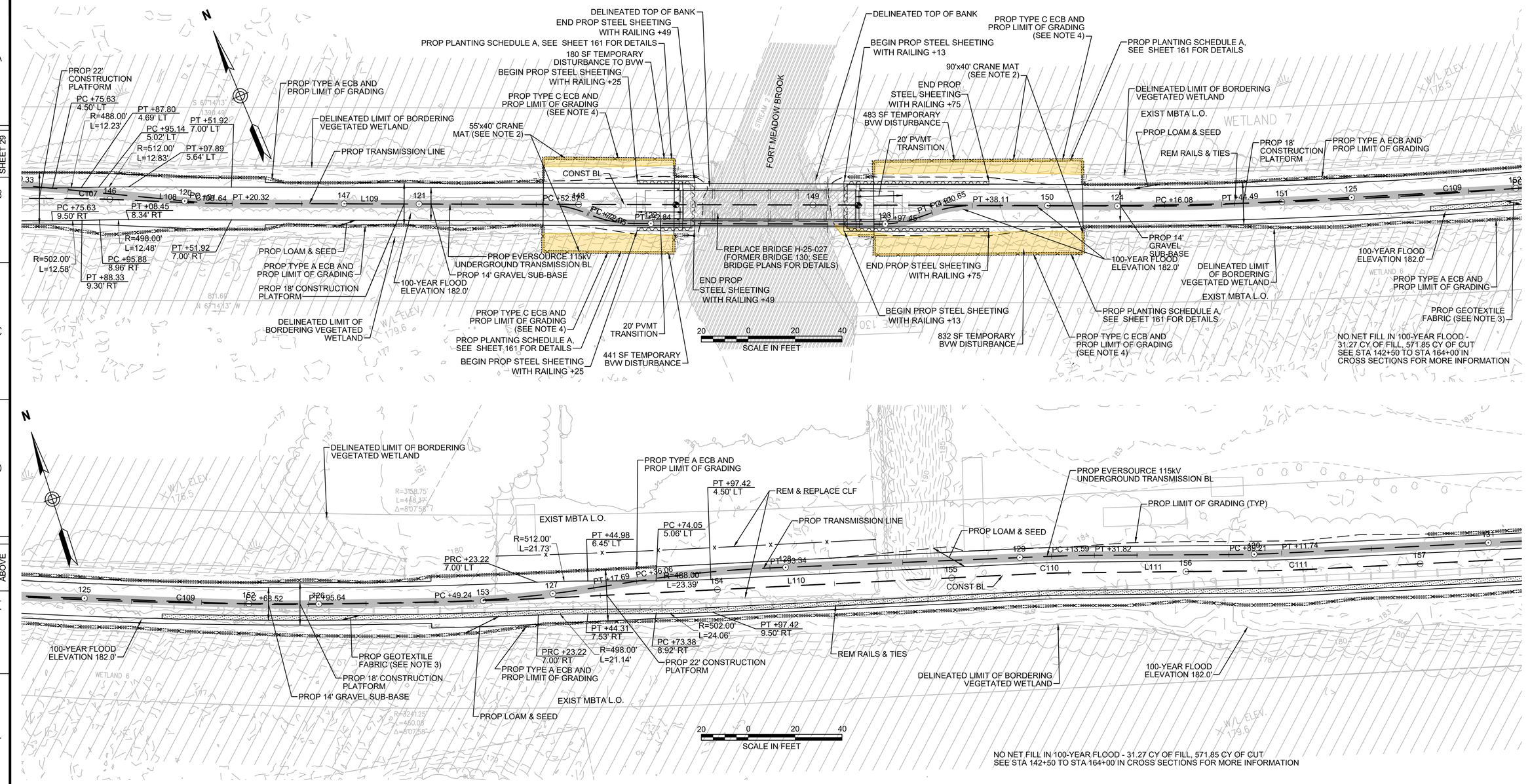
PLAN 29 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED FEBRUARY 5, 2018 (MADEP FILE NO.190-0611).
2. MAXIMUM CRANE PAD DIMENSIONS OF 40'X40' ARE ALLOWED AT ANY GIVEN TIME. A LONGER CRANE MAT FOOTPRINT IS SHOWN HERE TO ALLOW THE CRANE MAT LOCATION TO BE SHIFTED DURING CONSTRUCTION OF THE STEEL SHEETING AND BRIDGE. SEE SHEET 160 FOR CRANE MAT RESTORATION DETAILS.
3. CONTRACTOR TO INSTALL GEOTEXTILE FABRIC UNDERNEATH 8" GRAVEL BORROW WITHIN LIMITS SHOWN.
4. TYPE C ECB SHALL CONSIST OF EITHER STAKED 4' HIGH SILT FENCE OR BOTTOM-ANCHORED TURBIDITY CURTAIN DEPENDING ON WATER LEVELS AT THE TIME OF CONSTRUCTION. THE APPROPRIATE ECB SHALL BE INSTALLED AT THE DIRECTION OF THE ENVIRONMENTAL MONITOR.

NO.	DESCRIPTION	BY	DATE	APPR.

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

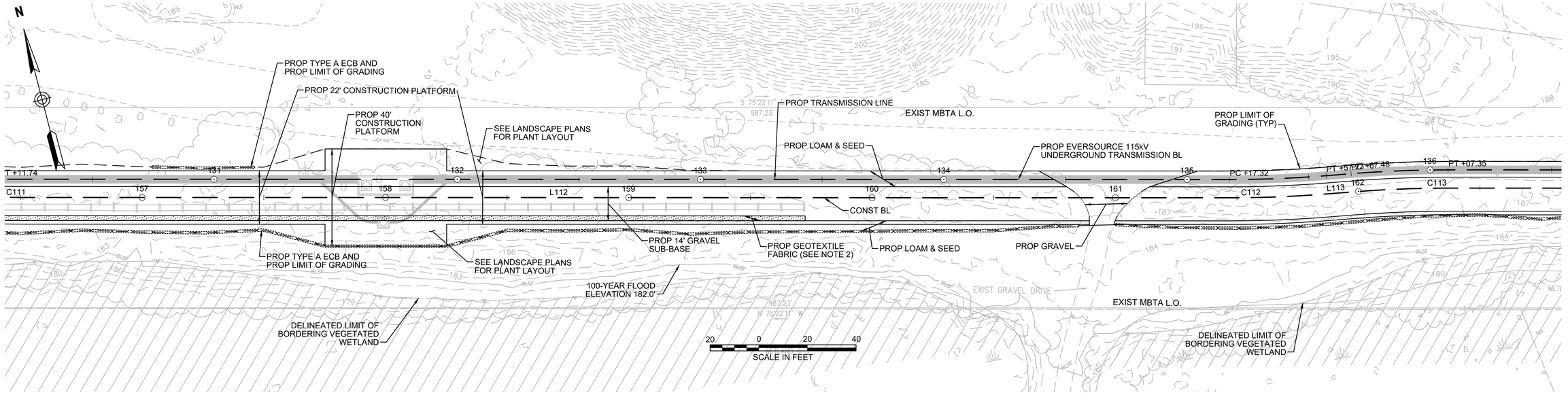
INFORMATIONAL SET, FOR REFERENCE ONLY

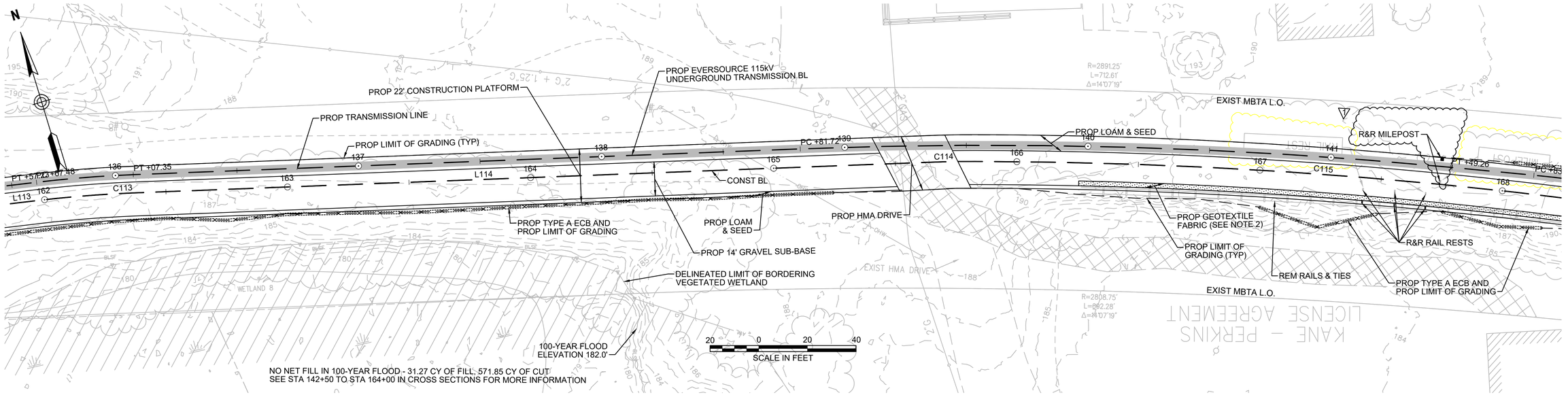
PLAN 30 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.

CONT. ON SHEET 30

CONT. BELOW





NO NET FILL IN 100-YEAR FLOOD - 31.27 CY OF FILL, 571.85 CY OF CUT
SEE STA 142+50 TO STA 164+00 IN CROSS SECTIONS FOR MORE INFORMATION

NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED FEBRUARY 5, 2018 (MADEP FILE NO.190-0611).
2. CONTRACTOR TO INSTALL GEOTEXTILE FABRIC UNDERNEATH 8" GRAVEL BORROW WITHIN LIMITS SHOWN.

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NO.	REVISION DESCRIPTION	BY	DATE	APPR.
1	HISTORIC FEATURE DISPOSITIONS		02/03/2022	

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

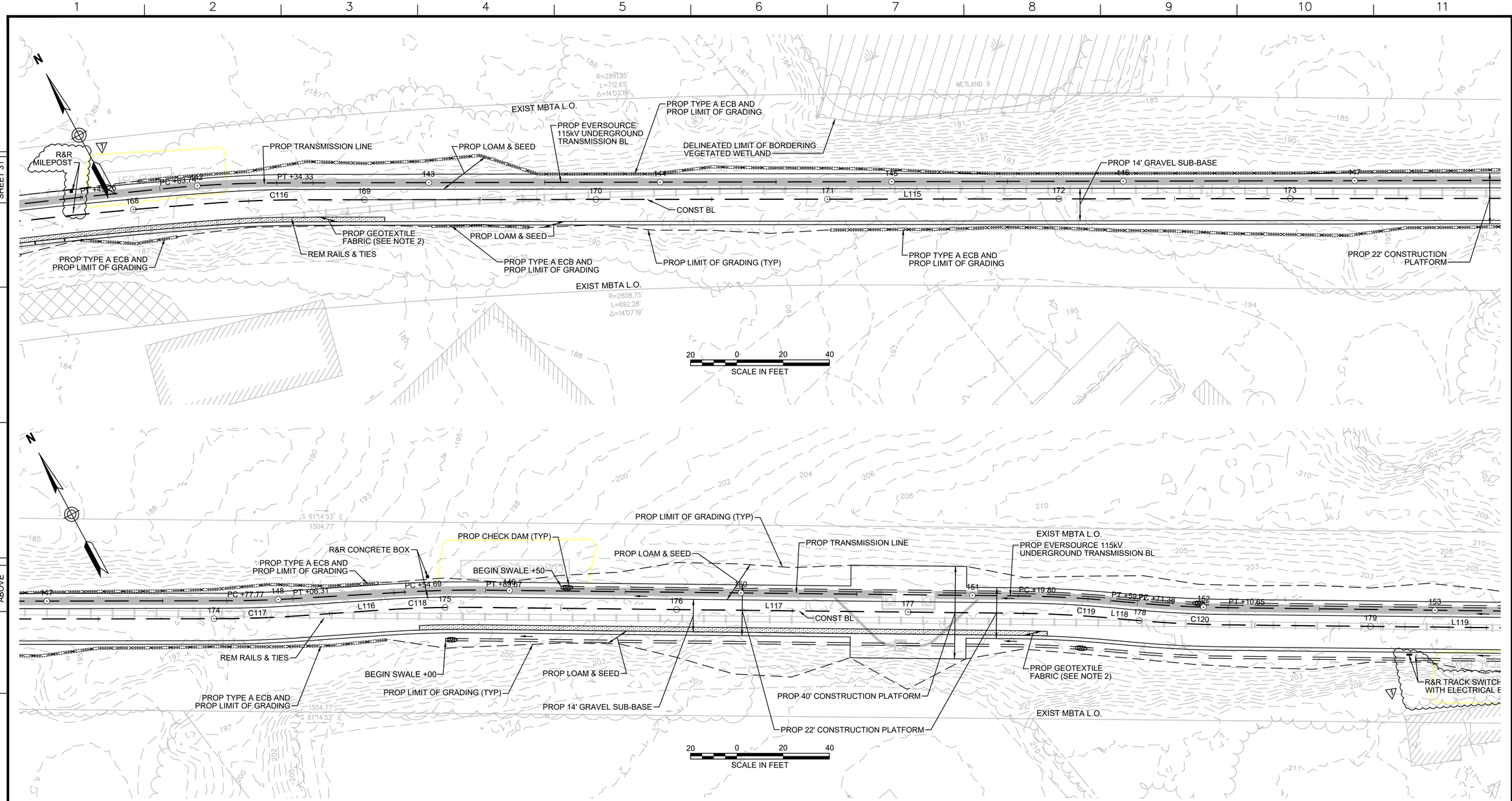
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 31 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED FEBRUARY 5, 2018 (MADEP FILE NO.190-0611).
2. CONTRACTOR TO INSTALL GEOTEXTILE FABRIC UNDERNEATH 8" GRAVEL BORROW WITHIN LIMITS SHOWN.

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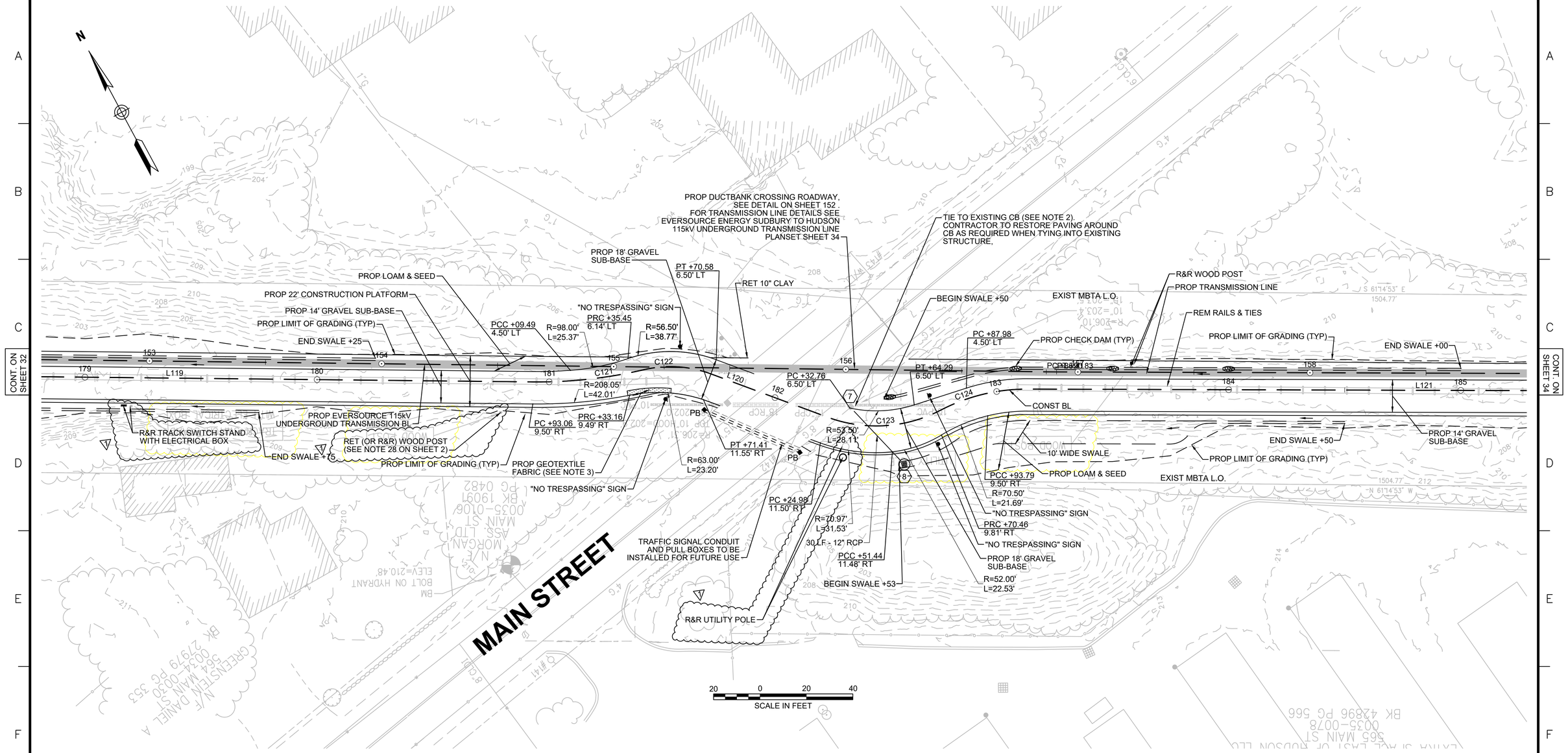
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 32 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



DRAINAGE STRUCTURE TABLE						
NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
7	EX CB	STA 182+32, 6.9' RT	206.10 (EX)	203.90' (8)	203.5 (EX)	
8	SHALLOW CB	STA 182+55, 15.3' RT	205.44		203.50'	SEE CONSTRUCTION DETAIL ON SHEET 156

NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED FEBRUARY 5, 2018 (MADEP FILE NO.190-0611).
2. CONTRACTOR TO VERIFY EXISTING DRAINAGE DISCHARGE PRIOR TO CONSTRUCTION.
3. CONTRACTOR TO INSTALL GEOTEXTILE FABRIC UNDERNEATH 8" GRAVEL BORROW WITHIN LIMITS SHOWN.

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NO.	DESCRIPTION	BY	DATE	APPR.
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

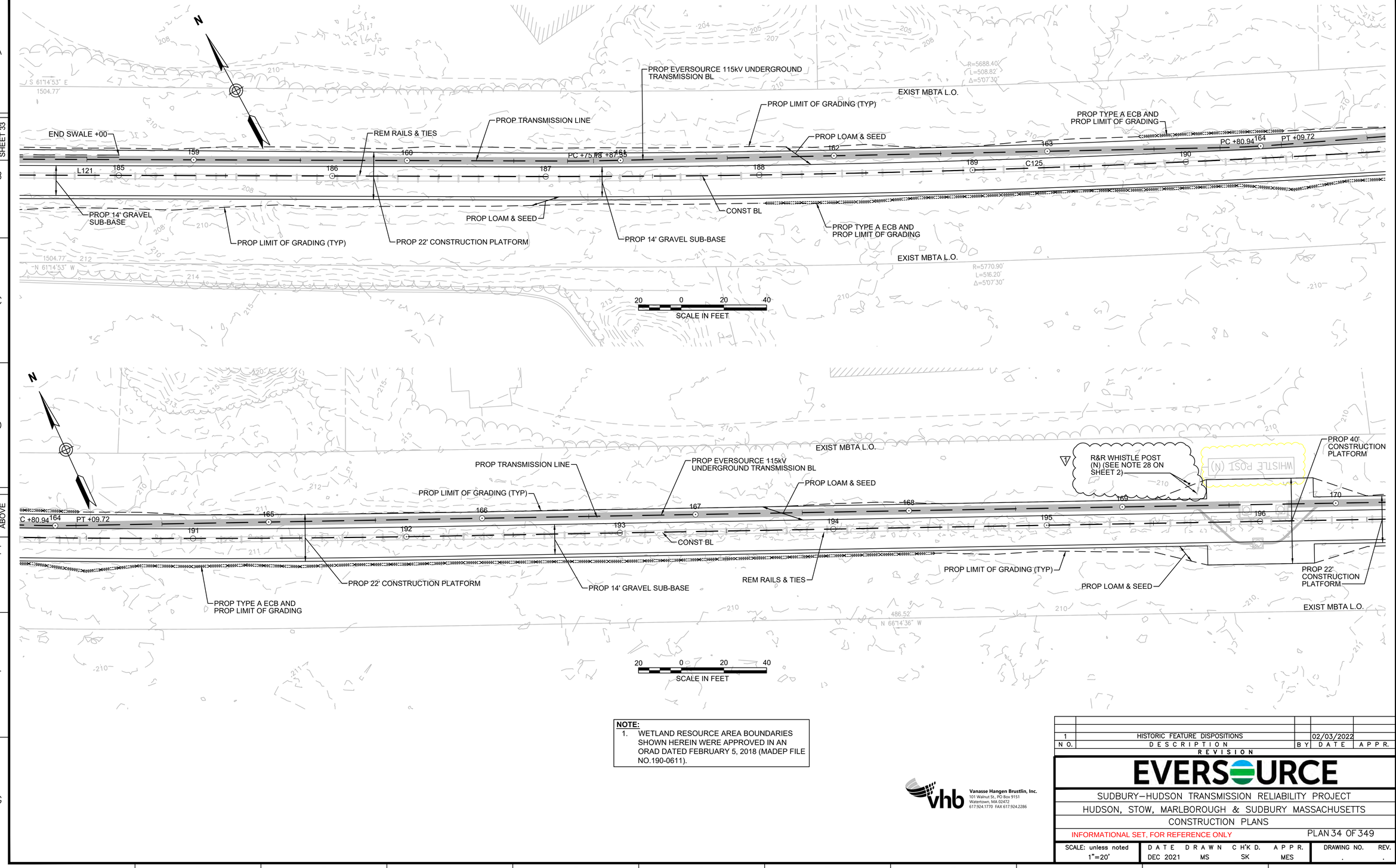
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 33 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



NOTE:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED FEBRUARY 5, 2018 (MADEP FILE NO.190-0611).

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			
1	HISTORIC FEATURE DISPOSITIONS		02/03/2022	

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 34 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.

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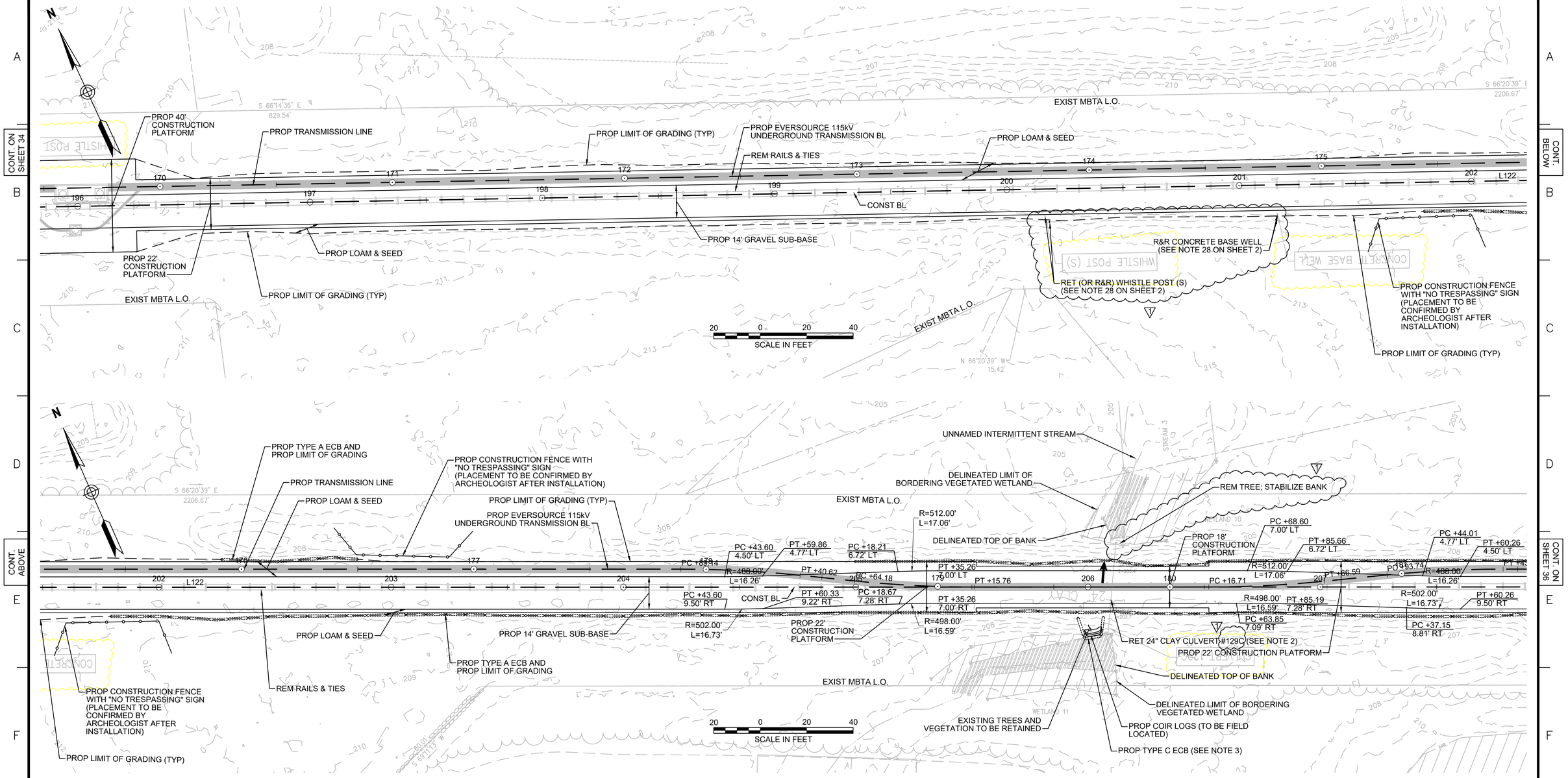

NOTE:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED FEBRUARY 5, 2018 (MADEP FILE NO.190-0611).
2. CONTRACTOR TO CUT TREE ON NORTHEAST CORNER OF PIPE. NO GRUBBING TO BE PERFORMED OUTSIDE OF LIMITS OF GRADING.
3. TYPE C ECB SHALL CONSIST OF EITHER STAKED 4' HIGH SILT FENCE OR BOTTOM-ANCHORED TURBIDITY CURTAIN DEPENDING ON WATER LEVELS AT THE TIME OF CONSTRUCTION. THE APPROPRIATE ECB SHALL BE INSTALLED AT THE DIRECTION OF THE ENVIRONMENTAL MONITOR.

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CONSTRUCTION PLANS

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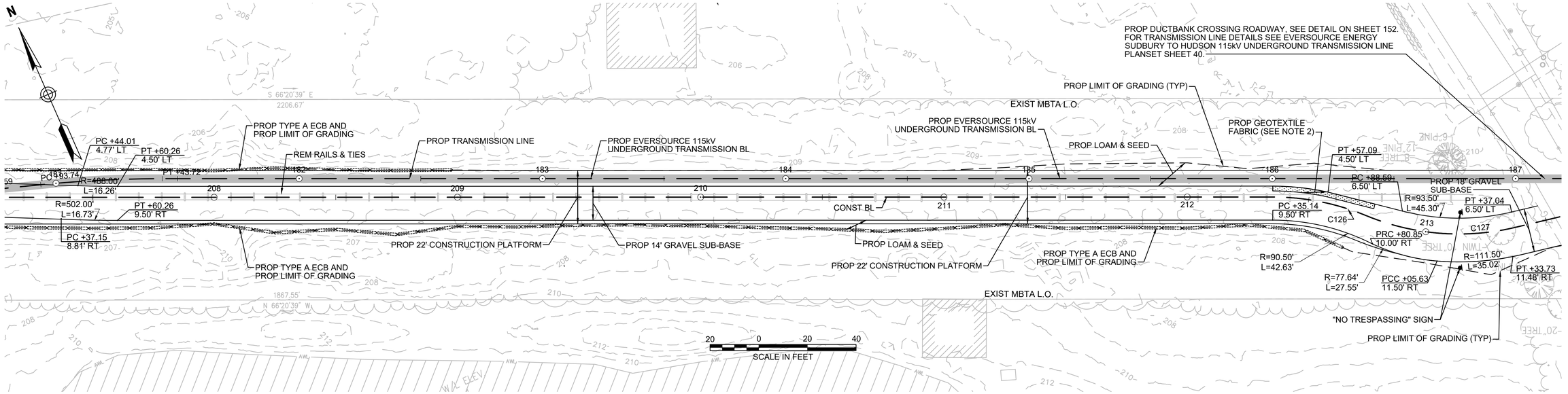
PLAN 35 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED FEBRUARY 5, 2018 (MADEP FILE NO.190-0611).
2. CONTRACTOR TO INSTALL GEOTEXTILE FABRIC UNDERNEATH 8" GRAVEL BORROW WITHIN LIMITS SHOWN.

Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

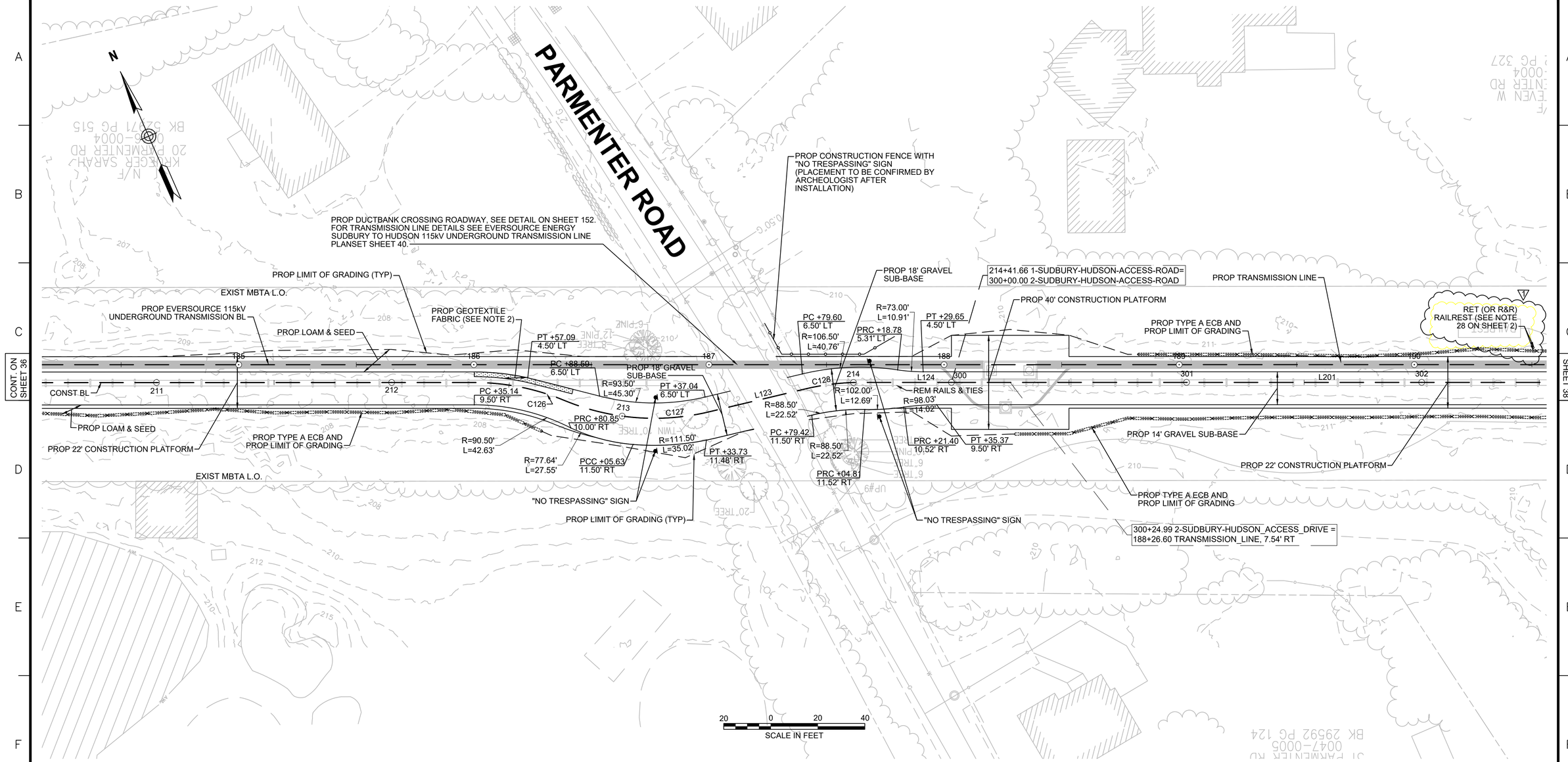
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 36 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



NOTES:

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NO.	DESCRIPTION	BY	DATE	APPR.
1	HISTORIC FEATURE DISPOSITIONS		02/03/2022	

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 37 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.

1-SUDBURY-HUDSON-ACCESS-ROAD CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L101	99+50.00	2969274.969	646438.132		S57° 19' 07"E 81.72'	100+31.72	2969230.845	646506.912
C101	100+31.72	2969230.845	646506.912	R=40.00' Δ=35°52'18" L=25.04' T=12.95'		100+56.76	2969224.574	646530.737
L102	100+56.76	2969224.574	646530.737		N86° 48' 34"E 48.81'	101+05.57	2969227.291	646579.472
C102	101+05.57	2969227.291	646579.472	R=200.00' Δ=15°02'47" L=52.52' T=26.41'		101+58.09	2969237.027	646630.930
L103	101+58.09	2969237.027	646630.930		N71° 45' 47"E 1063.15'	112+21.25	2969569.737	647640.682
C103	112+21.25	2969569.737	647640.682	R=1400.00' Δ=28°11'56" L=689.03' T=351.64'		119+10.28	2969618.950	648321.003
L104	119+10.28	2969618.950	648321.003		S80° 02' 16"E 1065.88'	129+76.16	2969434.556	649370.812
C104	129+76.16	2969434.556	649370.812	R=2800.00' Δ=12°47'24" L=625.04' T=313.83'		136+01.20	2969258.894	649969.313
L105	136+01.20	2969258.894	649969.313		S67° 14' 52"E 680.66'	142+81.86	2968995.652	650597.005
C105	142+81.86	2968995.652	650597.005	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		143+01.85	2968988.291	650615.589
L106	143+01.85	2968988.291	650615.589		S69° 32' 18"E 30.05'	143+31.90	2968977.787	650643.741
C106	143+31.90	2968977.787	650643.741	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		143+51.89	2968970.427	650662.324
L107	143+51.89	2968970.427	650662.324		S67° 14' 52"E 230.01'	145+81.89	2968881.472	650874.434
C107	145+81.89	2968881.472	650874.434	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		146+01.88	2968873.375	650892.709
L108	146+01.88	2968873.375	650892.709		S64° 57' 26"E 30.05'	146+31.93	2968860.656	650919.932
C108	146+31.93	2968860.656	650919.932	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		146+51.92	2968852.559	650938.207
L109	146+51.92	2968852.559	650938.207		S67° 14' 52"E 358.25'	150+10.17	2968714.005	651268.583
C109	150+10.17	2968714.005	651268.583	R=2300.00' Δ=8°06'43" L=325.63' T=163.09'		153+35.80	2968609.711	651576.773
L110	153+35.80	2968609.711	651576.773		S75° 21' 35"E 196.11'	155+31.91	2968560.145	651766.511
C110	155+31.91	2968560.145	651766.511	R=500.00' Δ=2°17'05" L=19.94' T=9.97'		155+51.85	2968554.722	651785.695
L111	155+51.85	2968554.722	651785.695		S73° 04' 30"E 80.40'	156+32.25	2968531.316	651862.614
C111	156+32.25	2968531.316	651862.614	R=500.00' Δ=2°17'05" L=19.94' T=9.97'		156+52.19	2968525.894	651881.798
L112	156+52.19	2968525.894	651881.798		S75° 21' 35"E 494.94'	161+47.12	2968400.798	652360.665
C112	161+47.12	2968400.798	652360.665	R=500.00' Δ=4°34'26" L=39.91' T=19.97'		161+87.04	2968392.260	652399.645
L113	161+87.04	2968392.260	652399.645		S79° 56' 01"E 10.22'	161+97.26	2968390.473	652409.711
C113	161+97.26	2968390.473	652409.711	R=500.00' Δ=4°34'26" L=39.91' T=19.97'		162+37.18	2968381.936	652448.692
L114	162+37.18	2968381.936	652448.692		S75° 21' 35"E 325.80'	165+62.97	2968299.591	652763.911
C114	165+62.97	2968299.591	652763.911	R=500.00' Δ=2°17'07" L=19.94' T=9.97'		165+82.92	2968294.166	652783.101
C115	165+82.92	2968294.166	652783.101	R=2000.00' Δ=7°17'45" L=254.67' T=127.51'		168+37.59	2968204.731	653021.372
C116	168+37.59	2968204.731	653021.372	R=500.00' Δ=3°55'20" L=34.23' T=17.12'		168+71.82	2968189.631	653052.082

1-SUDBURY-HUDSON-ACCESS-ROAD CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L115	168+71.82	2968189.631	653052.082		S61° 51' 22"E 529.98'	174+01.80	2967939.647	653519.398
C117	174+01.80	2967939.647	653519.398	R=500.00' Δ=3°54'19" L=34.08' T=17.05'		174+35.88	2967924.608	653549.974
L116	174+35.88	2967924.608	653549.974		S65° 45' 41"E 36.37'	174+72.25	2967909.677	653583.135
C118	174+72.25	2967909.677	653583.135	R=500.00' Δ=4°35'46" L=40.11' T=20.07'		175+12.35	2967891.763	653619.009
L117	175+12.35	2967891.763	653619.009		S61° 09' 55"E 234.86'	177+47.22	2967778.491	653824.754
C119	177+47.22	2967778.491	653824.754	R=500.00' Δ=4°34'29" L=39.92' T=19.97'		177+87.14	2967757.862	653858.921
L118	177+87.14	2967757.862	653858.921		S56° 35' 26"E 10.72'	177+97.86	2967751.962	653867.866
C120	177+97.86	2967751.962	653867.866	R=500.00' Δ=4°35'18" L=40.04' T=20.03'		178+37.90	2967731.276	653902.137
L119	178+37.90	2967731.276	653902.137		S61° 10' 44"E 255.16'	180+93.06	2967608.269	654125.690
C121	180+93.06	2967608.269	654125.690	R=200.00' Δ=13°48'39" L=48.21' T=24.22'		181+41.27	2967590.318	654170.307
C122	181+41.27	2967590.318	654170.307	R=50.00' Δ=33°35'20" L=29.31' T=15.09'		181+70.58	2967575.091	654194.862
L120	181+70.58	2967575.091	654194.862		S41° 24' 03"E 53.66'	182+24.24	2967534.839	654230.350
C123	182+24.24	2967534.839	654230.350	R=60.00' Δ=47°56'15" L=50.20' T=26.67'		182+74.44	2967514.523	654274.663
C124	182+74.44	2967514.523	654274.663	R=80.00' Δ=27°43'21" L=38.71' T=19.74'		183+13.15	2967504.910	654311.769
L121	183+13.15	2967504.910	654311.769		S61° 36' 57"E 368.60'	186+81.74	2967329.686	654636.052
C125	186+81.74	2967329.686	654636.052	R=6500.00' Δ=4°41'05" L=531.46' T=265.88'		192+13.21	2967096.424	655113.425
L122	192+13.21	2967096.424	655113.425		S66° 18' 02"E 2021.93'	212+35.14	2966283.729	656964.841
C126	212+35.14	2966283.729	656964.841	R=100.00' Δ=22°30'52" L=39.30' T=19.90'		212+74.44	2966261.359	656996.840
C127	212+74.44	2966261.359	656996.840	R=100.00' Δ=35°52'08" L=62.60' T=32.37'		213+37.04	2966232.181	657051.075
L123	213+37.04	2966232.181	657051.075		S79° 39' 18"E 42.56'	213+79.60	2966224.538	657092.945
C128	213+79.60	2966224.538	657092.945	R=100.00' Δ=13°22'03" L=23.33' T=11.72'		214+02.93	2966217.721	657115.202
L124	214+02.93	2966217.721	657115.202		S66° 17' 15"E 38.73'	214+41.66	2966202.144	657150.666

CHESTNUT-STREET CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L501	800+00.00	2969511.351	649678.545		S10° 58' 48"W 181.91'	801+81.91	2969332.767	649643.897
C501	801+81.91	2969332.767	649643.897	R=1000.00' Δ=4°22'21" L=76.32' T=38.18'		802+58.23	2969257.368	649632.233
L502	802+58.23	2969257.368	649632.233		S6° 36' 27"W 41.77'	803+00.00	2969215.874	649627.426

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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

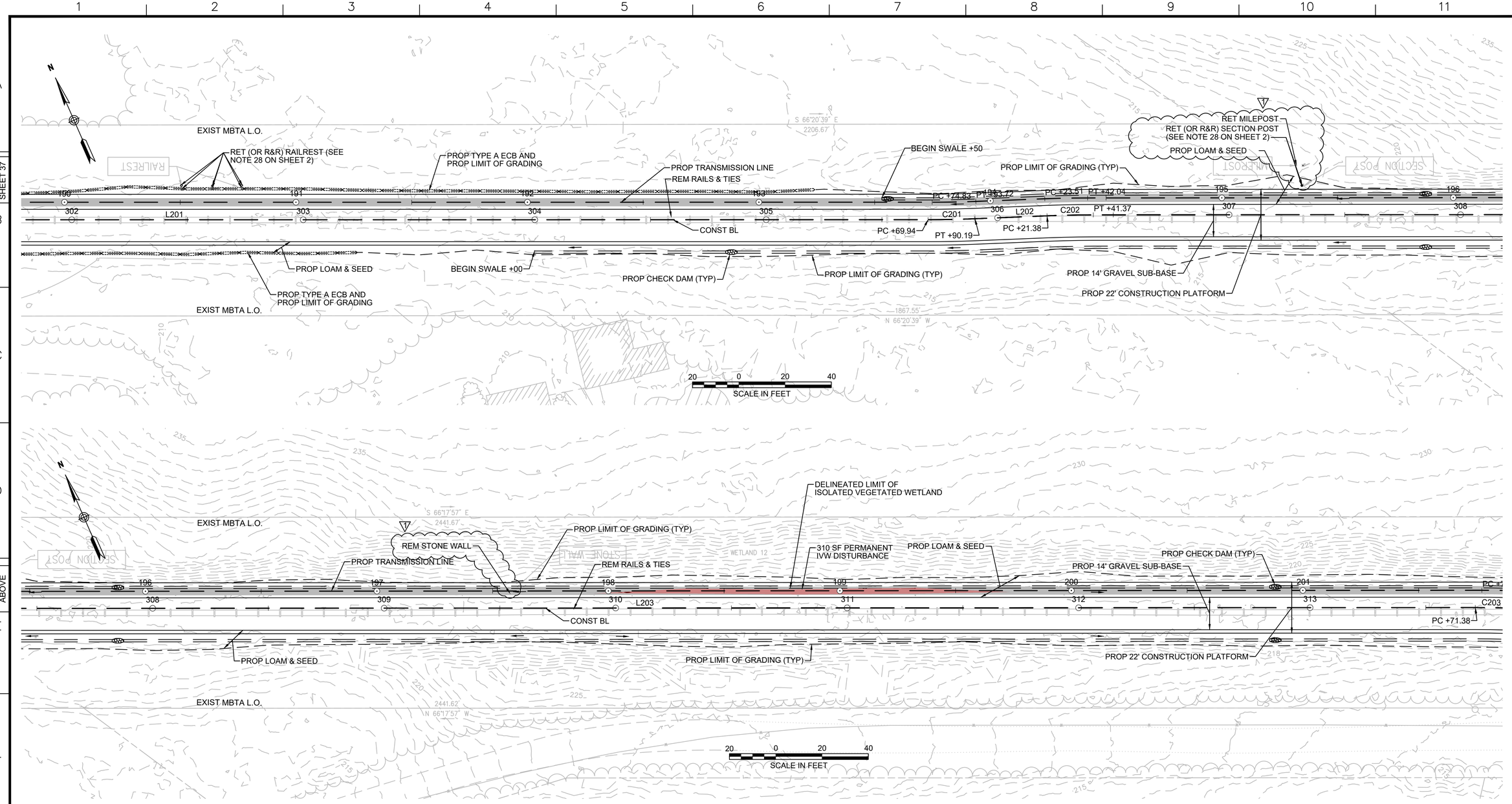
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION BASELINE DATA

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 71 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



NOTE:

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 38 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.

CONT. ON SHEET 38

CONT. BELOW

316+25 2-SUDBURY-HUDSON_ACCESS_DRIVE =
204+26.59 TRANSMISSION_LINE, 7.54' RT

EXIST MBTA L.O.

PROP LIMIT OF GRADING (TYP)

PROP 22' CONSTRUCTION PLATFORM

PROP TRANSMISSION LINE

END SWALE +25

PROP 22' CONSTRUCTION PLATFORM

PROP TYPE A ECB AND
PROP LIMIT OF GRADING

PROP LOAM & SEED

PC +77.34 L203 PT +53.38

PC +37.50 PT +53.45

314 203 315 204 316 205 317 206 318 207 319

C203 L204 C204 PT +40.99

PC +71.38 PT +91.37 PC +21.05

CONST BL

REM RAILS & TIES

END SWALE +75

PROP LOAM & SEED

PROP 14' GRAVEL SUB-BASE

PROP LIMIT OF GRADING (TYP)

PROP CHECK DAM (TYP)

PROP 40'
CONSTRUCTION
PLATFORM

EXIST MBTA L.O.

20 0 20 40
SCALE IN FEET

CONT. ABOVE

CONT. ON SHEET 40

EXIST MBTA L.O.

S 66°17'57" E
2441.67

PROP TYPE A ECB AND
PROP LIMIT OF GRADING

PROP LOAM & SEED

PROP TRANSMISSION LINE

REM RAILS & TIES

PROP 22' CONSTRUCTION PLATFORM

207 319 208 320 209 321 210 322 211 323 212 324 213 325

CONST BL

PROP LOAM & SEED

PROP 14' GRAVEL SUB-BASE

PROP LIMIT OF GRADING (TYP)

PROP TYPE A ECB AND
PROP LIMIT OF GRADING

EXIST MBTA L.O.

2441.62'
N 66°17'57" W

BM
STONE BOUND
ELEV=202.07

100-YEAR FLOOD

20 0 20 40
SCALE IN FEET

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CONSTRUCTION PLANS

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PLAN 39 OF 349

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1"=20'	DEC 2021	MS	SK	MES	.	.

CONT. ON SHEET 39

NO IMPACTS TO 100-YEAR FLOOD - NO FILL IN FLOODPLAIN
SEE STA 326+00 TO STA 331+50 IN CROSS- SECTIONS FOR MORE INFORMATION

EXIST MBTA L.O.

PROP TYPE A ECB AND PROP LIMIT OF GRADING

PROP TRANSMISSION LINE

DELINEATED LIMIT OF BORDERING VEGETATED WETLAND

100-YEAR FLOOD

PROP 22' CONSTRUCTION PLATFORM

PROP LOAM & SEED

CONST BL

REM RAILS & TIES

PROP LOAM & SEED

PROP TYPE A ECB AND PROP LIMIT OF GRADING

PROP 14' GRAVEL SUB-BASE

DELINEATED LIMIT OF BORDERING VEGETATED WETLAND

EXIST MBTA L.O.

100-YEAR FLOOD

WETLAND 14

WETLAND 13

S 66°17'57" E 2441.67'

N 66°17'57" W 2441.82'

BLSF

L205

213 214 215 216 217 218
325 326 327 328 329 330

20 0 20 40
SCALE IN FEET

CONT. BELOW

CONT. ABOVE

100-YEAR FLOOD

DELINEATED LIMIT OF BORDERING VEGETATED WETLAND

EXIST MBTA L.O.

NO IMPACTS TO 100-YEAR FLOOD - NO FILL IN FLOODPLAIN
SEE STA 326+00 TO STA 331+50 IN CROSS- SECTIONS FOR MORE INFORMATION

PROP TYPE A ECB AND PROP LIMIT OF GRADING

PROP TRANSMISSION LINE

PROP TYPE B ECB AND PROP LIMIT OF GRADING

PROP LOAM & SEED

REM RAILS & TIES

PROP 22' CONSTRUCTION PLATFORM

PROP LIMIT OF GRADING (TYP)

"NO TRESPASSING" SIGN

PT +25.50
4.50' LT

CONST BL

PROP LOAM & SEED

PROP TYPE A ECB AND PROP LIMIT OF GRADING

PROP TYPE B ECB AND PROP LIMIT OF GRADING

PROP 14' GRAVEL SUB-BASE

PT +25.50
9.50' RT

PROP LIMIT OF GRADING (TYP)

PROP 40' CONSTRUCTION PLATFORM

335+25 2-SUDBURY-HUDSON_ACCESS_DRIVE = 223+26.59 TRANSMISSION_LINE, 7.55' RT

EXIST MBTA L.O.

DELINEATED LIMIT OF BORDERING VEGETATED WETLAND

100-YEAR FLOOD

S 66°16'51" E 2172.27'

N 66°16'51" W 2172.26'

210 220 221 222 223 224
331 332 333 334 335 336

20 0 20 40
SCALE IN FEET

CONT. ON SHEET 41

NOTE:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED FEBRUARY 5, 2018 (MADEP FILE NO.190-0611).
2. SYNCOPATED SILT FENCE (TYPE B ECB) TO BE USED WITHIN PRIORITY HABITAT AREA AND WITHIN 450' OF VERNAL POOLS. SEE DETAIL ON SHEET 154.

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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

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PLAN 40 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
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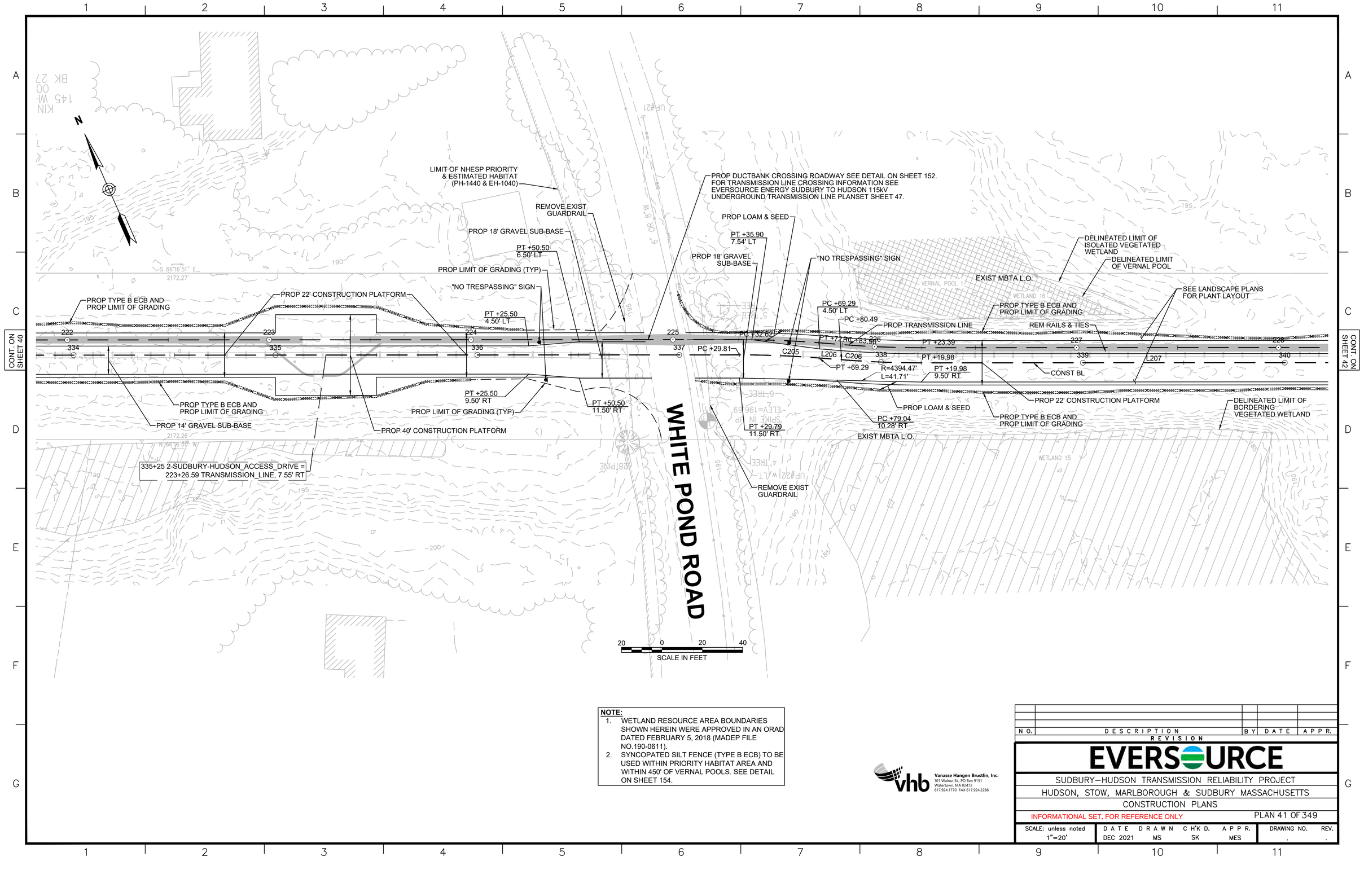

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NO.	DESCRIPTION	BY	DATE	APP'R.
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PLAN 41 OF 349

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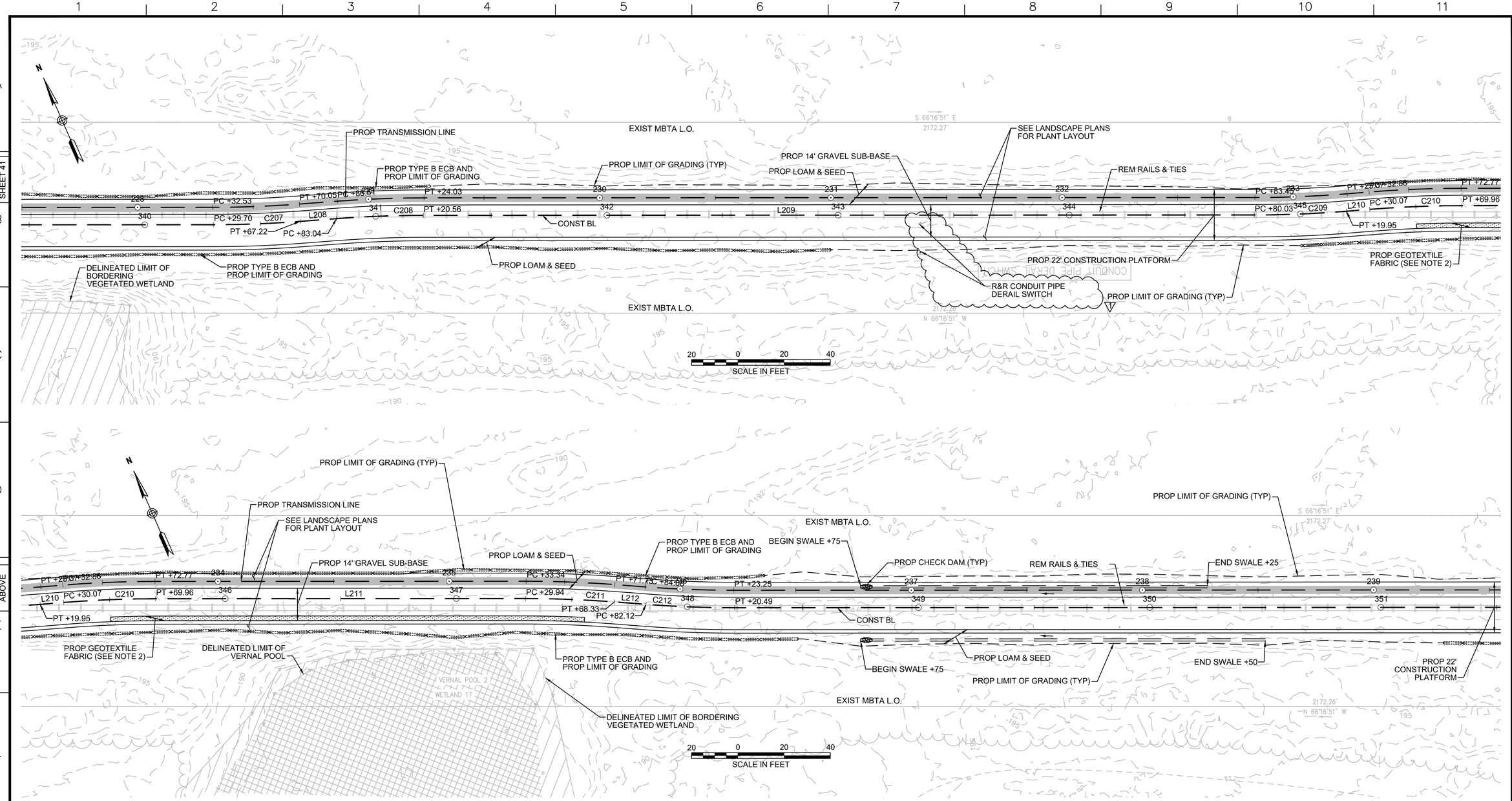

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NO.	DESCRIPTION	BY	DATE	APPR.
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PLAN 42 OF 349

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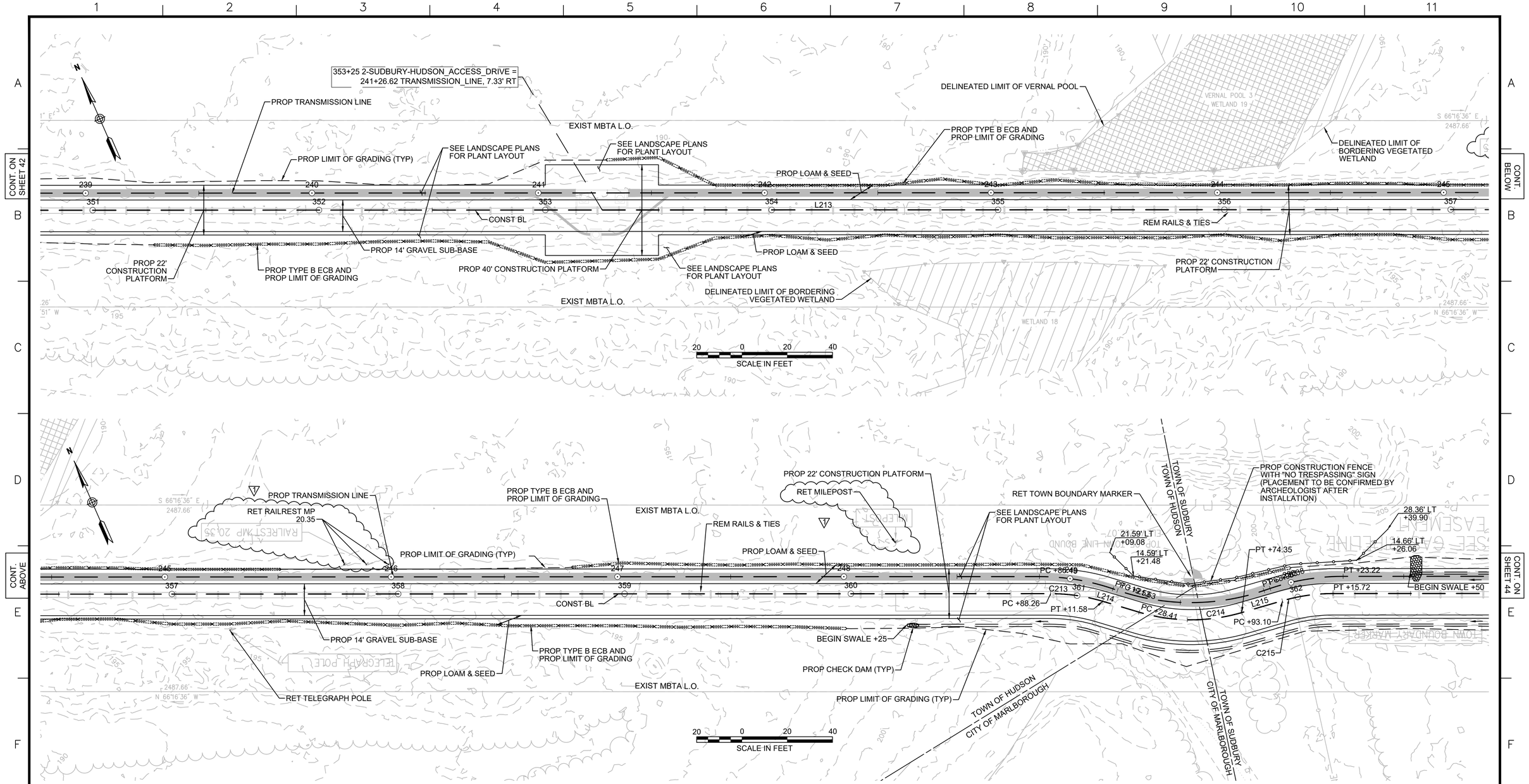

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NO.	DESCRIPTION	BY	DATE	APPR.
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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

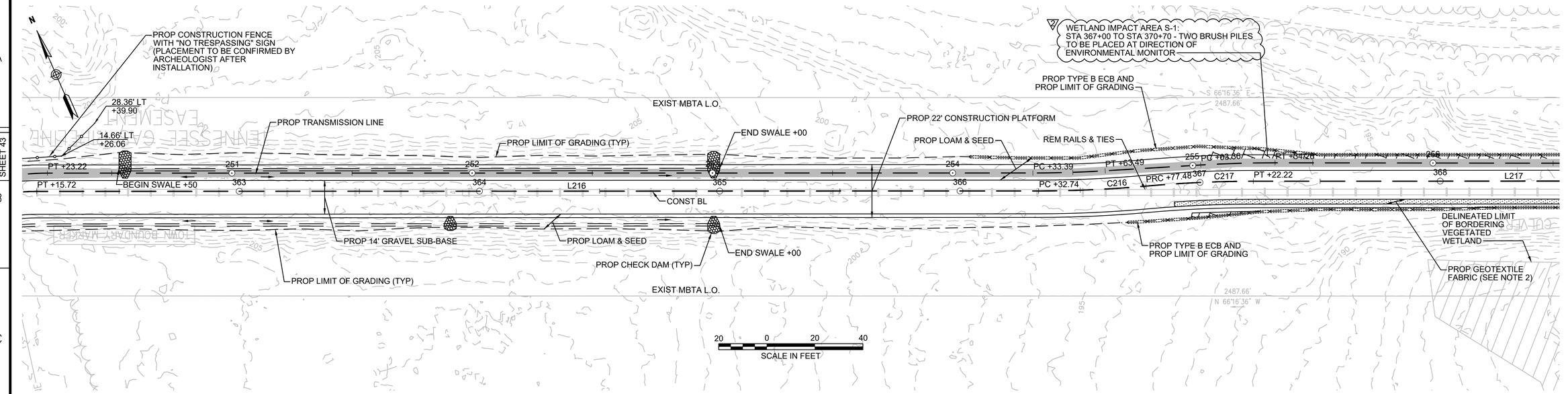
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

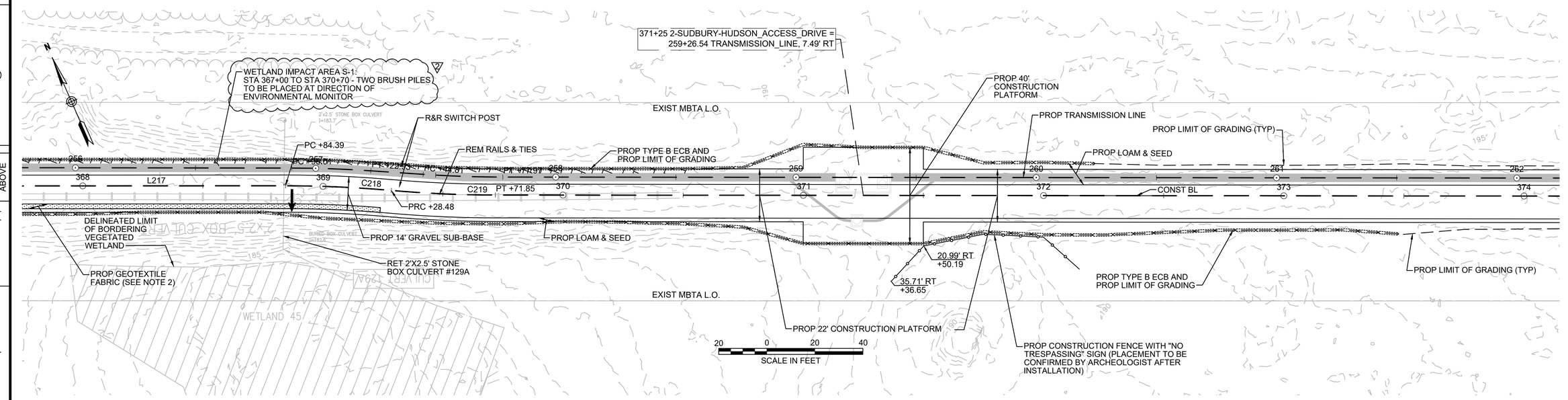
CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 43 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.





NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO.301-1227).
2. CONTRACTOR TO INSTALL GEOTEXTILE FABRIC UNDERNEATH 8" GRAVEL BORROW WITHIN LIMITS SHOWN.
3. SYNCOPATED SILT FENCE (TYPE B ECB) TO BE USED WITHIN PRIORITY HABITAT AREA AND 450' OF VERNAL POOLS. SEE DETAIL ON SHEET 154.

NO.	DESCRIPTION	BY	DATE	APPR.
2	ENVIRONMENTAL EDITS		03/28/2022	

REVISION

Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 44 OF 349

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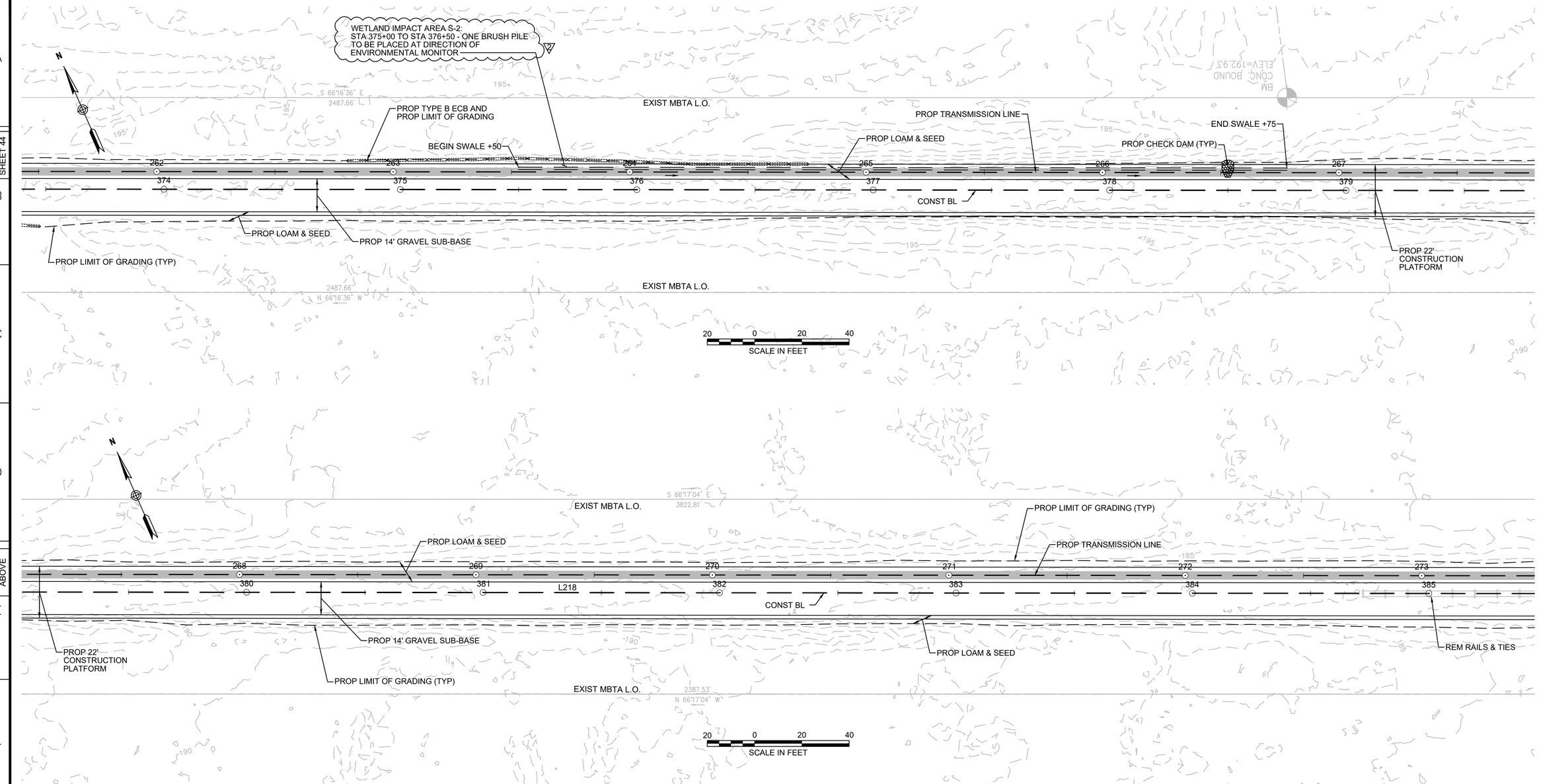

NOTE:

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NO.	DESCRIPTION	BY	DATE	APPR.
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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

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PLAN 45 OF 349

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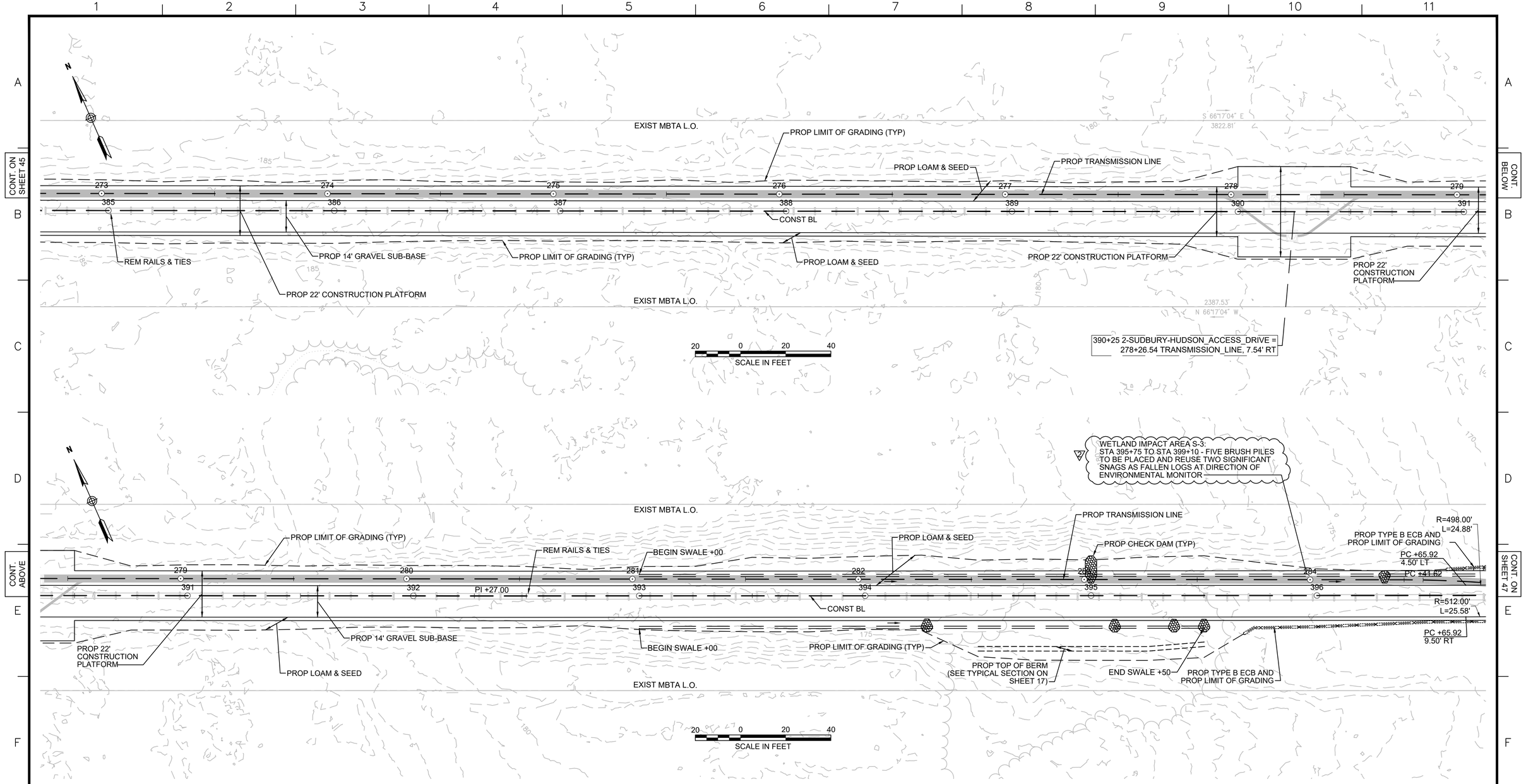

NOTE:

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2. SYNCOPATED SILT FENCE (TYPE B ECB) TO BE USED WITHIN PRIORITY HABITAT AREA AND 450' OF VERNAL POOLS. SEE DETAIL ON SHEET 154.

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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

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PLAN 46 OF 349

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1"=20'	DEC 2021	MS	SK	MES	.	.

CONT. ON SHEET 46

WETLAND IMPACT AREA S-3:
STA 395+75 TO 399+10 - REUSE TWO EXISTING SNAGS AS FALLEN LOGS AT DIRECTION OF ENVIRONMENTAL MONITOR. WORK WITH ENVIRONMENTAL MONITOR TO DETERMINE IF SNAG ON SOUTHERN LIMIT OF WORK CAN BE SAVED

WETLAND IMPACT AREA S-4:
STA 399+10 TO 400+10

WETLAND IMPACT AREA S-5:
STA 400+60 TO STA 401+65 - REUSE TWO EXISTING SNAGS AS FALLEN LOGS AT DIRECTION OF ENVIRONMENTAL MONITOR. WORK WITH ENVIRONMENTAL MONITOR TO DETERMINE IF SNAG ON NORTHERN LIMIT OF WORK CAN BE SAVED

PROP CHECK DAM (TYP)
EXIST MBTA L.O.
R=498.00' L=24.88'
PT +90.79 5.12' LT
END SWALE +00
PROP TYPE B ECB AND PROP LIMIT OF GRADING
PC +15.84 6.37' LT
PROP LIMIT OF GRADING (TYP)
PC +65.92 4.50' LT
PC +41.62
PT +85.46
R=502.00' L=25.08'
PT +40.91 7.00' LT
PC +15.82
PC +15.08
PT +60.54
R=512.00' L=25.58'
R=488.00' L=24.38'
PT +40.91 7.00' RT
PC +65.92 9.50' RT
REM RAILS & TIES
PC +16.54 7.61' RT
PROP 22' CONSTRUCTION PLATFORM
PROP LOAM & SEED
PT +91.49 8.86' RT
PROP 14' GRAVEL SUB-BASE
DELINEATED LIMIT OF BORDERING VEGETATED WETLAND
100-YEAR FLOOD ELEVATION 161.0'
100-YEAR FLOOD ELEVATION 161.0'
DELINEATED LIMIT OF BORDERING VEGETATED WETLAND
PROP TYPE B ECB AND PROP LIMIT OF GRADING
PROP LOAM & SEED
PROP TYPE B ECB AND PROP LIMIT OF GRADING
PROP 18' CONSTRUCTION PLATFORM
SEE LANDSCAPE PLANS FOR PLANT LAYOUT
EXIST MBTA L.O.
BEGIN PROP STEEL SHEETING WITH RAILING +91
20' PVMT TRANSITION
END PROP STEEL SHEETING WITH RAILING +08
BEGIN PROP STEEL SHEETING WITH RAILING +50
END PROP STEEL SHEETING WITH RAILING +09
85'x40' CRANE MAT (SEE NOTE 2)
CONST BL
L210
HOP BROOK
DELINEATED TOP OF BANK
DELINEATED TOP OF BANK
BEGIN PROP STEEL SHEETING WITH RAILING +56
20' PVMT TRANSITION
BEGIN PROP STEEL SHEETING WITH RAILING +55
REHABILITATE BRIDGE S-31-017 (FORMER BRIDGE 128; SEE BRIDGE PLANS FOR DETAILS)
DELINEATED LIMIT OF BORDERING VEGETATED WETLAND
95'x40' CRANE MAT (SEE NOTE 2)
END PROP STEEL SHEETING WITH RAILING +25
END PROP STEEL SHEETING WITH RAILING +25
SEE LANDSCAPE PLANS FOR PLANT LAYOUT
LIMIT OF NHESP PRIORITY & ESTIMATED HABITAT (PH-1440 & EH-1040)
100-YEAR FLOOD ELEVATION 161.0'
PROP TYPE B ECB AND PROP LIMIT OF GRADING
PROP 18" CONSTRUCTION PLATFORM
PROP TYPE B ECB AND PROP LIMIT OF GRADING
100-YEAR FLOOD ELEVATION 161.0'
WETLAND 44
WETLAND 43

SCALE IN FEET (20 0 20 40)

NO FILL IN 100-YEAR FLOOD ABOVE FLOODPLAIN ELEVATION
SEE STA 398+00 TO STA 402+00 IN CROSS-SECTIONS FOR MORE INFORMATION

CONT. BELOW

CONT. ABOVE

LIMIT OF NHESP PRIORITY & ESTIMATED HABITAT (PH-1440 & EH-1040)
100-YEAR FLOOD ELEVATION 161.0'
WETLAND IMPACT AREA S-6:
STA 401+65 TO STA 403+50 - ONE BRUSH PILE TO BE PLACED AT DIRECTION OF ENVIRONMENTAL MONITOR
WETLAND IMPACT AREA S-7:
STA 405+00 TO STA 416+40 - FIVE BRUSH PILES TO BE PLACED AND REUSE TWO SNAGS AT DIRECTION OF ENVIRONMENTAL MONITOR. WORK WITH ENVIRONMENTAL MONITOR TO DETERMINE IF SNAGS ON LIMITS OF WORK CAN REMAIN
DELINEATED LIMIT OF BORDERING VEGETATED WETLAND
PROP 40' CONSTRUCTION PLATFORM
PROP TRANSMISSION LINE
PROP 22' CONSTRUCTION PLATFORM
EXIST MBTA L.O.
PROP LIMIT OF GRADING (TYP)
PROP TYPE B ECB AND PROP LIMIT OF GRADING
PROP LOAM & SEED
SEE LANDSCAPE PLANS FOR PLANT LAYOUT
DELINEATED LIMIT OF VERNAL POOL
PROP TYPE B ECB AND PROP LIMIT OF GRADING
R=502.00' L=25.08'
PT +12.58 6.37' LT
PC +37.62 5.12' LT
PC +48.49
R=498.00' L=24.88'
PT +62.49 4.50' LT
PC +87.51 7.00' LT
PT +03.77
PC +66.39
PT +62.41
CONST BL
PC +37.42 8.87' RT
PT +62.49 9.50' RT
R=498.00' L=24.88'
PC +87.51 7.00' RT
PT +12.38 7.62' RT
14.25' RT +74.99
20.73' RT +61.46
PROP 18" CONSTRUCTION PLATFORM
PROP 14' GRAVEL SUB-BASE
PROP CONSTRUCTION FENCE WITH "NO TRESPASSING" SIGN (PLACEMENT TO BE CONFIRMED BY ARCHEOLOGIST AFTER INSTALLATION)
PROP LOAM & SEED
BEGIN SWALE +50
PROP 22' CONSTRUCTION PLATFORM
404+75 2-SUDBURY-HUDSON_ACCESS_DRIVE = 292+77.96 TRANSMISSION_LINE, 7.39' RT
REM RAILS & TIES
PROP CHECK DAM (TYP)
END SWALE +50
PROP LIMIT OF GRADING (TYP)
EXIST MBTA L.O.
PROP TYPE B ECB AND PROP LIMIT OF GRADING
100-YEAR FLOOD ELEVATION 161.0'
R=502.00' L=25.08'
PROP LIMIT OF GRADING (TYP)
RET (OR R&R) WHISTLE POST W ON WEST FACE, S OF TRACKS (SEE NOTE 28 ON SHEET 2)
PC +46.77 PT +66.08 PC +79.34 PT +99.79
C220 L220 PC +74.76
PC +26.60 PT +46.82
C221 PT +94.79
WETLAND 44
WETLAND 43

SCALE IN FEET (20 0 20 40)

NO FILL IN 100-YEAR FLOOD ABOVE FLOODPLAIN ELEVATION
SEE STA 398+00 TO STA 402+00 IN CROSS-SECTIONS FOR MORE INFORMATION

NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO.301-1227).
2. MAXIMUM CRANE PAD DIMENSIONS OF 40'X40' ARE ALLOWED AT ANY GIVEN TIME. A LONGER CRANE MAT FOOTPRINT IS SHOWN HERE TO ALLOW THE CRANE MAT LOCATION TO BE SHIFTED DURING CONSTRUCTION OF THE STEEL SHEETING AND BRIDGE.
3. SYNCOPATED SILT FENCE (TYPE B ECB) TO BE USED WITHIN PRIORITY HABITAT AREA AND 450' OF VERNAL POOLS. SEE DETAIL ON SHEET 154.

NO.	DESCRIPTION	BY	DATE	APPR.
2	ENVIRONMENTAL EDITS		03/28/2022	
1	HISTORIC FEATURE DISPOSITIONS		02/03/2022	

REVISION

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CONSTRUCTION PLANS
INFORMATIONAL SET, FOR REFERENCE ONLY
PLAN 47 OF 349

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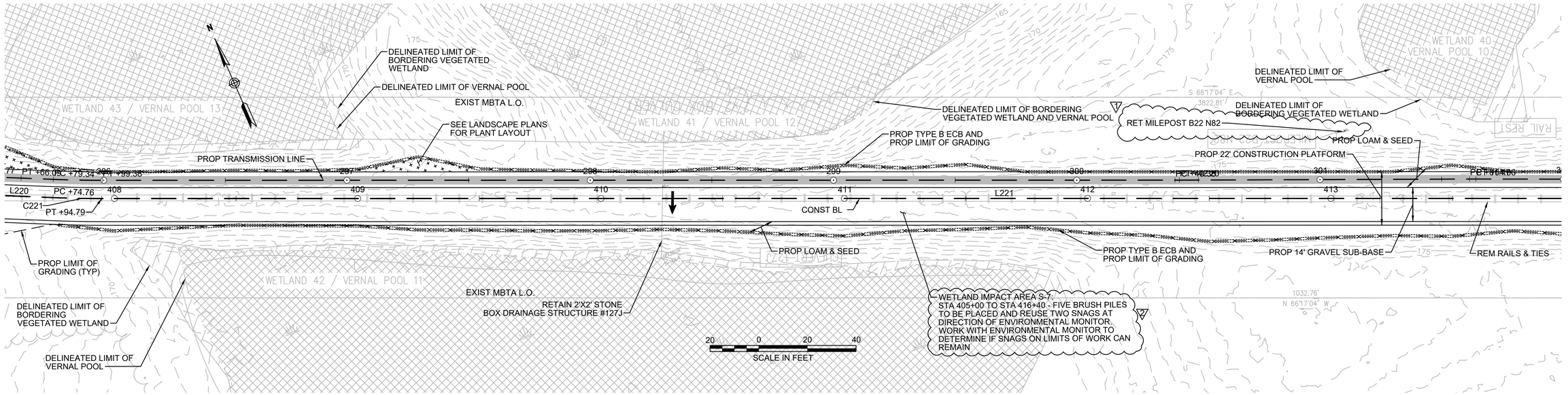

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1	HISTORIC FEATURE DISPOSITIONS		02/03/2022	

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 48 OF 349

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NOTES:

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PLAN 49 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.

2-SUDBURY-HUDSON-ACCESS-DRIVE CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L201	300+00.00	2966202.1444	657150.6659		S66°17'15"E 569.94'	305+69.94	2965972.9435	657672.4880
C201	305+69.94	2965972.9435	657672.4880	R=500.00' Δ=2°19'14" L=20.25' T=10.13'		305+90.19	2965965.1773	657691.1890
L202	305+90.19	2965965.1773	657691.1890		S68°36'29"E 31.19'	306+21.38	2965953.7996	657720.2333
C202	306+21.38	2965953.7996	657720.2333	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		306+41.37	2965946.1385	657738.6949
L203	306+41.37	2965946.1385	657738.6949		S66°19'03"E 730.01'	313+71.38	2965652.9160	658407.2248
C203	313+71.38	2965652.9160	658407.2248	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		313+91.37	2965644.5231	658425.3653
L204	313+91.37	2965644.5231	658425.3653		S64°01'36"E 29.68'	314+21.05	2965631.5251	658452.0469
C204	314+21.05	2965631.5251	658452.0469	R=500.00' Δ=2°17'04" L=19.94' T=9.97'		314+40.99	2965623.1534	658470.1391
L205	314+40.99	2965623.1534	658470.1391		S66°18'41"E 2288.82'	337+29.81	2964703.5807	660566.1091
C205	337+29.81	2964703.5807	660566.1091	R=500.00' Δ=4°31'29" L=39.49' T=19.75'		337+69.29	2964686.3060	660601.6044
L206	337+69.29	2964686.3060	660601.6044		S61°47'12"E 11.20'	337+80.49	2964681.0125	660611.4712
C206	337+80.49	2964681.0125	660611.4712	R=500.00' Δ=4°31'29" L=39.49' T=19.75'		338+19.98	2964663.7378	660646.9665
L207	338+19.98	2964663.7378	660646.9665		S66°18'41"E 209.72'	340+29.70	2964579.4775	660839.0199
C207	340+29.70	2964579.4775	660839.0199	R=500.00' Δ=4°17'58" L=37.52' T=18.77'		340+67.22	2964565.7061	660873.9108
L208	340+67.22	2964565.7061	660873.9108		S70°36'39"E 15.82'	340+83.04	2964560.4544	660888.8329
C208	340+83.04	2964560.4544	660888.8329	R=500.00' Δ=4°17'58" L=37.52' T=18.77'		341+20.56	2964546.6830	660923.7239
L209	341+20.56	2964546.6830	660923.7239		S66°18'41"E 359.47'	344+80.03	2964402.2587	661252.9083
C209	344+80.03	2964402.2587	661252.9083	R=500.00' Δ=4°34'26" L=39.91' T=19.97'		345+19.95	2964387.6974	661290.0610
L210	345+19.95	2964387.6974	661290.0610		S70°53'07"E 10.12'	345+30.07	2964384.3829	661299.6249
C210	345+30.07	2964384.3829	661299.6249	R=500.00' Δ=4°34'16" L=39.89' T=19.96'		345+69.96	2964369.8317	661336.7545
L211	345+69.96	2964369.8317	661336.7545		S66°18'51"E 159.98'	347+29.94	2964305.5655	661483.2559
C211	347+29.94	2964305.5655	661483.2559	R=500.00' Δ=4°23'59" L=38.39' T=19.21'		347+68.33	2964288.8077	661517.7892
L212	347+68.33	2964288.8077	661517.7892		S61°54'53"E 13.79'	347+82.12	2964282.3158	661529.9549

2-SUDBURY-HUDSON-ACCESS-DRIVE CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C212	347+82.12	2964282.3158	661529.9549	R=500.00' Δ=4°23'48" L=38.37' T=19.19'		348+20.49	2964265.5682	661564.4651
L213	348+20.49	2964265.5682	661564.4651		S66°18'41"E 1267.77'	360+88.26	2963756.2200	662725.4156
C213	360+88.26	2963756.2200	662725.4156	R=80.00' Δ=16°41'57" L=23.32' T=11.74'		361+11.58	2963743.8947	662745.1110
L214	361+11.58	2963743.8947	662745.1110		S49°36'43"E 16.84'	361+28.41	2963732.9851	662757.9352
C214	361+28.41	2963732.9851	662757.9352	R=80.00' Δ=32°54'10" L=45.94' T=23.62'		361+74.35	2963714.6008	662799.3503
L215	361+74.35	2963714.6008	662799.3503		S82°30'53"E 18.74'	361+93.10	2963712.1592	662817.9331
C215	361+93.10	2963712.1592	662817.9331	R=80.00' Δ=16°12'13" L=22.62' T=11.39'		362+15.72	2963706.1003	662839.6528
L216	362+15.72	2963706.1003	662839.6528		S66°18'41"E 417.03'	366+32.74	2963538.5534	663221.5402
C216	366+32.74	2963538.5534	663221.5402	R=500.00' Δ=5°07'35" L=44.74' T=22.38'		366+77.48	2963522.4353	663263.2560
C217	366+77.48	2963522.4353	663263.2560	R=500.00' Δ=5°07'35" L=44.74' T=22.38'		367+22.22	2963506.3172	663304.9718
L217	367+22.22	2963506.3172	663304.9718		S66°18'41"E 162.17'	368+84.39	2963441.1621	663453.4789
C218	368+84.39	2963441.1621	663453.4789	R=500.00' Δ=5°03'10" L=44.09' T=22.06'		369+28.48	2963421.6905	663493.0242
C219	369+28.48	2963421.6905	663493.0242	R=500.00' Δ=4°58'12" L=43.37' T=21.70'		369+71.85	2963402.5097	663531.9080
L218	369+71.85	2963402.5097	663531.9080		S66°13'43"E 2255.15'	392+27.00	2962493.4828	665595.7301
L219	392+27.00	2962493.4828	665595.7301		S66°18'55"E 1499.60'	407+26.60	2961891.0882	666969.0153
C220	407+26.60	2961891.0882	666969.0153	R=500.00' Δ=2°19'04" L=20.23' T=10.11'		407+46.82	2961882.5913	666987.3676
L220	407+46.82	2961882.5913	666987.3676		S63°59'51"E 27.94'	407+74.76	2961870.3416	667012.4806
C221	407+74.76	2961870.3416	667012.4806	R=500.00' Δ=2°17'42" L=20.03' T=10.01'		407+94.79	2961861.9243	667030.6513
L221	407+94.79	2961861.9243	667030.6513		S66°17'33"E 730.94'	415+25.73	2961568.0374	667699.9070
C222	415+25.73	2961568.0374	667699.9070	R=499.59' Δ=7°40'18" L=66.89' T=33.50'		415+92.62	2961545.3163	667762.7705
C223	415+92.62	2961545.3163	667762.7705	R=500.00' Δ=7°45'40" L=67.73' T=33.92'		416+60.35	2961522.2623	667826.3998
L222	416+60.35	2961522.2623	667826.3998		S66°12'11"E 50.19'	417+10.54	2961502.0115	667872.3213

NO.	DESCRIPTION	BY	DATE	APPR.

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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION LINE RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

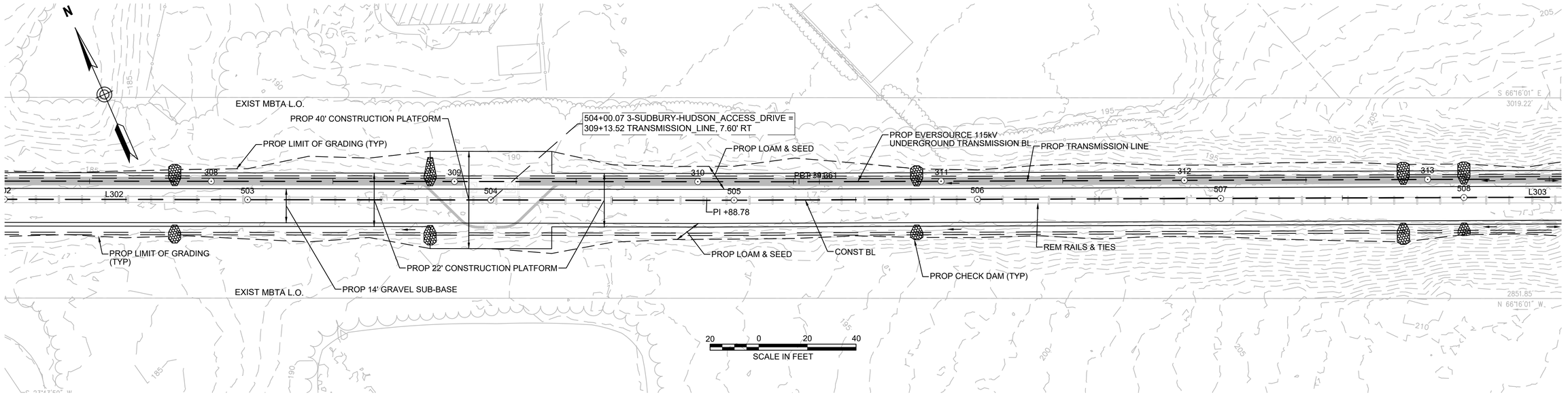
CONSTRUCTION BASELINE DATA

INFORMATIONAL SET, FOR REFERENCE ONLY

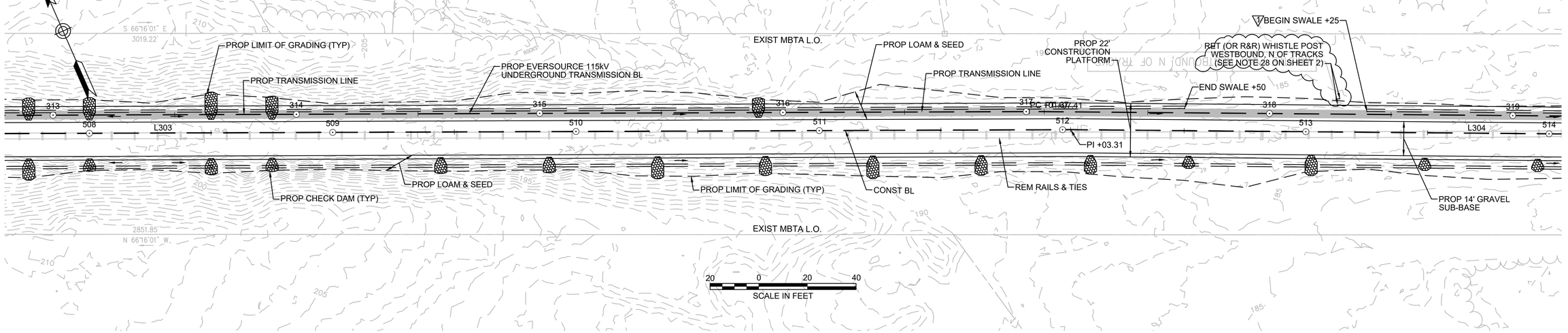
PLAN 72 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.

CONT. ON SHEET 49



CONT. ON SHEET 51



CONT. ABOVE

NOTE:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO. 301-1227).

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			
1	HISTORIC FEATURE DISPOSITIONS		02/03/2022	

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 50 OF 349

SCALE: unless noted	DATE DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.

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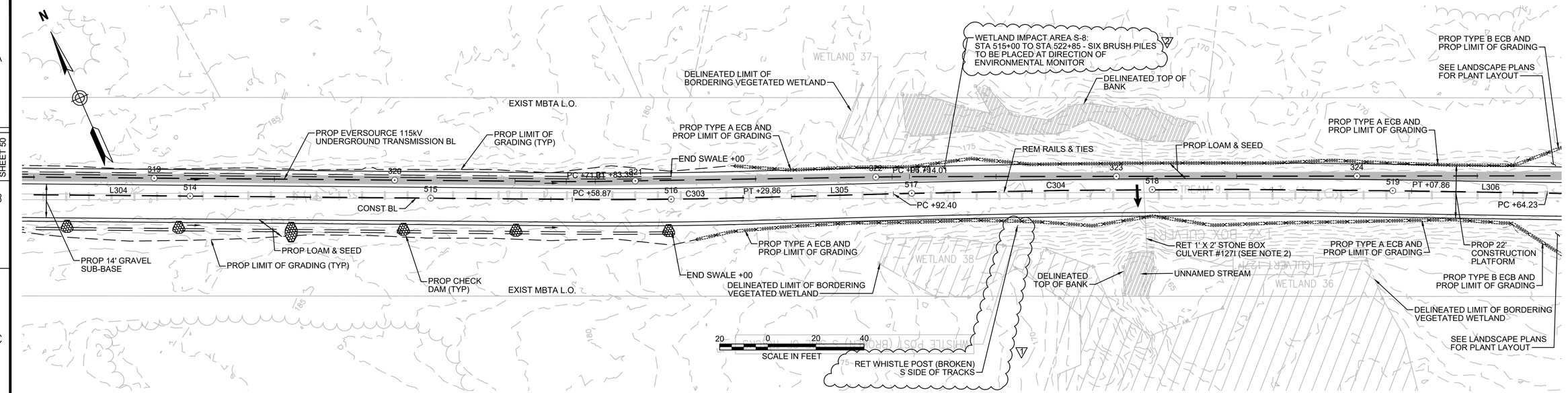

NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO. 301-1227).
2. CONTRACTOR TO CLEAR OUT DEBRIS IN NORTH END OF STONE BOX CULVERT BY HAND.
3. CONTRACTOR TO CUT TWO 12" TREES ON SOUTHWEST WINGWALL OF STONE BOX DRAINAGE STRUCTURE. NO GRUBBING TO BE PERFORMED OUTSIDE OF LIMITS OF GRADING.
4. SYNCOPATED SILT FENCE (TYPE B ECB) TO BE USED WITHIN PRIORITY HABITAT AREA AND 450' OF VERNAL POOLS. SEE DETAIL ON SHEET 154.

NO.	DESCRIPTION	BY	DATE	APPR.
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1	HISTORIC FEATURE DISPOSITIONS		02/03/2022	

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

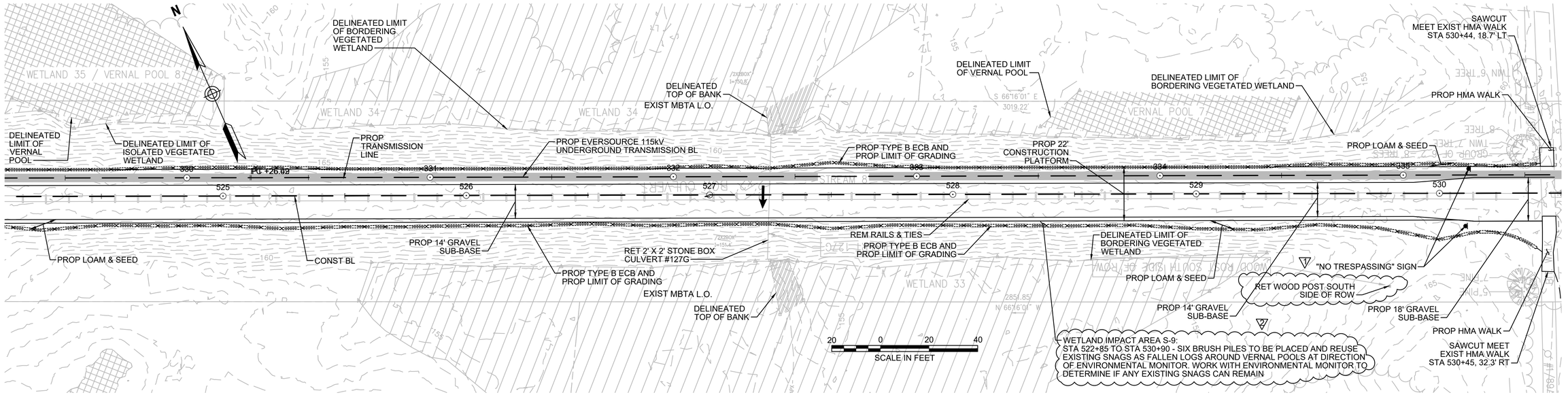
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 51 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K'D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



NOTE:

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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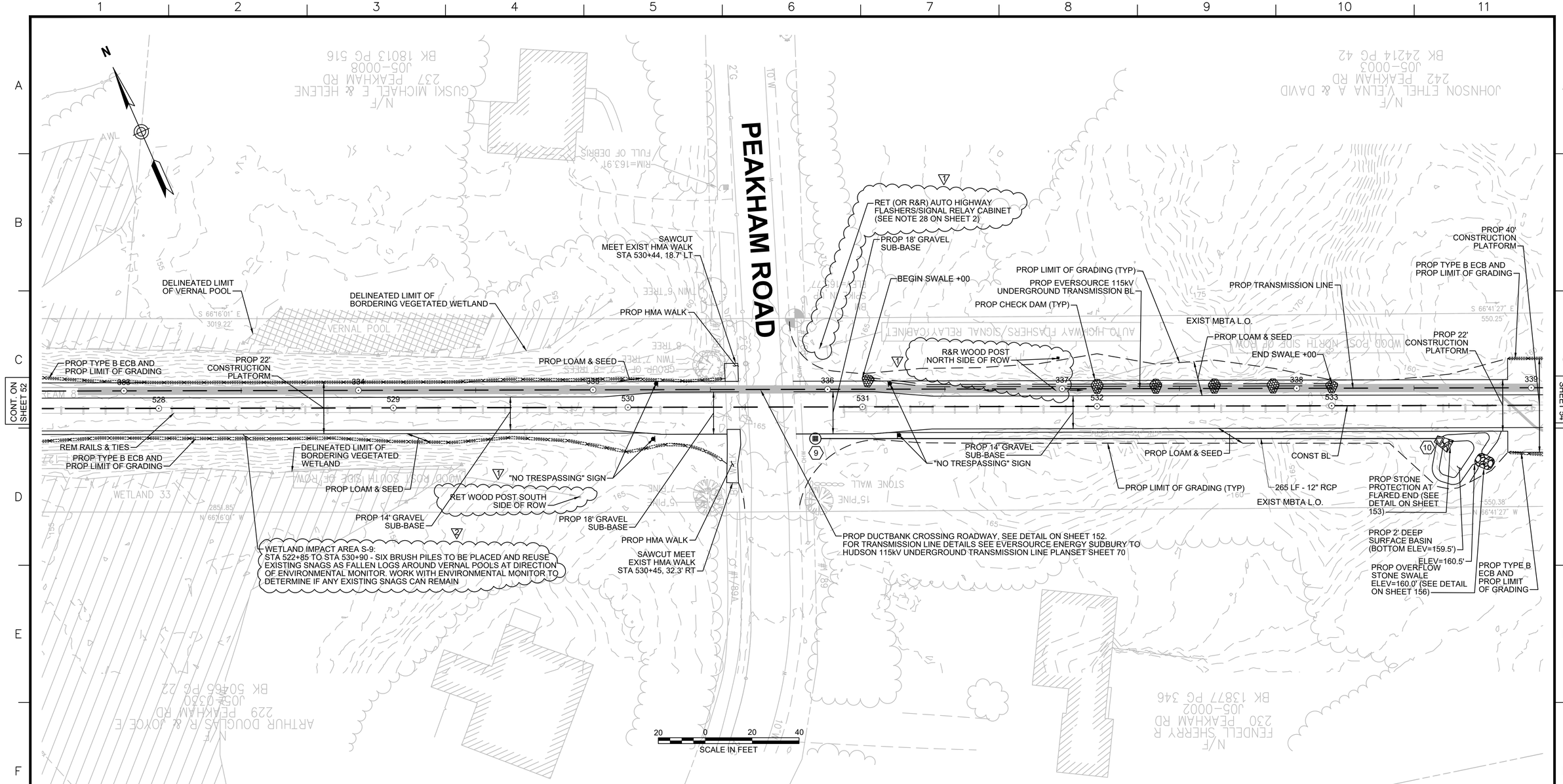
INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 52 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



DRAINAGE STRUCTURE TABLE						
NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
9	SHALLOW CB	STA 530+80, 10.4' RT	164.85		162.00'	SEE CONSTRUCTION DETAIL ON SHEET 156
10	FES	STA 533+46, 14.9' RT	161.68	160.50' (9)		

NOTE:

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2. SYNCOPATED SILT FENCE (TYPE B ECB) TO BE USED WITHIN PRIORITY HABITAT AREA AND 450' OF VERNAL POOLS. SEE DETAIL ON SHEET 154.

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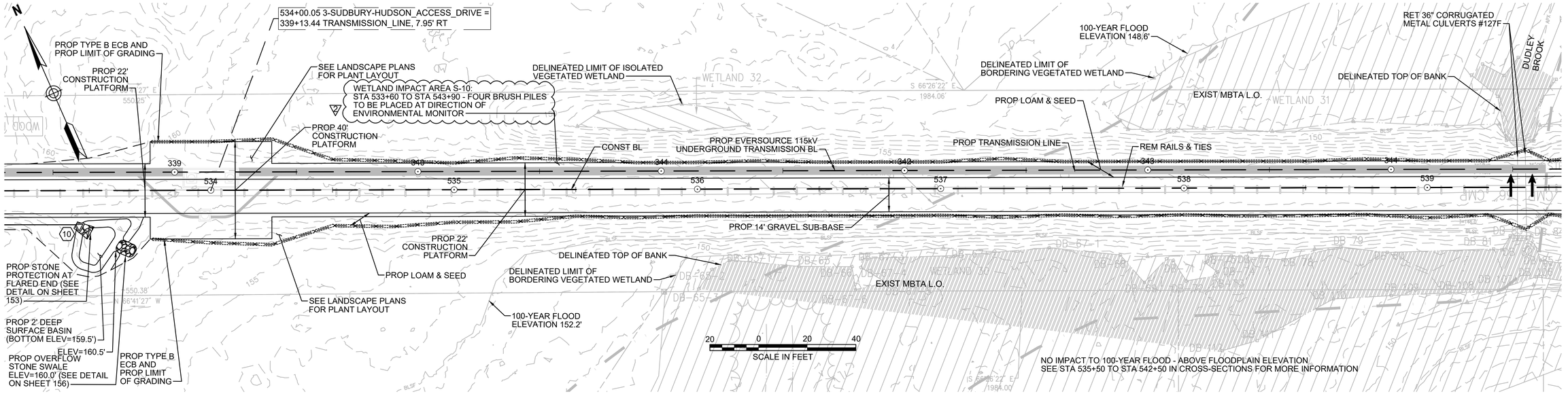
PLAN 53 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

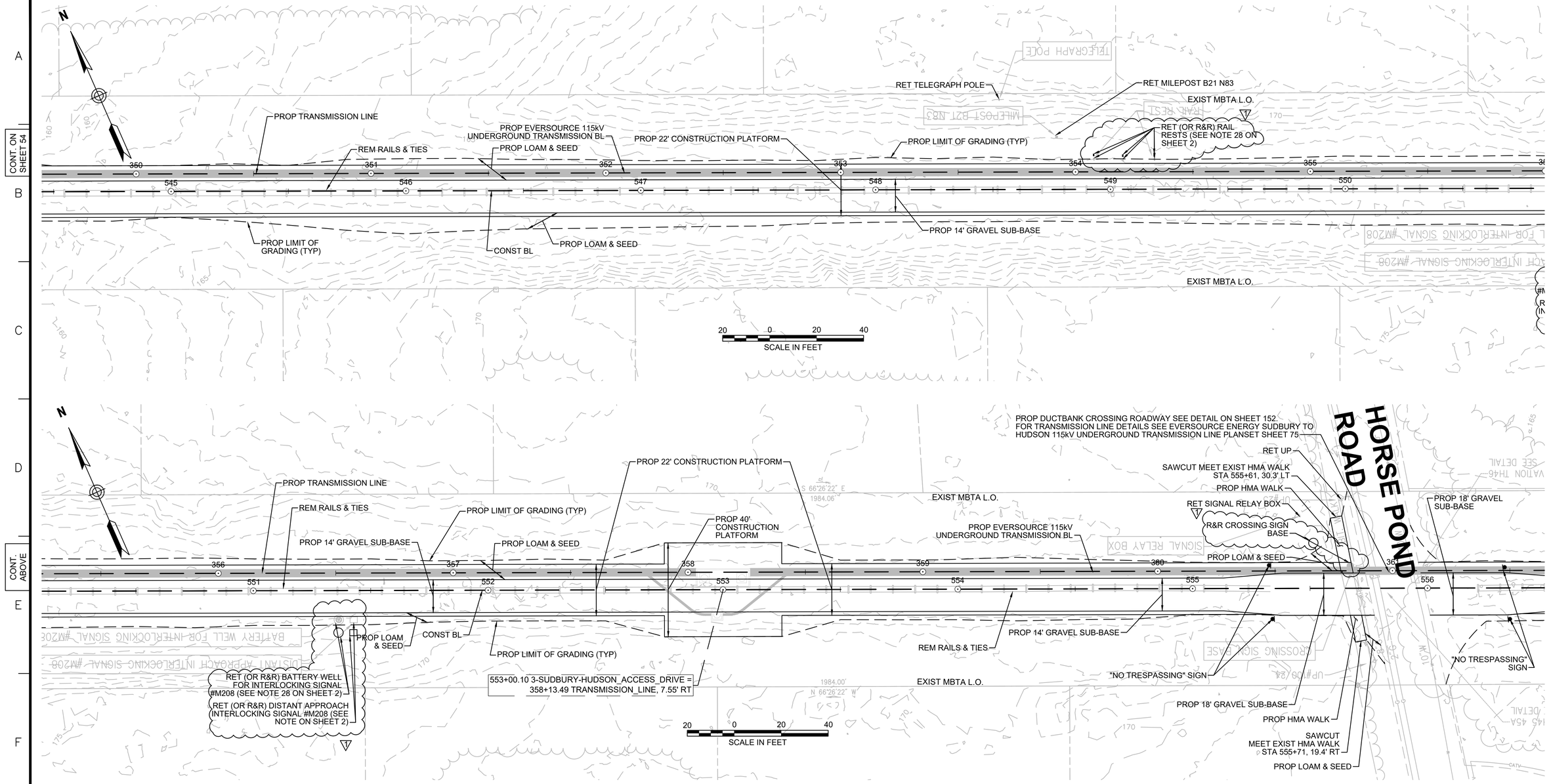
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 54 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



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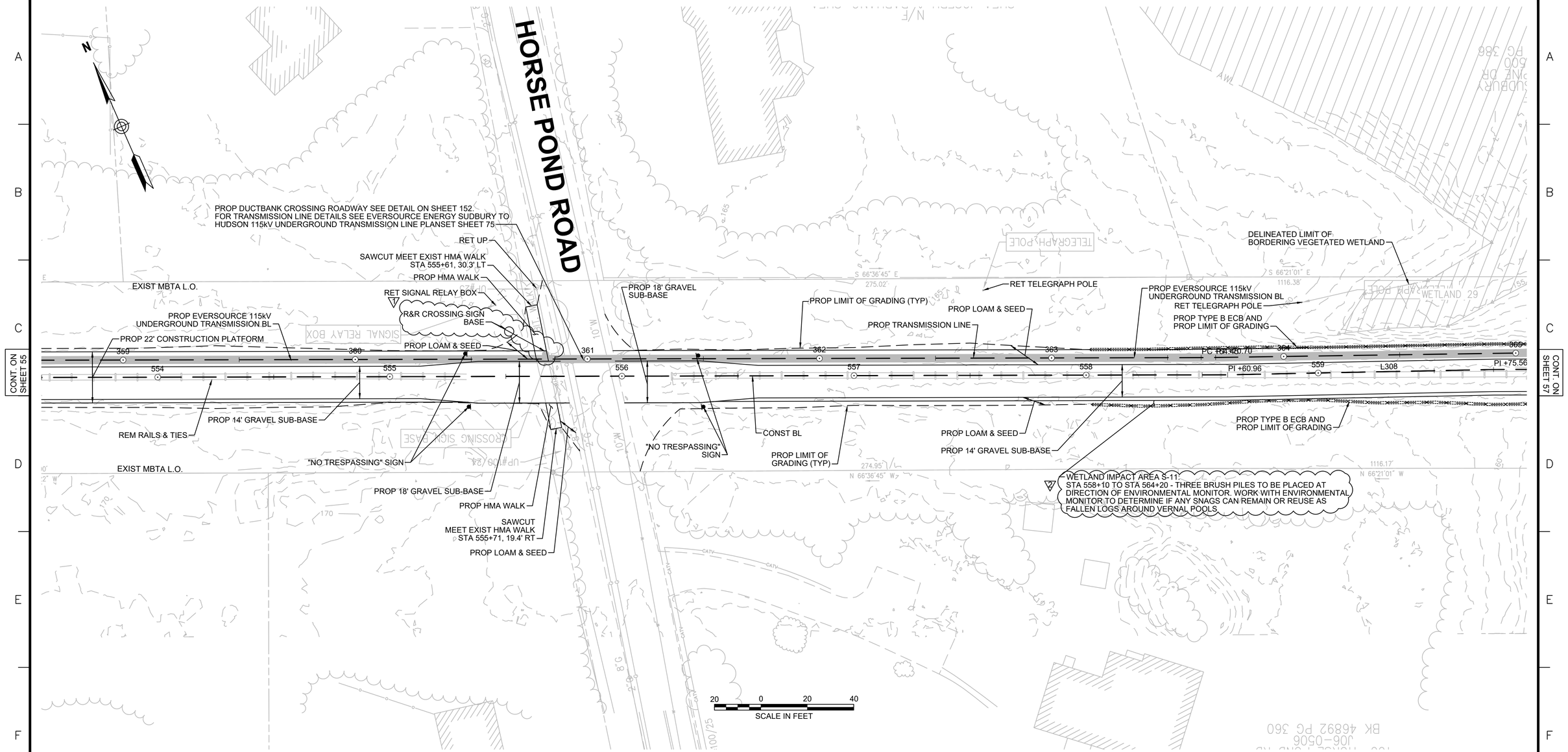
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 55 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



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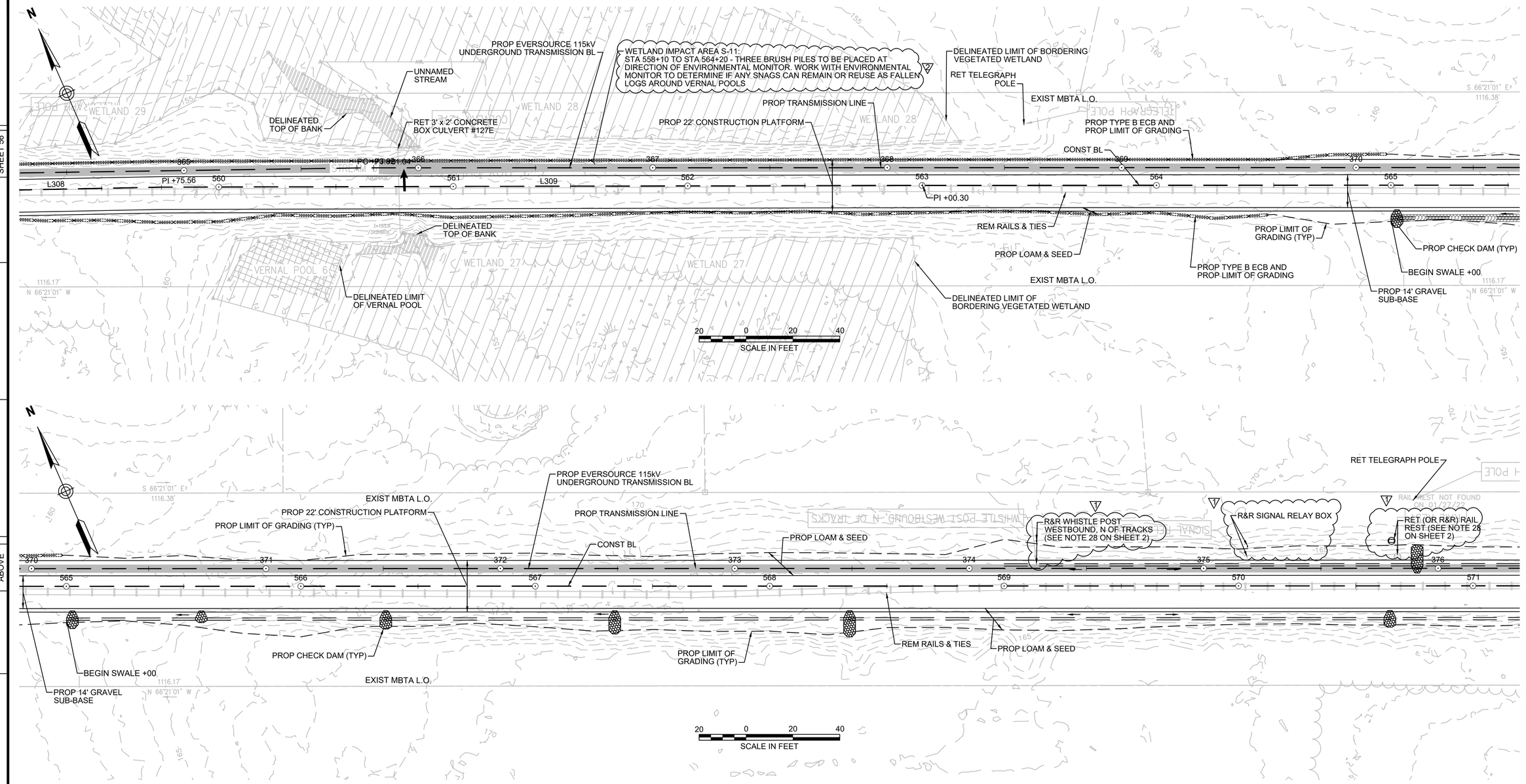
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 56 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



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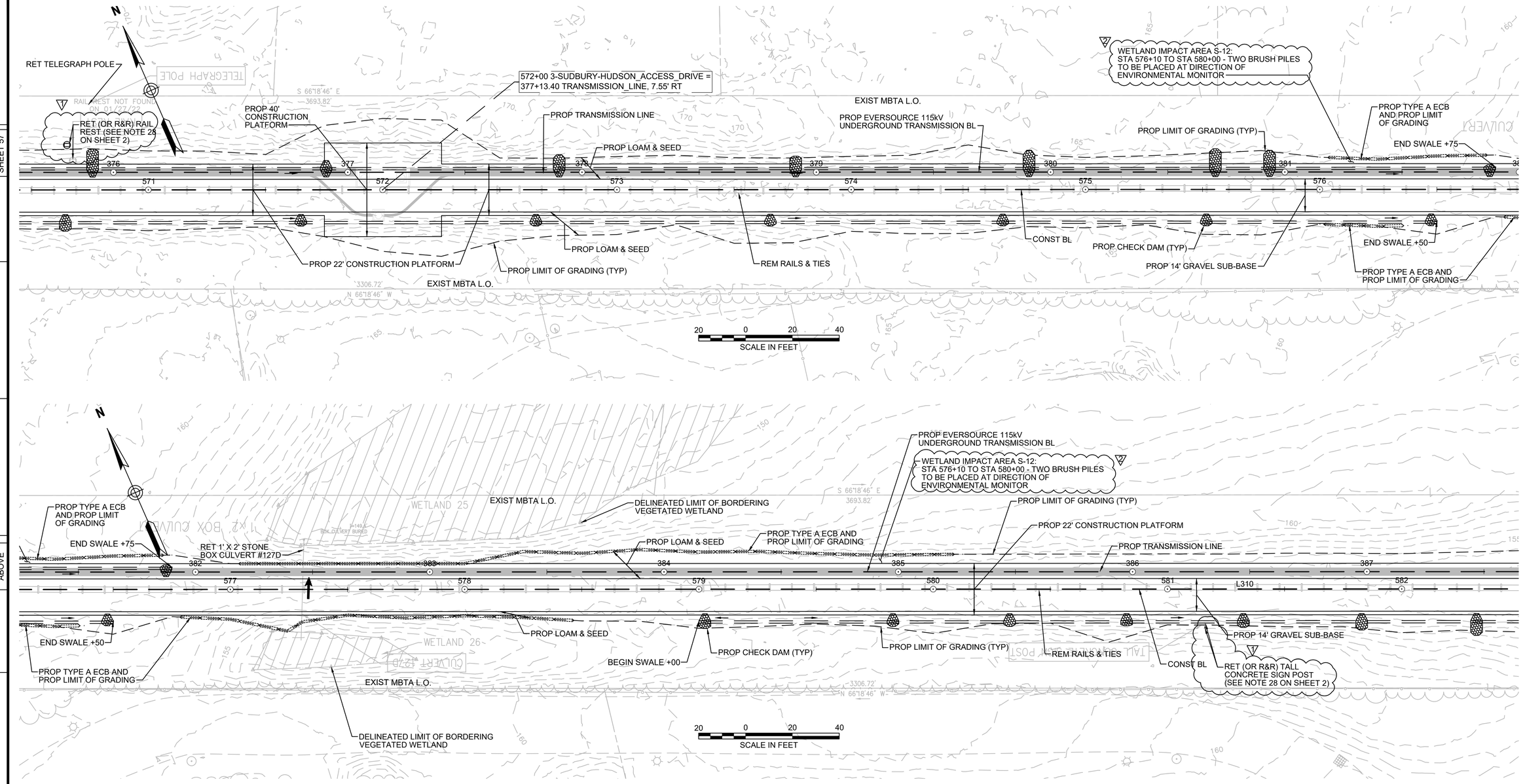
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 57 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



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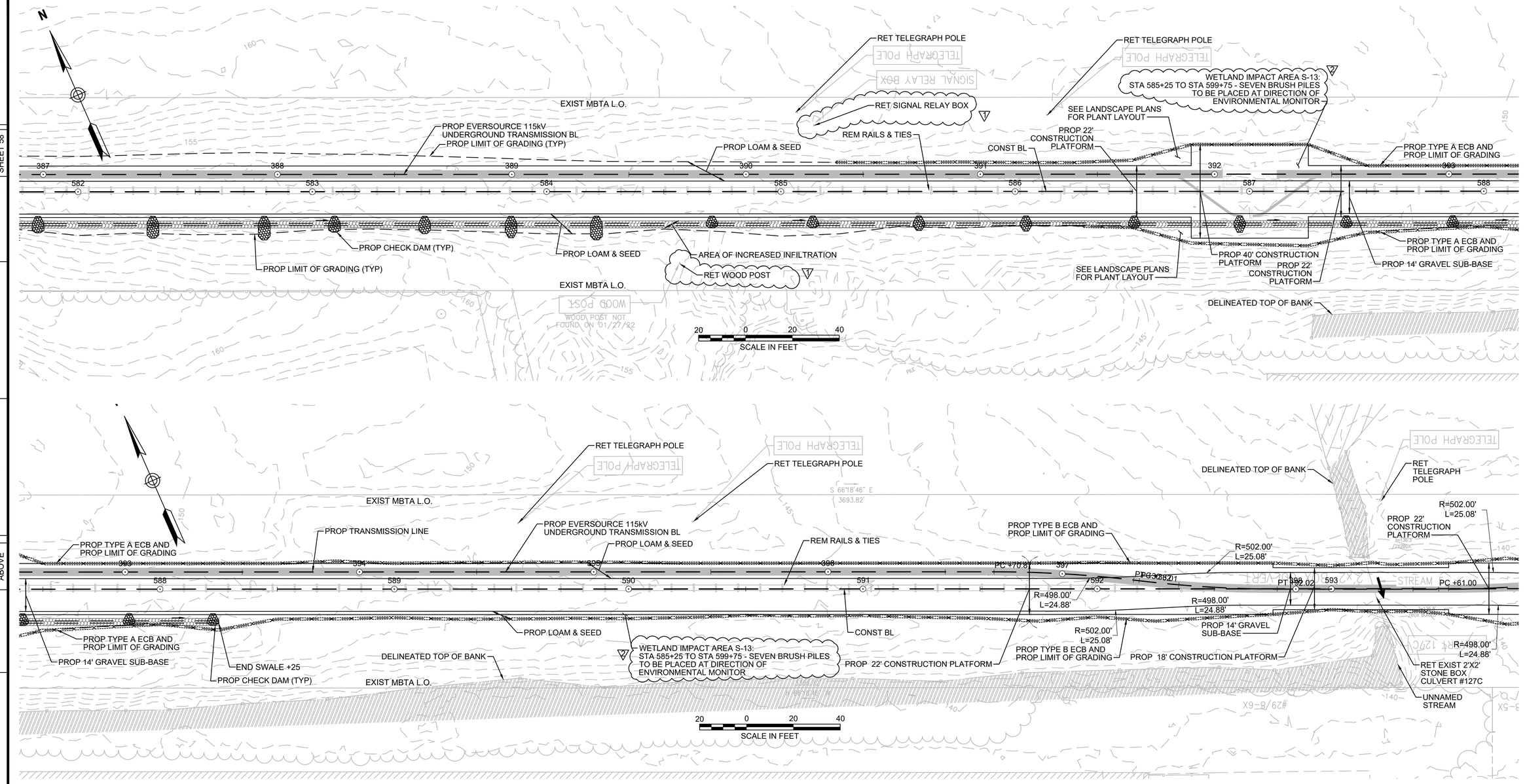
CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 58 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



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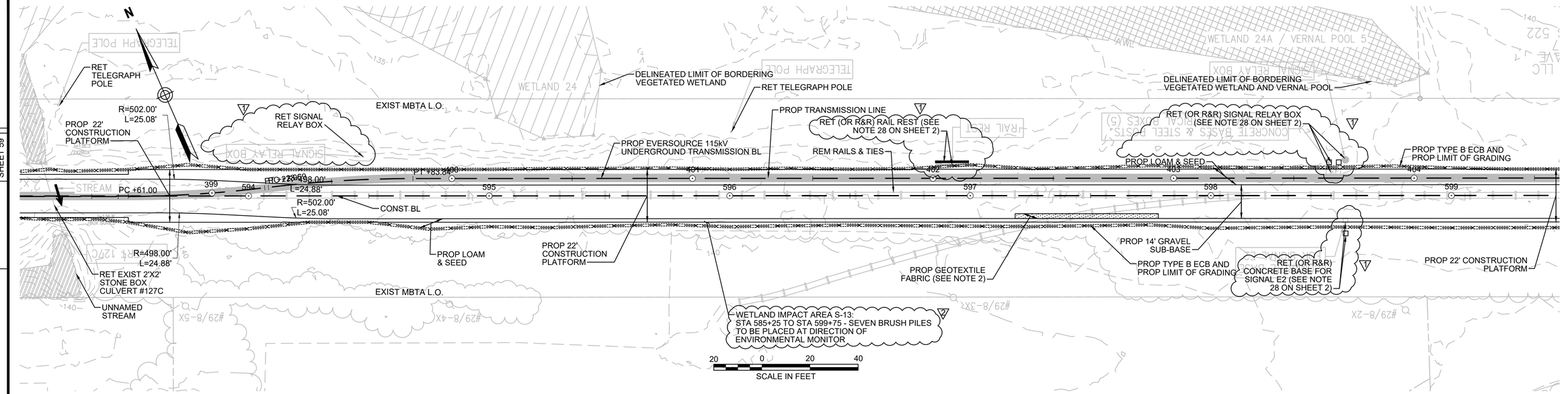
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 59 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APP R.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO. 301-1227).
2. CONTRACTOR TO INSTALL GEOTEXTILE FABRIC UNDERNEATH 12" GRAVEL BORROW WITHIN LIMITS SHOWN.
3. SYNCOPATED SILT FENCE (TYPE B ECB) TO BE USED WITHIN PRIORITY HABITAT AREA AND 450' OF VERNAL POOLS. SEE DETAIL ON SHEET 154.

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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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PLAN 60 OF 349

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601+37.30 3-SUDBURY-HUDSON_ACCESS_DRIVE = 406+51.20 TRANSMISSION_LINE, 7.69' RT

SEE LANDSCAPE PLANS FOR PLANT LAYOUT

R&R CONCRETE BASES & STEEL POSTS FOR SIGNAL/ELECTRIC BOXES (5)

TRAFFIC SIGNAL CONDUIT AND PULL BOXES TO BE INSTALLED FOR FUTURE USE

603+00.31 3-SUDBURY-HUDSON_ACCESS_DRIVE= 700+00.00 4-SUDBURY-HUDSON_ACCESS_DRIVE

STATION ROAD

RET CONCRETE BASES FOR HIGHWAY SIGNAL

REMOVE GUARDRAIL

100-YEAR FLOOD ELEVATION 134.0'

PROP LOAM & SEED

MEET EXIST

RET (OR R&R) WOOD WHISTLE/STOP SIGN POST (SEE NOTE 28 ON SHEET 2)

R&R MILEPOST

RET (OR R&R) CONCRETE SIGN POST (SEE NOTE 28 ON SHEET 2)

EXIST MBTA L.O.

REM TELEGRAPH POLE

R&S DIAMOND JUNCTION (TO BE COORDINATED WITH DCR)

"NO TRESPASSING" SIGN

REM RAILS & TIES

PROP TYPE B ECB AND PROP LIMIT OF GRADING

PC +69.23

PC +54.10

PT +19.63

PC +70.53

PC +58.16

PT +86.25

PC +05.94
4.51' LT

PRC +23.89
5.74' LT

R=152.00'
L=19.62'

SEE LANDSCAPE PLANS FOR PLANT LAYOUT

DELINEATED TOP OF BANK

TRIBUTARY TO HOP BROOK

PROP TYPE A ECB AND PROP LIMIT OF GRADING

R=148.81'
L=18.00'

PT +43.45
7.00' LT

PT +22.24

PC +65.87

PT +97.58

PC +82.57

PT +14.37

PT +89.60

CONST BL
PC +61.52

PROP 22' CONSTRUCTION PLATFORM

"NO TRESPASSING" SIGN

RET (OR R&R) 3 SWITCH STANDS (SEE NOTE 28 ON SHEET 2)

PROP 40' CONSTRUCTION PLATFORM

PROP 22' CONSTRUCTION PLATFORM

PROP LOAM & SEED

EXIST MBTA L.O.

PROP 14' GRAVEL SUB-BASE

PT +43.45
7.00' RT

PROP EVERSOURCE 115kV UNDERGROUND TRANSMISSION BL

PROP TRANSMISSION LINE

PROP 18' CONSTRUCTION PLATFORM

PC +06.00
9.49' RT

PRC +22.50
8.53' RT

R=151.96'
L=21.02'

PROP LIMIT OF GRADING (TYP)

WETLAND IMPACT AREA S-14 - STA 600+55 TO STA 602+25

WETLAND IMPACT AREA S-15: STA 602+50 TO STA 711+30 - FIVE BRUSH PILES TO BE PLACED AT DIRECTION OF ENVIRONMENTAL MONITOR

PROP DUCTBANK CROSSING ROADWAY SEE DETAIL ON SHEET 152.
FOR TRANSMISSION LINE DETAILS SEE EVERSOURCE ENERGY SUDBURY TO HUDSON 115kV UNDERGROUND TRANSMISSION LINE PLANSET SHEET 84

PROP TYPE B ECB AND PROP LIMIT OF GRADING

MEET EXIST

WETLAND IMPACT AREA S-13: STA 585+25 TO STA 599+75 - SEVEN BRUSH PILES TO BE PLACED AT DIRECTION OF ENVIRONMENTAL MONITOR

PROP ROUNDABOUT - SEE DETAIL ON SHEET 163

UNION AVENUE

20 0 20 40
SCALE IN FEET

NO NET FILL IN 100-YEAR FLOOD - 64.98 CY OF FILL, 163.20 CY OF CUT.
SEE STA 700+00 TO STA 728+50 IN CROSS-SECTIONS FOR MORE INFORMATION

CONT. ON SHEET 60

CONT. ON SHEET 62

NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO. 301-1227).
2. CONTRACTOR TO INSTALL GEOTEXTILE FABRIC UNDERNEATH 12" GRAVEL BORROW WITHIN LIMITS SHOWN.
3. SYNCOPATED SILT FENCE (TYPE B ECB) TO BE USED WITHIN PRIORITY HABITAT AREA AND 450' OF VERNAL POOLS. SEE DETAIL ON SHEET 154.

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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 61 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
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NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING

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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION BASELINE DATA

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 73 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
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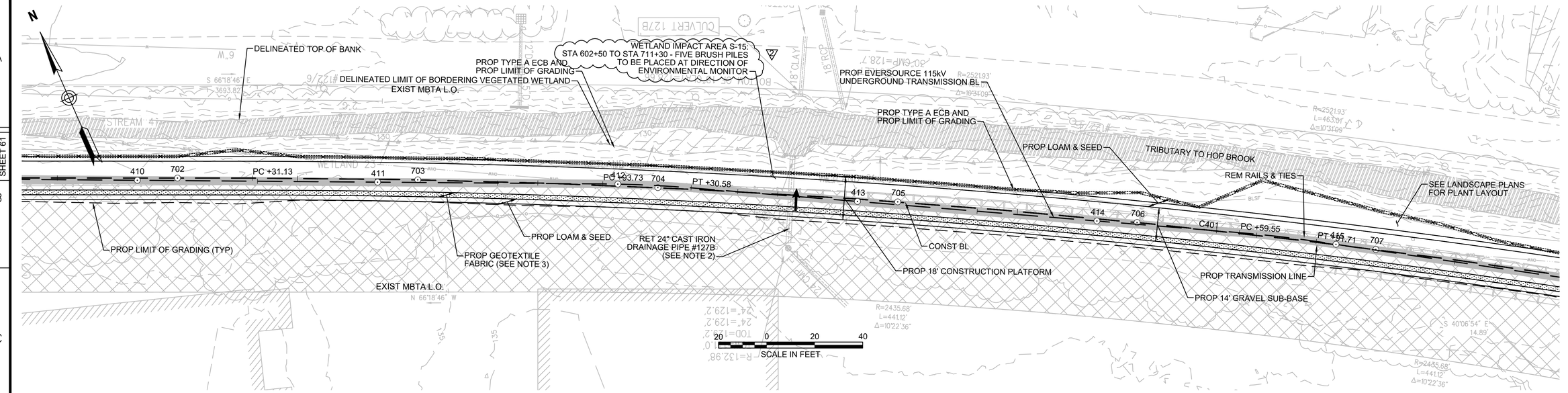

NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO. 301-1227).
2. TRANSMISSION LINE TO RUN UNDERNEATH DRAINAGE PIPE (SEE DETAIL ON SHEET 157).
3. CONTRACTOR TO INSTALL GEOTEXTILE FABRIC UNDERNEATH 12" GRAVEL BORROW WITHIN LIMITS SHOWN.

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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

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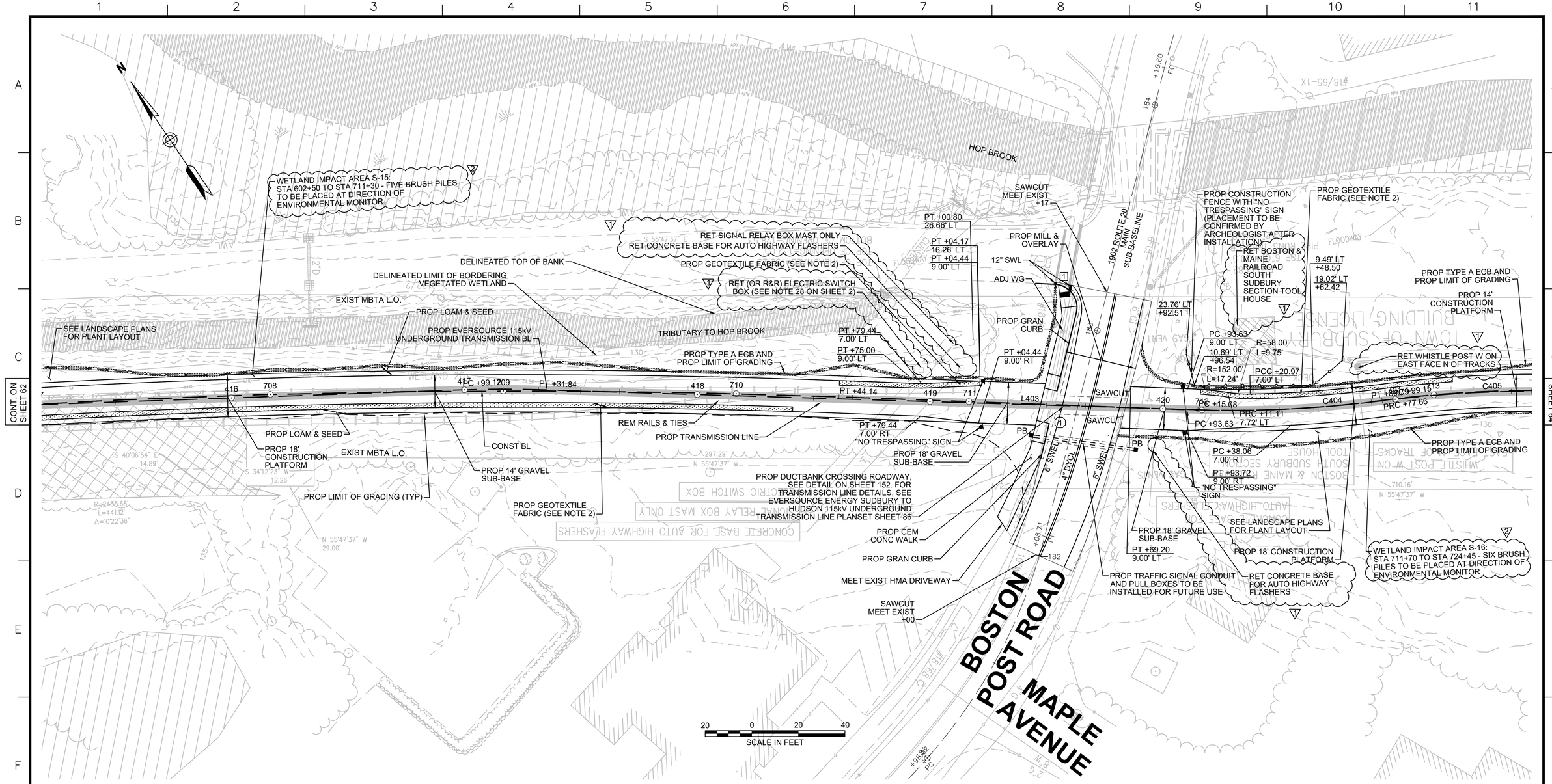

LEGEND:

- (X) ACCESS ROAD CROSSING NUMBER
- [X] WHEELCHAIR RAMP NUMBER

NOTES:

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2. CONTRACTOR TO INSTALL GEOTEXTILE FABRIC UNDERNEATH 12" GRAVEL BORROW WITHIN LIMITS SHOWN.
3. ALL PAVEMENT MARKINGS SHALL BE WET REFLECTIVE POLYUREA
4. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN THE PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
5. REMOVE ALL EXISTING SIGNS UNLESS OTHERWISE NOTED.

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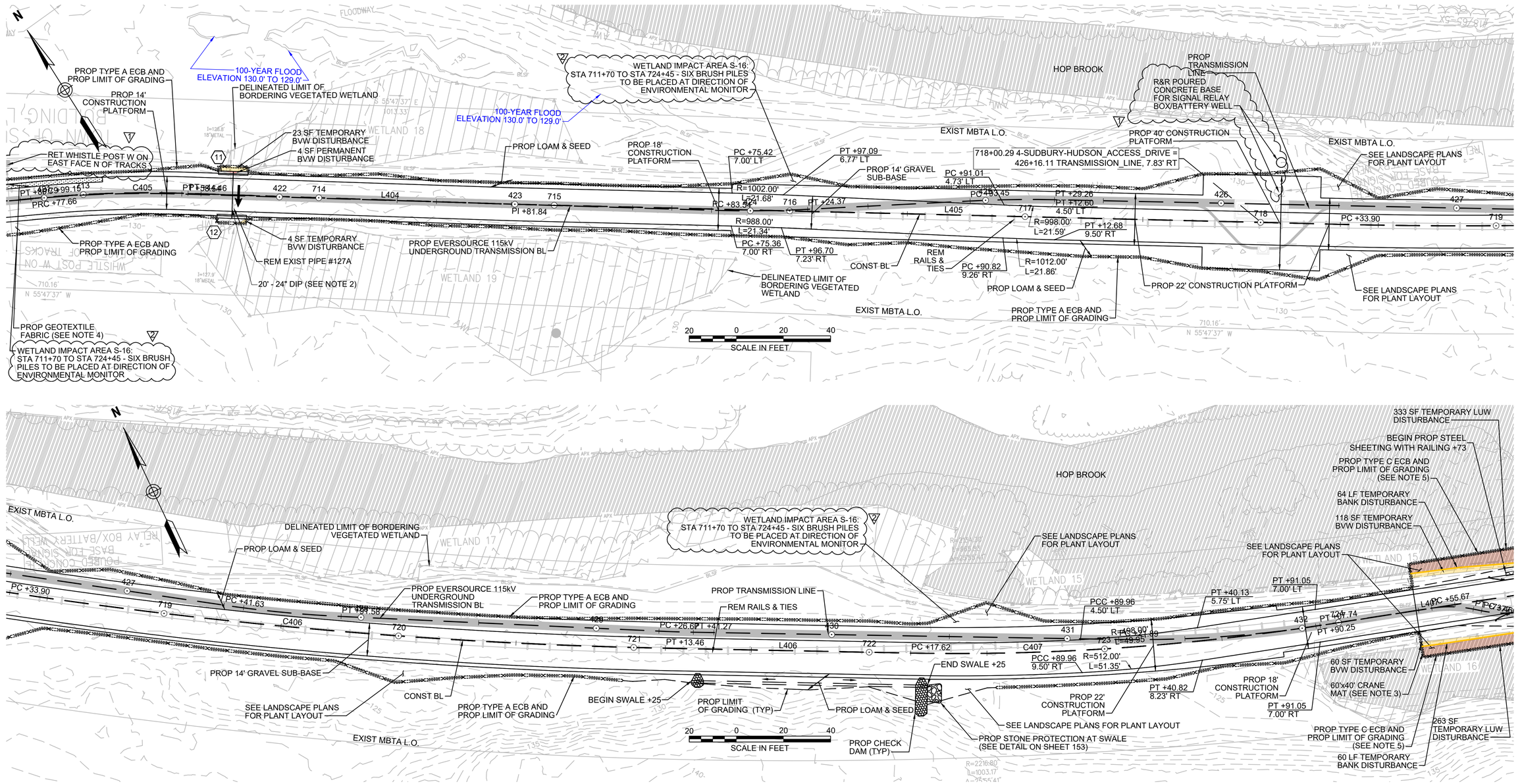
INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 63 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



DRAINAGE STRUCTURE TABLE						
NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
11	Concrete Headwall	713+63, 10.0' LT		128.81'		18" REVEAL
12	Concrete Headwall	713+63, 10.0' RT			128.55'	18" REVEAL

NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO. 301-1227).
2. TRANSMISSION LINE TO RUN UNDERNEATH DRAINAGE PIPE.
3. MAXIMUM CRANE PAD DIMENSIONS OF 40'X40' ARE ALLOWED AT ANY GIVEN TIME. A LONGER CRANE MAT FOOTPRINT IS SHOWN HERE TO ALLOW THE CRANE MAT LOCATION TO BE SHIFTED DURING CONSTRUCTION OF THE STEEL SHEETING AND BRIDGE.
4. CONTRACTOR TO INSTALL GEOTEXTILE FABRIC UNDERNEATH 12" GRAVEL BORROW WITHIN LIMITS SHOWN.
5. TYPE C ECB SHALL CONSIST OF EITHER STAKED 4' HIGH SILT FENCE OR BOTTOM-ANCHORED TURBIDITY CURTAIN DEPENDING ON WATER LEVELS AT THE TIME OF CONSTRUCTION. THE APPROPRIATE ECB SHALL BE INSTALLED AT THE DIRECTION OF THE ENVIRONMENTAL MONITOR.

vhb Vanasse Hangen Brustlin, Inc.
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617.924.1770 FAX 617.924.2286

NO.	DESCRIPTION	BY	DATE	APPR.
2	ENVIRONMENTAL EDITS		03/28/2022	
1	HISTORIC FEATURE DISPOSITIONS		02/03/2022	

REVISION

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

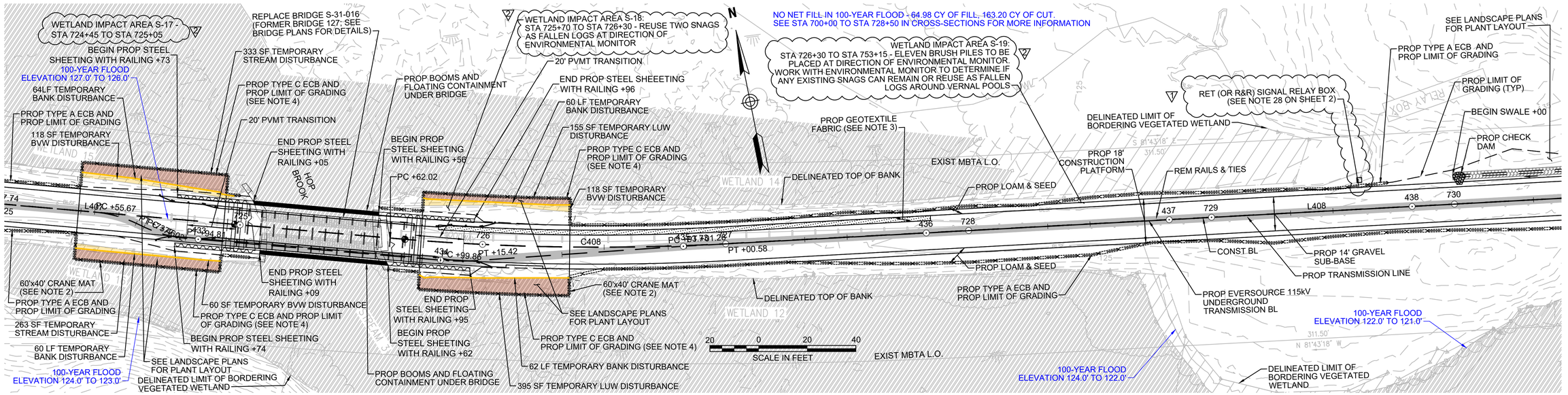
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 64 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO. 301-1227).
2. MAXIMUM CRANE PAD DIMENSIONS OF 40'X40' ARE ALLOWED AT ANY GIVEN TIME. A LONGER CRANE MAT FOOTPRINT IS SHOWN HERE TO ALLOW THE CRANE MAT LOCATION TO BE SHIFTED DURING CONSTRUCTION OF THE STEEL SHEETING AND BRIDGE.
3. CONTRACTOR TO INSTALL GEOTEXTILE FABRIC UNDERNEATH 12" GRAVEL BORROW WITHIN LIMITS SHOWN.
4. TYPE C ECB SHALL CONSIST OF EITHER STAKE 4' HIGH SILT FENCE OR BOTTOM-ANCHORED TURBIDITY CURTAIN DEPENDING ON WATER LEVELS AT THE TIME OF CONSTRUCTION. THE APPROPRIATE ECB SHALL BE INSTALLE AT THE DIRECTION OF THE ENVIRONMENTAL MONITOR.

NO.	DESCRIPTION	BY	DATE	APPR.
2	ENVIRONMENTAL EDITS		03/28/2022	
1	HISTORIC FEATURE DISPOSITIONS		02/03/2022	

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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

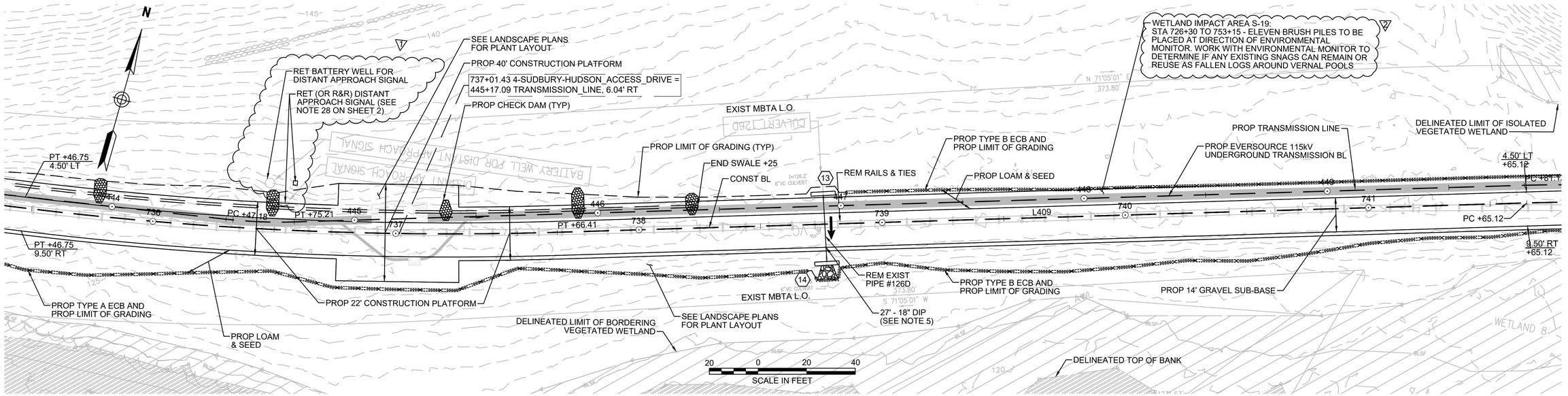
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

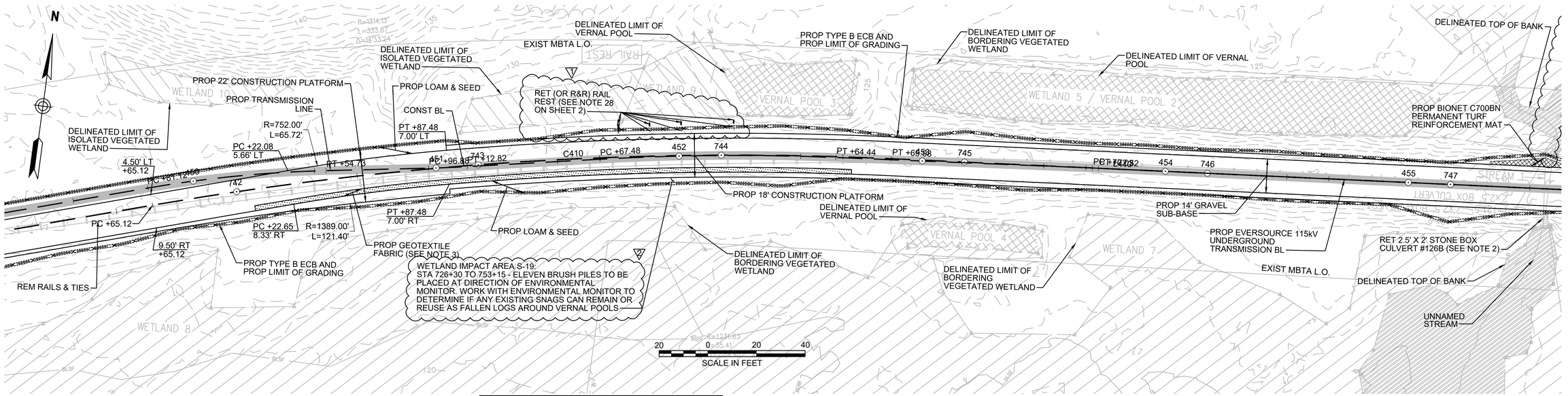
CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 65 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.





DRAINAGE STRUCTURE TABLE

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
13	Concrete Headwall	738+77, 12.0' LT			127.10'	
14	Concrete Headwall	738+77, 15.4' RT		125.07'		

NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO. 301-1227).
2. CONTRACTOR TO CUT VEGETATION ON NORTHEAST WINGWALL OF STONE BOX CULVERT. NO GRUBBING SHALL BE PERFORMED OUTSIDE LIMITS OF GRADING.
3. CONTRACTOR TO INSTALL GEOTEXTILE FABRIC UNDERNEATH 12" GRAVEL BORROW WITHIN LIMITS SHOWN.
4. SYNCOPATED SILT FENCE (TYPE B ECB) TO BE USED WITHIN PRIORITY HABITAT AREA AND 450' OF VERNAL POOLS. SEE DETAIL ON SHEET 154.
5. TRANSMISSION LINE TO RUN UNDERNEATH DRAINAGE PIPE. SEE DETAIL ON SHEET 157.

NO.	DESCRIPTION	BY	DATE	APPR.
2	ENVIRONMENTAL EDITS		03/28/2022	
1	HISTORIC FEATURE DISPOSITIONS		02/03/2022	

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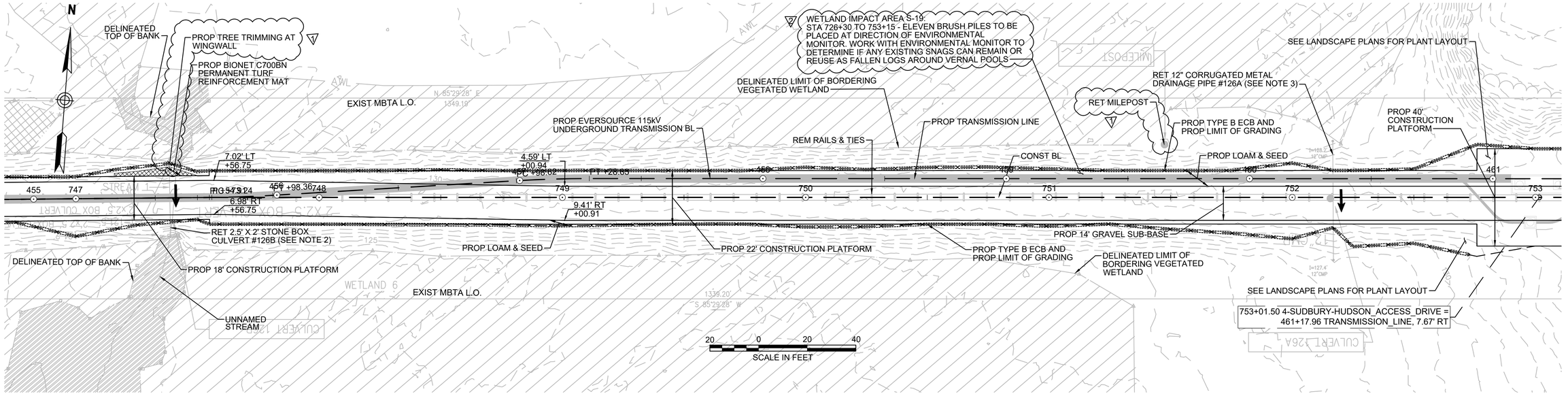
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

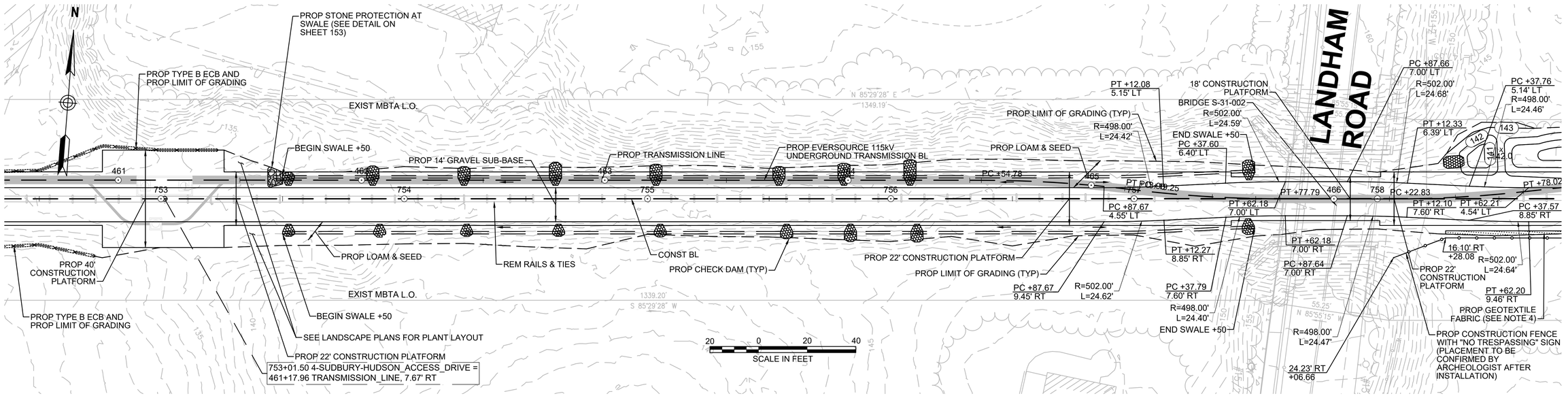
CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 66 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.





NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO. 301-1227).
2. CONTRACTOR TO CUT VEGETATION ON NORTHEAST WINGWALL OF STONE BOX CULVERT. NO GRUBBING SHALL BE PERFORMED OUTSIDE LIMITS OF GRADING.
3. CONTRACTOR TO CLEAR SEDIMENT IN DRAINAGE PIPE BY HAND.
4. SYNCOPATED SILT FENCE (TYPE B ECB) TO BE USED WITHIN PRIORITY HABITAT AREA AND 450' OF VERNAL POOLS. SEE DETAIL ON SHEET 154.

NO.	DESCRIPTION	BY	DATE	APPR.
2	ENVIRONMENTAL EDITS		03/28/2022	
1	HISTORIC FEATURE DISPOSITIONS		02/03/2022	

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

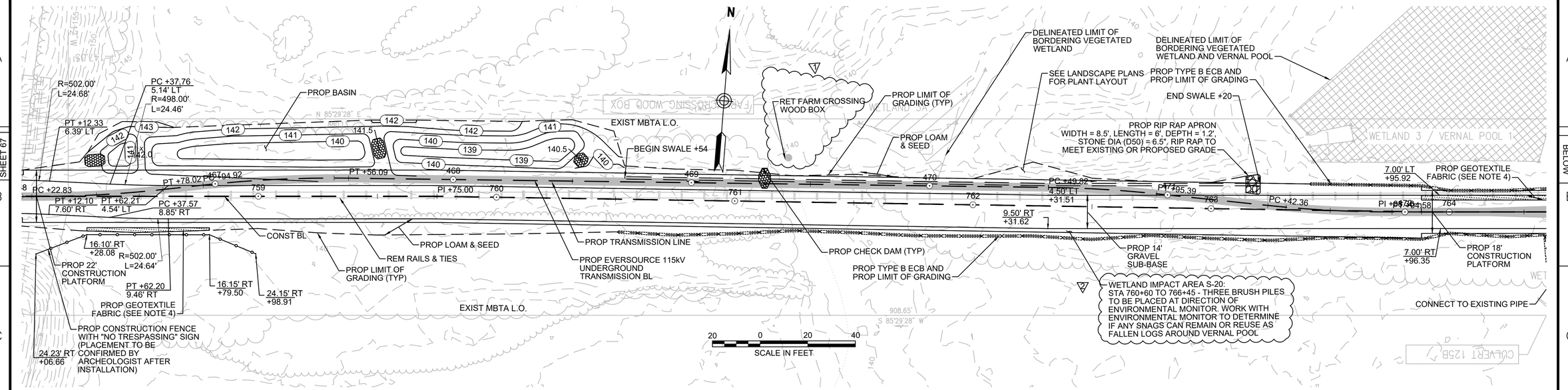
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 67 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.



NOTE:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO. 301-1227).
2. CONTRACTOR TO CUT VEGETATION ON NORTHEAST WINGWALL OF STONE BOX CULVERT. NO GRUBBING SHALL BE PERFORMED OUTSIDE LIMITS OF GRADING.
3. SYNCOPATED SILT FENCE (TYPE B ECB) TO BE USED WITHIN PRIORITY HABITAT AREA AND 450' OFF VERNAL POOLS. SEE DETAIL ON SHEET 154.
4. CONTRACTOR TO INSTALL GEOTEXTILE FABRIC UNDERNEATH 12" GRAVEL BORROW WITHIN LIMITS SHOWN.

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			
2	ENVIRONMENTAL EDITS		03/28/2022	
1	HISTORIC FEATURE DISPOSITIONS		02/03/2022	

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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

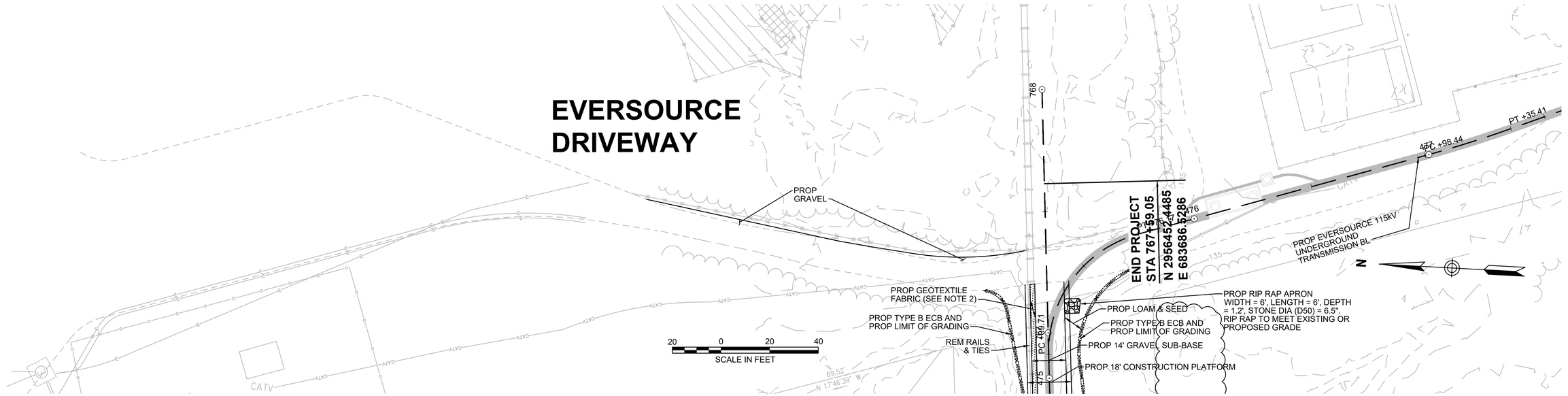
INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 68 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.

CONT. ON SHEET 68

EVERSOURCE DRIVEWAY

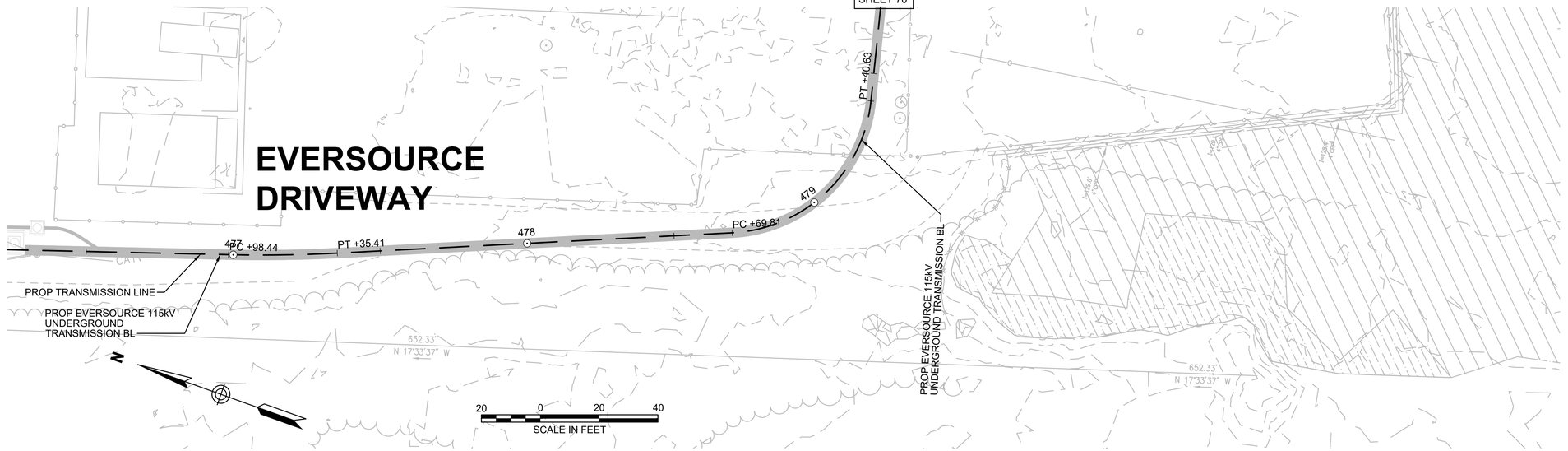


CONT. BELOW

CONT. ON SHEET 70

CONT. ABOVE

EVERSOURCE DRIVEWAY



NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO. 301-1227).
2. CONTRACTOR TO INSTALL GEOTEXTILE FABRIC UNDERNEATH 12" GRAVEL BORROW WITHIN LIMITS SHOWN.
3. SYNCOPATED SILT FENCE (TYPE B ECB) TO BE USED WITHIN PRIORITY HABITAT AREA AND 450' OF VERNAL POOL. SEE DETAIL ON SHEET 154.

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 69 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.

CONT. ON SHEET 69

EVERSOURCE DRIVEWAY

PC +69.81

PT +40.63

PROP TRANSMISSION LINE

PROP EVERSOURCE 115kV UNDERGROUND TRANSMISSION BL

Localized Dewatering

Safety Guard Posts See Det 012419

Erosion & Sediment Control Barrier

20 0 20 40

SCALE IN FEET

NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO. 301-1227).

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION PLANS

INFORMATIONAL SET, FOR REFERENCE ONLY

PLAN 70 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.

4-SUDBURY-HUDSON_ACCESS_DRIVE CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L401	700+00.00	2957366.0527	677304.8213		S66°14'03"E 231.13'	702+31.13	2957272.9091	677516.3488
C401	702+31.13	2957272.9091	677516.3488	R=3750.00' Δ=12°25'19" L=813.02' T=408.11'		710+44.14	2956867.4824	678219.2284
L403	710+44.14	2956867.4824	678219.2284		S53°48'44"E 149.49'	711+93.63	2956779.2208	678339.8770
C404	711+93.63	2956779.2208	678339.8770	R=500.00' Δ=9°37'46" L=84.03' T=42.12'		712+77.66	2956735.5245	678411.5389
C405	712+77.66	2956735.5245	678411.5389	R=500.00' Δ=7°39'17" L=66.80' T=33.45'		713+44.46	2956701.7603	678469.1214
L404	713+44.46	2956701.7603	678469.1214		S55°47'13"E 137.37'	714+81.84	2956624.5189	678582.7225
L405	714+81.84	2956624.5189	678582.7225		S56°18'15"E 352.06'	718+33.90	2956429.2013	678875.6350
C406	718+33.90	2956429.2013	678875.6350	R=2150.00' Δ=7°27'00" L=279.56' T=139.98'		721+13.46	2956289.6424	679117.6429
L406	721+13.46	2956289.6424	679117.6429		S63°45'15"E 104.16'	722+17.62	2956243.5785	679211.0686
C407	722+17.62	2956243.5785	679211.0686	R=1000.00' Δ=9°53'27" L=172.63' T=86.53'		723+90.25	2956180.9486	679371.7031
L407	723+90.25	2956180.9486	679371.7031		S73°38'42"E 171.77'	725+62.02	2956132.5797	679536.5242
C408	725+62.02	2956132.5797	679536.5242	R=975.00' Δ=8°08'34" L=138.56' T=69.40'		727+00.58	2956103.1249	679671.8017
L408	727+00.58	2956103.1249	679671.8017		S81°47'16"E 414.21'	731+14.79	2956043.9591	680081.7601
C409	731+14.79	2956043.9591	680081.7601	R=1450.00' Δ=25°44'54" L=651.62' T=331.41'		737+66.41	2956096.4751	680725.7736
L409	737+66.41	2956096.4751	680725.7736		N72°27'50"E 398.71'	741+65.12	2956216.6094	681105.9571
C410	741+65.12	2956216.6094	681105.9571	R=1400.00' Δ=12°28'35" L=304.86' T=153.03'		744+69.98	2956276.2156	681404.3155
L410	744+69.98	2956276.2156	681404.3155		N84°56'25"E 284.93'	747+54.91	2956301.3441	681688.1339
L412	763+88.36	2956423.2838	683316.9838		N85°29'15"E 411.64'	768+00.00	2956455.6704	683727.3522

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NO.	DESCRIPTION	BY	DATE	APPR.

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION BASELINE DATA

INFORMATIONAL SET, FOR REFERENCE ONLY

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.

1-SUDBURY-HUDSON-ACCESS-ROAD CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L101	99+50.00	2969274.969	646438.132		S57° 19' 07"E 81.72'	100+31.72	2969230.845	646506.912
C101	100+31.72	2969230.845	646506.912	R=40.00' Δ=35°52'18" L=25.04' T=12.95'		100+56.76	2969224.574	646530.737
L102	100+56.76	2969224.574	646530.737		N86° 48' 34"E 48.81'	101+05.57	2969227.291	646579.472
C102	101+05.57	2969227.291	646579.472	R=200.00' Δ=15°02'47" L=52.52' T=26.41'		101+58.09	2969237.027	646630.930
L103	101+58.09	2969237.027	646630.930		N71° 45' 47"E 1063.15'	112+21.25	2969569.737	647640.682
C103	112+21.25	2969569.737	647640.682	R=1400.00' Δ=28°11'56" L=689.03' T=351.64'		119+10.28	2969618.950	648321.003
L104	119+10.28	2969618.950	648321.003		S80° 02' 16"E 1065.88'	129+76.16	2969434.556	649370.812
C104	129+76.16	2969434.556	649370.812	R=2800.00' Δ=12°47'24" L=625.04' T=313.83'		136+01.20	2969258.894	649969.313
L105	136+01.20	2969258.894	649969.313		S67° 14' 52"E 680.66'	142+81.86	2968995.652	650597.005
C105	142+81.86	2968995.652	650597.005	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		143+01.85	2968988.291	650615.589
L106	143+01.85	2968988.291	650615.589		S69° 32' 18"E 30.05'	143+31.90	2968977.787	650643.741
C106	143+31.90	2968977.787	650643.741	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		143+51.89	2968970.427	650662.324
L107	143+51.89	2968970.427	650662.324		S67° 14' 52"E 230.01'	145+81.89	2968881.472	650874.434
C107	145+81.89	2968881.472	650874.434	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		146+01.88	2968873.375	650892.709
L108	146+01.88	2968873.375	650892.709		S64° 57' 26"E 30.05'	146+31.93	2968860.656	650919.932
C108	146+31.93	2968860.656	650919.932	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		146+51.92	2968852.559	650938.207
L109	146+51.92	2968852.559	650938.207		S67° 14' 52"E 358.25'	150+10.17	2968714.005	651268.583
C109	150+10.17	2968714.005	651268.583	R=2300.00' Δ=8°06'43" L=325.63' T=163.09'		153+35.80	2968609.711	651576.773
L110	153+35.80	2968609.711	651576.773		S75° 21' 35"E 196.11'	155+31.91	2968560.145	651766.511
C110	155+31.91	2968560.145	651766.511	R=500.00' Δ=2°17'05" L=19.94' T=9.97'		155+51.85	2968554.722	651785.695
L111	155+51.85	2968554.722	651785.695		S73° 04' 30"E 80.40'	156+32.25	2968531.316	651862.614
C111	156+32.25	2968531.316	651862.614	R=500.00' Δ=2°17'05" L=19.94' T=9.97'		156+52.19	2968525.894	651881.798
L112	156+52.19	2968525.894	651881.798		S75° 21' 35"E 494.94'	161+47.12	2968400.798	652360.665
C112	161+47.12	2968400.798	652360.665	R=500.00' Δ=4°34'26" L=39.91' T=19.97'		161+87.04	2968392.260	652399.645
L113	161+87.04	2968392.260	652399.645		S79° 56' 01"E 10.22'	161+97.26	2968390.473	652409.711
C113	161+97.26	2968390.473	652409.711	R=500.00' Δ=4°34'26" L=39.91' T=19.97'		162+37.18	2968381.936	652448.692
L114	162+37.18	2968381.936	652448.692		S75° 21' 35"E 325.80'	165+62.97	2968299.591	652763.911
C114	165+62.97	2968299.591	652763.911	R=500.00' Δ=2°17'07" L=19.94' T=9.97'		165+82.92	2968294.166	652783.101
C115	165+82.92	2968294.166	652783.101	R=2000.00' Δ=7°17'45" L=254.67' T=127.51'		168+37.59	2968204.731	653021.372
C116	168+37.59	2968204.731	653021.372	R=500.00' Δ=3°55'20" L=34.23' T=17.12'		168+71.82	2968189.631	653052.082

1-SUDBURY-HUDSON-ACCESS-ROAD CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L115	168+71.82	2968189.631	653052.082		S61° 51' 22"E 529.98'	174+01.80	2967939.647	653519.398
C117	174+01.80	2967939.647	653519.398	R=500.00' Δ=3°54'19" L=34.08' T=17.05'		174+35.88	2967924.608	653549.974
L116	174+35.88	2967924.608	653549.974		S65° 45' 41"E 36.37'	174+72.25	2967909.677	653583.135
C118	174+72.25	2967909.677	653583.135	R=500.00' Δ=4°35'46" L=40.11' T=20.07'		175+12.35	2967891.763	653619.009
L117	175+12.35	2967891.763	653619.009		S61° 09' 55"E 234.86'	177+47.22	2967778.491	653824.754
C119	177+47.22	2967778.491	653824.754	R=500.00' Δ=4°34'29" L=39.92' T=19.97'		177+87.14	2967757.862	653858.921
L118	177+87.14	2967757.862	653858.921		S56° 35' 26"E 10.72'	177+97.86	2967751.962	653867.866
C120	177+97.86	2967751.962	653867.866	R=500.00' Δ=4°35'18" L=40.04' T=20.03'		178+37.90	2967731.276	653902.137
L119	178+37.90	2967731.276	653902.137		S61° 10' 44"E 255.16'	180+93.06	2967608.269	654125.690
C121	180+93.06	2967608.269	654125.690	R=200.00' Δ=13°48'39" L=48.21' T=24.22'		181+41.27	2967590.318	654170.307
C122	181+41.27	2967590.318	654170.307	R=50.00' Δ=33°35'20" L=29.31' T=15.09'		181+70.58	2967575.091	654194.862
L120	181+70.58	2967575.091	654194.862		S41° 24' 03"E 53.66'	182+24.24	2967534.839	654230.350
C123	182+24.24	2967534.839	654230.350	R=60.00' Δ=47°56'15" L=50.20' T=26.67'		182+74.44	2967514.523	654274.663
C124	182+74.44	2967514.523	654274.663	R=80.00' Δ=27°43'21" L=38.71' T=19.74'		183+13.15	2967504.910	654311.769
L121	183+13.15	2967504.910	654311.769		S61° 36' 57"E 368.60'	186+81.74	2967329.686	654636.052
C125	186+81.74	2967329.686	654636.052	R=6500.00' Δ=4°41'05" L=531.46' T=265.88'		192+13.21	2967096.424	655113.425
L122	192+13.21	2967096.424	655113.425		S66° 18' 02"E 2021.93'	212+35.14	2966283.729	656964.841
C126	212+35.14	2966283.729	656964.841	R=100.00' Δ=22°30'52" L=39.30' T=19.90'		212+74.44	2966261.359	656996.840
C127	212+74.44	2966261.359	656996.840	R=100.00' Δ=35°52'08" L=62.60' T=32.37'		213+37.04	2966232.181	657051.075
L123	213+37.04	2966232.181	657051.075		S79° 39' 18"E 42.56'	213+79.60	2966224.538	657092.945
C128	213+79.60	2966224.538	657092.945	R=100.00' Δ=13°22'03" L=23.33' T=11.72'		214+02.93	2966217.721	657115.202
L124	214+02.93	2966217.721	657115.202		S66° 17' 15"E 38.73'	214+41.66	2966202.144	657150.666

CHESTNUT-STREET CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L501	800+00.00	2969511.351	649678.545		S10° 58' 48"W 181.91'	801+81.91	2969332.767	649643.897
C501	801+81.91	2969332.767	649643.897	R=1000.00' Δ=4°22'21" L=76.32' T=38.18'		802+58.23	2969257.368	649632.233
L502	802+58.23	2969257.368	649632.233		S6° 36' 27"W 41.77'	803+00.00	2969215.874	649627.426

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NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION BASELINE DATA

PLAN 71 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.

2-SUDBURY-HUDSON-ACCESS-DRIVE CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L201	300+00.00	2966202.1444	657150.6659		S66°17'15"E 569.94'	305+69.94	2965972.9435	657672.4880
C201	305+69.94	2965972.9435	657672.4880	R=500.00' Δ=2°19'14" L=20.25' T=10.13'		305+90.19	2965965.1773	657691.1890
L202	305+90.19	2965965.1773	657691.1890		S68°36'29"E 31.19'	306+21.38	2965953.7996	657720.2333
C202	306+21.38	2965953.7996	657720.2333	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		306+41.37	2965946.1385	657738.6949
L203	306+41.37	2965946.1385	657738.6949		S66°19'03"E 730.01'	313+71.38	2965652.9160	658407.2248
C203	313+71.38	2965652.9160	658407.2248	R=500.00' Δ=2°17'26" L=19.99' T=10.00'		313+91.37	2965644.5231	658425.3653
L204	313+91.37	2965644.5231	658425.3653		S64°01'36"E 29.68'	314+21.05	2965631.5251	658452.0469
C204	314+21.05	2965631.5251	658452.0469	R=500.00' Δ=2°17'04" L=19.94' T=9.97'		314+40.99	2965623.1534	658470.1391
L205	314+40.99	2965623.1534	658470.1391		S66°18'41"E 2288.82'	337+29.81	2964703.5807	660566.1091
C205	337+29.81	2964703.5807	660566.1091	R=500.00' Δ=4°31'29" L=39.49' T=19.75'		337+69.29	2964686.3060	660601.6044
L206	337+69.29	2964686.3060	660601.6044		S61°47'12"E 11.20'	337+80.49	2964681.0125	660611.4712
C206	337+80.49	2964681.0125	660611.4712	R=500.00' Δ=4°31'29" L=39.49' T=19.75'		338+19.98	2964663.7378	660646.9665
L207	338+19.98	2964663.7378	660646.9665		S66°18'41"E 209.72'	340+29.70	2964579.4775	660839.0199
C207	340+29.70	2964579.4775	660839.0199	R=500.00' Δ=4°17'58" L=37.52' T=18.77'		340+67.22	2964565.7061	660873.9108
L208	340+67.22	2964565.7061	660873.9108		S70°36'39"E 15.82'	340+83.04	2964560.4544	660888.8329
C208	340+83.04	2964560.4544	660888.8329	R=500.00' Δ=4°17'58" L=37.52' T=18.77'		341+20.56	2964546.6830	660923.7239
L209	341+20.56	2964546.6830	660923.7239		S66°18'41"E 359.47'	344+80.03	2964402.2587	661252.9083
C209	344+80.03	2964402.2587	661252.9083	R=500.00' Δ=4°34'26" L=39.91' T=19.97'		345+19.95	2964387.6974	661290.0610
L210	345+19.95	2964387.6974	661290.0610		S70°53'07"E 10.12'	345+30.07	2964384.3829	661299.6249
C210	345+30.07	2964384.3829	661299.6249	R=500.00' Δ=4°34'16" L=39.89' T=19.96'		345+69.96	2964369.8317	661336.7545
L211	345+69.96	2964369.8317	661336.7545		S66°18'51"E 159.98'	347+29.94	2964305.5655	661483.2559
C211	347+29.94	2964305.5655	661483.2559	R=500.00' Δ=4°23'59" L=38.39' T=19.21'		347+68.33	2964288.8077	661517.7892
L212	347+68.33	2964288.8077	661517.7892		S61°54'53"E 13.79'	347+82.12	2964282.3158	661529.9549

2-SUDBURY-HUDSON-ACCESS-DRIVE CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C212	347+82.12	2964282.3158	661529.9549	R=500.00' Δ=4°23'48" L=38.37' T=19.19'		348+20.49	2964265.5682	661564.4651
L213	348+20.49	2964265.5682	661564.4651		S66°18'41"E 1267.77'	360+88.26	2963756.2200	662725.4156
C213	360+88.26	2963756.2200	662725.4156	R=80.00' Δ=16°41'57" L=23.32' T=11.74'		361+11.58	2963743.8947	662745.1110
L214	361+11.58	2963743.8947	662745.1110		S49°36'43"E 16.84'	361+28.41	2963732.9851	662757.9352
C214	361+28.41	2963732.9851	662757.9352	R=80.00' Δ=32°54'10" L=45.94' T=23.62'		361+74.35	2963714.6008	662799.3503
L215	361+74.35	2963714.6008	662799.3503		S82°30'53"E 18.74'	361+93.10	2963712.1592	662817.9331
C215	361+93.10	2963712.1592	662817.9331	R=80.00' Δ=16°12'13" L=22.62' T=11.39'		362+15.72	2963706.1003	662839.6528
L216	362+15.72	2963706.1003	662839.6528		S66°18'41"E 417.03'	366+32.74	2963538.5534	663221.5402
C216	366+32.74	2963538.5534	663221.5402	R=500.00' Δ=5°07'35" L=44.74' T=22.38'		366+77.48	2963522.4353	663263.2560
C217	366+77.48	2963522.4353	663263.2560	R=500.00' Δ=5°07'35" L=44.74' T=22.38'		367+22.22	2963506.3172	663304.9718
L217	367+22.22	2963506.3172	663304.9718		S66°18'41"E 162.17'	368+84.39	2963441.1621	663453.4789
C218	368+84.39	2963441.1621	663453.4789	R=500.00' Δ=5°03'10" L=44.09' T=22.06'		369+28.48	2963421.6905	663493.0242
C219	369+28.48	2963421.6905	663493.0242	R=500.00' Δ=4°58'12" L=43.37' T=21.70'		369+71.85	2963402.5097	663531.9080
L218	369+71.85	2963402.5097	663531.9080		S66°13'43"E 2255.15'	392+27.00	2962493.4828	665595.7301
L219	392+27.00	2962493.4828	665595.7301		S66°18'55"E 1499.60'	407+26.60	2961891.0882	666969.0153
C220	407+26.60	2961891.0882	666969.0153	R=500.00' Δ=2°19'04" L=20.23' T=10.11'		407+46.82	2961882.5913	666987.3676
L220	407+46.82	2961882.5913	666987.3676		S63°59'51"E 27.94'	407+74.76	2961870.3416	667012.4806
C221	407+74.76	2961870.3416	667012.4806	R=500.00' Δ=2°17'42" L=20.03' T=10.01'		407+94.79	2961861.9243	667030.6513
L221	407+94.79	2961861.9243	667030.6513		S66°17'33"E 730.94'	415+25.73	2961568.0374	667699.9070
C222	415+25.73	2961568.0374	667699.9070	R=499.59' Δ=7°40'18" L=66.89' T=33.50'		415+92.62	2961545.3163	667762.7705
C223	415+92.62	2961545.3163	667762.7705	R=500.00' Δ=7°45'40" L=67.73' T=33.92'		416+60.35	2961522.2623	667826.3998
L222	416+60.35	2961522.2623	667826.3998		S66°12'11"E 50.19'	417+10.54	2961502.0115	667872.3213

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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION LINE RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION BASELINE DATA

PLAN 72 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.

3-SUDBURY-HUDSON_ACCESS_DRIVE CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L301	500+00.00	2961502.012	667872.321		S66° 12' 11"E 2.28'	500+02.28	2961501.092	667874.407
C301	500+02.28	2961501.092	667874.407	R=500.00' Δ=7°41'35" L=67.14' T=33.62'		500+69.41	2961469.967	667933.834
C302	500+69.41	2961469.967	667933.834	R=500.00' Δ=7°41'34" L=67.13' T=33.62'		501+36.55	2961438.842	667993.259
L302	501+36.55	2961438.842	667993.259		S66° 12' 10"E 352.24'	504+88.78	2961296.716	668315.548
L303	504+88.78	2961296.716	668315.548		S66° 29' 41"E 714.53'	512+03.31	2961011.736	668970.789
L304	512+03.31	2961011.736	668970.789		S65° 47' 36"E 355.56'	515+58.87	2960865.948	669295.083
C303	515+58.87	2960865.948	669295.083	R=2000.00' Δ=2°02'02" L=70.99' T=35.50'		516+29.86	2960837.994	669360.337
L305	516+29.86	2960837.994	669360.337		S67° 49' 38"E 62.53'	516+92.40	2960814.394	669418.247
C304	516+92.40	2960814.394	669418.247	R=5000.00' Δ=2°28'08" L=215.46' T=107.75'		519+07.86	2960728.805	669615.962
L306	519+07.86	2960728.805	669615.962		S65° 21' 30"E 56.37'	519+64.23	2960705.304	669667.194
C305	519+64.23	2960705.304	669667.194	R=5000.00' Δ=1°03'24" L=92.20' T=46.10'		520+56.43	2960667.637	669751.349
L307	520+56.43	2960667.637	669751.349		S66° 24' 53"E 3804.53'	558+60.96	2959145.398	673238.076
L308	558+60.96	2959145.398	673238.076		S67° 25' 05"E 114.60'	559+75.56	2959101.392	673343.887
L309	559+75.56	2959101.392	673343.887		S66° 25' 05"E 324.74'	563+00.30	2958971.476	673641.508
L310	563+00.30	2958971.476	673641.508		S66° 18' 26"E 3665.57'	599+65.87	2957498.529	676998.123
C306	599+65.87	2957498.529	676998.123	R=500.00' Δ=3°38'00" L=31.71' T=15.86'		599+97.58	2957486.717	677027.541
L311	599+97.58	2957486.717	677027.541		S69° 56' 26"E 84.99'	600+82.57	2957457.567	677107.371
C307	600+82.57	2957457.567	677107.371	R=500.00' Δ=3°38'42" L=31.81' T=15.91'		601+14.37	2957445.714	677136.884
L312	601+14.37	2957445.714	677136.884		S66° 17' 43"E 47.14'	601+61.52	2957426.761	677180.049
C308	601+61.52	2957426.761	677180.049	R=500.00' Δ=3°13'05" L=28.08' T=14.05'		601+89.60	2957414.756	677205.432
L313	601+89.60	2957414.756	677205.432		S63° 04' 38"E 68.56'	602+58.16	2957383.711	677266.565
C309	602+58.16	2957383.711	677266.565	R=500.00' Δ=3°13'05" L=28.08' T=14.05'		602+86.25	2957371.705	677291.948
L314	602+86.25	2957371.705	677291.948		S66° 17' 43"E 14.06'	603+00.31	2957366.053	677304.821

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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION BASELINE DATA

PLAN 73 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.

4-SUDBURY-HUDSON_ACCESS_DRIVE CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L401	700+00.00	2957366.0527	677304.8213		S66°14'03"E 231.13'	702+31.13	2957272.9091	677516.3488
C401	702+31.13	2957272.9091	677516.3488	R=3750.00' Δ=12°25'19" L=813.02' T=408.11'		710+44.14	2956867.4824	678219.2284
L403	710+44.14	2956867.4824	678219.2284		S53°48'44"E 149.49'	711+93.63	2956779.2208	678339.8770
C404	711+93.63	2956779.2208	678339.8770	R=500.00' Δ=9°37'46" L=84.03' T=42.12'		712+77.66	2956735.5245	678411.5389
C405	712+77.66	2956735.5245	678411.5389	R=500.00' Δ=7°39'17" L=66.80' T=33.45'		713+44.46	2956701.7603	678469.1214
L404	713+44.46	2956701.7603	678469.1214		S55°47'13"E 137.37'	714+81.84	2956624.5189	678582.7225
L405	714+81.84	2956624.5189	678582.7225		S56°18'15"E 352.06'	718+33.90	2956429.2013	678875.6350
C406	718+33.90	2956429.2013	678875.6350	R=2150.00' Δ=7°27'00" L=279.56' T=139.98'		721+13.46	2956289.6424	679117.6429
L406	721+13.46	2956289.6424	679117.6429		S63°45'15"E 104.16'	722+17.62	2956243.5785	679211.0686
C407	722+17.62	2956243.5785	679211.0686	R=1000.00' Δ=9°53'27" L=172.63' T=86.53'		723+90.25	2956180.9486	679371.7031
L407	723+90.25	2956180.9486	679371.7031		S73°38'42"E 171.77'	725+62.02	2956132.5797	679536.5242
C408	725+62.02	2956132.5797	679536.5242	R=975.00' Δ=8°08'34" L=138.56' T=69.40'		727+00.58	2956103.1249	679671.8017
L408	727+00.58	2956103.1249	679671.8017		S81°47'16"E 414.21'	731+14.79	2956043.9591	680081.7601
C409	731+14.79	2956043.9591	680081.7601	R=1450.00' Δ=25°44'54" L=651.62' T=331.41'		737+66.41	2956096.4751	680725.7736
L409	737+66.41	2956096.4751	680725.7736		N72°27'50"E 398.71'	741+65.12	2956216.6094	681105.9571
C410	741+65.12	2956216.6094	681105.9571	R=1400.00' Δ=12°28'35" L=304.86' T=153.03'		744+69.98	2956276.2156	681404.3155
L410	744+69.98	2956276.2156	681404.3155		N84°56'25"E 284.93'	747+54.91	2956301.3441	681688.1339
L412	763+88.36	2956423.2838	683316.9838		N85°29'15"E 411.64'	768+00.00	2956455.6704	683727.3522

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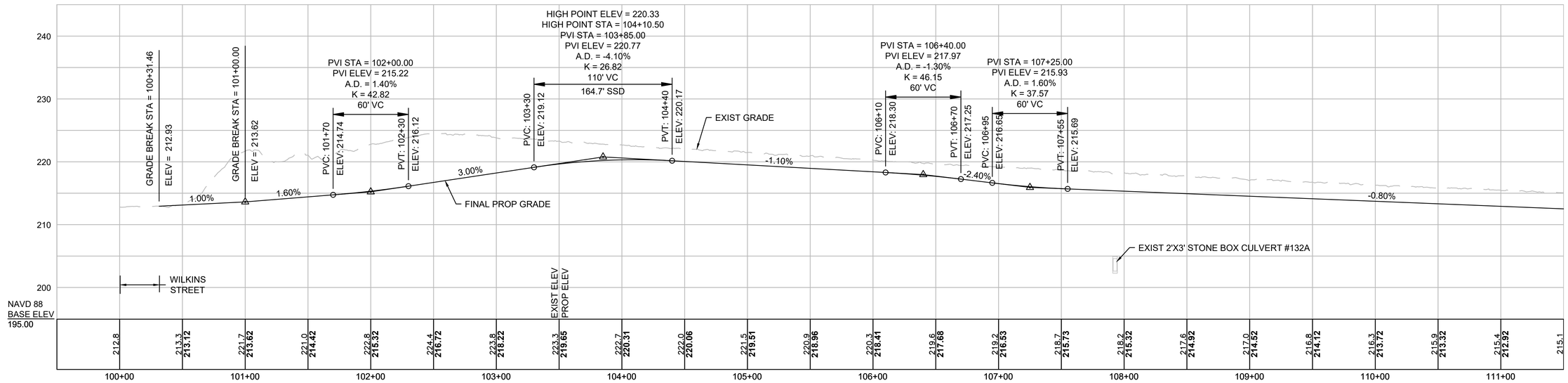
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

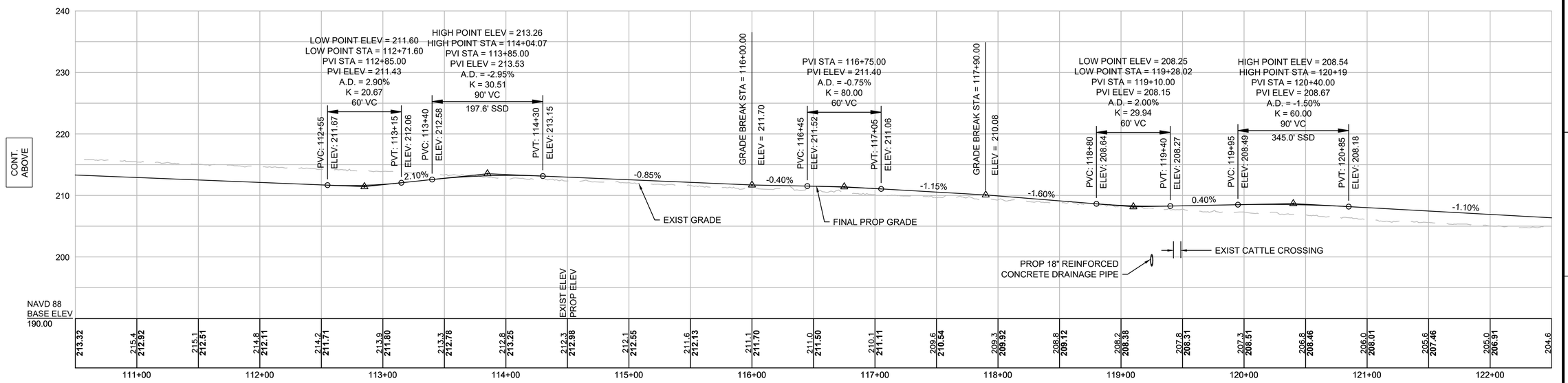
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION BASELINE DATA

PLAN 74 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MS	SK	MES	.	.





NOTE:
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HORIZONTAL
40 0 40 80
8 0 8 16
VERTICAL
SCALE IN FEET

Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
Watertown, MA 02472
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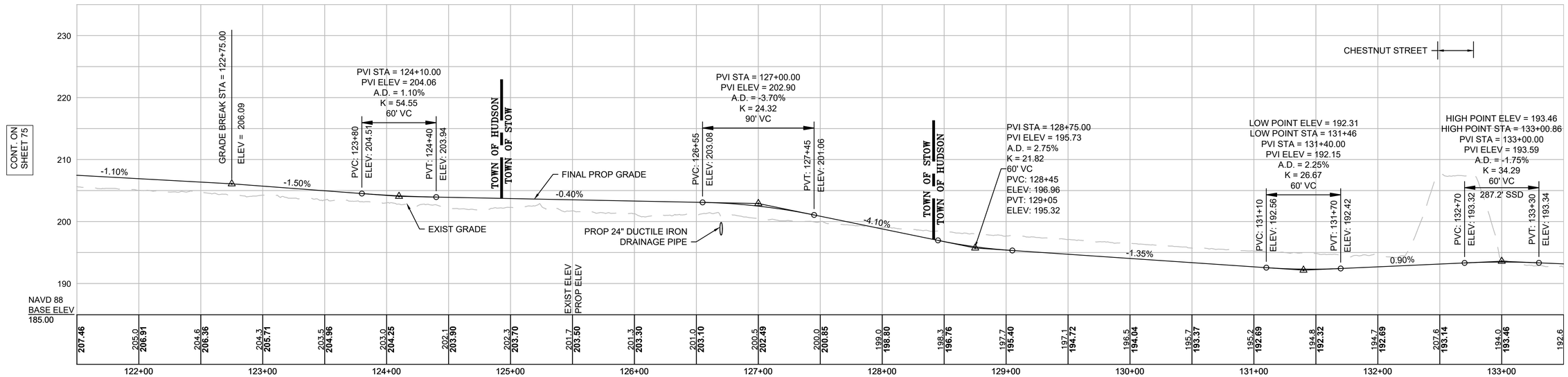
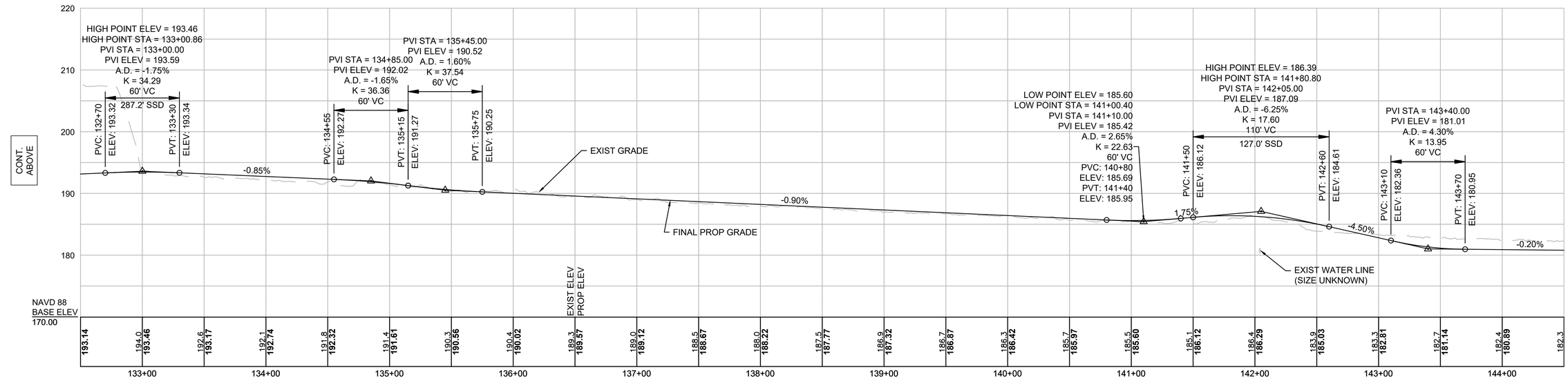
NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
PROFILE
PLAN 75 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APP R.	DRAWING NO.	REV.
H: 1"=40' V: 1"=8'	DEC 2021	MS	SK	MES	.	.





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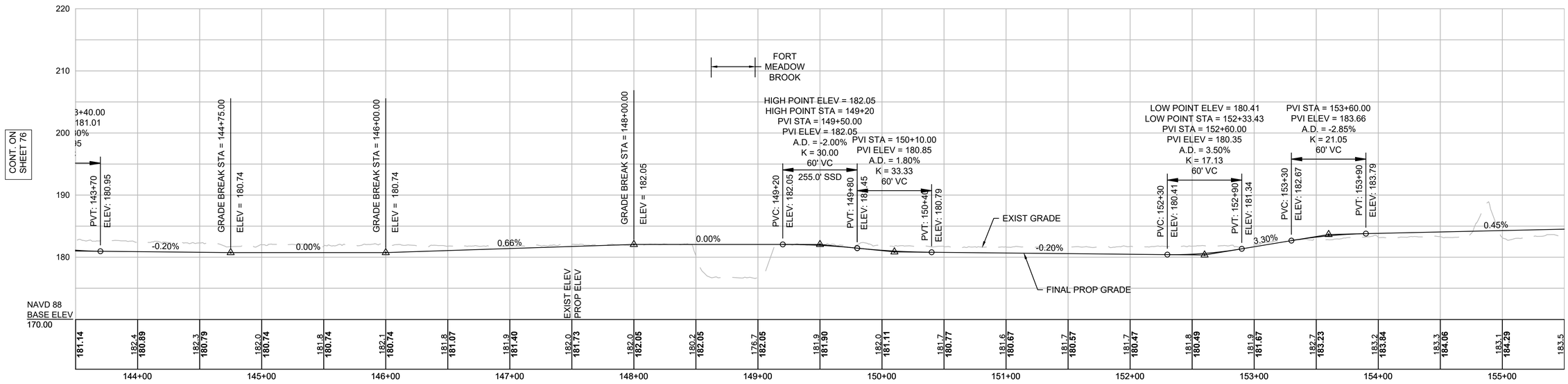
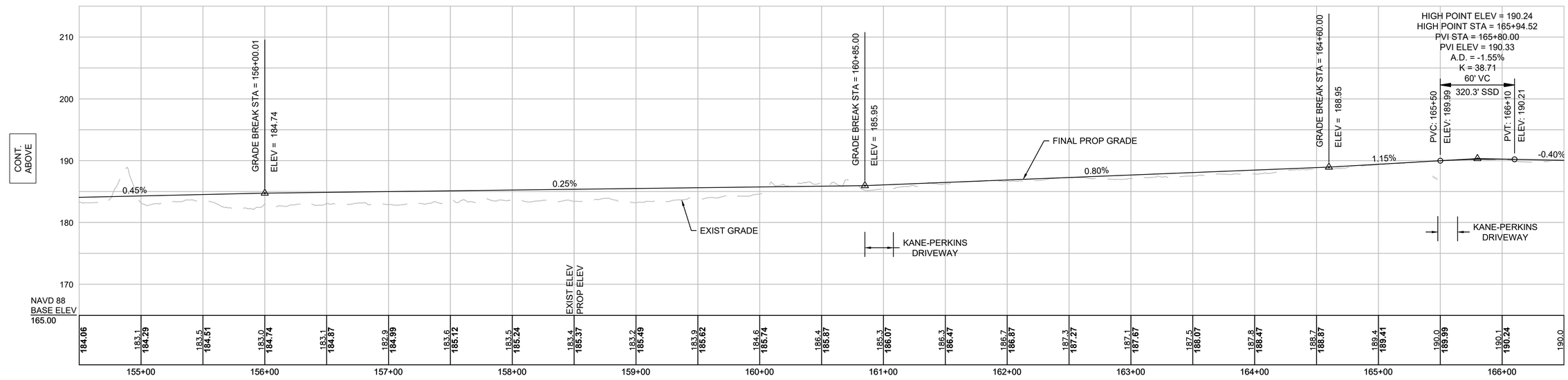
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
PROFILE
PLAN 76 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
H: 1"=40' V: 1"=8'	DEC 2021	MS	SK	MES	.	.





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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
PROFILE
PLAN 77 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
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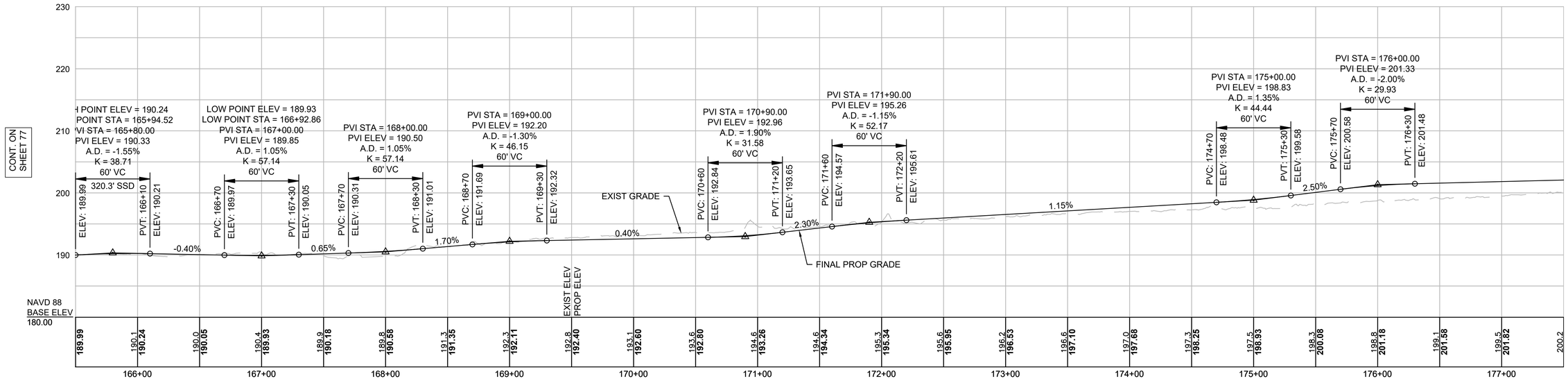

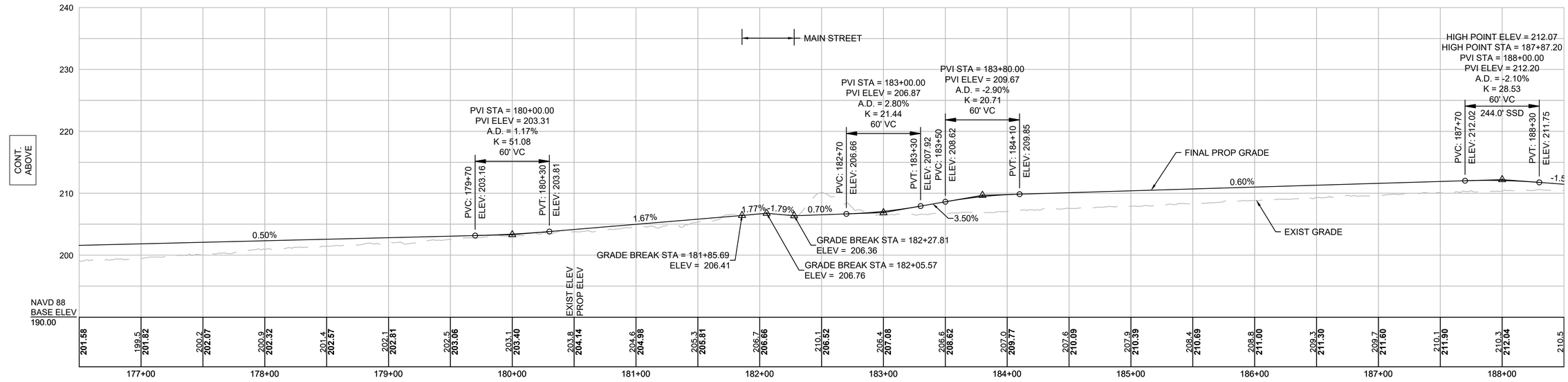

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

PROFILE

PLAN 78 OF 349

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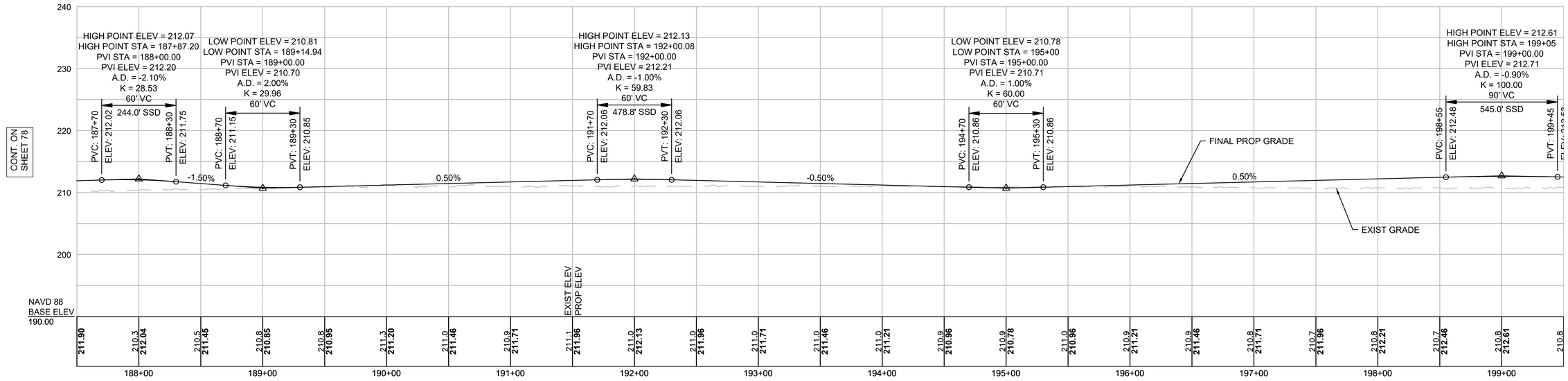

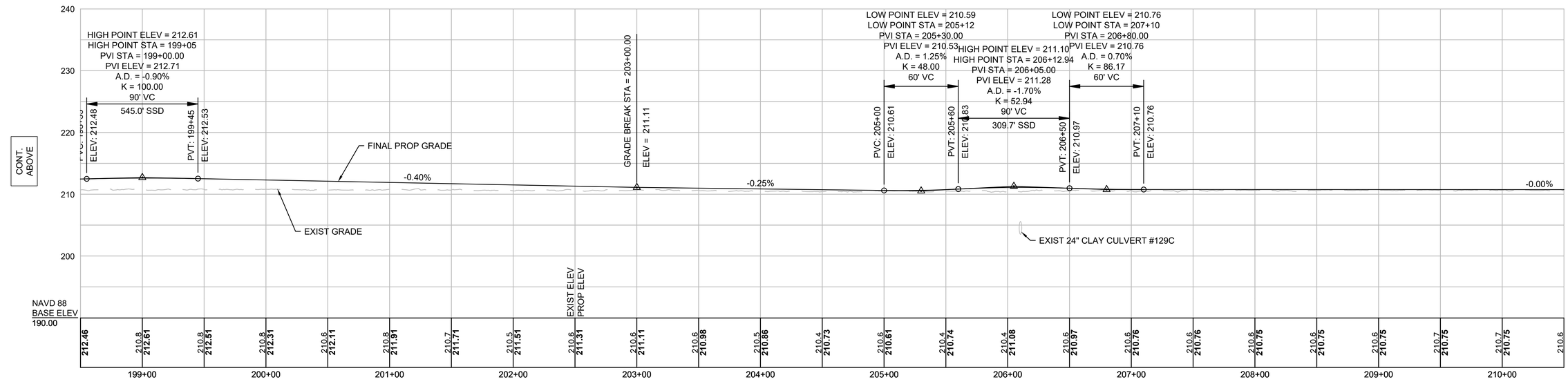

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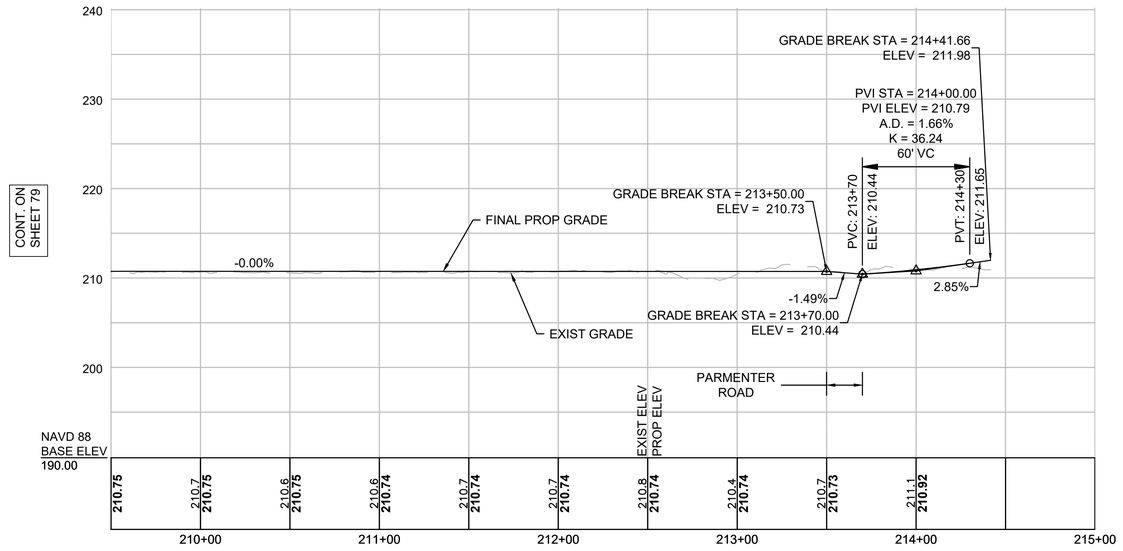
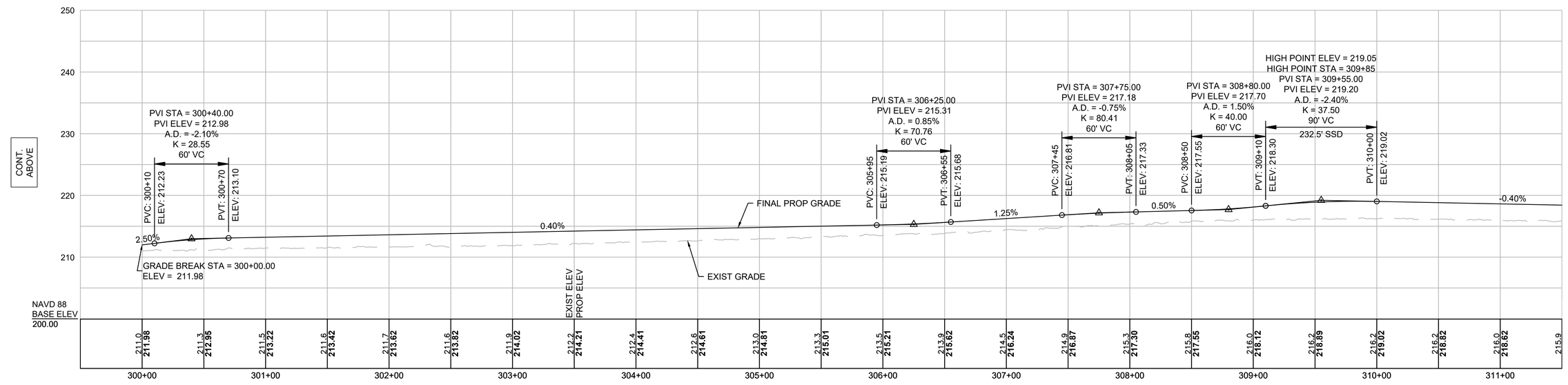
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
PROFILE
PLAN 79 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
H: 1"=40' V: 1"=8'	DEC 2021	MS	SK	MES	.	.





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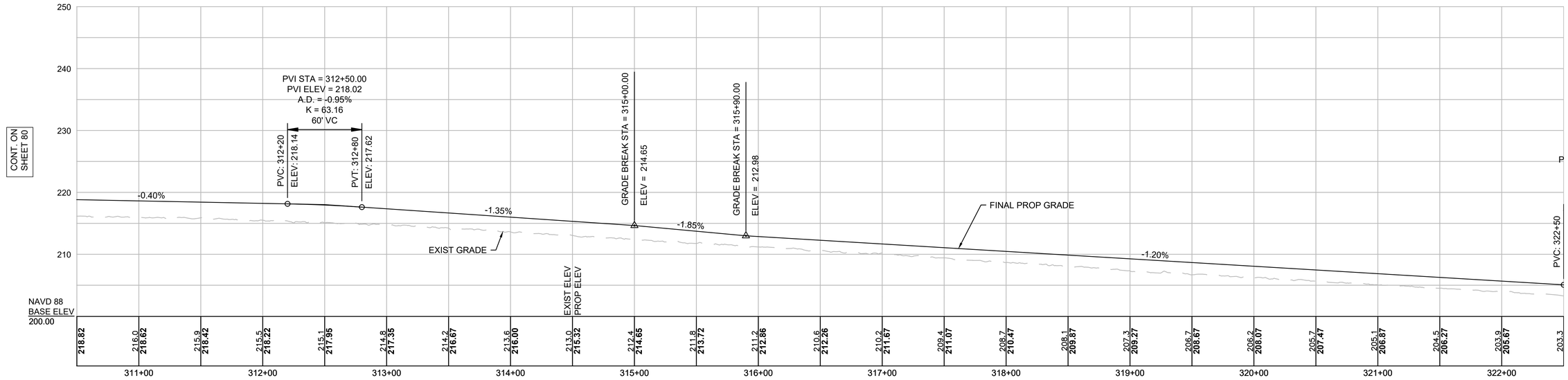
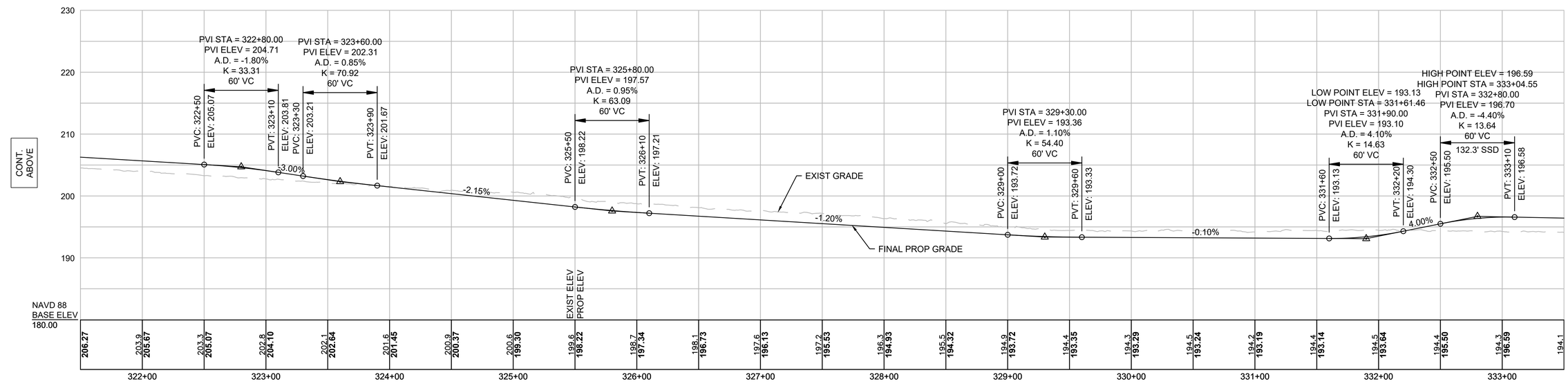
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
PROFILE
PLAN 80 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
H: 1"=40' V: 1"=8'	DEC 2021	MS	SK	MES	.	.





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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
PROFILE
PLAN 81 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
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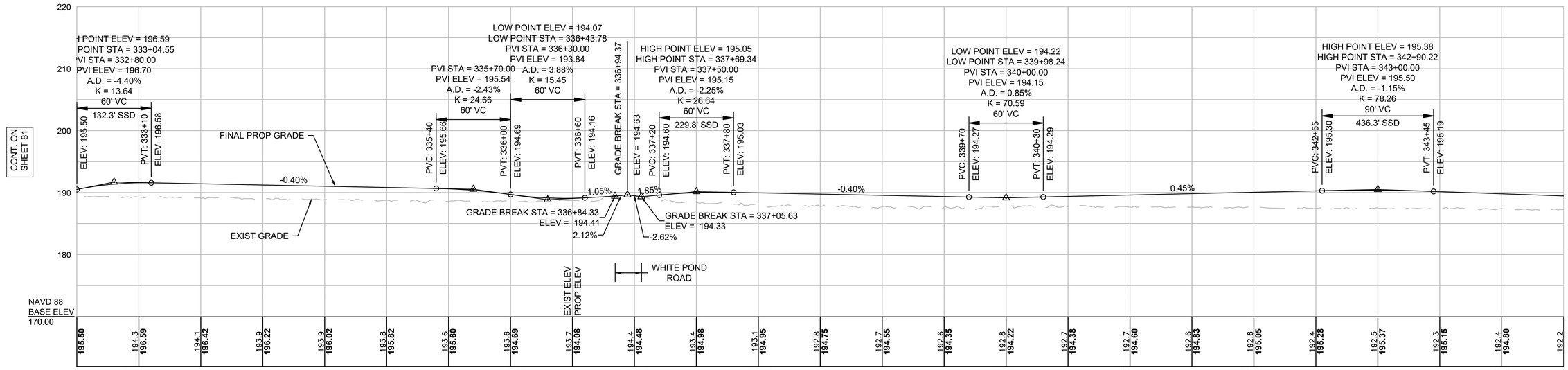

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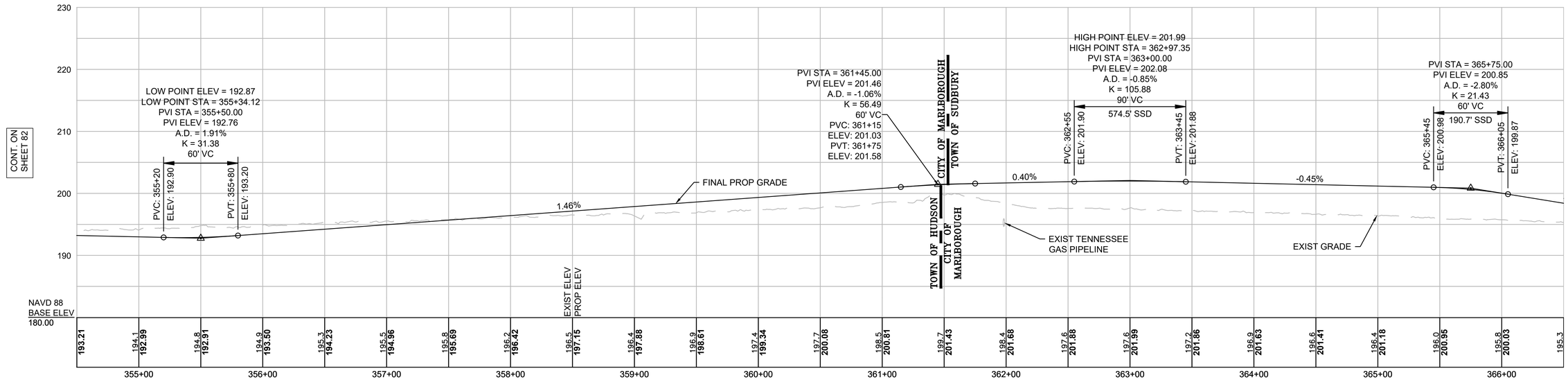
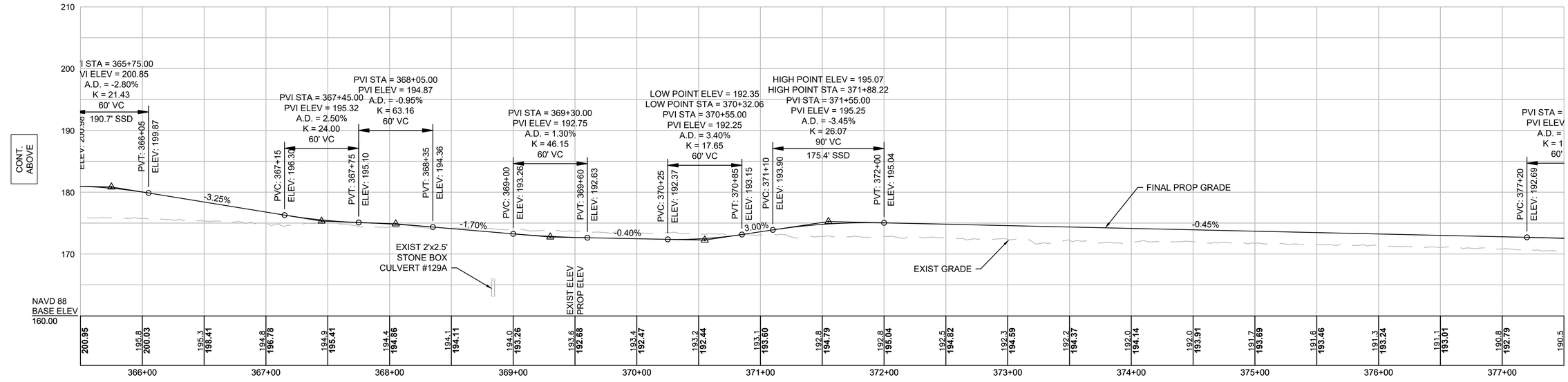
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
PROFILE
PLAN 82 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
H: 1"=40' V: 1"=8'	DEC 2021	MS	SK	MES	.	.





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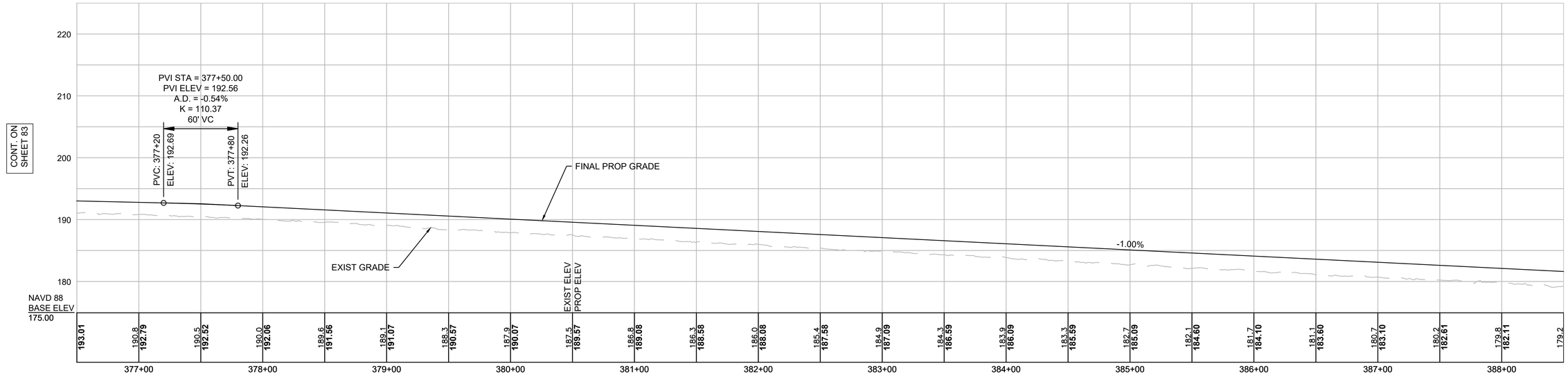
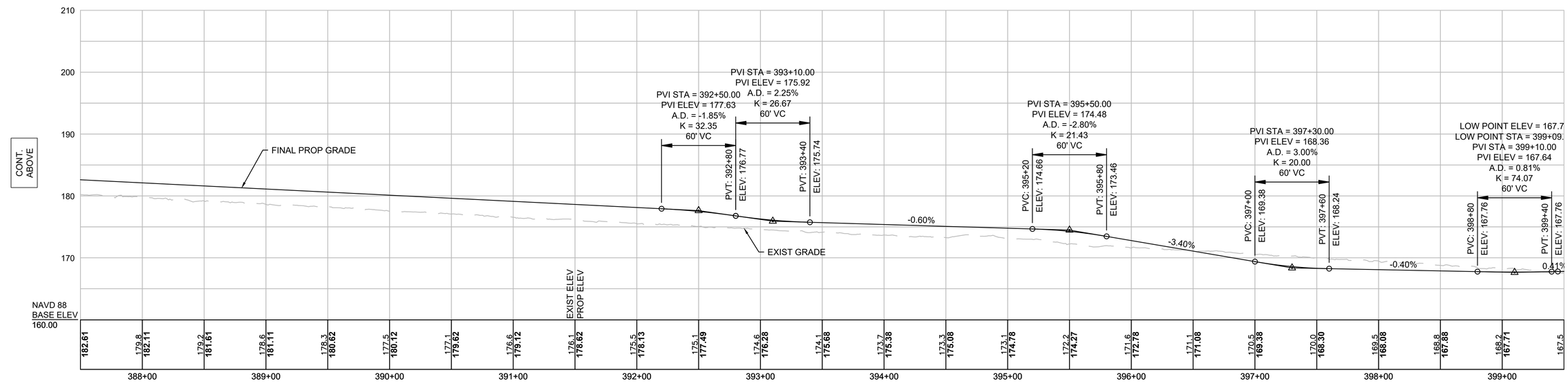
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
PROFILE
PLAN 83 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
H: 1"=40' V: 1"=8'	DEC 2021	MS	SK	MES	.	.





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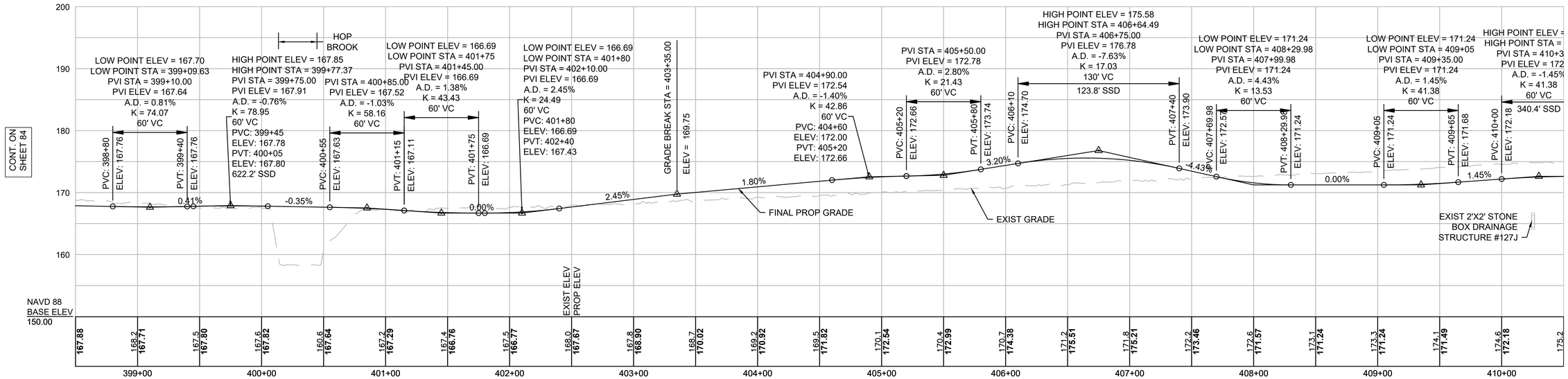
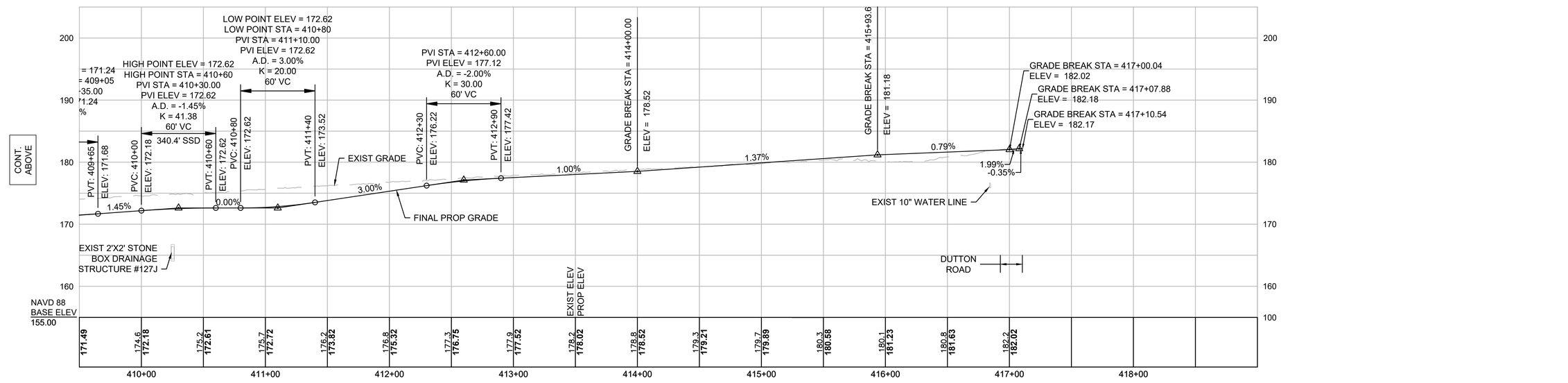
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
PROFILE
PLAN 84 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
H: 1"=40' V: 1"=8'	DEC 2021	MS	SK	MES	.	.





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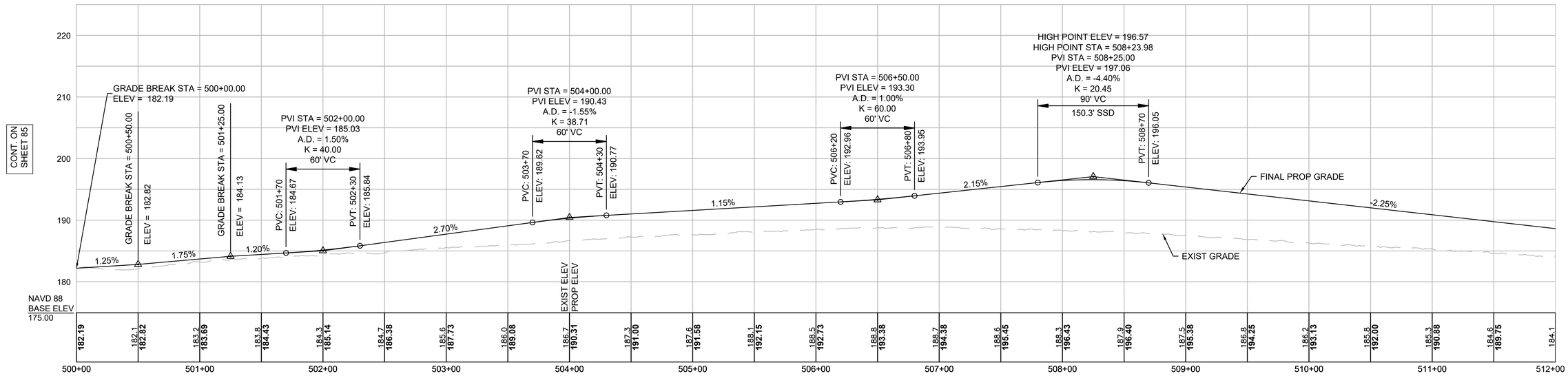
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

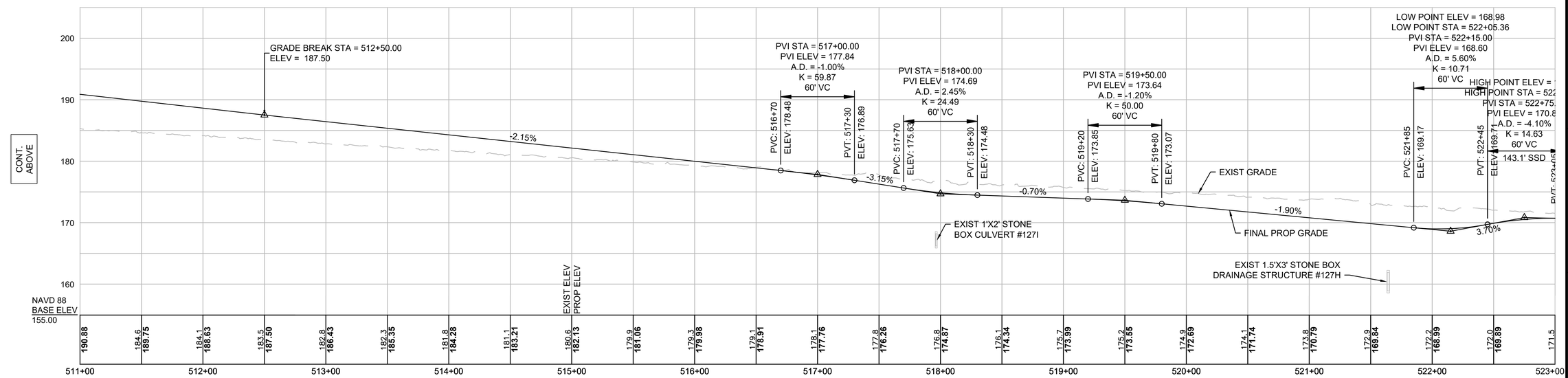
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

PROFILE

PLAN 85 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APP R.	DRAWING NO.	REV.
H: 1"=40' V: 1"=8'	DEC 2021	MS	SK	MS	.	.





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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
PROFILE
PLAN 86 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
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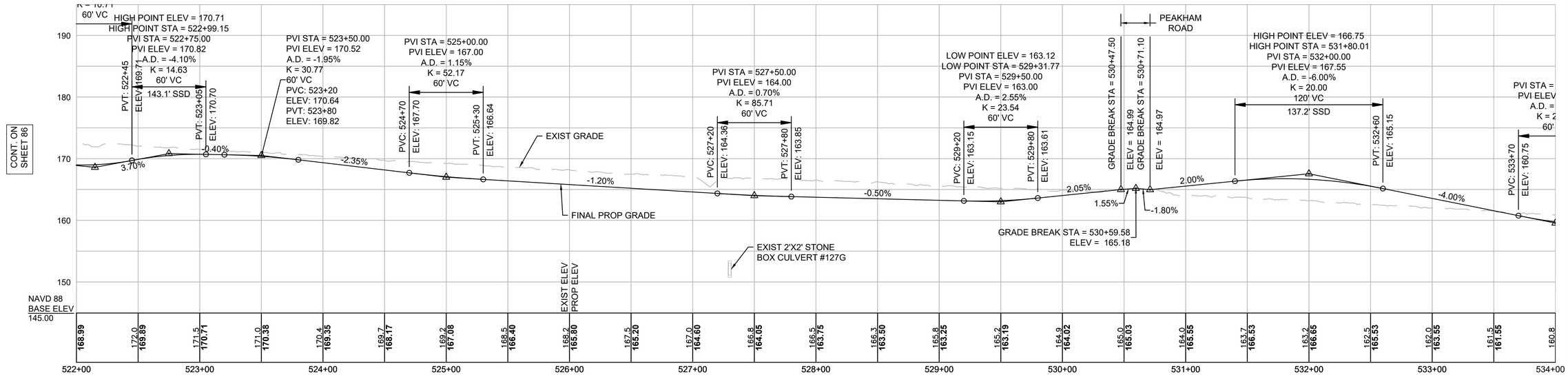

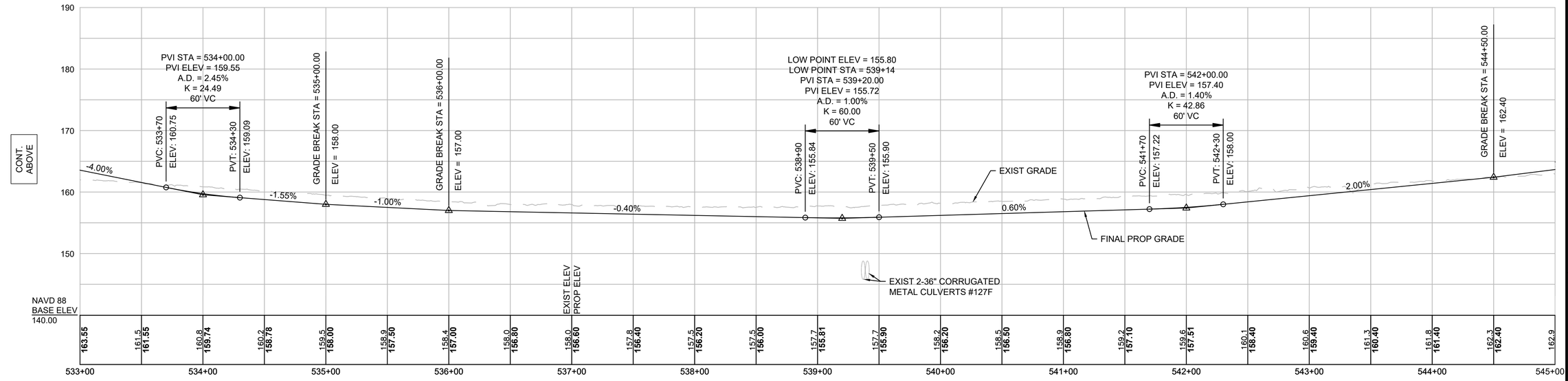

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PROFILE
PLAN 87 OF 349

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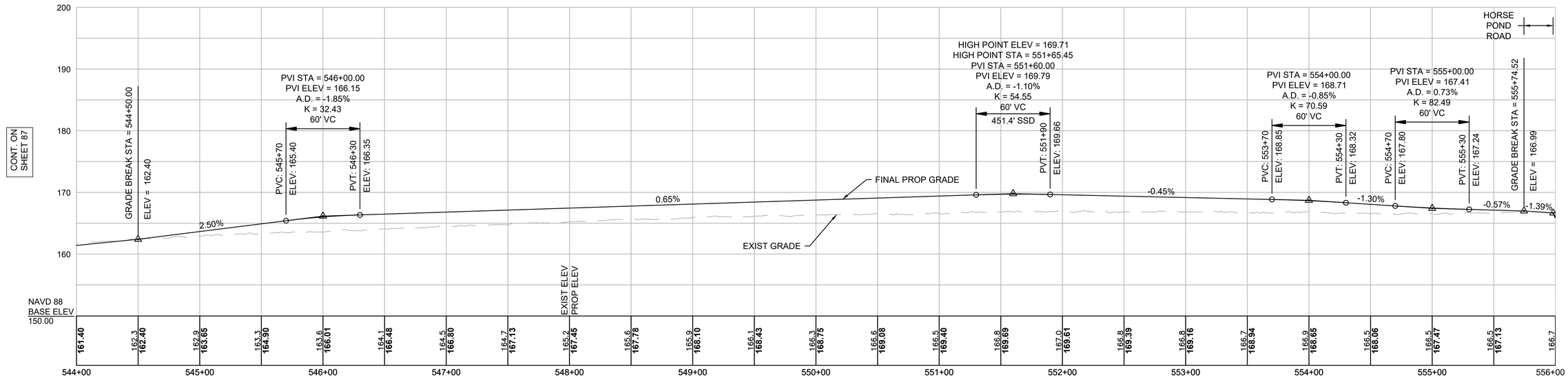

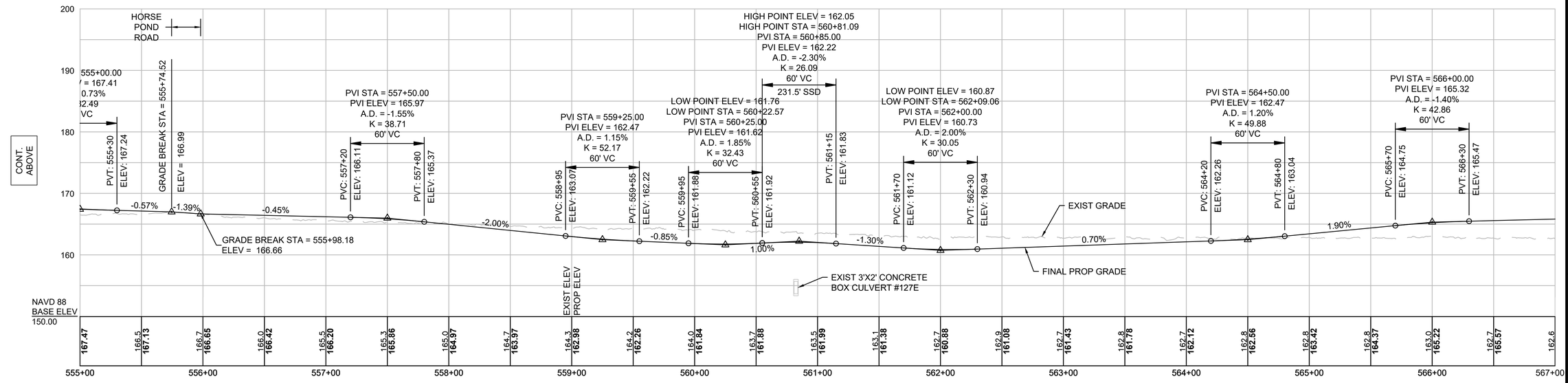

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
PROFILE
PLAN 88 OF 349

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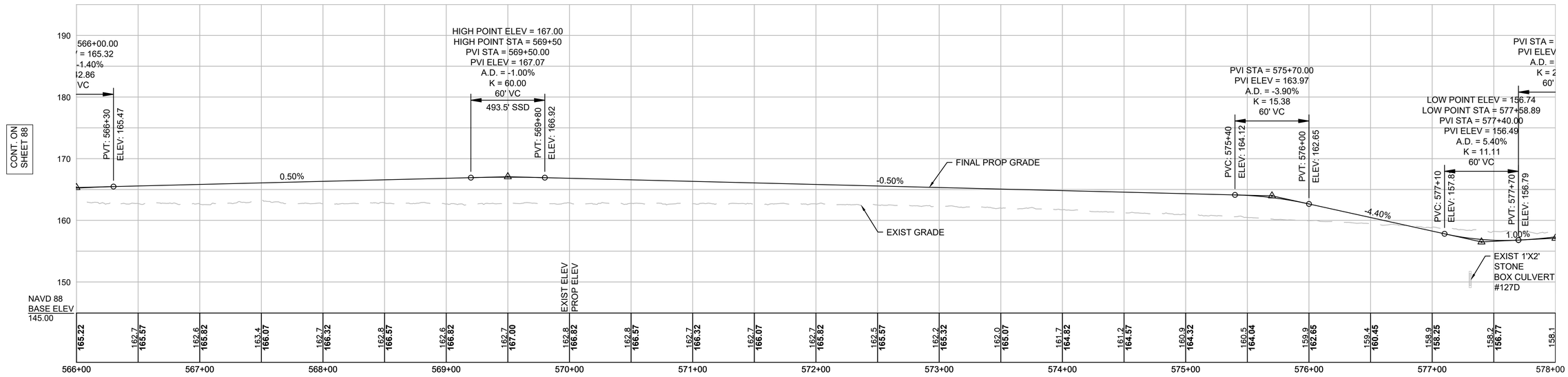

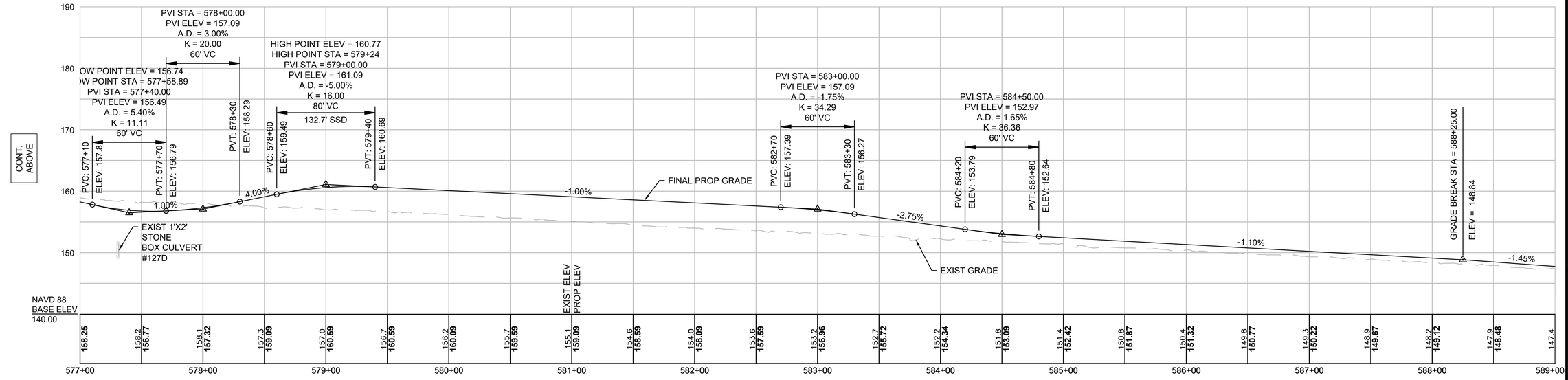

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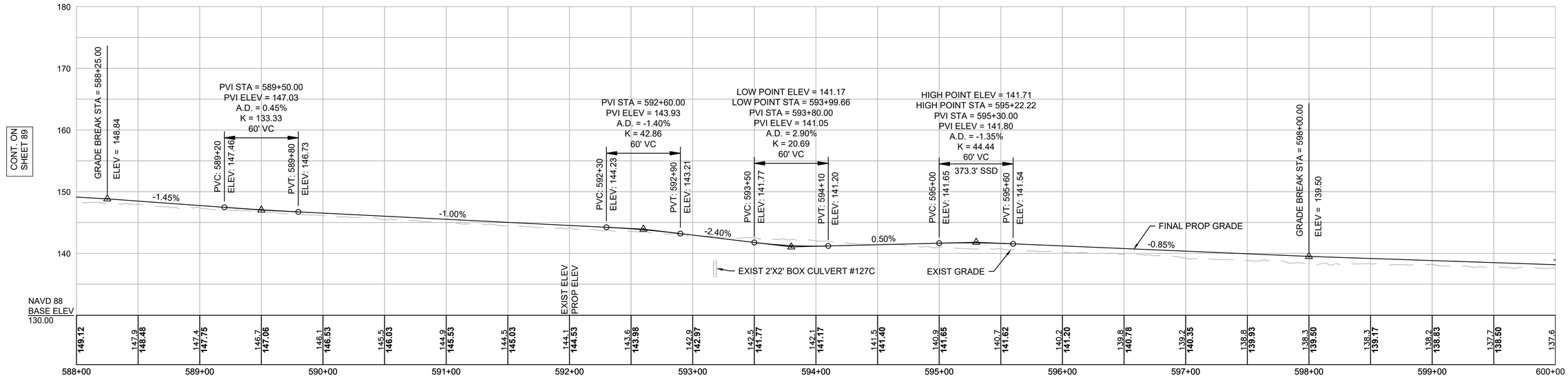
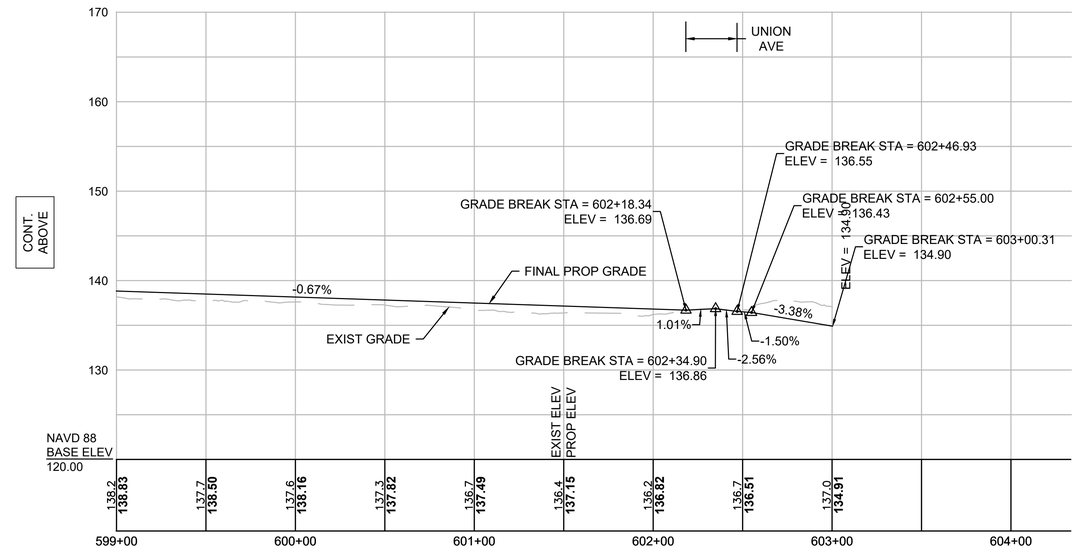
PROFILE
PLAN 89 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
H: 1"=40' V: 1"=8'	DEC 2021	MS	SK	MES	.	.





NOTE:
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HORIZONTAL
40 0 40 80
8 0 8 16
VERTICAL
SCALE IN FEET

CONT. ON SHEET 91

NO.	DESCRIPTION	BY	DATE	APPR.
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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
PROFILE
PLAN 90 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
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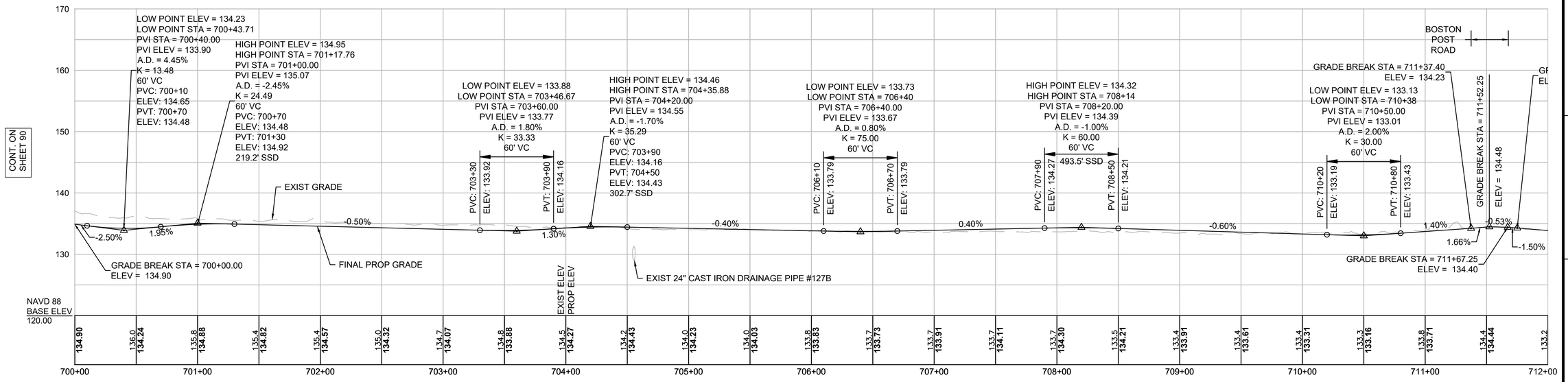

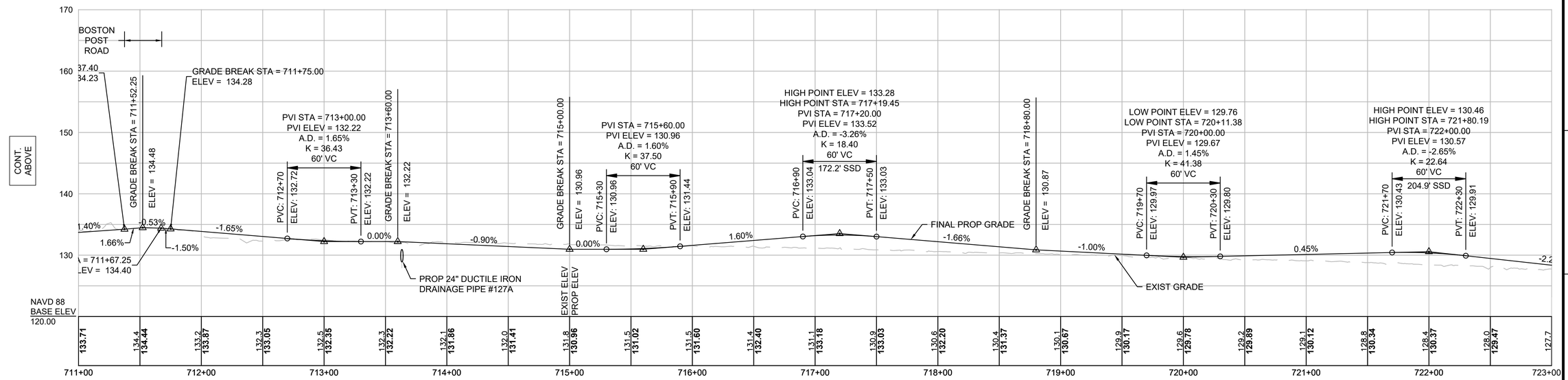

CONT. ON SHEET 12

NOTE:
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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
PROFILE
PLAN 91 OF 349

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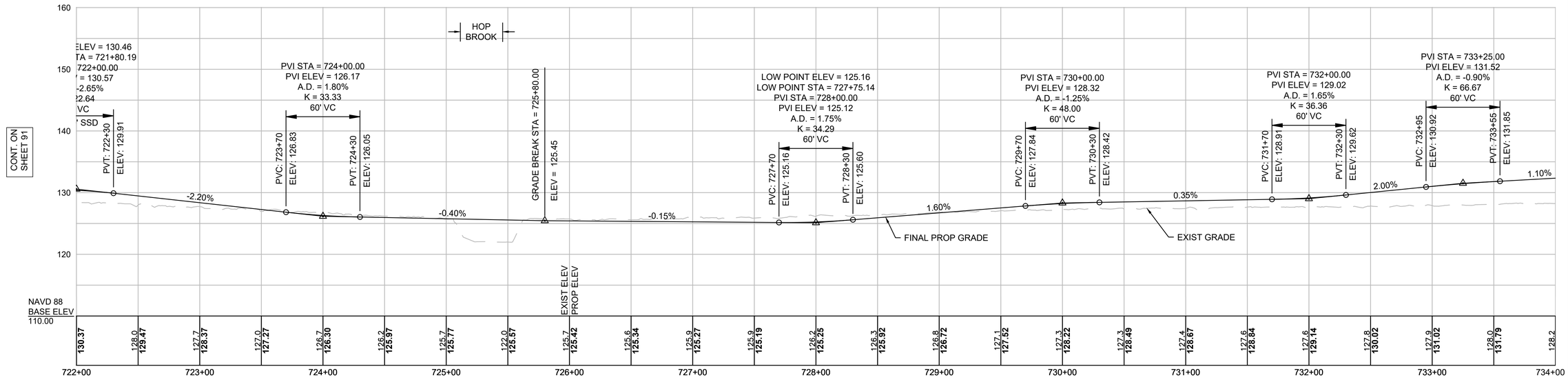

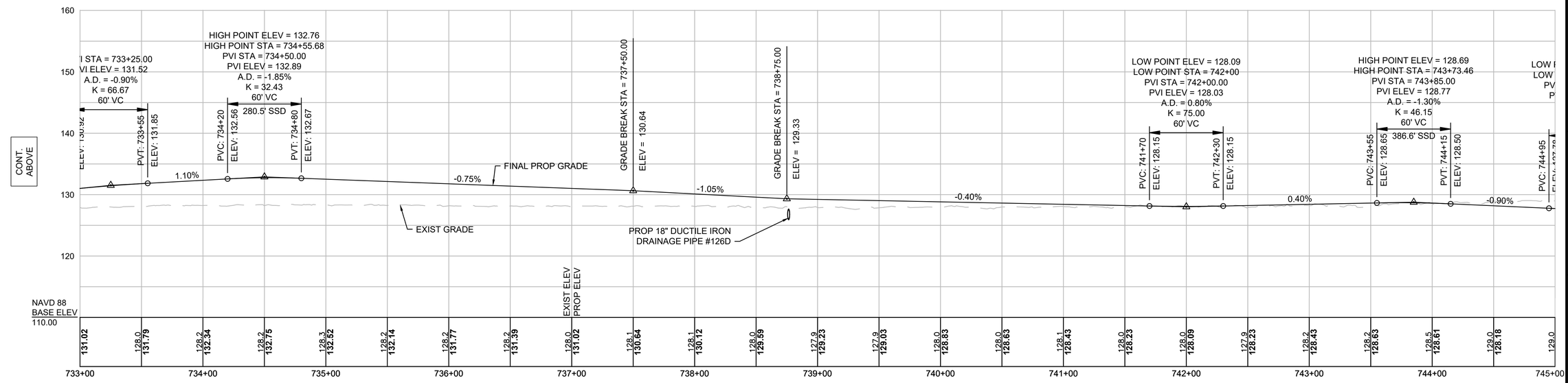

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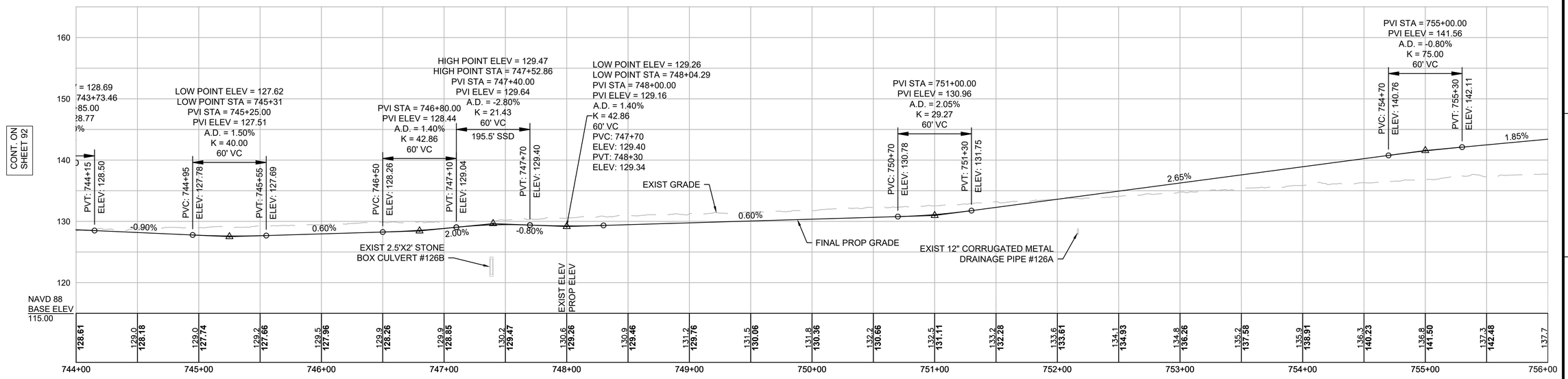
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

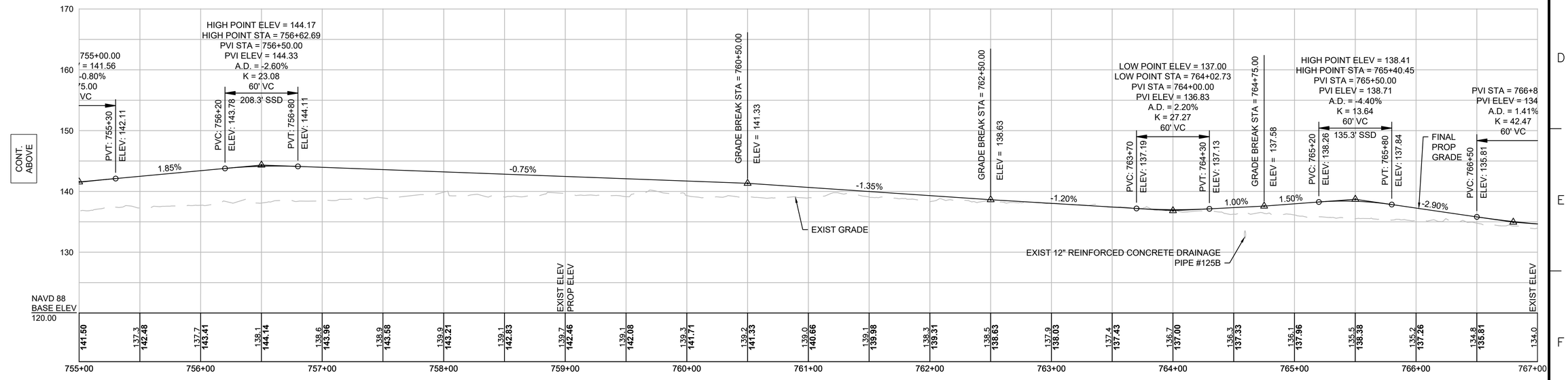
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

PROFILE

PLAN 92 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
H: 1"=40' V: 1"=8'	DEC 2021	MS	SK	MES	.	.





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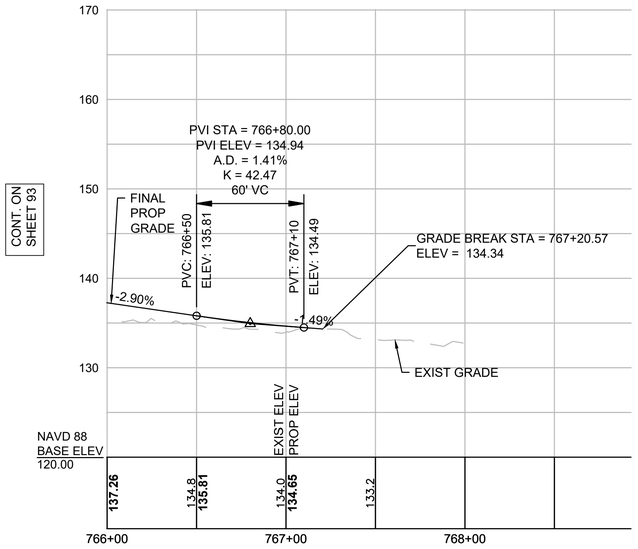
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
PROFILE
PLAN 93 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
H: 1"=40' V: 1"=8'	DEC 2021	MS	SK	MES	.	.



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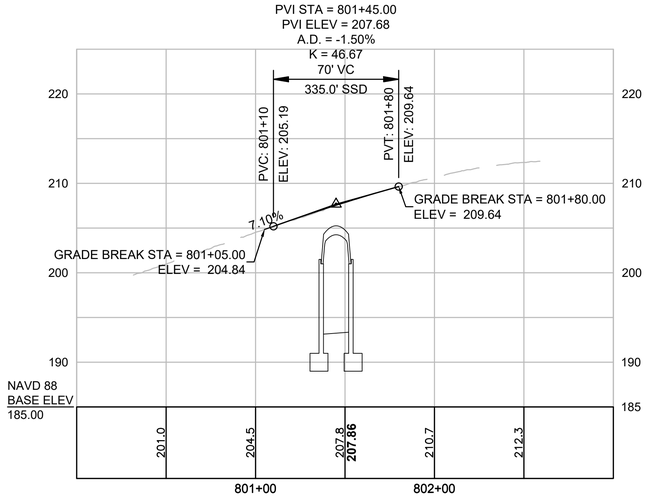
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

PROFILE

PLAN 94 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
H: 1"=40' V: 1"=8'	DEC 2021	MS	SK	MES	.	.



CHESTNUT STREET

HORIZONTAL
40 0 40 80
8 0 8 16
VERTICAL
SCALE IN FEET

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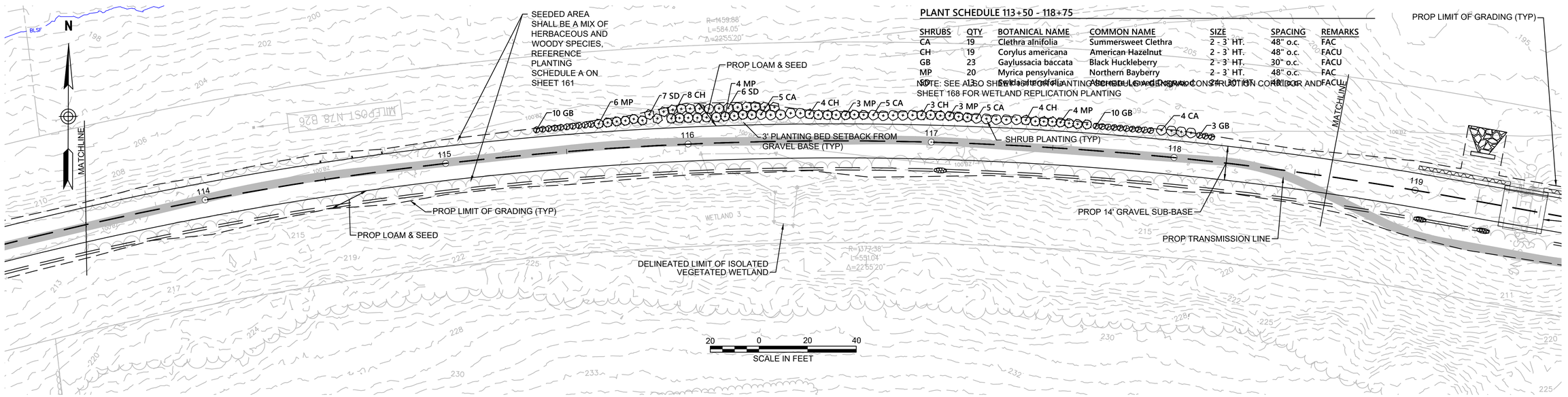
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
PROFILE
PLAN 95 OF 349

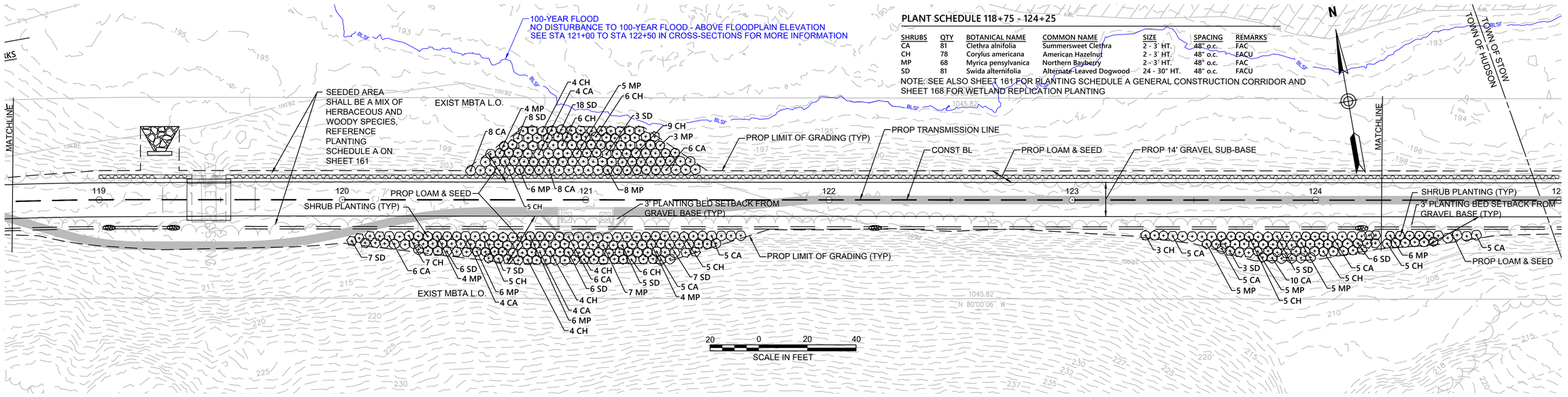
SCALE: unless noted	DATE	DRAWN	CH'K D.	APP'R.	DRAWING NO.	REV.
H: 1"=40' V: 1"=8'	DEC 2021	MS	SK	MS	.	.



PLANT SCHEDULE 113+50 - 118+75

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	19	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
CH	19	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
GB	23	Gaylussacia baccata	Black Huckleberry	2 - 3` HT.	30" o.c.	FACU
MP	20	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	13	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING



PLANT SCHEDULE 118+75 - 124+25

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	81	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
CH	78	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
MP	68	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	81	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

NOTE:
1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED FEBRUARY 5, 2018 (MADEP FILE NO.190-0611).

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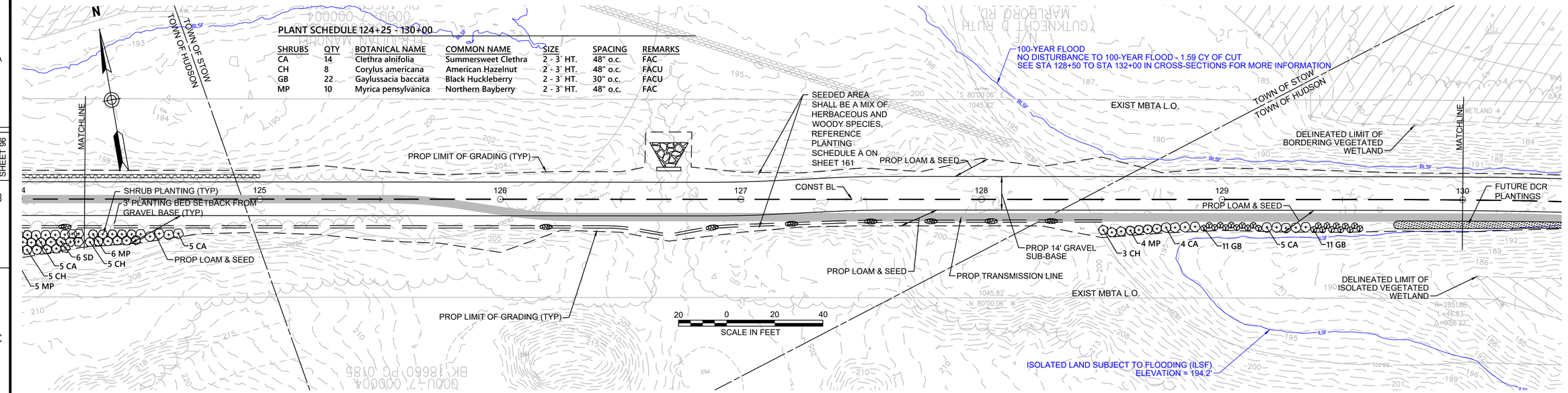
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
LANDSCAPE PLANS
PLAN 96 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.



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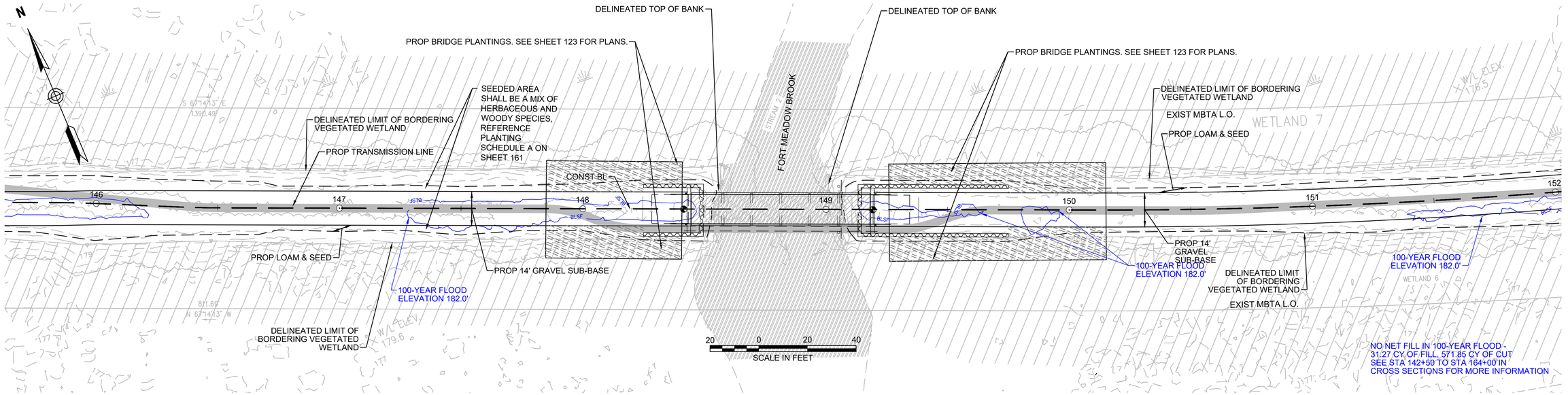
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

PLAN 97 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.



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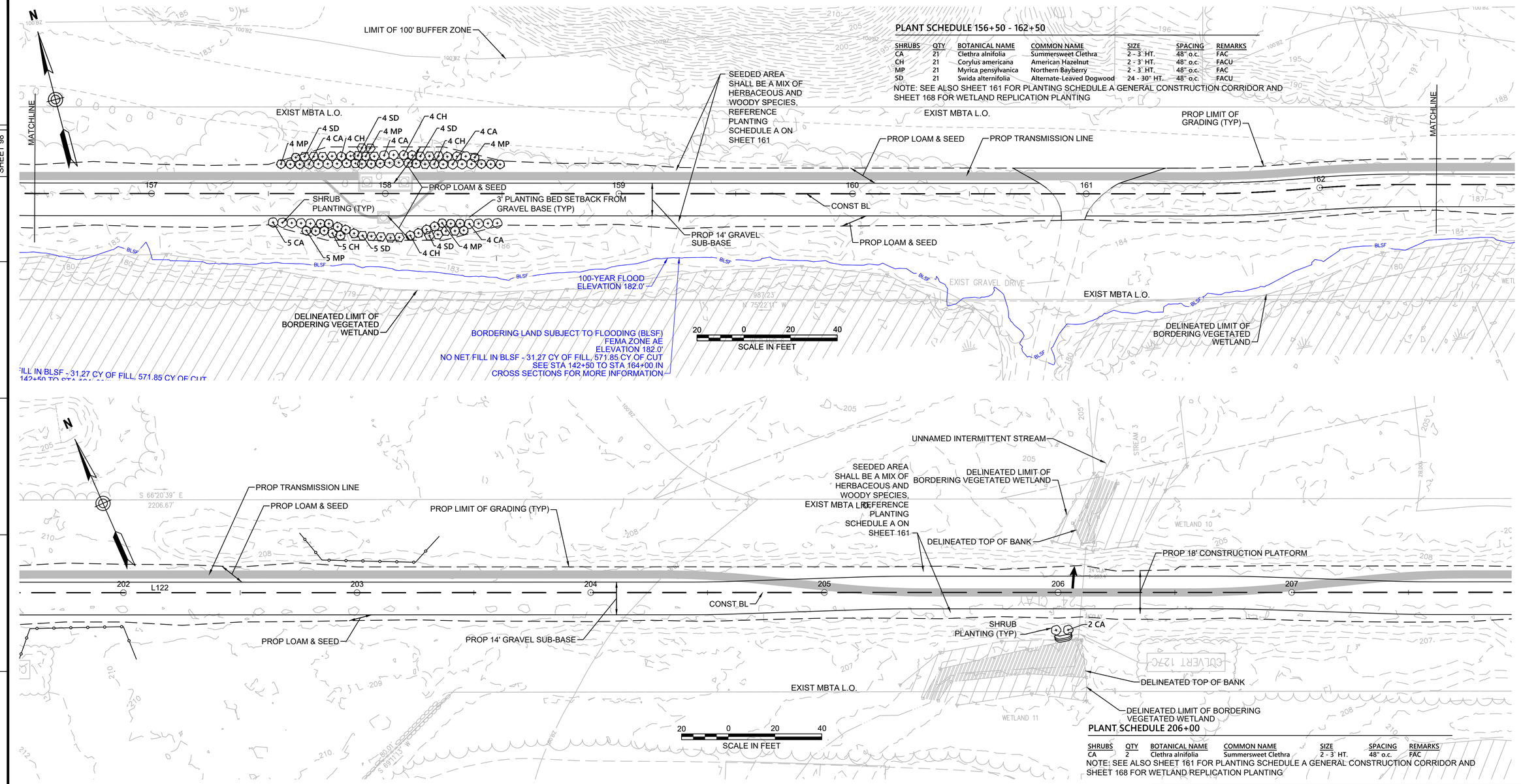
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

PLAN 98 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.



PLANT SCHEDULE 156+50 - 162+50

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	21	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
CH	21	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
MP	21	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	21	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

PLANT SCHEDULE 206+00

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	2	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

NOTES:

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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

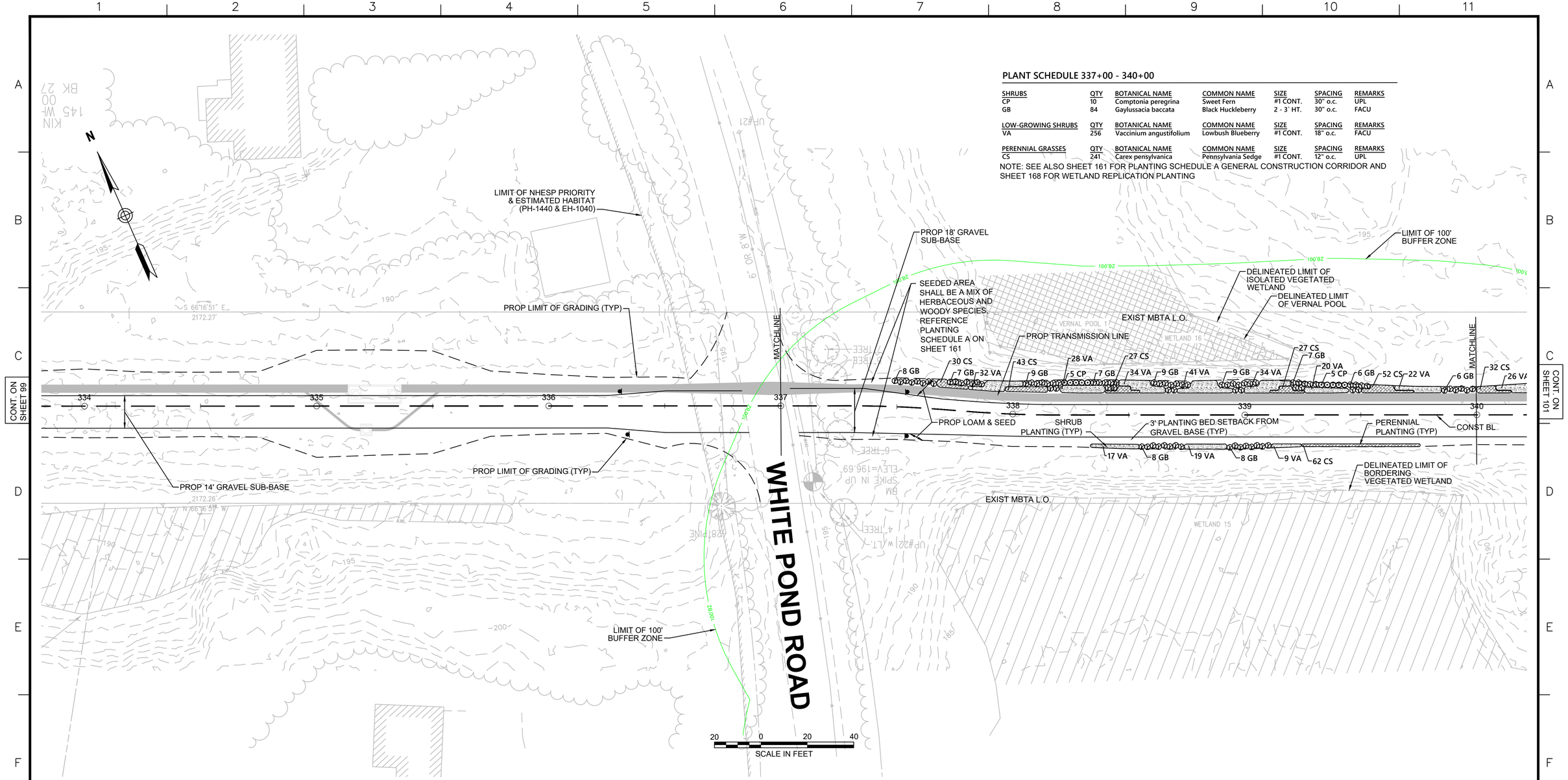
PLAN 99 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.

PLANT SCHEDULE 337+00 - 340+00

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CP	10	Comptonia peregrina	Sweet Fern	#1 CONT.	30" o.c.	UPL
GB	84	Gaylussacia baccata	Black Huckleberry	2 - 3` HT.	30" o.c.	FACU
LOW-GROWING SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
VA	256	Vaccinium angustifolium	Lowbush Blueberry	#1 CONT.	18" o.c.	FACU
PERENNIAL GRASSES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
CS	241	Carex pensylvanica	Pennsylvania Sedge	#1 CONT.	12" o.c.	UPL

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING



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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
LANDSCAPE PLANS
PLAN100 OF 349

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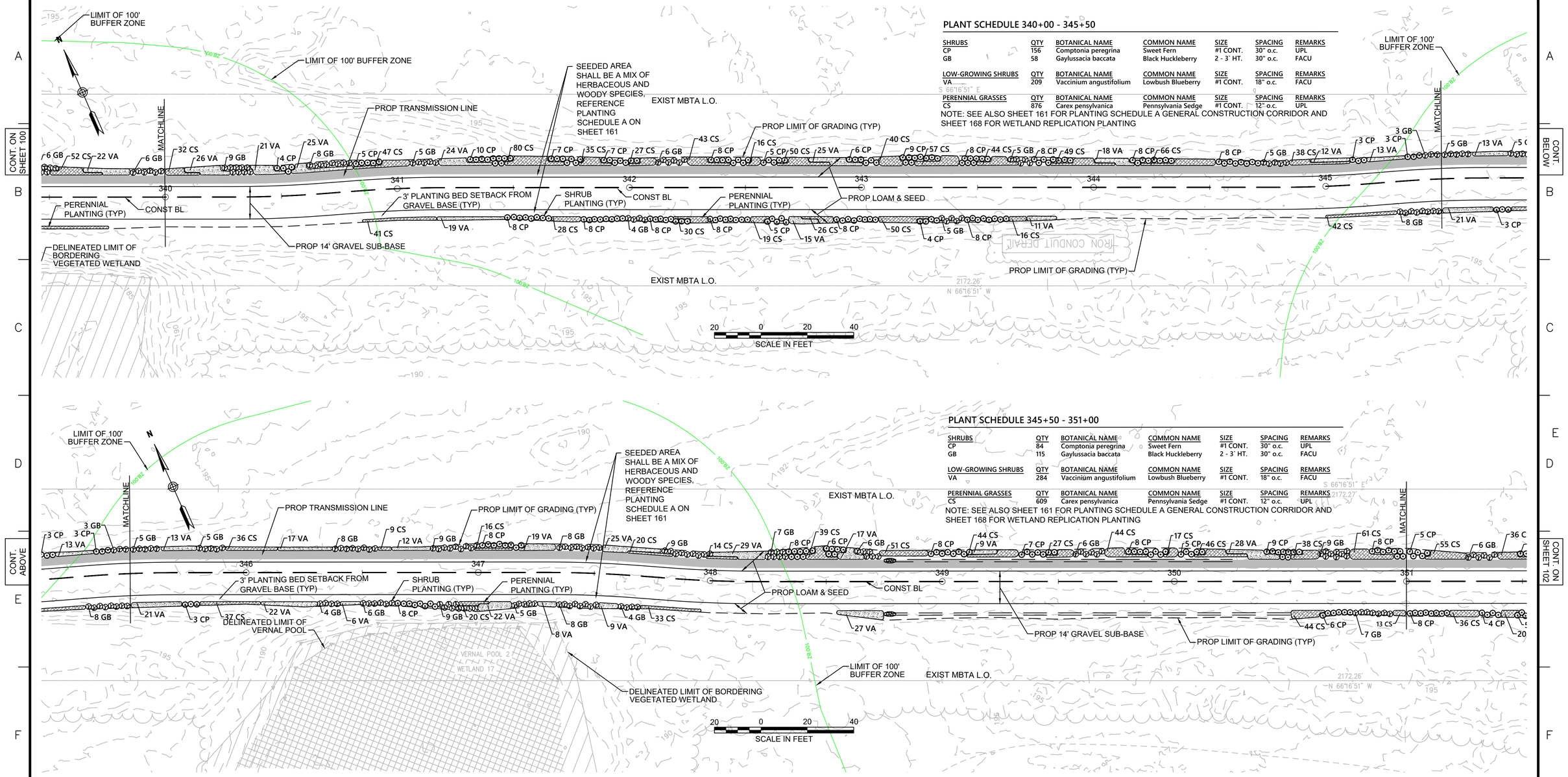
1"=20'	DEC 2021	MS	SK	MES	.	.



PLANT SCHEDULE 340+00 - 345+50

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CP	156	Comptonia peregrina	Sweet Fern	#1 CONT.	30" o.c.	UPL
GB	58	Gaylussacia baccata	Black Huckleberry	2 - 3` HT.	30" o.c.	FACU
LOW-GROWING SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
VA	209	Vaccinium angustifolium	Lowbush Blueberry	#1 CONT.	18" o.c.	FACU
PERENNIAL GRASSES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
CS	876	Carex pensylvanica	Pennsylvania Sedge	#1 CONT.	12" o.c.	UPL

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

PLANT SCHEDULE 345+50 - 351+00

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CP	84	Comptonia peregrina	Sweet Fern	#1 CONT.	30" o.c.	UPL
GB	115	Gaylussacia baccata	Black Huckleberry	2 - 3` HT.	30" o.c.	FACU
LOW-GROWING SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
VA	284	Vaccinium angustifolium	Lowbush Blueberry	#1 CONT.	18" o.c.	FACU
PERENNIAL GRASSES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
CS	609	Carex pensylvanica	Pennsylvania Sedge	#1 CONT.	12" o.c.	UPL

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

PLAN 101 OF 349

SCALE: unless noted	DATE DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021 MS	SK	MES	.	.

PLANT SCHEDULE 351+00 - 357+00

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CP	168	Comptonia peregrina	Sweet Fern	#1 CONT.	30" o.c.	UPL
GB	104	Gaylussacia baccata	Black Huckleberry	2 - 3' HT.	30" o.c.	FACU
LOW-GROWING SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
VA	449	Vaccinium angustifolium	Lowbush Blueberry	#1 CONT.	18" o.c.	FACU
PERENNIAL GRASSES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
CS	747	Carex pensylvanica	Pennsylvania Sedge	#1 CONT.	12" o.c.	UPL

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

PLANT SCHEDULE 357+00 - 361+60: HUDSON AND MARLBOROUGH

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CP	120	Comptonia peregrina	Sweet Fern	#1 CONT.	30" o.c.	UPL
GB	50	Gaylussacia baccata	Black Huckleberry	2 - 3' HT.	30" o.c.	FACU
LOW-GROWING SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
VA	127	Vaccinium angustifolium	Lowbush Blueberry	#1 CONT.	18" o.c.	FACU
PERENNIAL GRASSES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
CS	532	Carex pensylvanica	Pennsylvania Sedge	#1 CONT.	12" o.c.	UPL

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

PLANT SCHEDULE 361+60 - 362+50 : SUDBURY

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CP	18	Comptonia peregrina	Sweet Fern	#1 CONT.	30" o.c.	UPL
GB	13	Gaylussacia baccata	Black Huckleberry	2 - 3' HT.	30" o.c.	FACU
LOW-GROWING SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
VA	43	Vaccinium angustifolium	Lowbush Blueberry	#1 CONT.	18" o.c.	FACU
PERENNIAL GRASSES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
CS	110	Carex pensylvanica	Pennsylvania Sedge	#1 CONT.	12" o.c.	UPL

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

NOTE:
1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED FEBRUARY 5, 2018 (MADEP FILE NO.190-0611).

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
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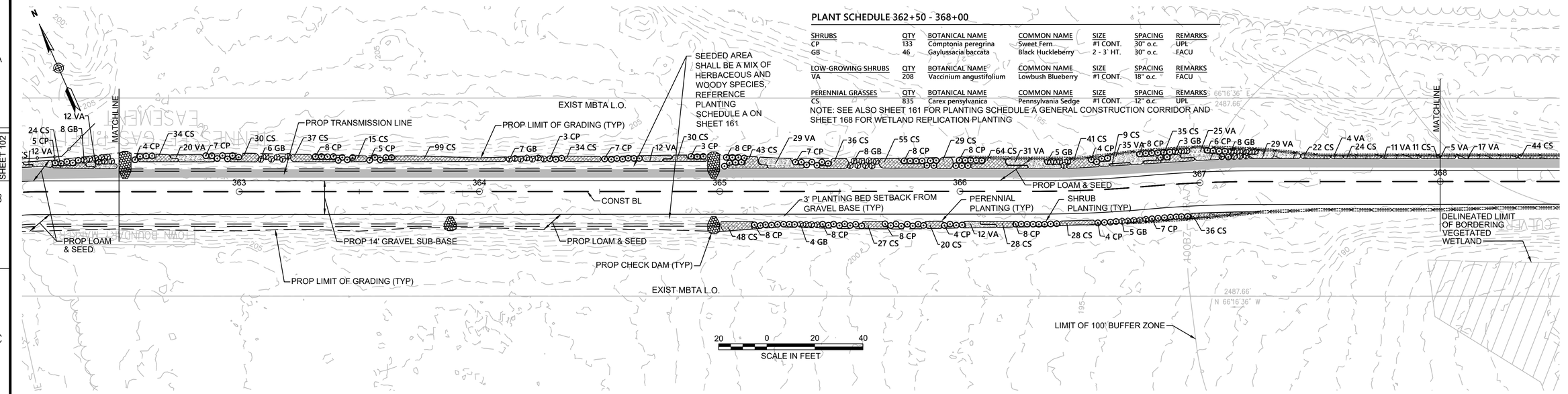
EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
LANDSCAPE PLANS
PLAN 102 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.



NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO.301-1227).

NO.	DESCRIPTION	BY	DATE	APPR.

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EVERSOURCE

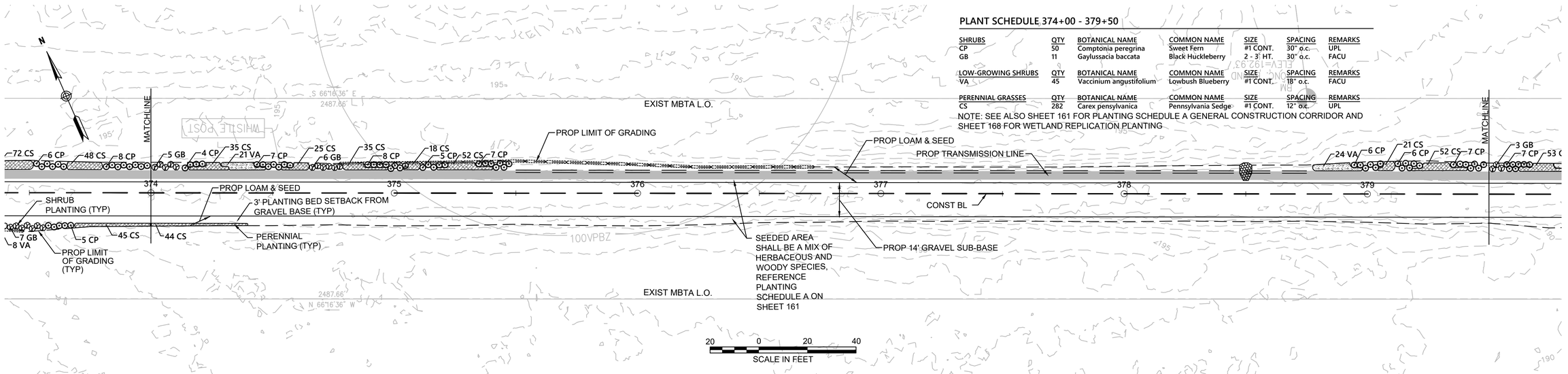
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

PLAN 103 OF 349

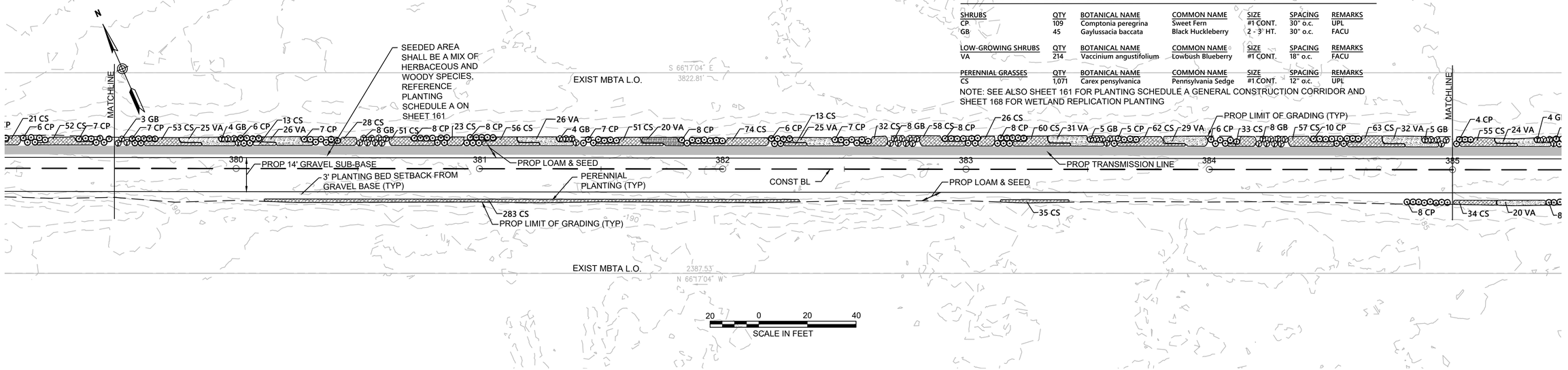
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.



PLANT SCHEDULE 374+00 - 379+50

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CP	50	Comptonia peregrina	Sweet Fern	#1 CONT.	30" o.c.	UPL
GB	11	Gaylussacia baccata	Black Huckleberry	2 - 3' HT.	30" o.c.	FACU
LOW-GROWING SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
VA	45	Vaccinium angustifolium	Lowbush Blueberry	#1 CONT.	18" o.c.	FACU
PERENNIAL GRASSES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
CS	282	Carex pensylvanica	Pennsylvania Sedge	#1 CONT.	12" o.c.	UPL

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING



PLANT SCHEDULE 379+50 - 385+00

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CP	109	Comptonia peregrina	Sweet Fern	#1 CONT.	30" o.c.	UPL
GB	45	Gaylussacia baccata	Black Huckleberry	2 - 3' HT.	30" o.c.	FACU
LOW-GROWING SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
VA	214	Vaccinium angustifolium	Lowbush Blueberry	#1 CONT.	18" o.c.	FACU
PERENNIAL GRASSES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
CS	1,071	Carex pensylvanica	Pennsylvania Sedge	#1 CONT.	12" o.c.	UPL

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

NOTE:
1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO.301-1227).

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NO.	DESCRIPTION	BY	DATE	APPR.
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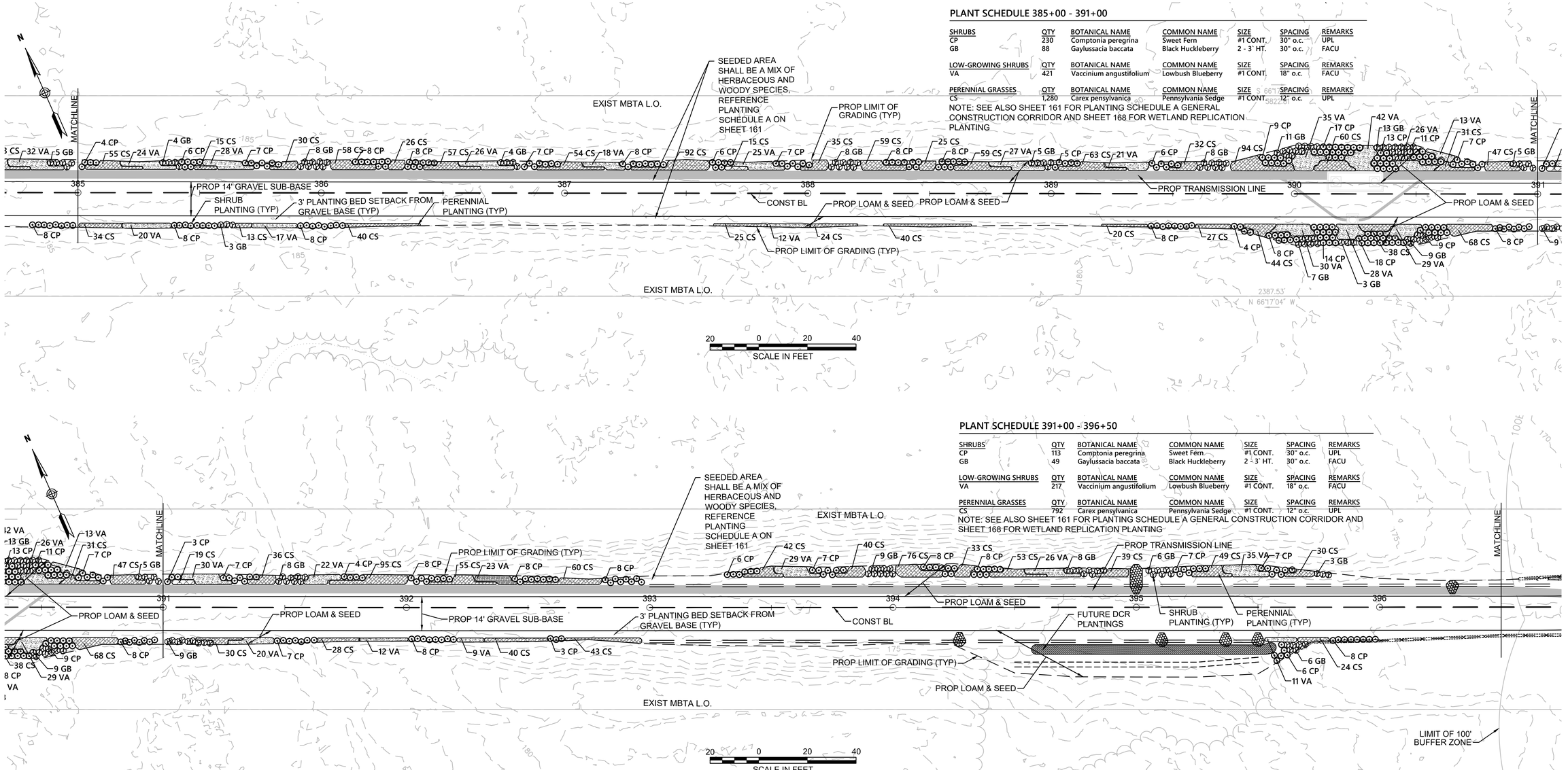
EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
LANDSCAPE PLANS
PLAN104 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.



NOTE:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO.301-1227).

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NO.	DESCRIPTION	BY	DATE	APPR.
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

PLAN105 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.

PLANT SCHEDULE 396+50 - 402+00

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CP	5	Comptonia peregrina	Sweet Fern	#1 CONT.	30" o.c.	UPL
GB	42	Gaylussacia baccata	Black Huckleberry	2 - 3` HT.	30" o.c.	FACU
LOW-GROWING SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
VA	84	Vaccinium angustifolium	Lowbush Blueberry	#1 CONT.	18" o.c.	FACU
PERENNIAL GRASSES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**SPACING**	**REMARKS**
CS	135	Carex pensylvanica	Pennsylvania Sedge	#1 CONT.	12" o.c.	UPL

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

CONT. ON SHEET 105

CONT. BELOW

MATCHLINE

2 GB, 12 VA, 28 CS, 5 GB, 27 CS, 13 VA, 34 VA, 7 GB, 41 CS, 5 CP, 9 GB, 13 VA, 5 GB

PROP 14' GRAVEL SUB-BASE

PERENNIAL PLANTING (TYP)

SHRUB PLANTING (TYP)

12 VA, 4 GB, 7 GB, 3 GB, 39 CS

3' PLANTING BED SETBACK FROM GRAVEL BASE (TYP)

SEEDED AREA SHALL BE A MIX OF HERBACEOUS AND WOODY SPECIES, REFERENCE PLANTING SCHEDULE A ON SHEET 161

LIMIT OF 100' BUFFER ZONE

100-YEAR FLOOD ELEVATION 161.0'

EXIST MBTA L.O.

PROP LIMIT OF GRADING (TYP)

PROP LOAM & SEED

DELINEATED LIMIT OF BORDERING VEGETATED WETLAND

WETLAND

FLOODWAY

CONST BL

397, 398, 399, 400, 401, 402

PROP BRIDGE PLANTINGS SEE SHEET 124 FOR PLANS.

DELINEATED TOP OF BANK

HOP BROOK

WETLAND 44

BLSF

LIMIT OF NHESP PRIORITY & ESTIMATED HABITAT (PH-1440 & EH-1040)

100-YEAR FLOOD ELEVATION 161.0'

SCALE IN FEET: 20 0 20 40

NO FILL IN 100-YEAR FLOOD ABOVE FLOODPLAIN ELEVATION
SEE STA 398+00 TO STA 402+00 IN CROSS-SECTIONS FOR MORE INFORMATION

PLANT SCHEDULE 402+00 - 408+00

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CH	10	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
MP	10	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	10	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU
VC	3	Vaccinium corymbosum	Highbush Blueberry	3 - 4` HT.	48" o.c.	FACW

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

CONT. ABOVE

CONT. ON SHEET 107

MATCHLINE

LIMIT OF NHESP PRIORITY & ESTIMATED HABITAT (PH-1440 & EH-1040)

100-YEAR FLOOD ELEVATION 161.0'

LIMIT OF 100' BUFFER ZONE

PROP TRANSMISSION LINE

PROP 14' GRAVEL SUB-BASE

SEEDED AREA SHALL BE A MIX OF HERBACEOUS AND WOODY SPECIES, REFERENCE PLANTING SCHEDULE A ON SHEET 161

PROP LIMIT OF GRADING (TYP)

PROP LOAM & SEED

EXIST MBTA L.O.

CONST BL

402, 403, 404, 405, 406, 407, 408

WETLAND 44

100' BUFFER ZONE

DELINEATED LIMIT OF BORDERING VEGETATED WETLAND

DELINEATED LIMIT OF VERNAL POOL

SHRUB PLANTING (TYP)

3 VC, 5 MP, 5 SD, 5 CH

SCALE IN FEET: 20 0 20 40

NO FILL IN 100-YEAR FLOOD ABOVE FLOODPLAIN ELEVATION
SEE STA 398+00 TO STA 402+00 IN CROSS-SECTIONS FOR MORE INFORMATION

NOTES:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO.301-1227).

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

vhb
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EVERSOURCE

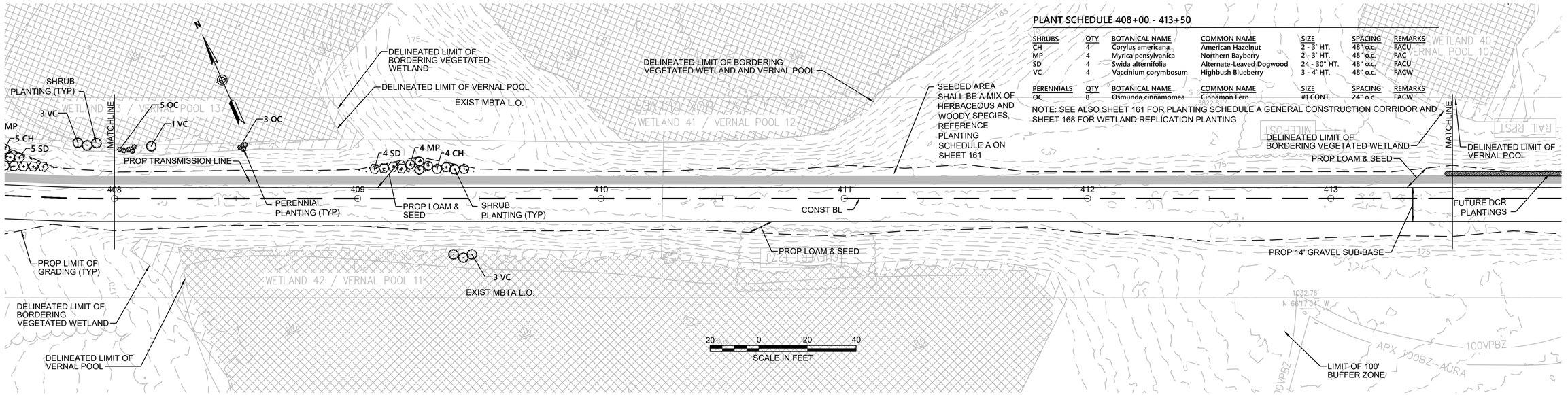
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

PLAN 106 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.



PLANT SCHEDULE 408+00 - 413+50

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CH	4	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
MP	4	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	4	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU
VC	4	Vaccinium corymbosum	Highbush Blueberry	3 - 4` HT.	48" o.c.	FACW

PERENNIALS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
OC	8	Osmunda cinnamomea	Cinnamon Fern	#1 CONT.	24" o.c.	FACW

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

NOTE:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO.301-1227).

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NO.	DESCRIPTION	BY	DATE	APPR.

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EVERSOURCE

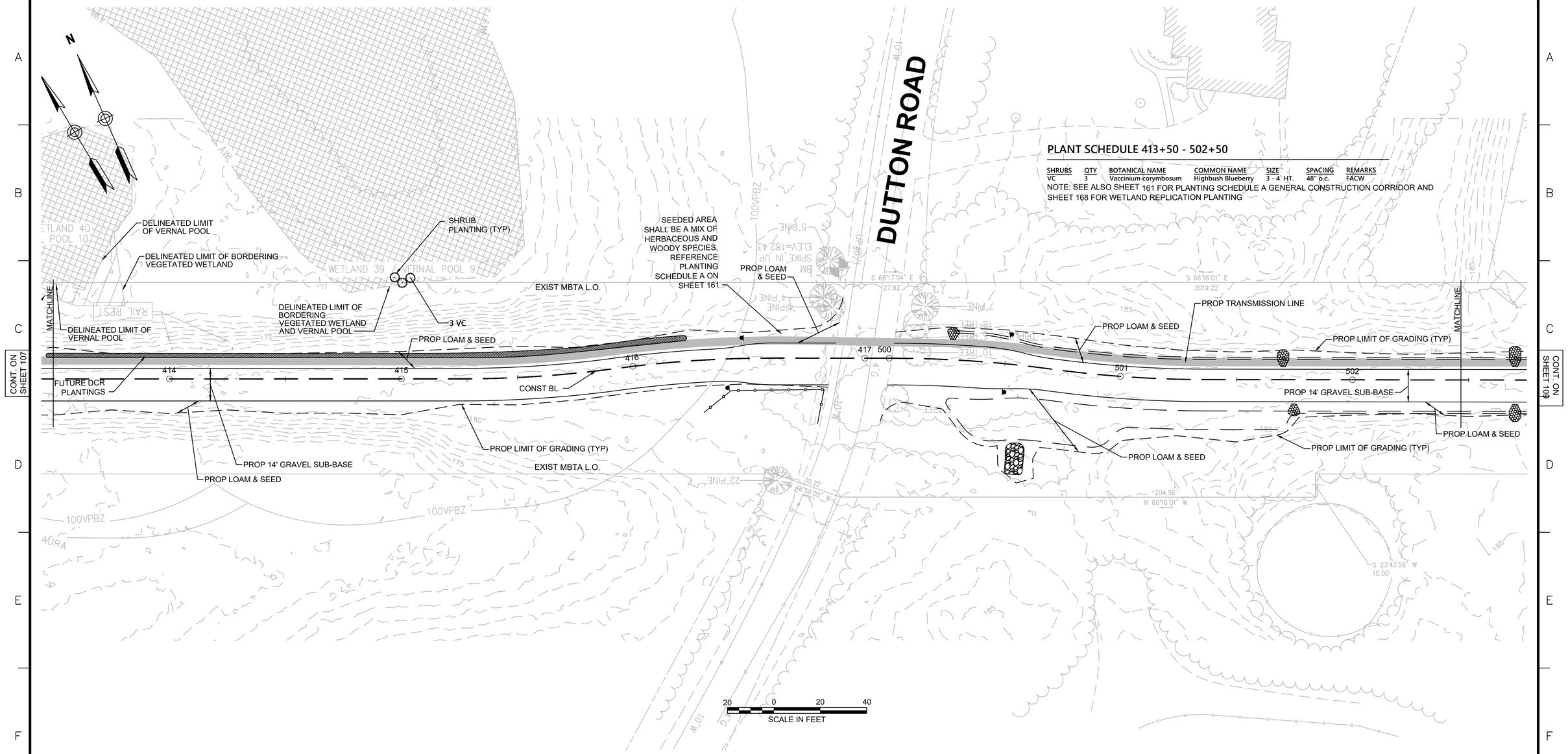
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

PLAN 107 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.



PLANT SCHEDULE 413+50 - 502+50

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
VC	3	Vaccinium corymbosum	Highbush Blueberry	3 - 4' HT.	48" o.c.	FACW

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

NOTES:

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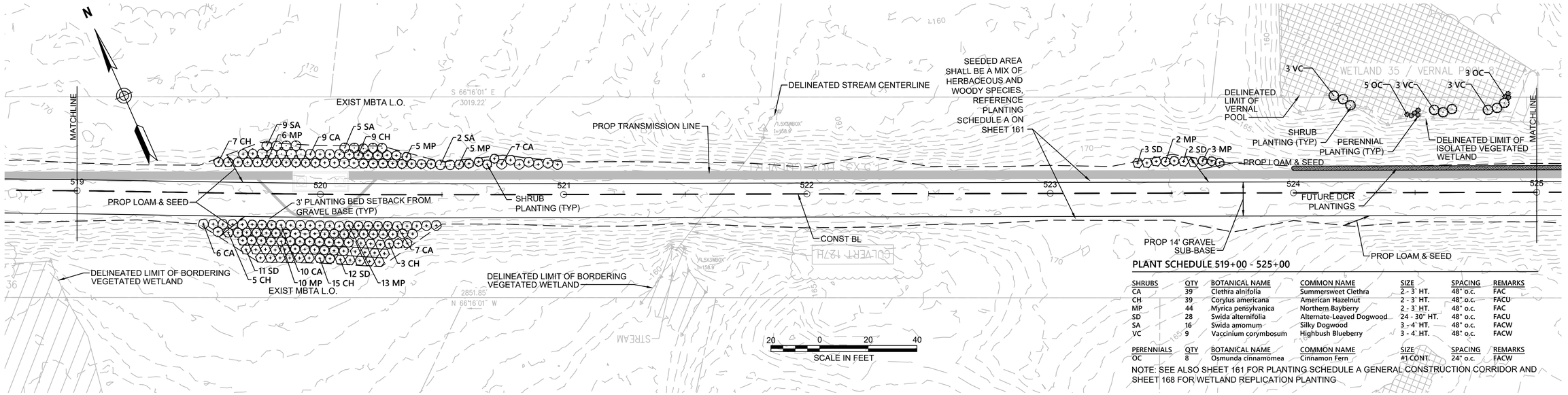
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

PLAN 108 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.



CONT. ON SHEET 108

CONT. ON SHEET 110

PLANT SCHEDULE 519+00 - 525+00

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	39	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
CH	39	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
MP	44	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	28	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU
SA	16	Swida amomum	Silky Dogwood	3 - 4` HT.	48" o.c.	FACW
VC	9	Vaccinium corymbosum	Highbush Blueberry	3 - 4` HT.	48" o.c.	FACW

PERENNIALS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
OC	8	Osmunda cinnamomea	Cinnamon Fern	#1 CONT.	24" o.c.	FACW

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

NOTES:

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NO.	DESCRIPTION	BY	DATE	APPR.

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

PLAN 109 OF 349

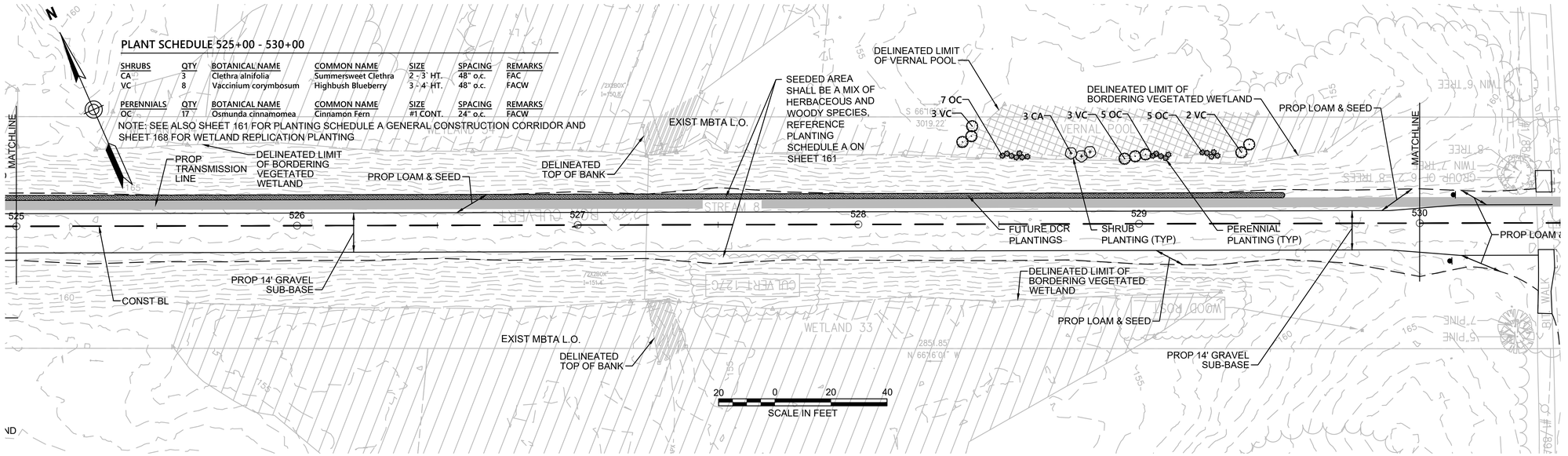
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.

PLANT SCHEDULE 525+00 - 530+00

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	3	Clethra alnifolia	Summersweet Clethra	2 - 3' HT.	48" o.c.	FAC
VC	8	Vaccinium corymbosum	Highbush Blueberry	3 - 4' HT.	48" o.c.	FACW

PERENNIALS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
OC	17	Osmunda cinnamomea	Cinnamon Fern	#1 CONT.	24" o.c.	FACW

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING



NOTE:
1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO. 301-1227).

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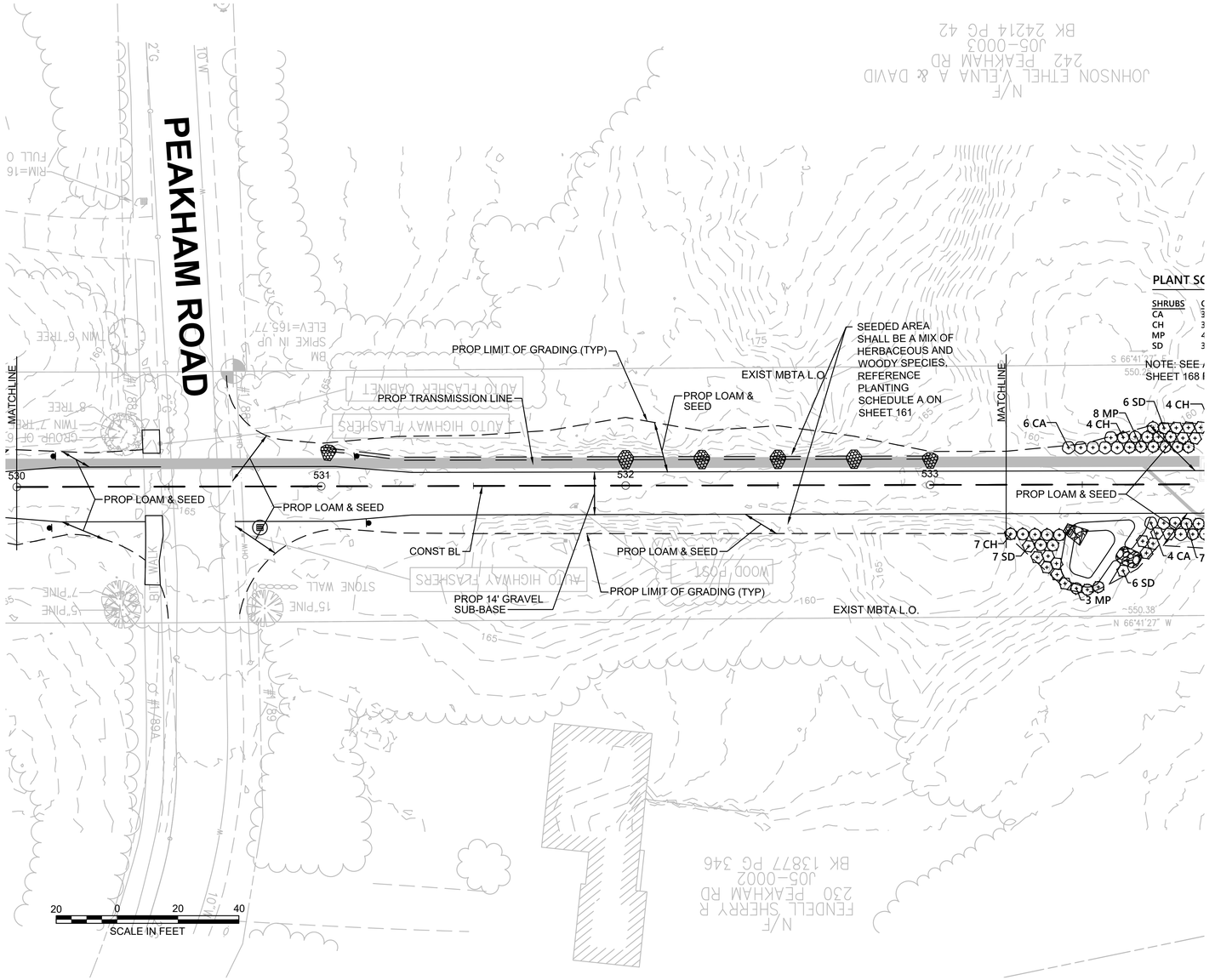
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

PLAN 110 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.



PLANT SC

SHRUBS
CA
CH
MP
SD

NOTE: SEE SHEET 168

CONT. ON SHEET 110

CONT. ON SHEET 112

NOTE:

1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO. 301-1227).

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

PLAN 111 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.

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PLANT SCHEDULE 533+25 - 539+00

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	35	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
CH	34	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
MP	40	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	32	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

CONT. ON SHEET 111

MATCH LINE

6 CA, 4 CH, 8 MP, 6 SD, 4 CH, 6 SD, 6 CA, 4 CH, 4 MP

PROP LOAM & SEED

SHRUB PLANTING (TYP)

3' PLANTING BED SETBACK FROM GRAVEL BASE (TYP)

8 MP, 3 CA, CONST BL

DELINEATED LIMIT OF ISOLATED VEGETATED WETLAND

WETLAND 32

SEEDED AREA SHALL BE A MIX OF HERBACEOUS AND WOODY SPECIES, REFERENCE PLANTING SCHEDULE A ON SHEET 161

PROP 14' GRAVEL SUB-BASE

DELINEATED LIMIT OF BORDERING VEGETATED WETLAND

DELINEATED TOP OF BANK

EXIST MBTA L.O.

100-YEAR FLOOD ELEVATION 152.2'

100-YEAR FLOOD ELEVATION 148.6'

PROP TRANSMISSION LINE

FUTURE DCR PLANTINGS

7 CH, 7 SD, 3 MP, 6 SD, 4 CA, 7 MP, 8 CA, 8 CH, 7 SD, 5 MP, 7 CH, 3 CA, 5 MP, 5 CA, 4 CA

534, 535, 536, 537, 538, 539

S 66°41'27" E 550.38 — N 66°41'27" W

S 66°26'22" E 1984.06 — N 66°26'22" W 1984.00

20 0 20 40
SCALE IN FEET

NO IMPACT TO 100-YEAR FLOOD - ABOVE FLOODPLAIN ELEVATION
SEE STA 535+50 TO STA 542+50 IN CROSS-SECTIONS FOR MORE INFORMATION

CONT. BELOW

CONT. ABOVE

DUDLEY BROOK

DELINEATED TOP OF BANK

PROP TRANSMISSION LINE

DELINEATED LIMIT OF BORDERING VEGETATED WETLAND

CONST BL

SEEDED AREA SHALL BE A MIX OF HERBACEOUS AND WOODY SPECIES, REFERENCE PLANTING SCHEDULE A ON SHEET 161

PROP LOAM & SEED

PROP LIMIT OF GRADING (TYP)

EXIST MBTA L.O.

PLANT SCHEDULE 539+00 - 545+00

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	8	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
GB	8	Gaylussacia baccata	Black Huckleberry	2 - 3` HT.	30" o.c.	FACU

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

CONT. ON SHEET 113

MATCH LINE

539, 540, 541, 542, 543, 544, 545

3' PLANTING BED SETBACK FROM GRAVEL BASE (TYP)

FUTURE DCR PLANTINGS

4 CA, 4 CA, 8 GB

SHRUB PLANTING (TYP)

PROP 14' GRAVEL SUB-BASE

DELINEATED LIMIT OF BORDERING VEGETATED WETLAND

DELINEATED TOP OF BANK

100-YEAR FLOOD ELEVATION 152.2'

100-YEAR FLOOD ELEVATION 148.6'

PROP LOAM & SEED

PROP LIMIT OF GRADING (TYP)

EXIST MBTA L.O.

20 0 20 40
SCALE IN FEET

NO IMPACT TO 100-YEAR FLOOD - ABOVE FLOODPLAIN ELEVATION
SEE STA 535+50 TO STA 542+50 IN CROSS-SECTIONS FOR MORE INFORMATION

NOTE:
1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO. 301-1227).

NO.	DESCRIPTION	BY	DATE	APPR.
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EVERSOURCE

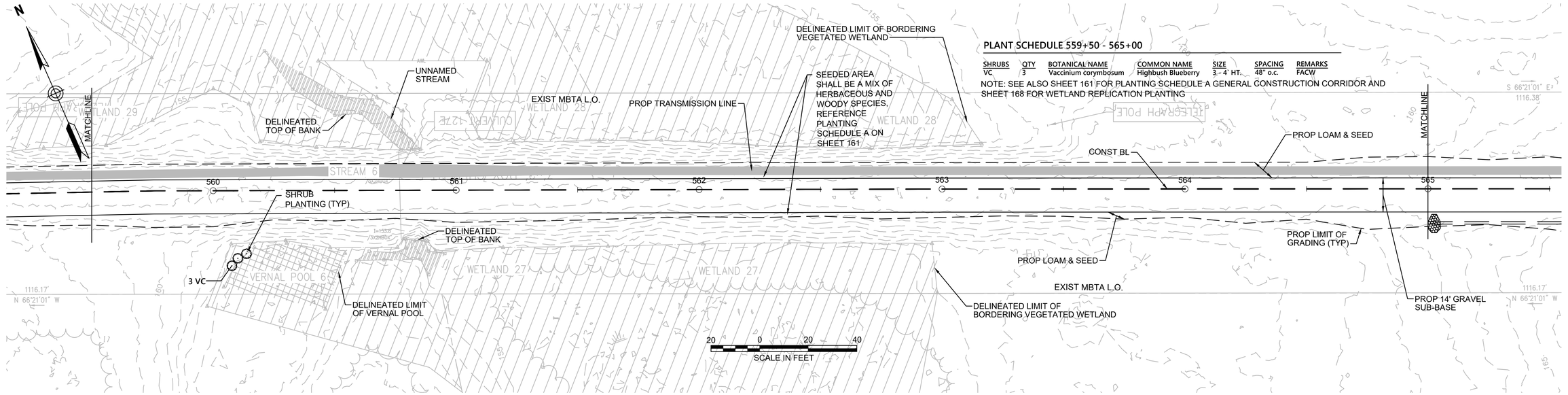
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

PLAN 112 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APP R.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.



PLANT SCHEDULE 559+50 - 565+00

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
VC	3	Vaccinium corymbosum	Highbush Blueberry	3 - 4' HT.	48" o.c.	FACW

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

NOTE:
1. WETLAND RESOURCE AREA BOUNDARIES SHOWN HEREIN WERE APPROVED IN AN ORAD DATED AUGUST 27, 2018 (MADEP FILE NO. 301-1227).

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NO.	DESCRIPTION	BY	DATE	APPR.
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EVERSOURCE

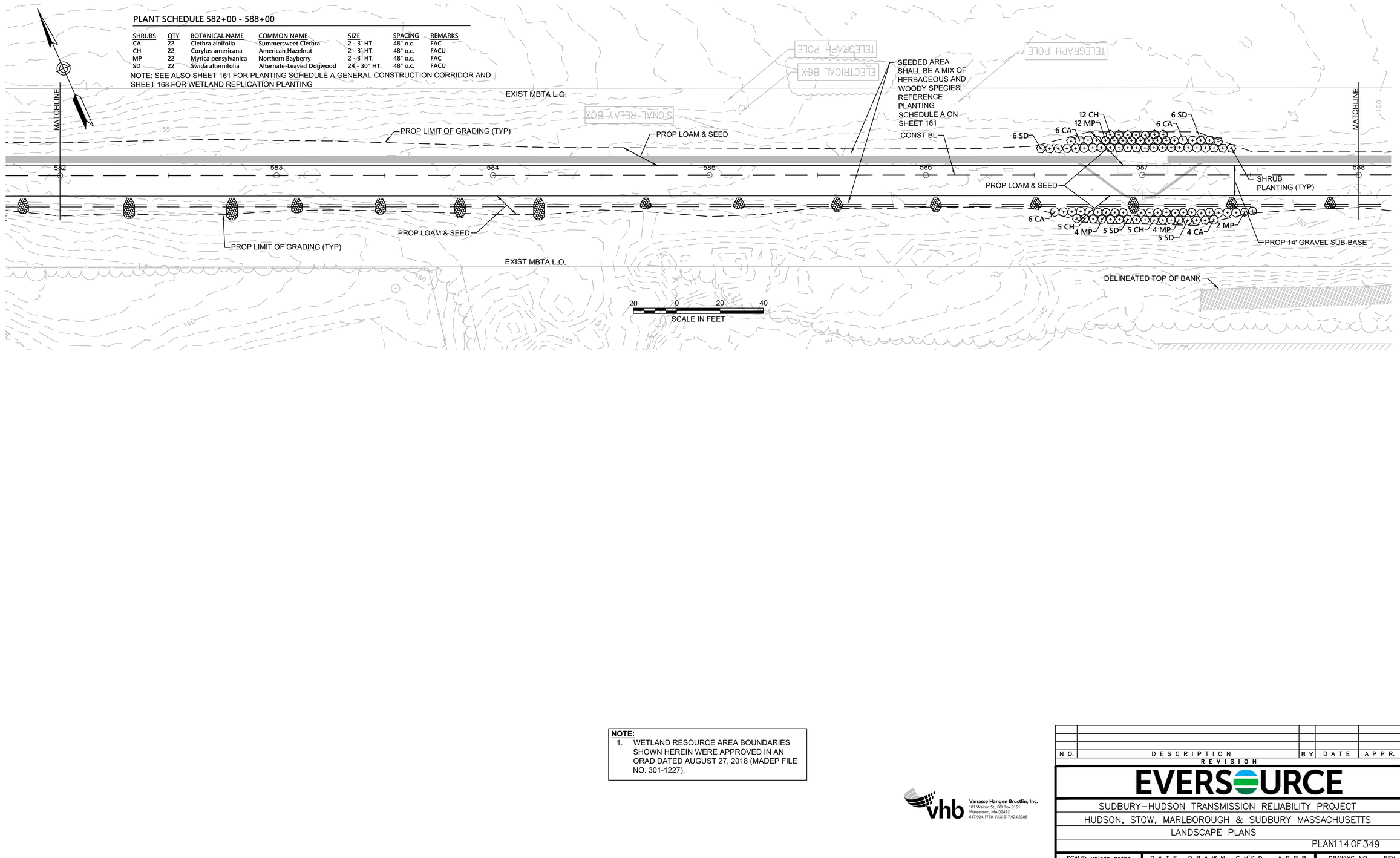
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
LANDSCAPE PLANS
PLAN 113 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.

PLANT SCHEDULE 582+00 - 588+00

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	22	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
CH	22	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
MP	22	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	22	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING



NOTE:
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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

PLAN 114 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.

PLANT SCHEDULE 599+00 - 702+00

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	23	Clethra alnifolia	Summersweet Clethra	2 - 3' HT.	48" o.c.	FAC
CH	23	Corylus americana	American Hazelnut	2 - 3' HT.	48" o.c.	FACU
MP	23	Myrica pensylvanica	Northern Bayberry	2 - 3' HT.	48" o.c.	FAC
SD	23	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

STATION ROAD

SEEDED AREA SHALL BE A MIX OF HERBACEOUS AND WOODY SPECIES, REFERENCE PLANTING SCHEDULE A ON SHEET 161

EXIST MBTA L.O.

MATCHLINE

CONT. ON SHEET 114

8 CA
6 SD
6 SD
4 MP
9 CH
3 CH
7 MP
10 CA
6 SD
7 MP
6 CH

CONST BL

PROP LOAM & SEED

PROP 14' GRAVEL SUB-BASE

599
600
601
602

PROP LOAM & SEED

EXIST MBTA L.O.

100-YEAR FLOOD ELEVATION 134.0'

DELINEATED TOP OF BANK

3 CA
2 MP
3 CH
3 SD
3 MP
2 CH
2 CA
2 SD

BLSF

TRIBUTARY TO HOP BROOK

STREAM 4

MATCHLINE

CONT. ON SHEET 116

603
700
701
702

SHRUB PLANTING (TYP)

3' PLANTING BED SETBACK FROM GRAVEL BASE (TYP)

PROP LOAM & SEED

PROP LOAM & SEED

PROP TRANSMISSION LINE

PROP LIMIT OF GRADING (TYP)

UNION AVENUE

20 0 20 40
SCALE IN FEET

NO NET FILL IN 100-YEAR FLOOD - 64.98 CY OF FILL, 163.20 CY OF CUT.
SEE STA 700+00 TO STA 728+50 IN CROSS-SECTIONS FOR MORE INFORMATION

NOTES:

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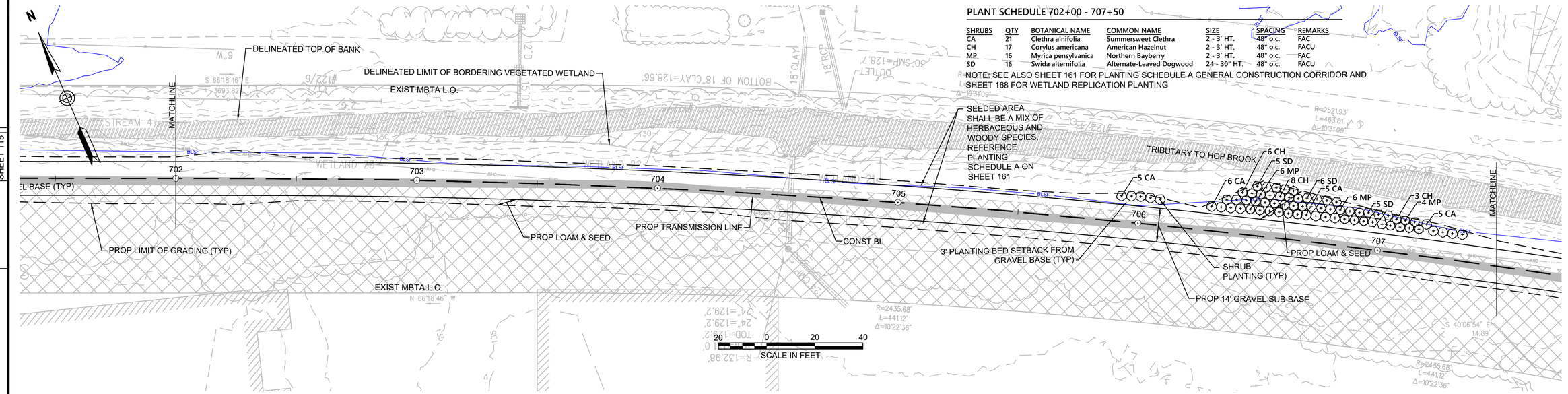

PLANT SCHEDULE 702+00 - 707+50

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	21	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
CH	17	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
MP	16	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	16	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

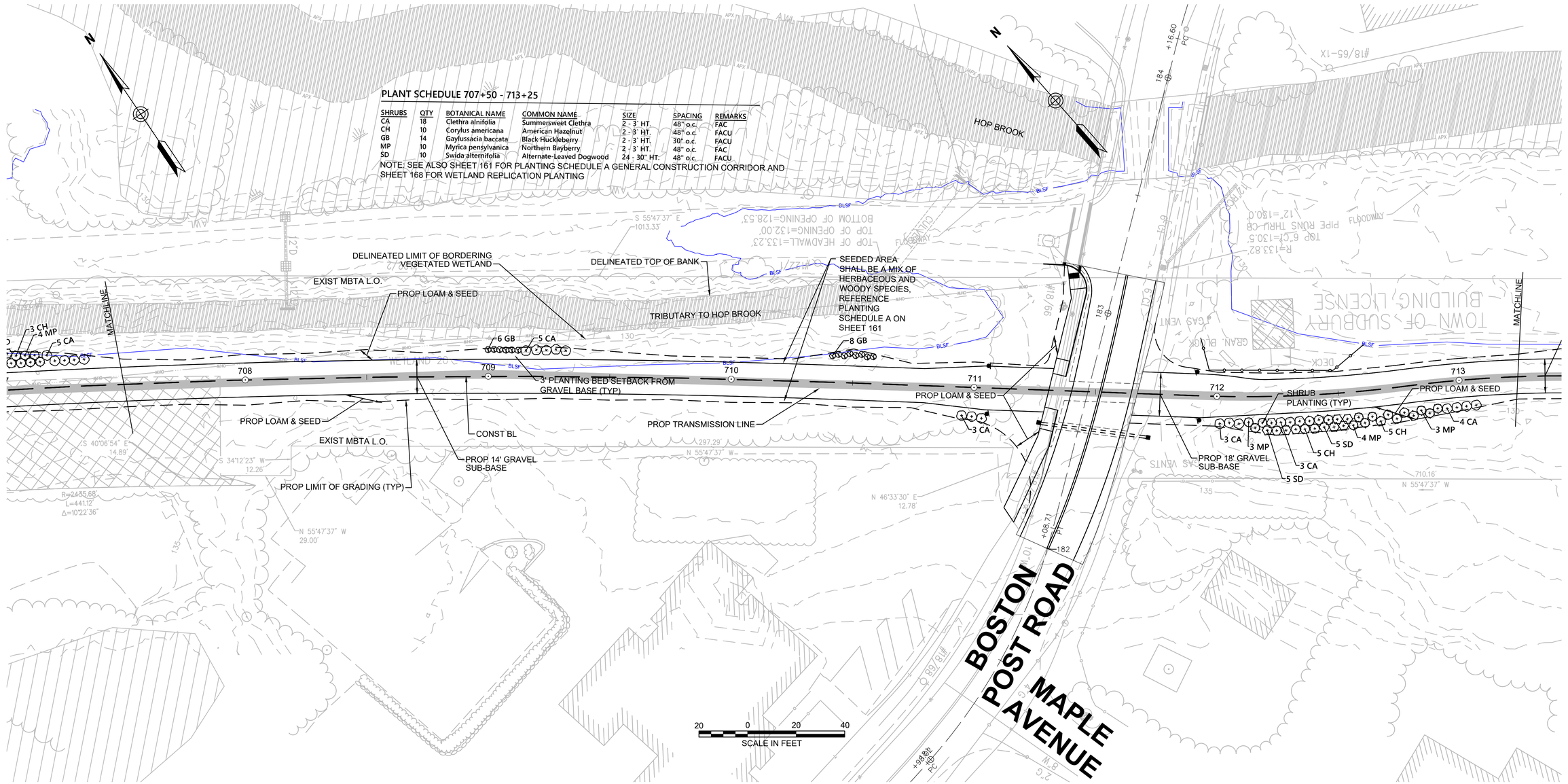
PLAN 116 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.

PLANT SCHEDULE 707+50 - 713+25

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	18	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
CH	10	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
GB	14	Gaylussacia baccata	Black Huckleberry	2 - 3` HT.	30" o.c.	FACU
MP	10	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	10	Svida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING



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LANDSCAPE PLANS

PLAN 117 OF 349

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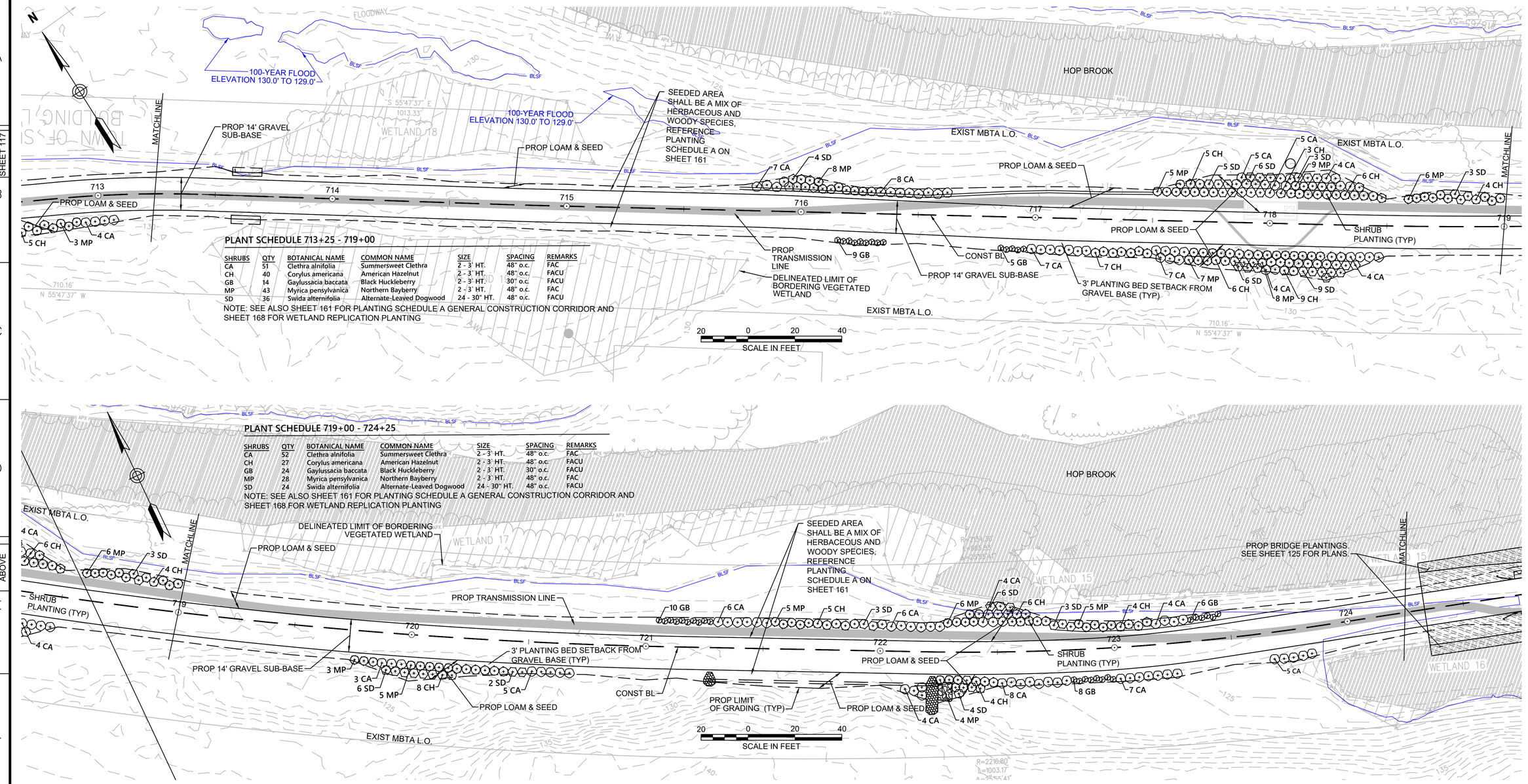

PLANT SCHEDULE 713+25 - 719+00

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	51	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
CH	40	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
GB	14	Gaylussacia baccata	Black Huckleberry	2 - 3` HT.	30" o.c.	FACU
MP	43	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	36	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

PLANT SCHEDULE 719+00 - 724+25

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	52	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
CH	27	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
GB	24	Gaylussacia baccata	Black Huckleberry	2 - 3` HT.	30" o.c.	FACU
MP	28	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	24	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING

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LANDSCAPE PLANS

PLAN 118 OF 349

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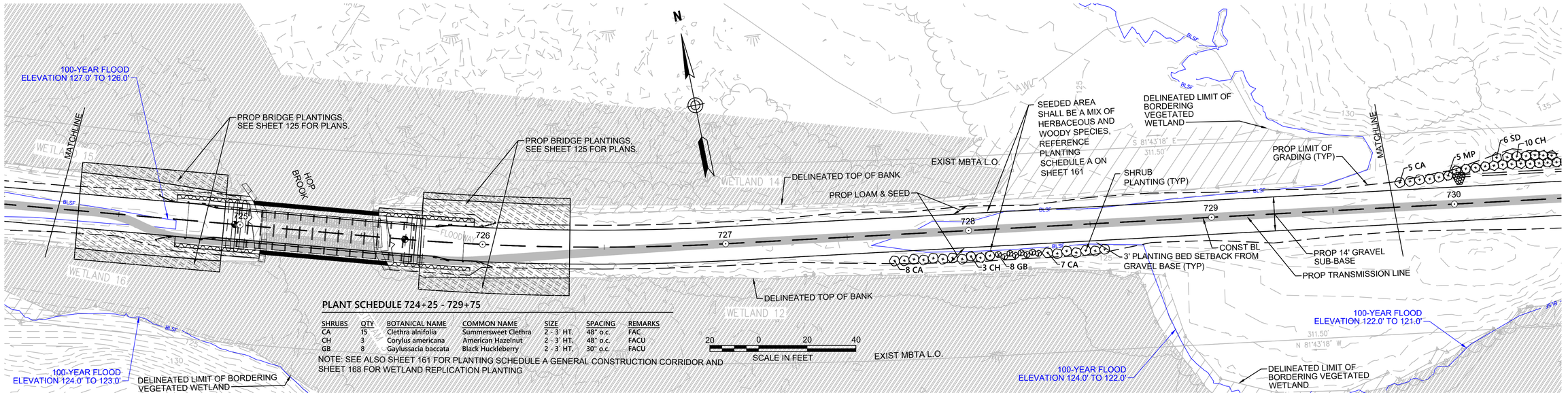
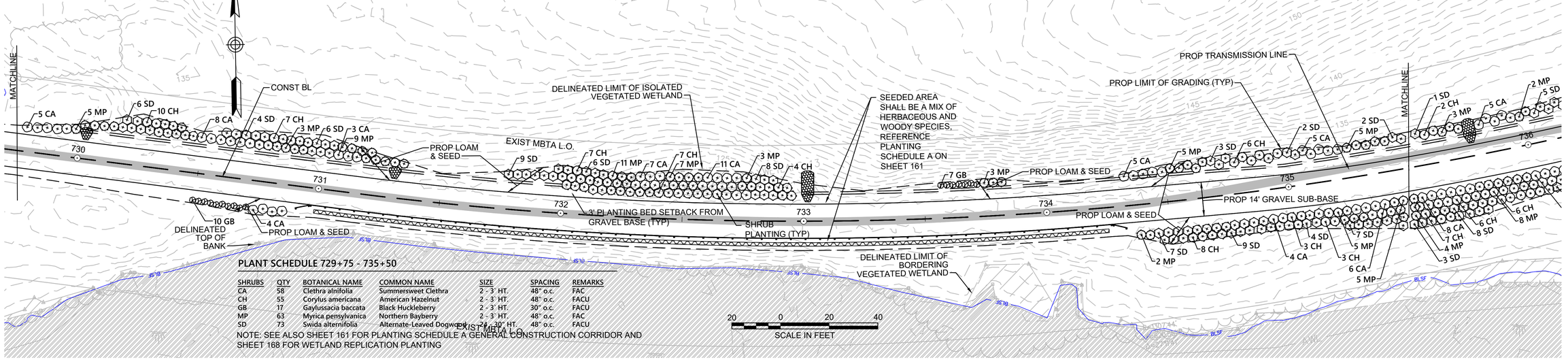


PLANT SCHEDULE 724+25 - 729+75

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	15	Clethra alnifolia	Summersweet Clethra	2 - 3' HT.	48" o.c.	FAC
CH	3	Corylus americana	American Hazelnut	2 - 3' HT.	48" o.c.	FACU
GB	8	Gaylussacia baccata	Black Huckleberry	2 - 3' HT.	30" o.c.	FACU

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING



PLANT SCHEDULE 729+75 - 735+50

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	58	Clethra alnifolia	Summersweet Clethra	2 - 3' HT.	48" o.c.	FAC
CH	55	Corylus americana	American Hazelnut	2 - 3' HT.	48" o.c.	FACU
GB	17	Gaylussacia baccata	Black Huckleberry	2 - 3' HT.	30" o.c.	FACU
MP	63	Myrica pensylvanica	Northern Bayberry	2 - 3' HT.	48" o.c.	FAC
SD	73	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

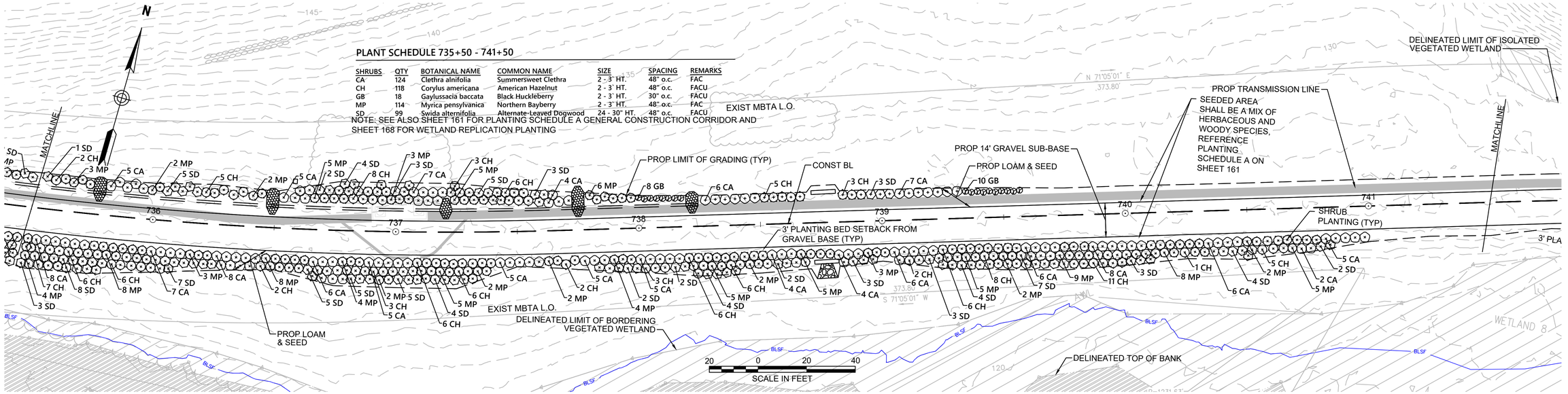
PLAN 119 OF 349

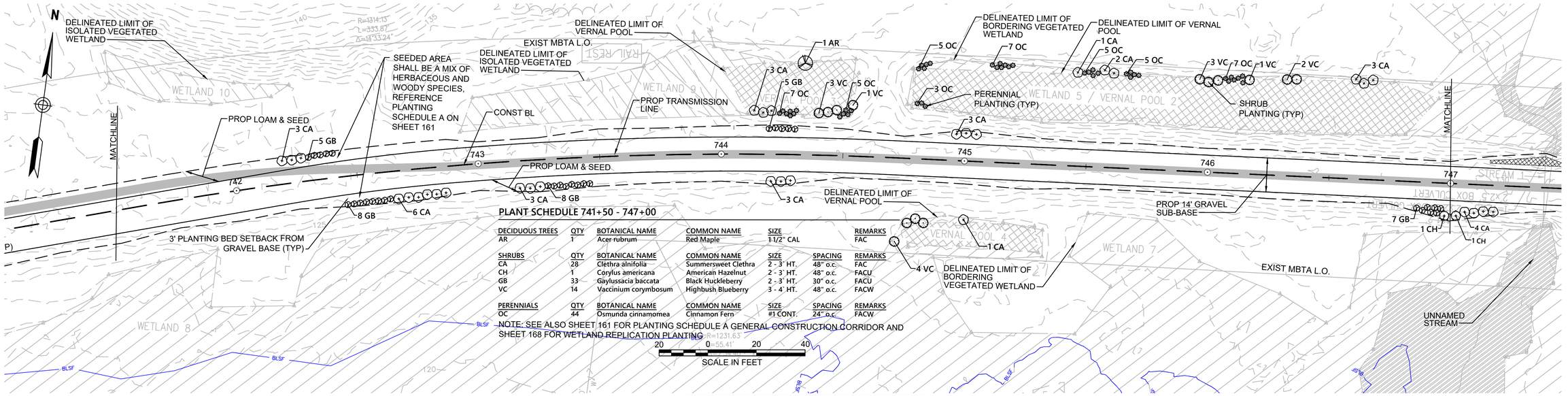
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.

PLANT SCHEDULE 735+50 - 741+50

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	124	Clethra alnifolia	Summersweet Clethra	2 - 3' HT.	48" o.c.	FAC
CH	118	Corylus americana	American Hazelnut	2 - 3' HT.	48" o.c.	FACU
GB	18	Gaylussacia baccata	Black Huckleberry	2 - 3' HT.	30" o.c.	FACU
MP	114	Myrica pensylvanica	Northern Bayberry	2 - 3' HT.	48" o.c.	FAC
SD	99	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING





PLANT SCHEDULE 741+50 - 747+00

DECIDUOUS TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
AR	1	Acer rubrum	Red Maple	1-1/2" CAL	FAC

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	28	Clethra alnifolia	Summersweet Clethra	2 - 3' HT.	48" o.c.	FAC
CH	1	Corylus americana	American Hazelnut	2 - 3' HT.	48" o.c.	FACU
GB	33	Gaylussacia baccata	Black Huckleberry	2 - 3' HT.	30" o.c.	FACU
VC	14	Vaccinium corymbosum	Highbush Blueberry	3 - 4' HT.	48" o.c.	FACW

PERENNIALS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
OC	44	Osmunda cinnamomea	Cinnamon Fern	#1 CONT.	24" o.c.	FACW

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LANDSCAPE PLANS

PLAN 120 OF 349

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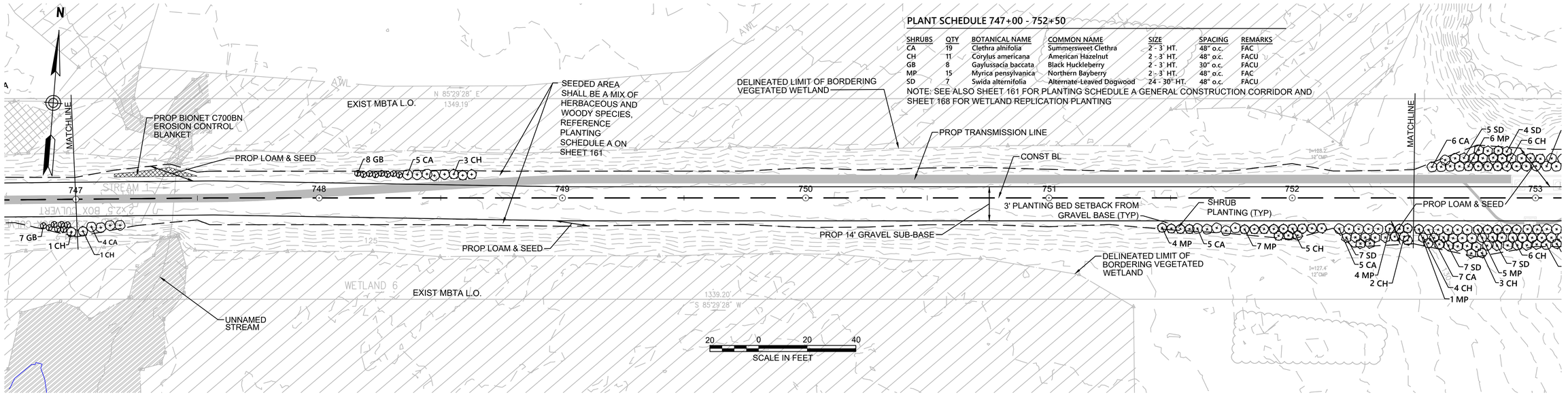
1"=20'	DEC 2021	CW	JG	JG	.	.

PLANT SCHEDULE 747+00 - 752+50

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	19	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
CH	11	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
GB	8	Gaylussacia baccata	Black Huckleberry	2 - 3` HT.	30" o.c.	FACU
MP	15	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	7	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

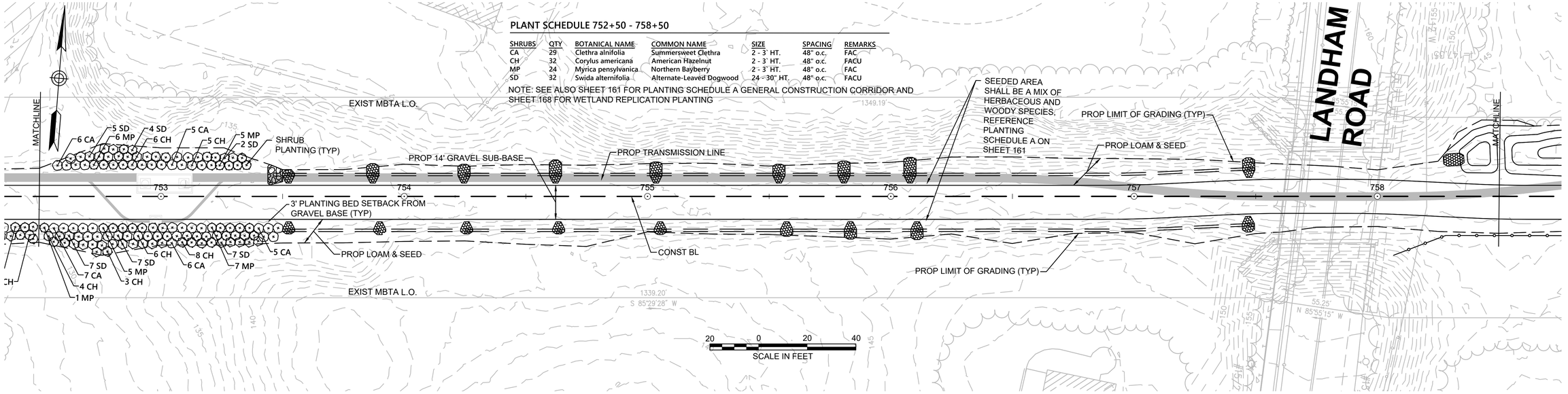
NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING



PLANT SCHEDULE 752+50 - 758+50

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	29	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
CH	32	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
MP	24	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	32	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING



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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

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LANDSCAPE PLANS

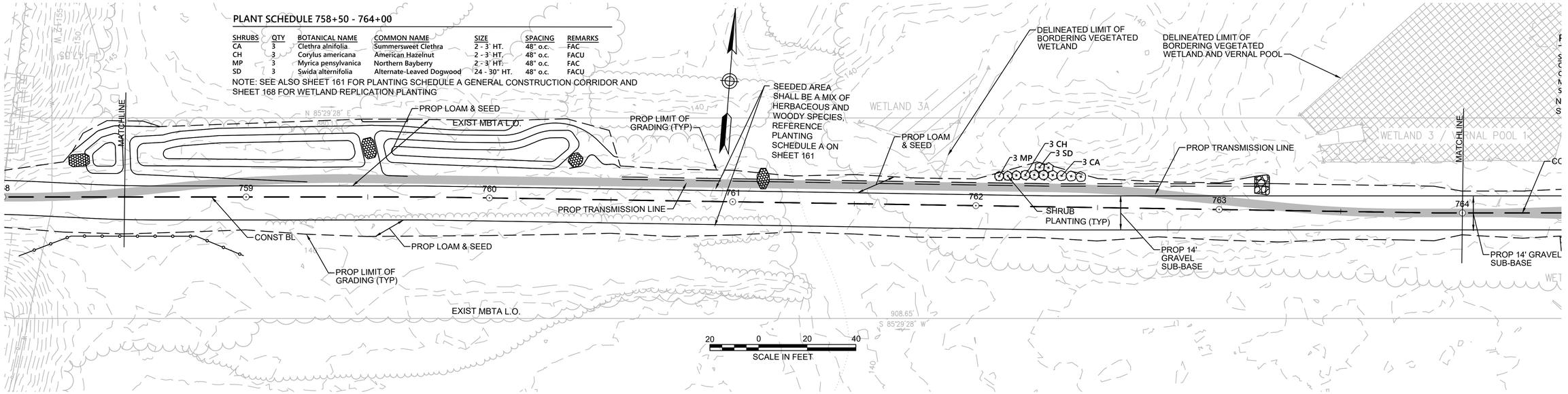
PLAN 121 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	CW	JG	JG	.	.

PLANT SCHEDULE 758+50 - 764+00

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	3	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
CH	3	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
MP	3	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	3	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

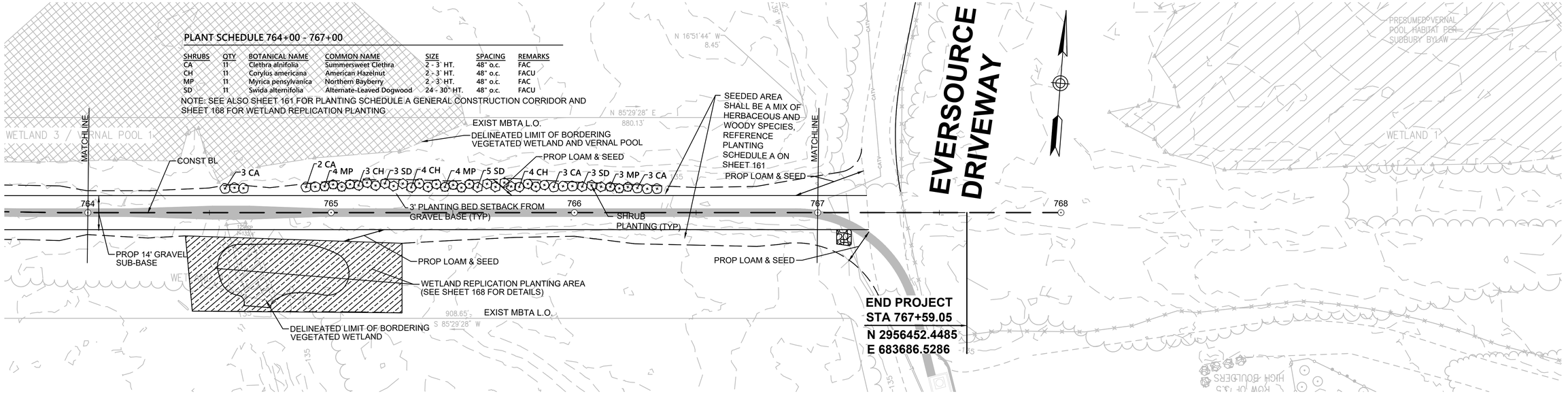
NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING



PLANT SCHEDULE 764+00 - 767+00

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	REMARKS
CA	11	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
CH	11	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
MP	11	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	11	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

NOTE: SEE ALSO SHEET 161 FOR PLANTING SCHEDULE A GENERAL CONSTRUCTION CORRIDOR AND SHEET 168 FOR WETLAND REPLICATION PLANTING



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LANDSCAPE PLANS

PLAN122 OF 349

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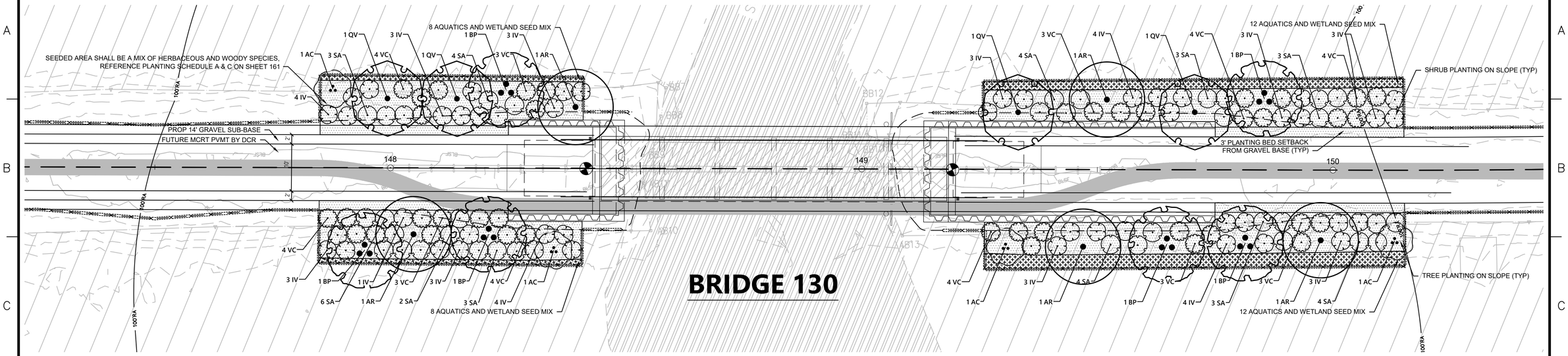

LEGEND

AQUATIC PLANTS AND WETLAND SEED MIX

SEEDED AREA

PLANT SCHEDULE WEST SIDE

DECIDUOUS TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	WETLAND STATUS
AR	2	Acer rubrum	Red Maple	1 1/2" CAL	FAC
AC	2	Amelanchier canadensis	Serviceberry	10 - 12` HT./Multi-Stem	FAC
BP	3	Betula populifolia	Gray Birch	10 - 12` HT./Multi-Stem	FAC
QV	2	Quercus velutina	Black Oak	1 1/2" CAL	UPL

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	
IV	21	Ilex verticillata	Winterberry	3` - 4`	48" o.c.	FACW
SA	18	Swida amomum	Silky Dogwood	3` - 4`	48" o.c.	FACW
VC	18	Vaccinium corymbosum	Highbush Blueberry	3` - 4`	48" o.c.	FACW

AQUATICS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	
	4	Alisma plantago-aquatica	Northern Water-Plantain	2" plug	OBL
	4	Peltandra virginica	Green Arrow-Arum	2" plug	OBL
	4	Pontederia cordata	Pickerelweed	2" plug	OBL
	4	Sagittaria latifolia	Common Arrowhead	2" plug	OBL

PLANT SCHEDULE EAST SIDE

DECIDUOUS TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	WETLAND STATUS
AR	3	Acer rubrum	Red Maple	1 1/2" CAL	FAC
AC	2	Amelanchier canadensis	Serviceberry	10 - 12` HT./Multi-Stem	FAC
BP	3	Betula populifolia	Gray Birch	10 - 12` HT./Multi-Stem	FAC
QV	2	Quercus velutina	Black Oak	1 1/2" CAL	UPL

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	
IV	23	Ilex verticillata	Winterberry	3` - 4`	48" o.c.	FACW
SA	21	Swida amomum	Silky Dogwood	3` - 4`	48" o.c.	FACW
VC	21	Vaccinium corymbosum	Highbush Blueberry	3` - 4`	48" o.c.	FACW

AQUATICS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	
	6	Alisma plantago-aquatica	Northern Water-Plantain	2" plug	OBL
	6	Peltandra virginica	Green Arrow-Arum	2" plug	OBL
	6	Pontederia cordata	Pickerelweed	2" plug	OBL
	6	Sagittaria latifolia	Common Arrowhead	2" plug	OBL

WETLAND SEED MIX

WETLAND SEED MIX SHALL BE APPLIED AT A DENSITY OF 18LB./AC.

[1]Wetland seed mix "New England Wetmix" from New England Wetland Plants, Inc. or similar. Typical species: fox sedge (Carex vulpinoidea), sallow sedge (Carex lurida), broom sedge (Carex scoparia), sensitive fern (Onoclea sensibilis), blue vervain (Verbena hastata), hop sedge (Carex lupulina), dark-green bulrush (Scirpus atrovirens), nodding bur-marigold (Bidens cernua), bristly sedge (Carex comosa), fringed sedge (Carex crinita), tall mannagrass (Glyceria grandis), wool-grass (Scirpus cyperinus), soft rush (Juncus effusus), spotted Joe-Pye-weed (Eutrochium maculatum), boneset (Eupatorium perfoliatum), American water-plantain (Alisma subcordatum), New England aster (Symphyotrichum novae-angliae), rattlesnake mannagrass (Glyceria canadensis), purple-stem aster (Symphyotrichum puniceum), soft-stemmed bulrush (Schoenoplectus tabernaemontani), blueflag (Iris versicolor), swamp milkweed (Asclepias incarnata), and Allegheny monkey-flower (Mimulus ringens).

Vanasse Hangen Brustlin, Inc.
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NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

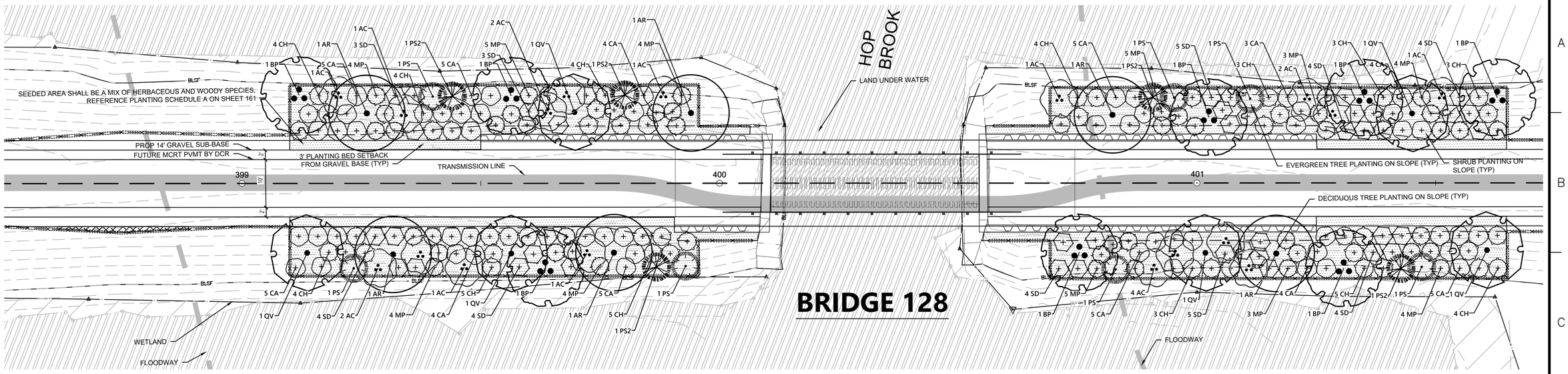
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION DETAILS

PLAN123OF349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=10'	DEC 2021	MS	SK	MES	.	.



LEGEND

SEEDED AREA

PLANT SCHEDULE WEST SIDE

DECIDUOUS TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	WETLAND STATUS
AR	4	Acer rubrum	Red Maple	1 1/2" CAL	FAC
AC	9	Amelanchier canadensis	Serviceberry	10 - 12` HT./Multi-Stem	FAC
BP	3	Betula populifolia	Gray Birch	10 - 12` HT./Multi-Stem	FAC
QV	3	Quercus velutina	Black Oak	1 1/2" CAL	UPL

EVERGREEN TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	WETLAND STATUS
PS	3	Pinus strobus	White Pine	6 - 8` HT.	FACU
PS2	3	Pinus strobus	White Pine	8 - 10` HT.	FACU

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	WETLAND STATUS
CA	28	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
CH	26	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
MP	21	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	14	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

PLANT SCHEDULE EAST SIDE

DECIDUOUS TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	WETLAND STATUS
AR	2	Acer rubrum	Red Maple	1 1/2" CAL	FAC
AC	8	Amelanchier canadensis	Serviceberry	10 - 12` HT./Multi-Stem	FAC
BP	5	Betula populifolia	Gray Birch	10 - 12` HT./Multi-Stem	FAC
QV	3	Quercus velutina	Black Oak	1 1/2" CAL	UPL

EVERGREEN TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	WETLAND STATUS
PS	4	Pinus strobus	White Pine	6 - 8` HT.	FACU
PS2	2	Pinus strobus	White Pine	8 - 10` HT.	FACU

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	WETLAND STATUS
CA	26	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
CH	25	Corylus americana	American Hazelnut	2 - 3` HT.	48" o.c.	FACU
MP	24	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SD	26	Swida alternifolia	Alternate-Leaved Dogwood	24 - 30" HT.	48" o.c.	FACU

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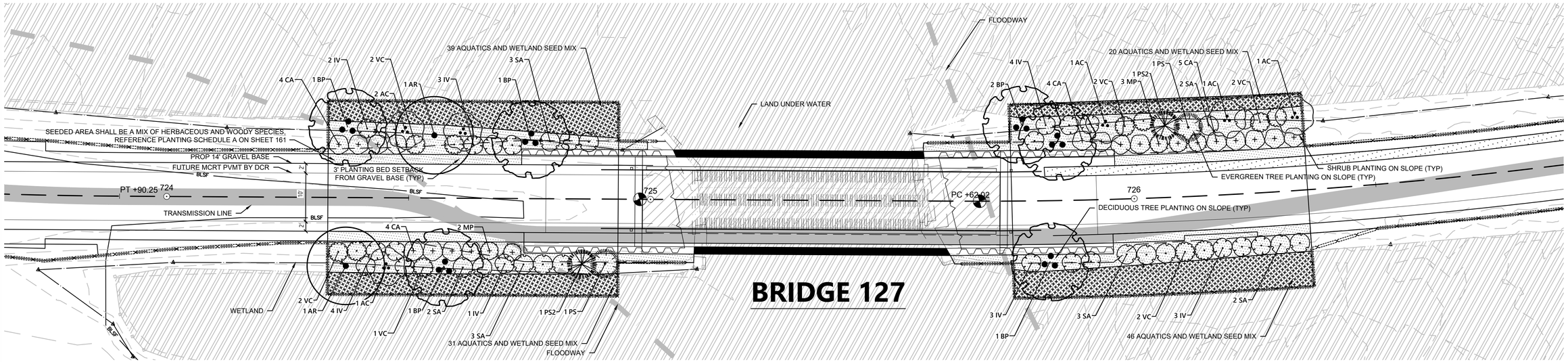
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

PLAN 124 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=10'	DEC 2021	MS	SK	MES	.	.



BRIDGE 127

LEGEND

AQUATIC PLANTS AND WETLAND SEED MIX

SEEDED AREA

PLANT SCHEDULE WEST SIDE

DECIDUOUS TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	WETLAND STATUS
AR	2	Acer rubrum	Red Maple	1 1/2" CAL	FAC
AC	3	Amelanchier canadensis	Serviceberry	10 - 12` HT./Multi-Stem	FAC
BP	3	Betula populifolia	Gray Birch	10 - 12` HT./Multi-Stem	FAC

EVERGREEN TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	WETLAND STATUS
PS	1	Pinus strobus	White Pine	6 - 8` HT.	FACU
PS2	1	Pinus strobus	White Pine	8 - 10` HT.	FACU

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	WETLAND STATUS
CA	8	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
IV	10	Ilex verticillata	Winterberry	3 - 4` HT.	48" o.c.	FACW
MP	2	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SA	8	Swida amomum	Silky Dogwood	3 - 4` HT.	48" o.c.	FACW
VC	5	Vaccinium corymbosum	Highbush Blueberry	3 - 4` HT.	48" o.c.	FACW

AQUATICS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	WETLAND STATUS
	18	Alisma plantago-aquatica	Northern Water-Plantain	2" plug	36" o.c.	OBL
	18	Peltandra virginica	Green Arrow-Arum	2" plug	36" o.c.	OBL
	17	Pontederia cordata	Pickerelweed	2" plug	36" o.c.	OBL
	17	Sagittaria latifolia	Common Arrowhead	2" plug	36" o.c.	OBL

PLANT SCHEDULE EAST SIDE

DECIDUOUS TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	WETLAND STATUS
AC	3	Amelanchier canadensis	Serviceberry	10 - 12` HT./Multi-Stem	FAC
BP	3	Betula populifolia	Gray Birch	10 - 12` HT./Multi-Stem	FAC

EVERGREEN TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	WETLAND STATUS
PS	1	Pinus strobus	White Pine	6 - 8` HT.	FACU
PS2	1	Pinus strobus	White Pine	8 - 10` HT.	FACU

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	WETLAND STATUS
CA	9	Clethra alnifolia	Summersweet Clethra	2 - 3` HT.	48" o.c.	FAC
IV	10	Ilex verticillata	Winterberry	3 - 4` HT.	48" o.c.	FACW
MP	3	Myrica pensylvanica	Northern Bayberry	2 - 3` HT.	48" o.c.	FAC
SA	7	Swida amomum	Silky Dogwood	3 - 4` HT.	48" o.c.	FACW
VC	6	Vaccinium corymbosum	Highbush Blueberry	3 - 4` HT.	48" o.c.	FACW

AQUATICS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	WETLAND STATUS
	17	Alisma plantago-aquatica	Northern Water-Plantain	2" plug	36" o.c.	OBL
	17	Peltandra virginica	Green Arrow-Arum	2" plug	36" o.c.	OBL
	16	Pontederia cordata	Pickerelweed	2" plug	36" o.c.	OBL
	16	Sagittaria latifolia	Common Arrowhead	2" plug	36" o.c.	OBL

WETLAND SEED MIX

WETLAND SEED MIX SHALL BE APPLIED AT A DENSITY OF 18LB./AC.

[1]Wetland seed mix "New England Wetmix" from New England Wetland Plants, Inc. or similar. Typical species: fox sedge (Carex vulpinoidea), sallow sedge (Carex lurida), broom sedge (Carex scoparia), sensitive fern (Onoclea sensibilis), blue vervain (Verbena hastata), hop sedge (Carex lupulina), dark-green bulrush (Scirpus atrovirens), nodding bur-marigold (Bidens cernua), bristly sedge (Carex comosa), fringed sedge (Carex crinita), tall mannagrass (Glyceria grandis), wool-grass (Scirpus cyperinus), soft rush (Juncus effusus), spotted Joe-Pye-weed (Eutrochium maculatum), boneset (Eupatorium perfoliatum), American water-plantain (Alisma subcordatum), New England aster (Symphyotrichum novae-angliae), rattlesnake mannagrass (Glyceria canadensis), purple-stem aster (Symphyotrichum puniceum), soft-stemmed bulrush (Schoenoplectus tabernaemontani), blueflag (Iris versicolor), swamp milkweed (Asclepias incarnata), and Allegheny monkey-flower (Mimulus ringens).

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NO.	DESCRIPTION	BY	DATE	APPR.

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

LANDSCAPE PLANS

PLAN 125 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=10'	DEC 2021	MS	SK	MES	.	.

GENERAL NOTES

1. ALL CONSTRUCTION SIGNING, TEMPORARY TRAFFIC CONTROL DEVICES, AND ROADSIDE ELEMENTS SHALL CONFORM WITH THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AS AMENDED, THE MASSDOT STANDARD DETAILS AND DRAWINGS FOR THE DEVELOPMENT OF TEMPORARY TRAFFIC CONTROL PLANS, THE LATEST REVISIONS OF THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, (AASHTO) ROADSIDE DESIGN GUIDE, AASHTO POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, AND NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 OR THE AASHTO MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).

2. THE ALLOWABLE WORK HOURS ARE IDENTIFIED IN THE ENERGY FACILITIES SITING BOARD FINAL DECISION. THE CONTRACTOR SHALL NOTE THAT THERE ARE FURTHER RESTRICTED WORKING HOURS WHILE WORKING IN MUNICIPAL AND MASSDOT RIGHTS OF WAY (ROWS) IN ACCORDANCE WITH THEIR RESPECTIVE PERMITS.

   WORK HOURS WITHIN THE ROADWAY SHALL BE AS STATED IN THE STATE/LOCAL PERMIT ISSUED BY MASSDOT OR THE MUNICIPALITY WITH JURISDICTION OF THE ROADWAY. AT A MINIMUM, THE CONTRACTOR SHALL NOTE THE FOLLOWING POTENTIAL RESTRICTIONS:
   - TYPICALLY, MASSDOT OR LOCAL MUNICIPALITY WILL NOT ALLOW WORK THAT IMPACTS THE TRAVEL WAY DURING PEAK TRAFFIC PERIODS. FOR EXAMPLE, PEAK PERIODS ARE COMMONLY DEFINED AS MONDAY THRU FRIDAY, 7:00 AM TO 9:00 AM AND 3:00 PM TO 7:00 PM.
   - IN ORDER TO MINIMIZE IMPACTS TO TRAFFIC DURING CONSTRUCTION, IT IS SUGGESTED THAT WORK AT THE INTERSECTIONS OF FOREST AVENUE AT MARLBORO STREET AND MAIN STREET AT FOREST AVENUE/ WILKINS STREET WILL REQUIRE NIGHT WORK.
   - WORK IN THE PROXIMITY OF FOREST AVENUE ELEMENTARY SCHOOL AND CHAPS CHILD CARE WILL ALSO REQUIRE COORDINATION WITH THE TOWN OF HUDSON.
   - ROAD CLOSURE AND DETOUR OF CHESTNUT STREET SHALL BE COORDINATED WITH THE TOWN OF HUDSON AND THE TOWN OF STOW AND ANY IMPACTS TO SCHOOL BUS ROUTES SHALL BE CLOSELY COORDINATED WITH THE APPROPRIATE AGENCY.

3. NO WORK SHALL OCCUR WITHIN THE PUBLIC WAY ON STATE RECOGNIZED HOLIDAYS UNLESS OTHERWISE APPROVED BY THE ENGINEER.

4. ALL TEMPORARY PEDESTRIAN PATHWAYS SHALL COMPLY FULLY WITH ALL REQUIREMENTS OF THE MUTCD AND ALL APPLICABLE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (MAAB) AND AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG) REQUIREMENTS AND PUBLIC RIGHTS-OF WAY ACCESSIBILITY GUIDELINES (PROWAG).

5. ALL DRUMS OUTSIDE TAPERS SHALL BE SET AT 20' ON CENTER MAX. UNLESS OTHERWISE NOTED OR ADJUSTED BY THE ENGINEER.

6. ALL DRUMS SHALL BE APPROXIMATELY PLACED AND MOVED AS NECESSARY TO MAINTAIN SAFE AND REASONABLE ABUTTER ACCESS. WORK MAY REQUIRE ADDITIONAL SIGNS, DRUMS AND OTHER TRAFFIC CONTROL DEVICES, GRADING AND TEMPORARY PAVEMENT FOR PASSAGE OF PEDESTRIAN, VEHICULAR AND EMERGENCY TRAFFIC THROUGH THE WORK AREAS, BOTH DURING AND AFTER WORKING HOURS, TO MAINTAIN SUCH ACCESS.

7. THE FIRST 10 DRUMS ON TAPERS SHALL BE REFLECTORIZED DRUMS WITH SEQUENTIAL FLASHING WARNING LIGHTS AND SHALL BE OPERATING, AT A MINIMUM, BETWEEN DUSK AND DAWN, WHEN TAPER IS DEPLOYED.

8. REFLECTORIZED CONES SHALL BE A MINIMUM OF 36 INCHES IN HEIGHT.

9. CONES MAY BE USED IN LIEU OF DRUMS OUTSIDE OF TAPER AREAS.

10. THE CONTRACTOR SHALL NOTIFY EACH ABUTTER AT LEAST 2 WEEKS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OR RESTRICTION OF ACCESS.

11. FOR DROP-OFFS 3" OR LESS WITHIN THE CLEAR ZONE, CONDITION MAY BE MITIGATED WITH W8-9 (LOW SHOULDER) SIGN OR TEMPORARY CHANNELIZATION DEVICES.

12. CONTRACTOR SHALL STAGE WORK SUCH THAT A DROP-OFF OF NO MORE THAN 3" AT THE END OF EACH WORK DAY EXISTS WITHIN THE CLEAR ZONE AT ANY TIME AND ENSURE DROP-OFF IS MITIGATED WITHOUT BARRIER PER NOTE 11.

13. CONSTRUCTION CLEAR ZONE SHALL BE IN ACCORDANCE WITH MASSDOT BOSTON TRAFFIC GUIDELINES AS FOLLOWS:
    4' IF POSTED SPEED IS LESS THAN 35 MPH
    8' IF POSTED SPEED IS 35 MPH
    15' IF POSTED SPEED IS 40 MPH

14. 11' MINIMUM LANE WIDTHS SHALL BE MAINTAINED UNLESS OTHERWISE NOTED.

15. NON-ESSENTIAL TRAFFIC CONTROL DEVICES AND SIGNS SHALL BE COVERED OR REMOVED DURING NON-WORKING HOURS WHEN NOT IN USE.

16. SIGNS INSTALLED ON PORTABLE STANDS REQUIRE 12 INCH MINIMUM MOUNTING HEIGHT FROM THE ROADWAY SURFACE TO THE BOTTOM OF THE SIGN.

17. SIGNS INSTALLED ON PORTABLE STANDS PLACED AMONG CHANNELIZATION DEVICES REQUIRE A 36 INCH MINIMUM MOUNTING HEIGHT FROM THE ROADWAY SURFACE TO THE BOTTOM OF THE SIGN.

18. SIGNS MOUNTED ON POSTS REQUIRE A MINIMUM 84 INCH MOUNTING HEIGHT FROM THE ROADWAY OR SIDEWALK SURFACE TO THE BOTTOM OF THE SIGN.

19. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN NCHRP 350 AND/OR MASH CRASH TESTED SIGN SUPPORTS AND INSTALLED IN ACCORDANCE WITH THE MUTCD. SIGNS SHALL NOT BE MOUNTED TO OR LEANED AGAINST DRUMS OR CONES.

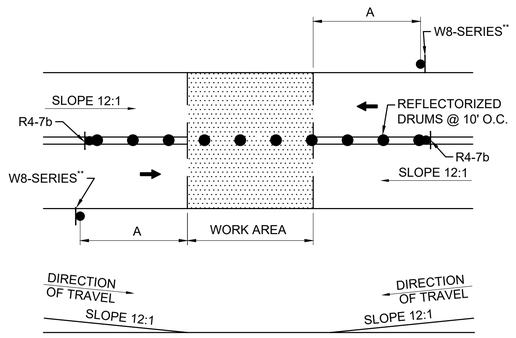
20. CONTRACTOR SHALL SECURE WORK AREAS BY APPROPRIATE MEANS, TO PREVENT UNAUTHORIZED ACCESS AT ALL TIMES.

21. THERE IS NO DESIGNATED BICYCLE LANE ON THE ROADWAY WITHIN THE PROJECT LIMITS. BICYCLES ARE EXPECTED TO SHARE THE ROAD WITH GENERAL VEHICULAR TRAFFIC.

22. TEMPORARY CONSTRUCTION FENCING IS TO BE USED WHEN WORKING ADJACENT TO PRIVATE PROPERTY TO DELINEATE WORK ZONE LIMITS AND PREVENT UNAUTHORIZED ACCESS.

23. WORK ZONE ACCESS POINTS ARE IDENTIFIED ON THE KEY PLAN AND WORK ZONE ACCESS PLAN ON SHEETS 127 - 129. CONTRACTOR SHALL SWEEP AREAS ADJACENT TO THE SITE ON A DAILY BASIS. CONTRACTOR SHALL REPAIR DAMAGED ROADWAYS AND SIDEWALKS AT THEIR OWN COST.

LANE TAPER LENGTH FORMULAS	
L= TAPER LENGTH IN FEET	
W= WIDTH OF ROADWAY TO BE SHIFTED OR REDIRECTED IN FEET	
S= POSTED SPEED LIMIT IN MPH	
POSTED SPEED	
40 MPH OR LESS	
$L = \frac{WS^2}{60}$	

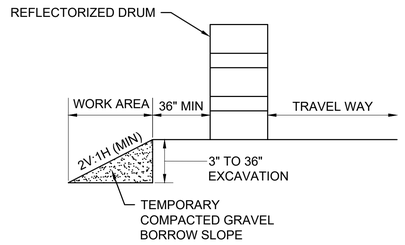


NOTES:
1. SQUARE OFF THE FULL WIDTH OF THE ROADWAY AT THE END OF WORK DAY
2. ** CONTRACTOR SHALL INSTALL W8-1 OR W8-8 SIGN, AS APPROPRIATE, ON ALL ROADWAYS IN ADVANCE OF THE TRANSITION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

TEMPORARY PAVEMENT TRANSITION

SCALE: NTS

LEGEND	
P	POLICE OFFICER
S	TRAFFIC SIGNAL
●	REFLECTORIZED DRUM
◉	REFLECTORIZED DRUMS WITH SEQUENTIAL FLASHING WARNING LIGHTS (SEE NOTE 7)
	TEMPORARY CONSTRUCTION SIGN
▲	TRAFFIC CONE
	TYPE III BARRICADE
	WORK AREA (PUBLIC ACCESS RESTRICTED)
	ROAD CLOSED, LOCAL ACCESS ONLY
	TRAFFIC FLOW
	PEDESTRIAN ROUTE
	CONSTRUCTION FENCE
	TEMPORARY PEDESTRIAN BARRICADE
	PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
NTS	NOT TO SCALE



NOTE:
1. CONTRACTOR SHALL INSTALL W8-9 SIGN ON ALL ROADWAYS 350 FT IN ADVANCE OF THE START OF DROP-OFF CONDITION.

TYPICAL ROADWAY DROP-OFF PROTECTION

SCALE: NTS

ADVANCE SIGN SPACING					
	DISTANCE BETWEEN SIGNS (FEET)				
ROADWAY	A	B	C	D	
BOSTON POST RD (ROUTE 20), FOREST AVE, WILKINS ST, MAIN ST, CONCORD RD, DUTTON RD, PEAKHAM RD, HORSE POND RD, UNION AVE, LANDHAM RD	350	150	350	350	
ALL OTHERS	100	50	100	100	

BUFFER SPACING	
SPEED (MPH)	DISTANCE (FEET)
15	80
20	115
25	155
30	200
35	250
40	305

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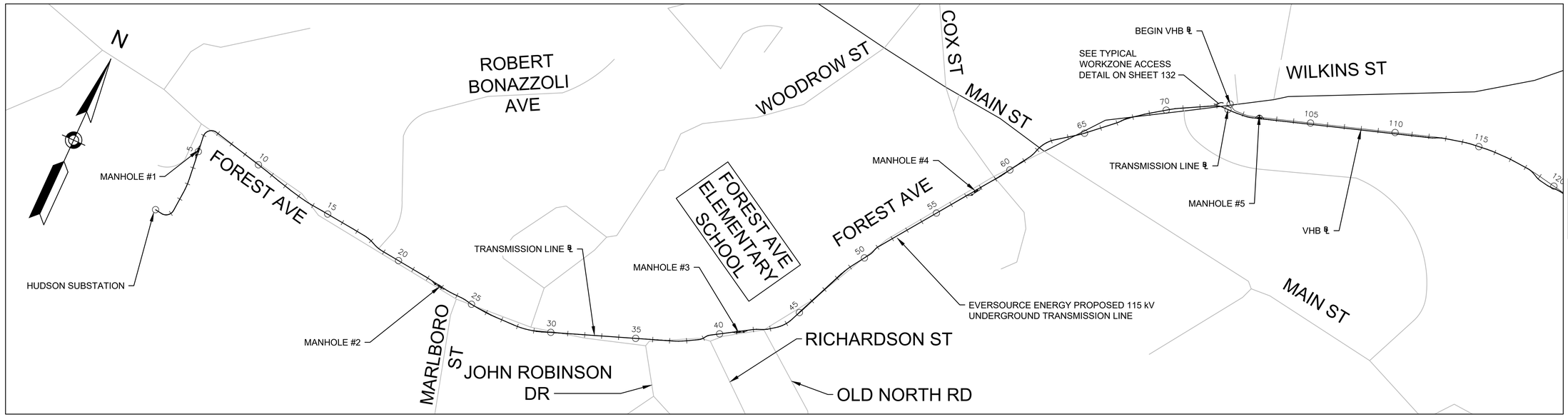
EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
TEMPORARY TRAFFIC CONTROL PLANS
GENERAL NOTES AND LEGEND

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
NTS	DEC 2021	MM	KW	MES	126 OF 349	.



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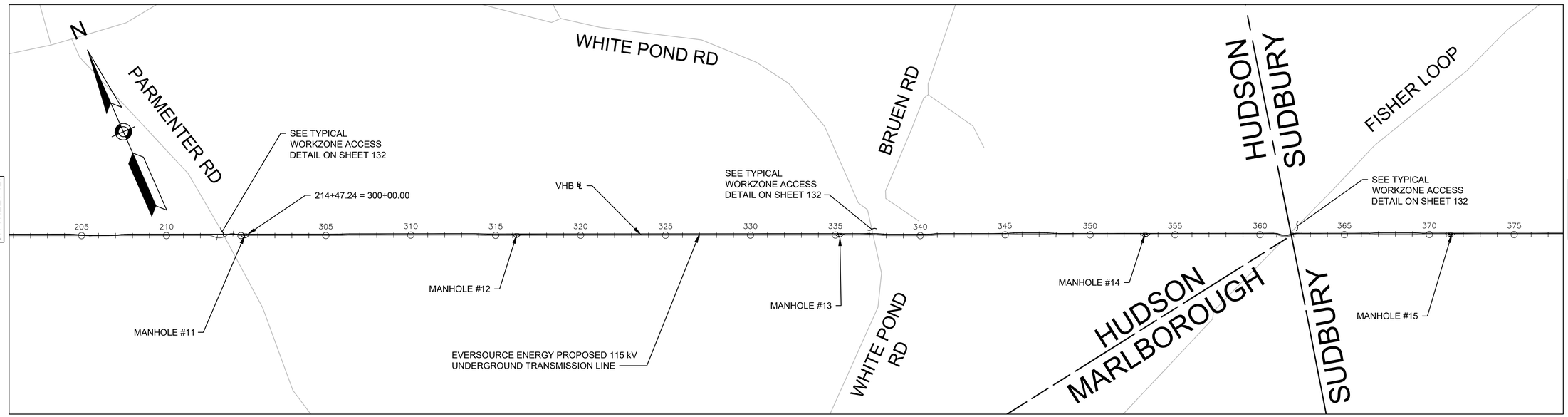
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

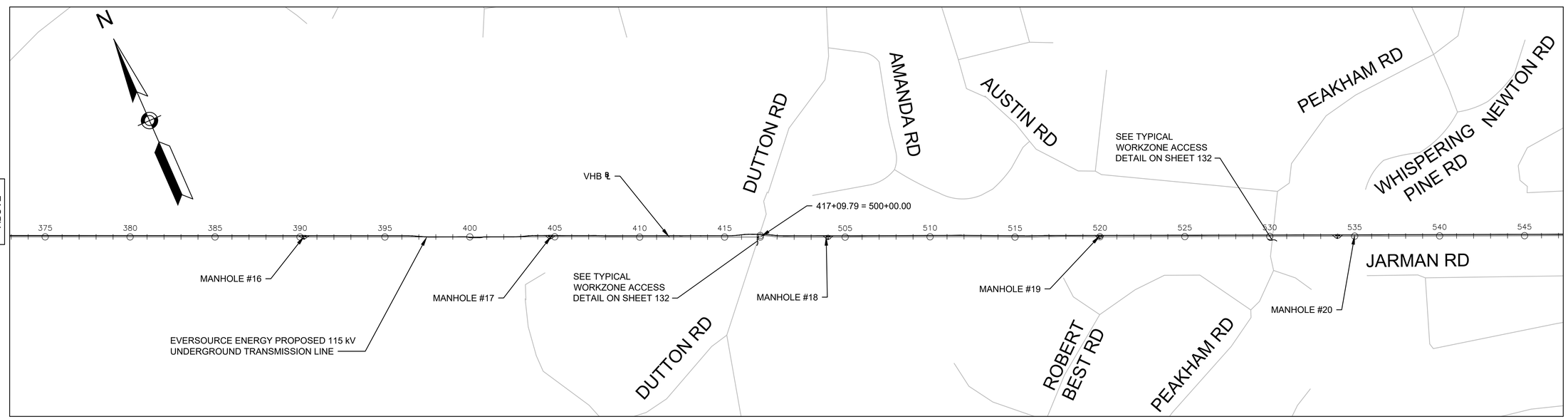
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

KEY PLAN AND WORKZONE ACCESS PLAN

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=300'	DEC 2021	MM	KW	MES	127 OF 349	.





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SCALE: 1" = 300'

NO.	DESCRIPTION	BY	DATE	APPR.
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

KEY PLAN AND WORKZONE ACCESS PLAN

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=300'	DEC 2021	MM	KW	MES	128 OF 349	.

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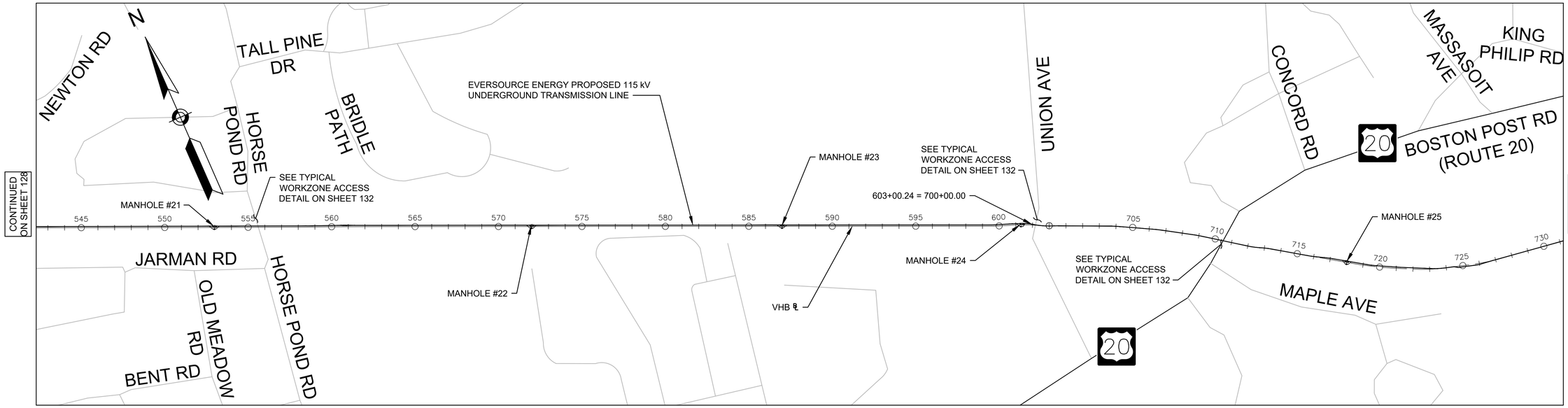

NO.	DESCRIPTION	BY	DATE	APPR.

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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

KEY PLAN AND WORKZONE ACCESS PLAN

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=300'	DEC 2021	MM	KW	MES	129 OF 349	.

SUGGESTED TEMPORARY TRAFFIC CONTROL SETUP APPLICATION

TOWN	ROADWAY	TRANSMISSION ℄ STATION (SEE NOTE 1)	VHB ℄ STATION (SEE NOTE 2)	TEMPORARY TRAFFIC CONTROL SETUPS	SHEET NUMBER	NOTES
HUDSON	EVERSOURCE	0+00 ± TO 6+20 ± MANHOLE #1	--	OFF-ROAD	--	MANHOLE #4
	FOREST AVENUE	6+20 ± TO 6+40 ±	--	TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC PEDESTRIAN BYPASS TYPE II DETAIL	SHEET 131 SHEET 132	--
		6+40 ± TO 22+20 ±	--	TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC	SHEET 131	--
		22+20 ± TO 24+00 ± MANHOLE #2	--	TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC	SHEET 131	MANHOLE #2
		24+00 ± TO 24+40 ±	--	SITE SPECIFIC FOREST AVE AT MARLBORO ST STAGE 1	SHEET 133	AT MARLBORO ST
		24+40 ± TO 24+80 ±	--	SITE SPECIFIC FOREST AVE AT MARLBORO ST STAGE 2	SHEET 134	AT MARLBORO ST
		24+80 ± TO 29+20 ±	--	TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC	SHEET 131	--
		29+20 ± TO 30+20 ±	--	TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC	SHEET 131	AT WOODROW ST
		30+20 ± TO 35+60 ±	--	TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC	SHEET 131	--
		35+60 ± TO 37+00 ±	--	CLOSURE AND DETOUR PLAN - JOHN ROBINSON DR	SHEET 139	AT JOHN ROBINSON RD
		37+00 ± TO 39+00 ±	--	TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC	SHEET 131	--
		39+00 ± TO 40+50 ±	--	ONE LANE BI-DIRECTIONAL TRAFFIC AT INTERSECTIONS	SHEET 131	AT RICHARDSON ST
		40+50 ± TO 41+80 ± MANHOLE #3	--	CLOSURE AND DETOUR PLAN- FOREST AVENUE - MANHOLE #3	SHEET 140	MANHOLE #3
		41+80 ± TO 42+50 ±	--	TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC	SHEET 131	--
		42+50 ± TO 44+00 ±	--	ONE LANE BI-DIRECTIONAL TRAFFIC AT INTERSECTIONS	SHEET 131	AT OLD NORTH RD
		44+00 ± TO 56+80 ±	--	TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC	SHEET 131	--
		56+80 ± TO 58+40 ± MANHOLE #4	--	CLOSURE AND DETOUR PLAN- FOREST AVENUE - MANHOLE #4	SHEET 141	MANHOLE #4
		58+40 ± TO 61+40 ±	--	TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC	SHEET 131	--
	FOREST AVENUE / WILKINS ST	61+40 ± TO 62+00 ±	--	SITE SPECIFIC FOREST AVE AT MAIN ST STAGE 1 PCMS PLAN - FOREST AVE AT MAIN ST NIGHT WORK	SHEET 135 SHEET 149	AT MAIN / WILKINS ST
		62+00 ± TO 62+30 ±	--	SITE SPECIFIC FOREST AVE AT MAIN ST STAGE 2 CLOSURE AND DETOUR PLAN - FOREST AVENUE - MANHOLE #4	SHEET 136 SHEET 141	AT MAIN / WILKINS ST
		62+30 ± TO 62+40 ±	--	SITE SPECIFIC FOREST AVE AT MAIN ST STAGE 3 CLOSURE AND DETOUR PLAN - FOREST AVENUE - MANHOLE #4	SHEET 137 SHEET 141	AT MAIN / WILKINS ST
		62+40 ± TO 63+30 ±	--	SITE SPECIFIC FOREST AVE AT MAIN ST STAGE 4 PCMS PLAN - FOREST AVE AT MAIN ST NIGHT WORK	SHEET 138 SHEET 149	AT MAIN / WILKINS ST
	WILKINS ST	63+30 ± TO 73+60 ±	--	TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC	SHEET 131	--
	MBTA ROW	--	100+31 ± TO 124+95 ±	OFF-ROAD	--	--
STOW	MBTA ROW	--	124+95 ± TO 128+30 ±	OFF-ROAD	--	--
HUDSON	MBTA ROW	--	128+30 ± TO 132+50 ±	OFF-ROAD	--	--
	CHESTNUT ST	--	132+50 ± TO 132+80 ±	CLOSURE AND DETOUR PLAN- CHESTNUT ST AND MARLBORO RD	SHEET 143	AT CHESTNUT ST
	MBTA ROW	--	132+80 ± TO 181+60 ±	OFF-ROAD	--	--
	MAIN ST	--	181+60 ± TO 182+30 ±	TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC	SHEET 131	AT MAIN ST
	MBTA ROW	--	182+30 ± TO 213+50 ±	OFF-ROAD	--	--
	PARMENTER RD	--	213+50 ± TO 213+70 ±	TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC	SHEET 131	AT PARMENTER RD
	MBTA ROW	--	213+70 ± TO 214+47 ± 214+47 ± = 300+00 ± 300+00 ± TO 336+90 ±	OFF-ROAD	--	--
	WHITE POND RD	--	336+90 ± TO 337+10 ±	CLOSURE AND DETOUR PLAN- WHITE POND RD	SHEET 144	AT WHITE POND RD
	MBTA ROW	--	337+10 ± TO 361+40 ±	OFF-ROAD	--	--
MARLBOROUGH	MBTA ROW	--	361+40 ± TO 361+55 ±	OFF-ROAD	--	--
SUDBURY	MBTA ROW	--	361+55 ± TO 416+85 ±	OFF-ROAD	--	--
	DUTTON RD	--	416+85 ± TO 417+10 ± 417+10 ± = 500+00 ±	CLOSURE AND DETOUR PLAN- DUTTON RD	SHEET 145	AT DUTTON RD
	MBTA ROW	--	500+00 ± TO 530+45 ±	OFF-ROAD	--	--
	PEAKHAM RD	--	530+45 ± TO 530+65 ±	PEDESTRIAN BYPASS TYPE I DETAIL CLOSURE AND DETOUR- PEAKHAM RD	SHEET 132 SHEET 146	AT PEAKHAM RD
	MBTA ROW	--	530+65 ± TO 555+75 ±	OFF-ROAD	--	--
	HORSE POND RD	--	555+75 ± TO 556+00 ±	PEDESTRIAN BYPASS TYPE I DETAIL CLOSURE AND DETOUR- HORSE POND RD	SHEET 132 SHEET 147	AT HORSE POND RD
	MBTA ROW	--	556+00 ± TO 602+35 ±	OFF-ROAD	--	--
	UNION AVE	--	602+35 ± TO 602+65 ±	TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC	SHEET 131	AT UNION AVE
	MBTA ROW	--	602+65 ± TO 603+00 ± 603+00 ± = 700+00 ± 700+00 ± TO 711+35 ±	OFF-ROAD	--	--
	BOSTON POST RD (ROUTE 20)	--	711+35 ± TO 711+65 ±	SEE NOTE 4	--	AT BOSTON POST RD
	MBTA ROW	--	711+65 ± TO 757+65 ±	OFF-ROAD	--	--
	LANDHAM RD	--	757+65 ± TO 758+00 ±	OFF-ROAD	--	BELOW LANDHAM RD
	MBTA ROW	--	758+00 ± TO 767+30 ±	OFF-ROAD	--	--
SUDBURY	EVERSOURCE	475+40 ± TO 479+85	--	OFF-ROAD	--	--

NOTES:
1. REFER TO KEY PLAN AND WORKZONE ACCESS PLAN ON SHEETS 128 & 129 FOR OVERVIEW. SEE EVERSOURCE ENERGY 115kV UNDERGROUND TRANSMISSION LINE PLAN AND PROFILE FOR ADDITIONAL INFORMATION.
2. REFER TO VHB CONSTRUCTION PLANS ON SHEETS 24-74 FOR ADDITIONAL INFORMATION.
3. REFER TO GENERAL NOTE 2 ON SHEET 126 REGARDING WORK HOURS.
4. REFER TO APPROVED MASSDOT ACCESS PERMIT TTCP FOR WORK ALONG ROUTE 20.

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
TEMPORARY TRAFFIC CONTROL PLANS
SUGGESTED TEMPORARY TRAFFIC CONTROL SETUP

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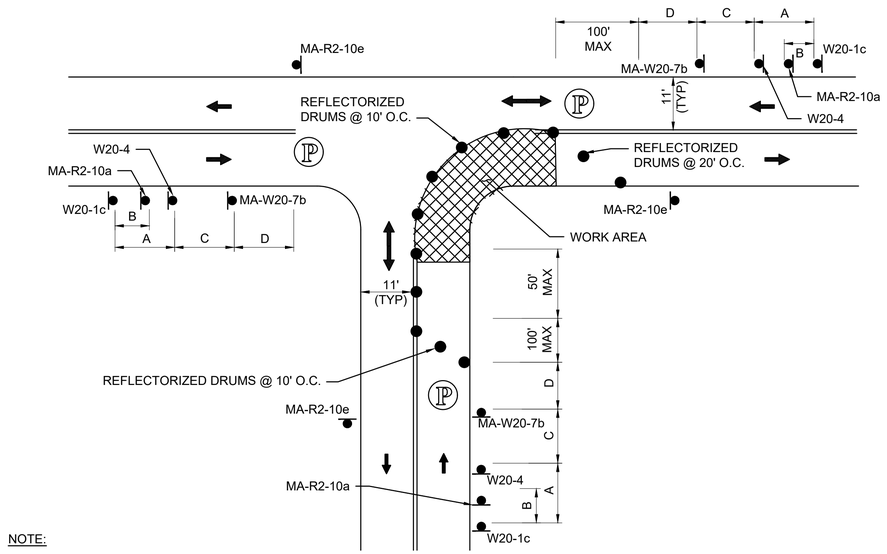
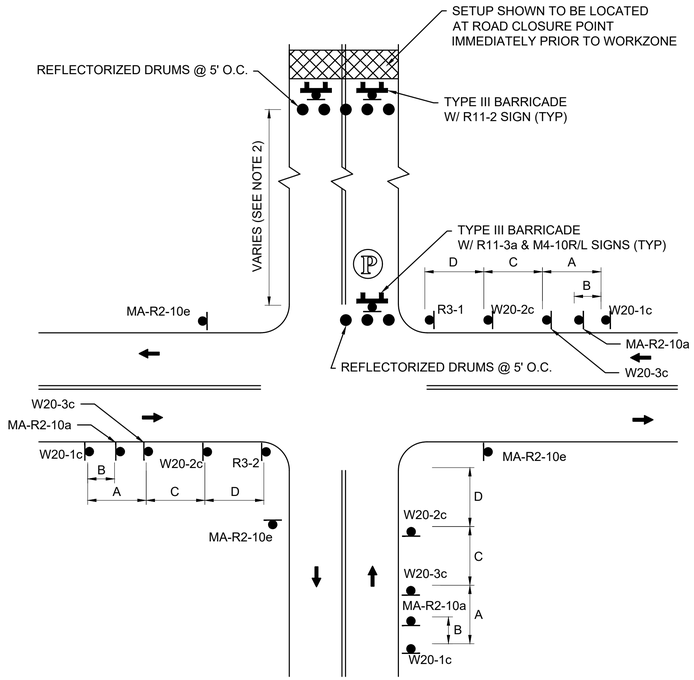


NOTE:

1. ADVANCE WARNING SIGN PLACEMENT TO BE ADJUSTED AS NECESSARY.

ONE LANE BI-DIRECTIONAL TRAFFIC AT INTERSECTIONS

SCALE: NTS

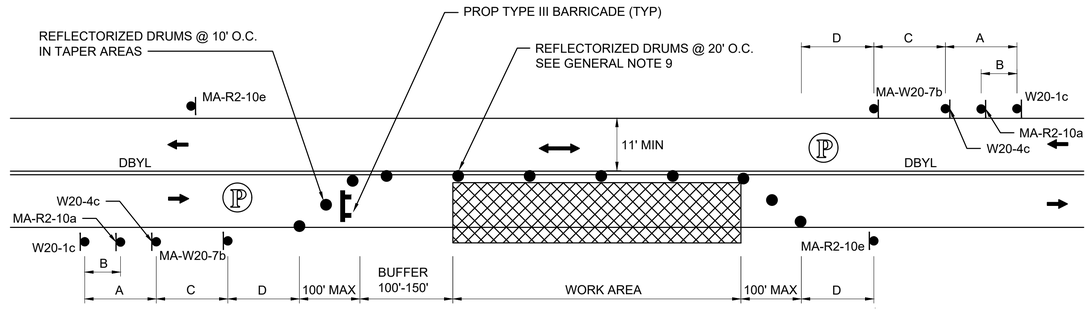


NOTE:

1. REFER TO ADVANCE SIGN SPACING TABLE ON TTCP GENERAL NOTES & LEGEND SHEET.
2. SEE DETOUR PLAN FOR LOCATION OF ROAD CLOSURE WITH LOCAL ACCESS.

TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS

SCALE: NTS

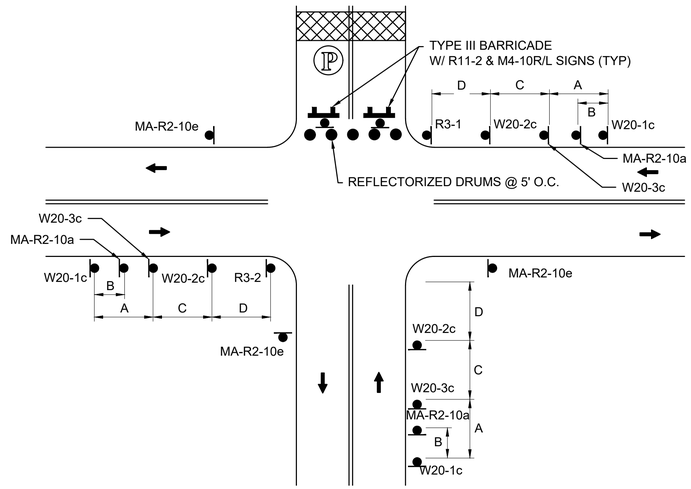


NOTE:

1. REFER TO ADVANCE SIGN SPACING TABLE ON TTCP GENERAL NOTES & LEGEND SHEET.

TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC

SCALE: NTS



NOTE:

1. REFER TO ADVANCE SIGN SPACING TABLE ON TTCP GENERAL NOTES & LEGEND SHEET.

TYPICAL LOCAL ROAD CLOSURE

SCALE: NTS

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

TYPICAL DETAILS

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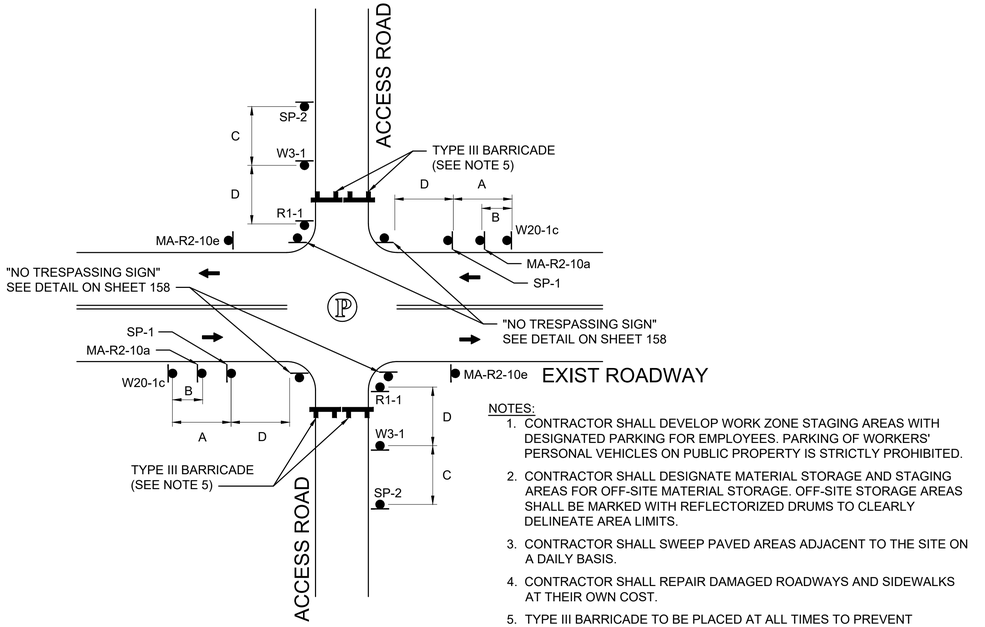


NOTES:

1. CONTRACTOR SHALL DEVELOP WORK ZONE STAGING AREAS WITH DESIGNATED PARKING FOR EMPLOYEES. PARKING OF WORKERS' PERSONAL VEHICLES ON PUBLIC PROPERTY IS STRICTLY PROHIBITED.
2. CONTRACTOR SHALL DESIGNATE MATERIAL STORAGE AND STAGING AREAS FOR OFF-SITE MATERIAL STORAGE. OFF-SITE STORAGE AREAS SHALL BE MARKED WITH REFLECTORIZED DRUMS TO CLEARLY DELINEATE AREA LIMITS.
3. CONTRACTOR SHALL SWEEP PAVED AREAS ADJACENT TO THE SITE ON A DAILY BASIS.
4. CONTRACTOR SHALL REPAIR DAMAGED ROADWAYS AND SIDEWALKS AT THEIR OWN COST.
5. TYPE III BARRICADE TO BE PLACED AT ALL TIMES TO PREVENT UNAUTHORIZED ACCESS.

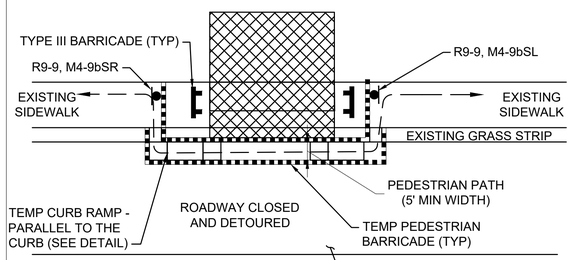
TYPICAL WORKZONE ACCESS

SCALE: NTS

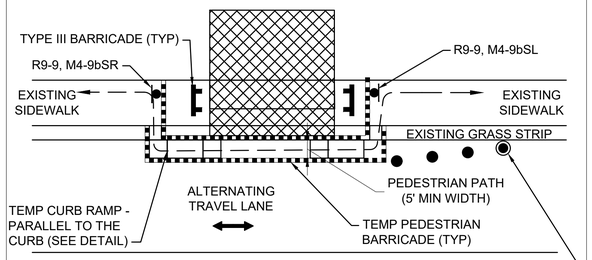
NOTES:

1. ADDITIONAL ADVANCE WARNING SIGNS MAY BE NECESSARY AS DETERMINED BY THE ENGINEER.
2. CONTROLS FOR PEDESTRIAN TRAFFIC ONLY, ARE SHOWN. VEHICULAR TRAFFIC SHALL BE MAINTAINED AS SHOWN ELSEWHERE.
3. STREET LIGHTING SHOULD BE CONSIDERED WHEN LOCATING CONTROL DEVICES.
4. ◄ — ► INDICATES DIRECTION OF PEDESTRIAN TRAVEL.
5. ALL TEMPORARY PEDESTRIAN PATHWAYS SHALL COMPLY FULLY WITH ALL REQUIREMENTS OF THE MUTCD AND ALL APPLICABLE MAAB AND ADAAG REQUIREMENTS AND INCLUDE THE USE OF A COMPLIANT TEMPORARY PEDESTRIAN MANAGEMENT GUIDANCE SYSTEM AT ALL TIMES.
6. CONTRACTOR SHALL MAINTAIN AS WIDE OF A PEDESTRIAN ACCESS AS POSSIBLE AT ALL TIMES. EXCEPT WHERE NECESSARY, THE CONTRACTOR MAY TEMPORARILY REDUCE PEDESTRIAN PATHWAYS TO 4 FEET IN WIDTH (EXCLUDING CURB) FOR NO MORE THAN 200 LINEAR FEET AT A TIME IN ACCORDANCE WITH ALL STANDARDS. A 5' x 5' PASSING AREA SHALL BE PROVIDED IN INTERVALS NOT EXCEEDING 200 FEET.
7. TEMPORARY WHEELCHAIR RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH MASSDOT, MAAB, AND ADAAG REQUIREMENTS.

PEDESTRIAN BYPASS TYPE I

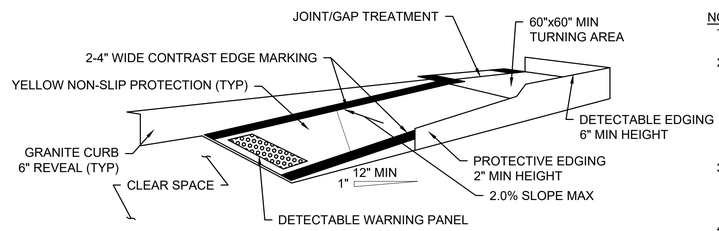


PEDESTRIAN BYPASS TYPE II

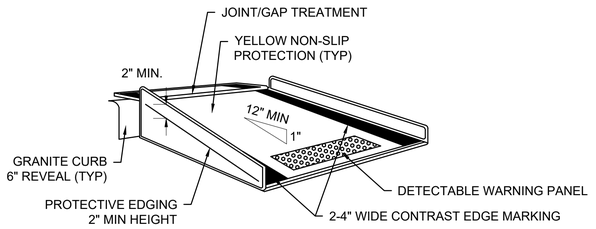


PEDESTRIAN BYPASS DETAIL

SCALE: NTS



TEMPORARY CURB RAMP-PARALLEL TO CURB



TEMPORARY CURB RAMP-PERPENDICULAR TO CURB

NOTES:

1. CURB RAMPS SHALL BE 60" MINIMUM WIDTH WITH A FIRM, STABLE AND NON-SLIP SURFACE.
2. PROTECTIVE EDGING WITH A 2" MINIMUM HEIGHT SHALL BE INSTALLED WHEN THE CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 6" OR GREATER OR HAS A SIDE APRON SLOPE STEEPER THAN 1:3 (33%). PROTECTIVE EDGING SHOULD BE CONSIDERED WHEN THE CURB RAMPS OR LANDING PLATFORMS HAVE A VERTICAL DROP OF 3" OR MORE.
3. DETECTABLE EDGING WITH 6" MINIMUM HEIGHT AND CONTRASTING COLOR SHALL BE INSTALLED ON ALL CURB RAMP LANDINGS WHERE THE WALKWAY CHANGES DIRECTION (TURNS).
4. THE CURB RAMP WALKWAY AND LANDING AREA SURFACE SHALL BE OF A SOLID CONTINUOUS CONTRASTING COLOR ABUTTING UP TO THE EXISTING SIDEWALK.
5. CURB RAMPS AND LANDINGS SHOULD HAVE A 1:50 (2%) MAX CROSS-SLOPE.
6. CLEAR SPACE OF 48"x48" MINIMUM SHALL BE PROVIDED ABOVE AND BELOW THE CURB RAMP.
7. WATER FLOW IN THE GUTTER SYSTEM SHALL HAVE MINIMAL RESTRICTION.
8. LATERAL JOINTS OR GAPS BETWEEN SURFACES SHALL BE LESS THAN 0.5" WIDTH.
9. CHANGES BETWEEN SURFACE HEIGHTS SHOULD NOT EXCEED 0.5" LATERAL EDGES SHOULD BE VERTICAL UP TO 0.25" HIGH, AND BEVELED AT 1:2 BETWEEN 0.25" AND 0.5" HEIGHT.
10. IF A TEMPORARY PEDESTRIAN RAMP LEADS TO A CROSSWALK, THEN A DETECTABLE WARNING PAD MUST BE ADHERED TO THE BASE OF THE RAMP. IF IT LEADS TO A PROTECTED PEDESTRIAN BYPASS THAT DOES NOT CONFLICT WITH VEHICULAR TRAFFIC, THEN A PAD SHALL NOT BE INSTALLED ON THE RAMP.

TEMPORARY CURB RAMPS

SCALE: NTS

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

TYPICAL DETAILS

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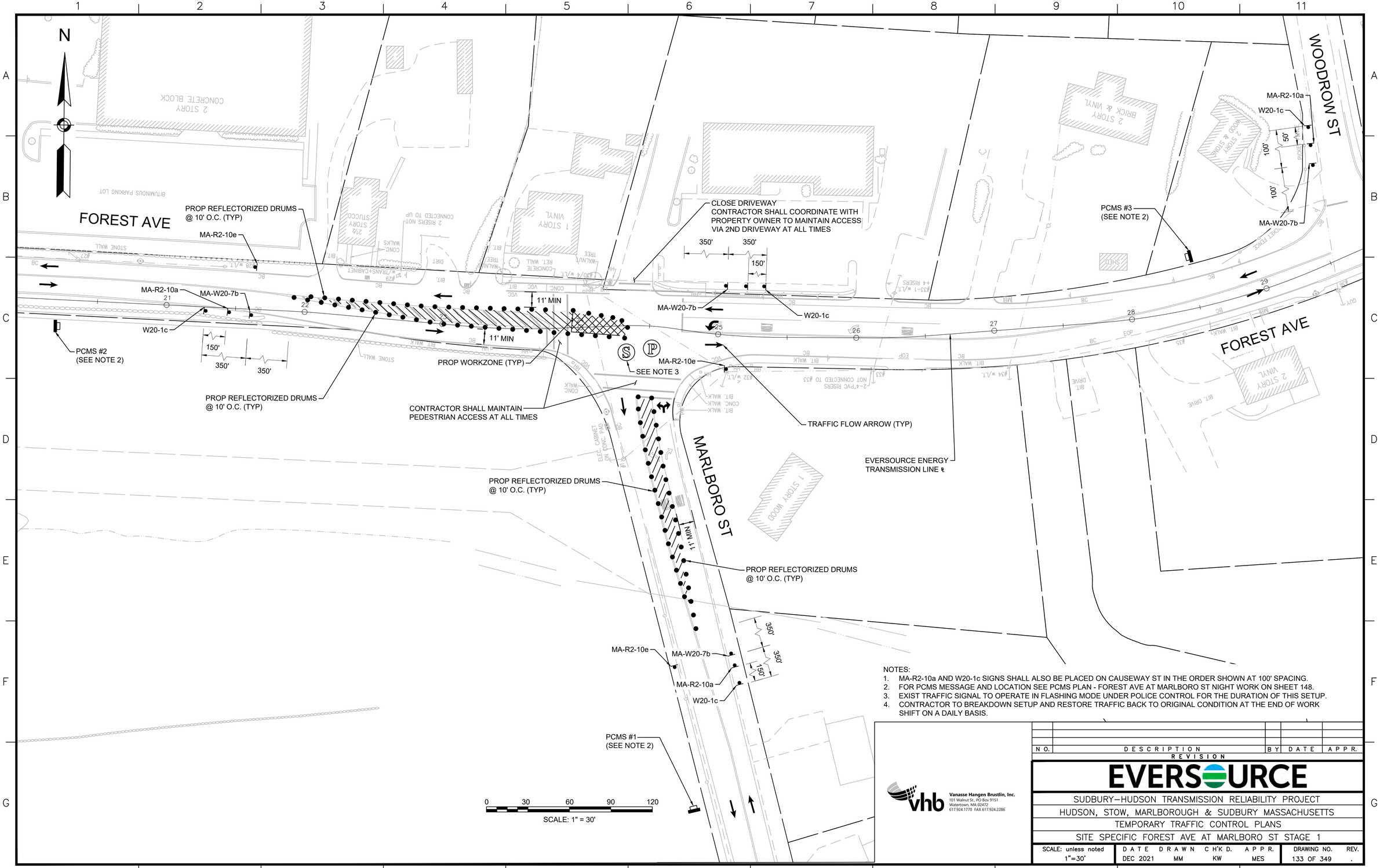

NOTES:
1. MA-R2-10a AND W20-1c SIGNS SHALL ALSO BE PLACED ON CAUSEWAY ST IN THE ORDER SHOWN AT 100' SPACING.
2. FOR PCMS MESSAGE AND LOCATION SEE PCMS PLAN - FOREST AVE AT MARLBORO ST NIGHT WORK ON SHEET 148.
3. EXIST TRAFFIC SIGNAL TO OPERATE IN FLASHING MODE UNDER POLICE CONTROL FOR THE DURATION OF THIS SETUP.
4. CONTRACTOR TO BREAKDOWN SETUP AND RESTORE TRAFFIC BACK TO ORIGINAL CONDITION AT THE END OF WORK SHIFT ON A DAILY BASIS.

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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

SITE SPECIFIC FOREST AVE AT MARLBORO ST STAGE 1

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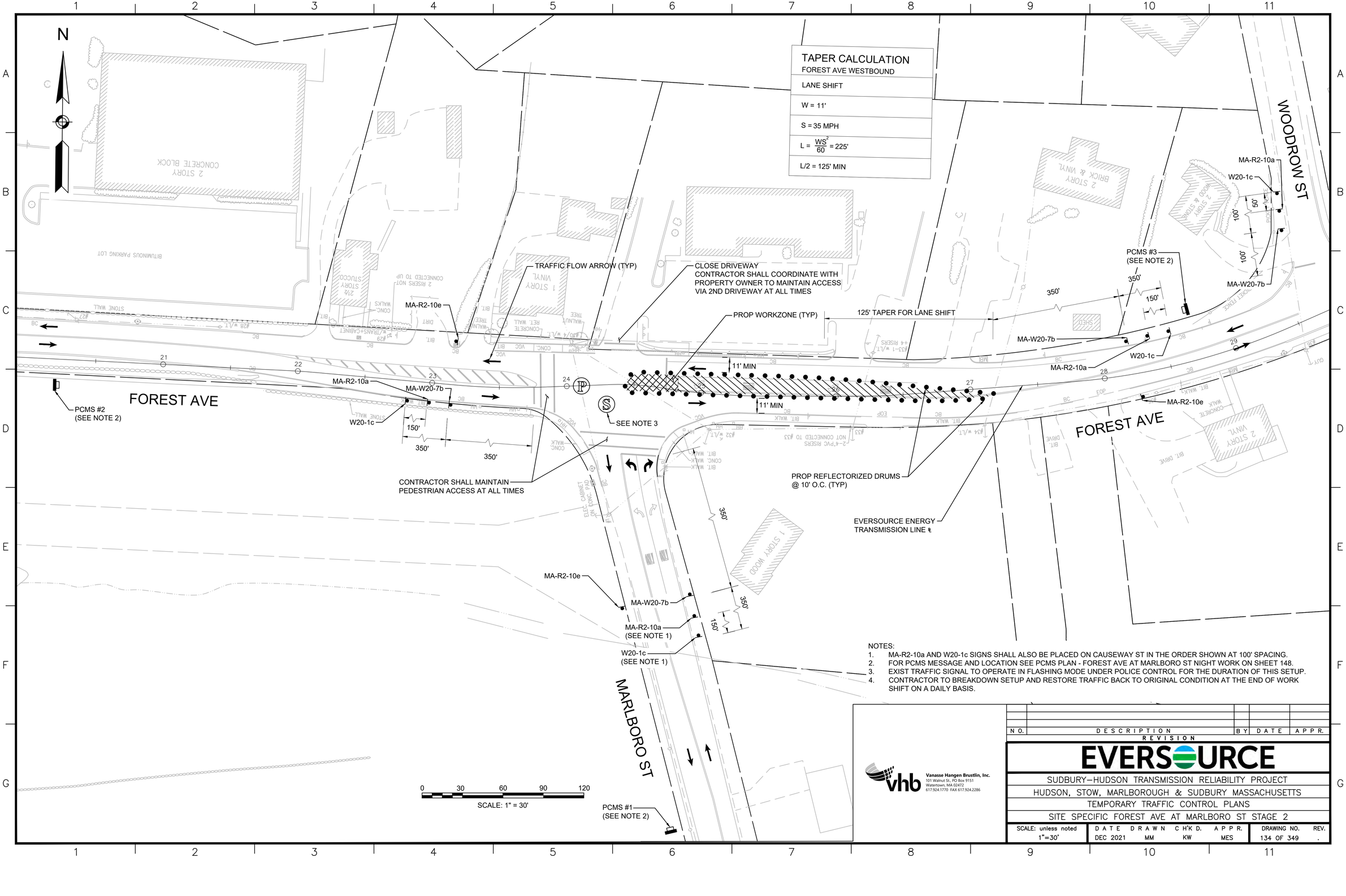

NOTES:
1. MA-R2-10a AND W20-1c SIGNS SHALL ALSO BE PLACED ON CAUSEWAY ST IN THE ORDER SHOWN AT 100' SPACING.
2. FOR PCMS MESSAGE AND LOCATION SEE PCMS PLAN - FOREST AVE AT MARLBORO ST NIGHT WORK ON SHEET 148.
3. EXIST TRAFFIC SIGNAL TO OPERATE IN FLASHING MODE UNDER POLICE CONTROL FOR THE DURATION OF THIS SETUP.
4. CONTRACTOR TO BREAKDOWN SETUP AND RESTORE TRAFFIC BACK TO ORIGINAL CONDITION AT THE END OF WORK SHIFT ON A DAILY BASIS.

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

SITE SPECIFIC FOREST AVE AT MARLBORO ST STAGE 2

SCALE: unless noted	DATE	DRAWN	CH'K D.	APP'R.	DRAWING NO.	REV.
1"=30'	DEC 2021	MM	KW	MES	134 OF 349	.

N

WILKINS ST

SOLO RD

MAIN ST

GLENDALE RD

FOREST AVE

TRAFFIC FLOW ARROW (TYP)

PROP TRAFFIC CONES @ 10'O.C. (TYP)

PROP REFLECTORIZED DRUMS @ 10'O.C. (TYP)

MA-W24-2(MOD) (SEE NOTE 1)

MA-R2-10a (SEE NOTE 1)

W1-4L (SEE NOTE 1)

W20-1c (SEE NOTE 1)

MA-R2-10e

MA-W20-7b

R4-7b

11' MIN

11' MIN

125' TAPER FOR LANE SHIFT

350' 350' 350' 350' 150'

PCMS #3 (SEE NOTE 2)

PCMS #2 (SEE NOTE 2)

PCMS #4 (SEE NOTE 2)

PCMS #1 (SEE NOTE 2)

SEE NOTE 3

W1-4R

W20-4c

EVERSOURCE ENERGY TRANSMISSION LINE

PROP TRAFFIC CONES @ 10'O.C. (TYP)

155' TAPER FOR LANE SHIFT

350' 350' 350' 350' 150'

PROP REFLECTORIZED DRUMS @ 10'O.C. (TYP)

PROP WORKZONE (TYP)

30' TAPER

50'

TAPER CALCULATION MAIN ST EASTBOUND	
LANE SHIFT	
W = 11'	
S = 35 MPH	
L = $\frac{WS^2}{60}$ = 225'	
L/2 = 125' MIN	

TAPER CALCULATION MAIN ST WESTBOUND	
LANE SHIFT	
W = 11'	
S = 35 MPH	
L = $\frac{WS^2}{60}$ = 225'	
L/2 = 125' MIN	

NOTES:
1. W1-4L, MA-W24-2(MOD), MA-R2-10a, W20-1c SIGNS SHALL ALSO BE PLACED ON COX STREET IN THE ORDER SHOWN AT 100' SPACING.
2. FOR PCMS MESSAGE AND LOCATION SEE PCMS PLAN - FOREST AVE AT MAIN ST NIGHT WORK ON SHEET 149.
3. EXIST TRAFFIC SIGNAL TO OPERATE IN FLASHING MODE UNDER POLICE CONTROL FOR THE DURATION OF THIS SETUP.
4. CONTRACTOR TO BREAKDOWN SETUP AND RESTORE TRAFFIC BACK TO ORIGINAL CONDITION AT THE END OF WORK SHIFT ON A DAILY BASIS.

0 30 60 90 120

SCALE: 1" = 30'

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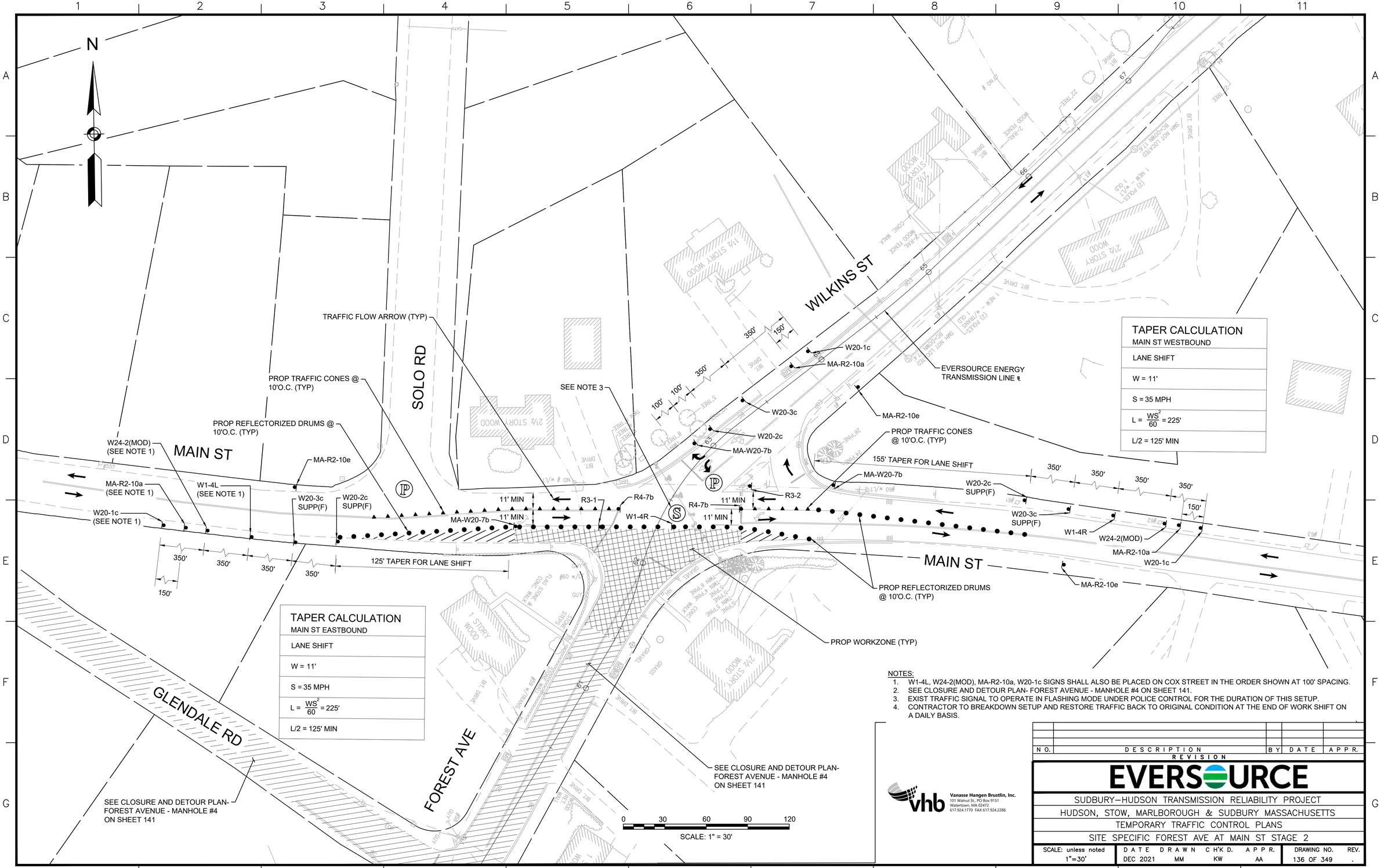
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

SITE SPECIFIC FOREST AVE AT MAIN ST STAGE 1

SCALE: unless noted	DATE	DRAWN	CH'K D.	APP R.	DRAWING NO.	REV.
1"=30'	DEC 2021	MM	KW	MES	135 OF 349	.



TAPER CALCULATION MAIN ST EASTBOUND
LANE SHIFT
W = 11'
S = 35 MPH
$L = \frac{WS^2}{60} = 225'$
L/2 = 125' MIN

TAPER CALCULATION MAIN ST WESTBOUND
LANE SHIFT
W = 11'
S = 35 MPH
$L = \frac{WS^2}{60} = 225'$
L/2 = 125' MIN

NOTES:
1. W1-4L, W24-2(MOD), MA-R2-10a, W20-1c SIGNS SHALL ALSO BE PLACED ON COX STREET IN THE ORDER SHOWN AT 100' SPACING.
2. SEE CLOSURE AND DETOUR PLAN- FOREST AVENUE - MANHOLE #4 ON SHEET 141.
3. EXIST TRAFFIC SIGNAL TO OPERATE IN FLASHING MODE UNDER POLICE CONTROL FOR THE DURATION OF THIS SETUP.
4. CONTRACTOR TO BREAKDOWN SETUP AND RESTORE TRAFFIC BACK TO ORIGINAL CONDITION AT THE END OF WORK SHIFT ON A DAILY BASIS.

NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

SITE SPECIFIC FOREST AVE AT MAIN ST STAGE 2

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=30'	DEC 2021	MM	KW	AA	136 OF 349	.

N

SOLO RD

MAIN ST

WILKINS ST

MAIN ST

GLENDALE RD

FOREST AVE

TRAFFIC FLOW ARROW (TYP)

SEE NOTE 3

PROP REFLECTORIZED DRUMS @ 10'O.C. (TYP)

PROP REFLECTORIZED DRUMS @ 10'O.C. (TYP)

W20-4c (SEE NOTE 1)

MA-R2-10a (SEE NOTE 1)

W20-1c (SEE NOTE 1)

W20-3c SUPP(F) (SEE NOTE 1)

W20-2c SUPP(F)

MA-W20-7b

MA-R2-10e

R3-1

R3-2

11' MIN

11' MIN

150'

350'

350'

350'

350'

100'

50'

100'

100'

350'

350'

150'

W20-1c

MA-R2-10a

W20-3c

W20-2c

MA-W20-7b

MA-R2-10e

EVERSOURCE ENERGY TRANSMISSION LINE

155' TAPER FOR LANE SHIFT

MA-W20-7b

W20-2c SUPP(F)

W20-3c SUPP(F)

W20-2c

W24-2(MOD)

MA-R2-10a

W20-1c

MA-R2-10e

R4-7b

50'

PROP TRAFFIC CONES @ 10'O.C. (TYP)

PROP REFLECTORIZED DRUMS @ 10'O.C. (TYP)

PROP WORKZONE (TYP)

SEE CLOSURE AND DETOUR PLAN- FOREST AVENUE - MANHOLE #4 ON SHEET 141

SEE CLOSURE AND DETOUR PLAN- FOREST AVENUE - MANHOLE #4 ON SHEET 141

0 30 60 90 120

SCALE: 1" = 30'

TAPER CALCULATION
MAIN ST WESTBOUND
LANE SHIFT
W = 11'
S = 35 MPH
$L = \frac{WS^2}{60} = 225'$
L/2 = 125' MIN

NOTES:

1. W20-2c, W24-2(MOD), MA-R2-10a, W20-1c SIGNS SHALL ALSO BE PLACED ON COX STREET IN THE ORDER SHOWN AT 100' SPACING.
2. SEE CLOSURE AND DETOUR PLAN- FOREST AVENUE - MANHOLE #4 ON SHEET 141.
3. EXIST TRAFFIC SIGNAL TO OPERATE IN FLASHING MODE UNDER POLICE CONTROL FOR THE DURATION OF THIS SETUP.
4. CONTRACTOR TO BREAKDOWN SETUP AND RESTORE TRAFFIC BACK TO ORIGINAL CONDITION AT THE END OF WORK SHIFT ON A DAILY BASIS.

NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

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EVERSOURCE

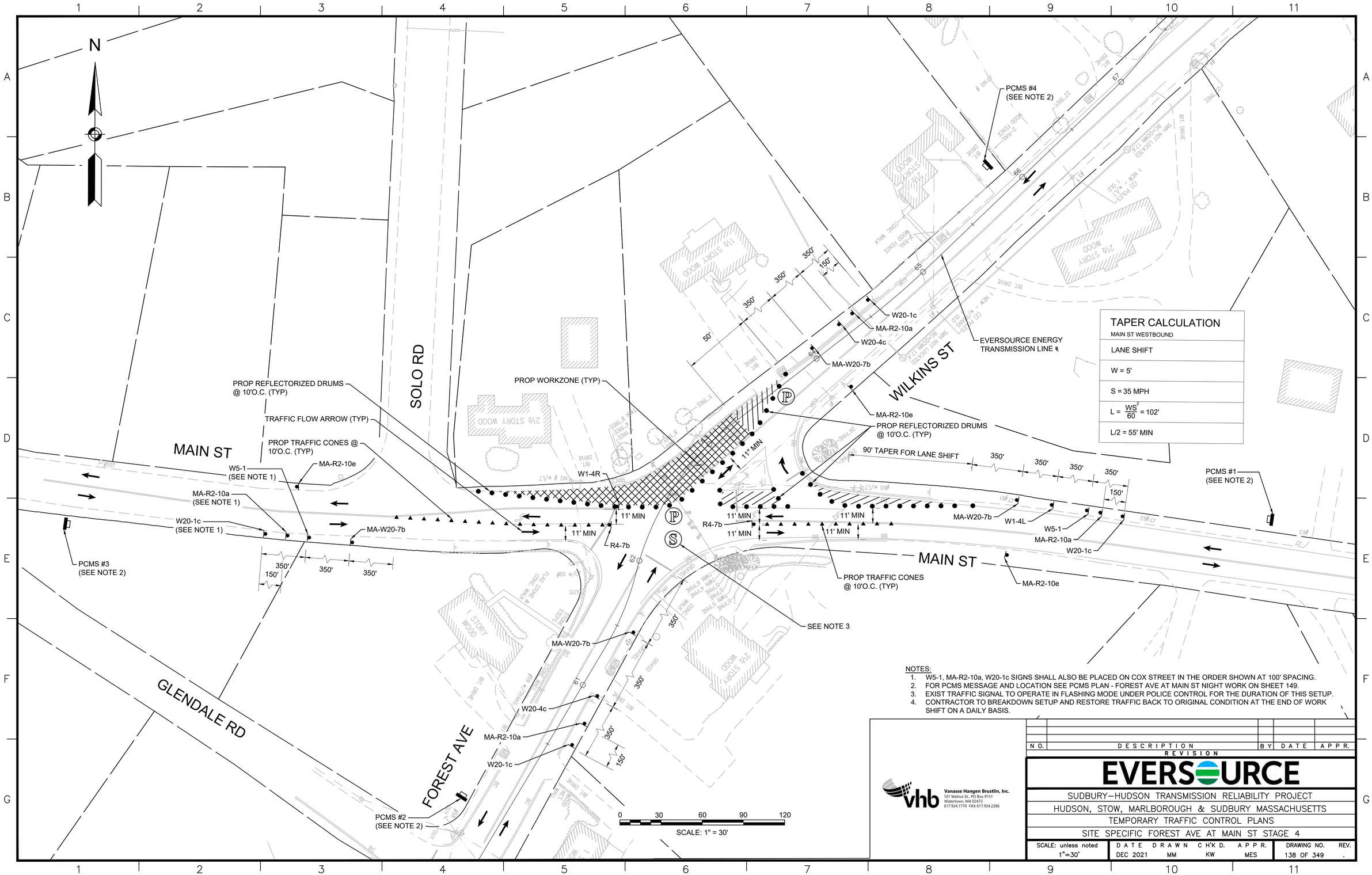
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

SITE SPECIFIC FOREST AVE AT MAIN ST STAGE 3

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=30'	DEC 2021	MM	KW	MES	137 OF 349	.



TAPER CALCULATION
MAIN ST WESTBOUND
LANE SHIFT
W = 5'
S = 35 MPH
$L = \frac{WS^2}{60} = 102'$
L/2 = 55' MIN

NOTES:

1. W5-1, MA-R2-10a, W20-1c SIGNS SHALL ALSO BE PLACED ON COX STREET IN THE ORDER SHOWN AT 100' SPACING.
2. FOR PCMS MESSAGE AND LOCATION SEE PCMS PLAN - FOREST AVE AT MAIN ST NIGHT WORK ON SHEET 149.
3. EXIST TRAFFIC SIGNAL TO OPERATE IN FLASHING MODE UNDER POLICE CONTROL FOR THE DURATION OF THIS SETUP.
4. CONTRACTOR TO BREAKDOWN SETUP AND RESTORE TRAFFIC BACK TO ORIGINAL CONDITION AT THE END OF WORK SHIFT ON A DAILY BASIS.

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NO.	DESCRIPTION	BY	DATE	APP'R.

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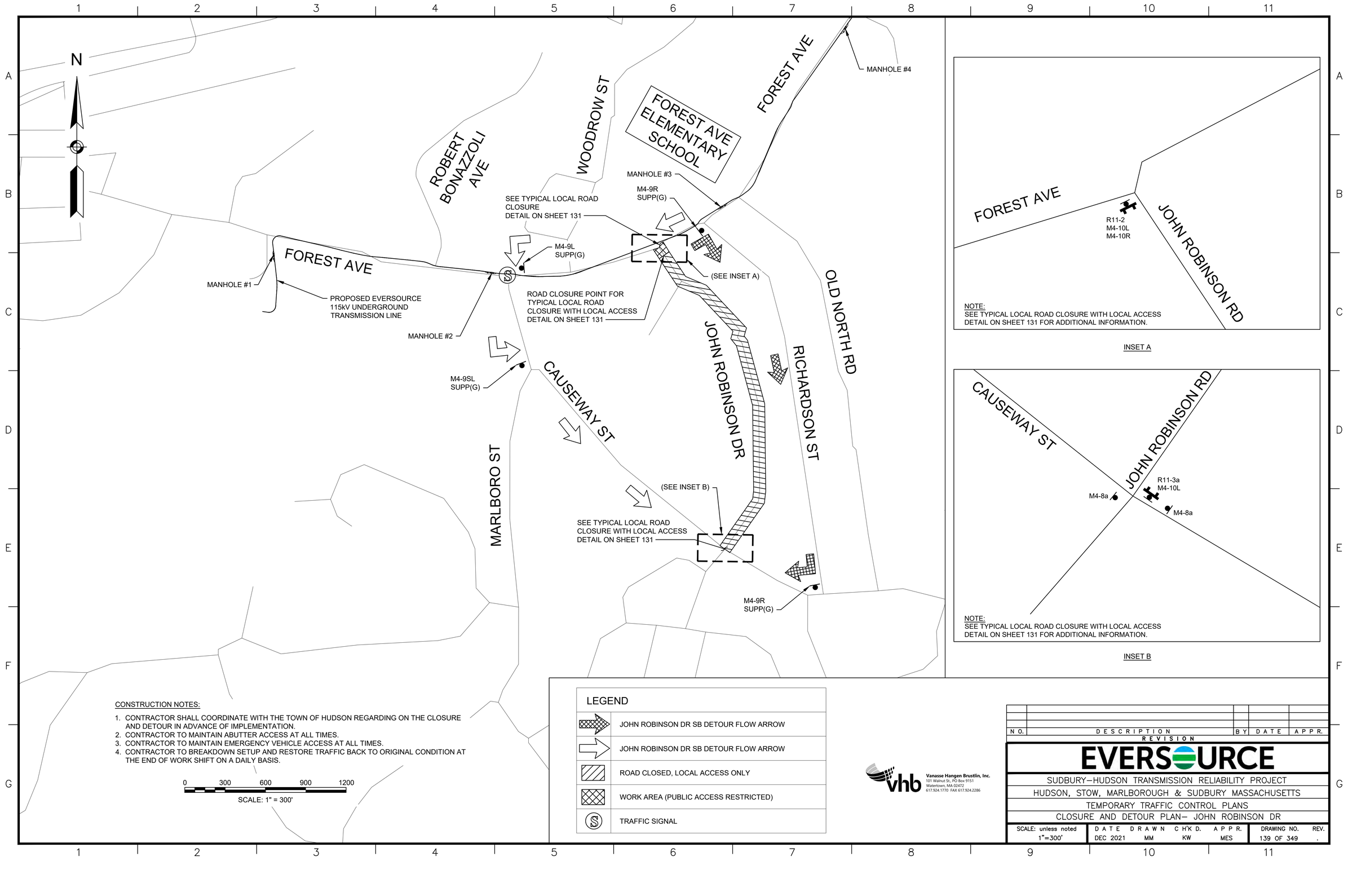
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

SITE SPECIFIC FOREST AVE AT MAIN ST STAGE 4

SCALE: unless noted	DATE	DRAWN	CH'K D.	APP'R.	DRAWING NO.	REV.
1"=30'	DEC 2021	MM	KW	MES	138 OF 349	.



NOTE:
SEE TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 131 FOR ADDITIONAL INFORMATION.

INSET A

NOTE:
SEE TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 131 FOR ADDITIONAL INFORMATION.

INSET B

CONSTRUCTION NOTES:

1. CONTRACTOR SHALL COORDINATE WITH THE TOWN OF HUDSON REGARDING ON THE CLOSURE AND DETOUR IN ADVANCE OF IMPLEMENTATION.
2. CONTRACTOR TO MAINTAIN ABUTTER ACCESS AT ALL TIMES.
3. CONTRACTOR TO MAINTAIN EMERGENCY VEHICLE ACCESS AT ALL TIMES.
4. CONTRACTOR TO BREAKDOWN SETUP AND RESTORE TRAFFIC BACK TO ORIGINAL CONDITION AT THE END OF WORK SHIFT ON A DAILY BASIS.

LEGEND

	JOHN ROBINSON DR SB DETOUR FLOW ARROW
	JOHN ROBINSON DR SB DETOUR FLOW ARROW
	ROAD CLOSED, LOCAL ACCESS ONLY
	WORK AREA (PUBLIC ACCESS RESTRICTED)
S	TRAFFIC SIGNAL

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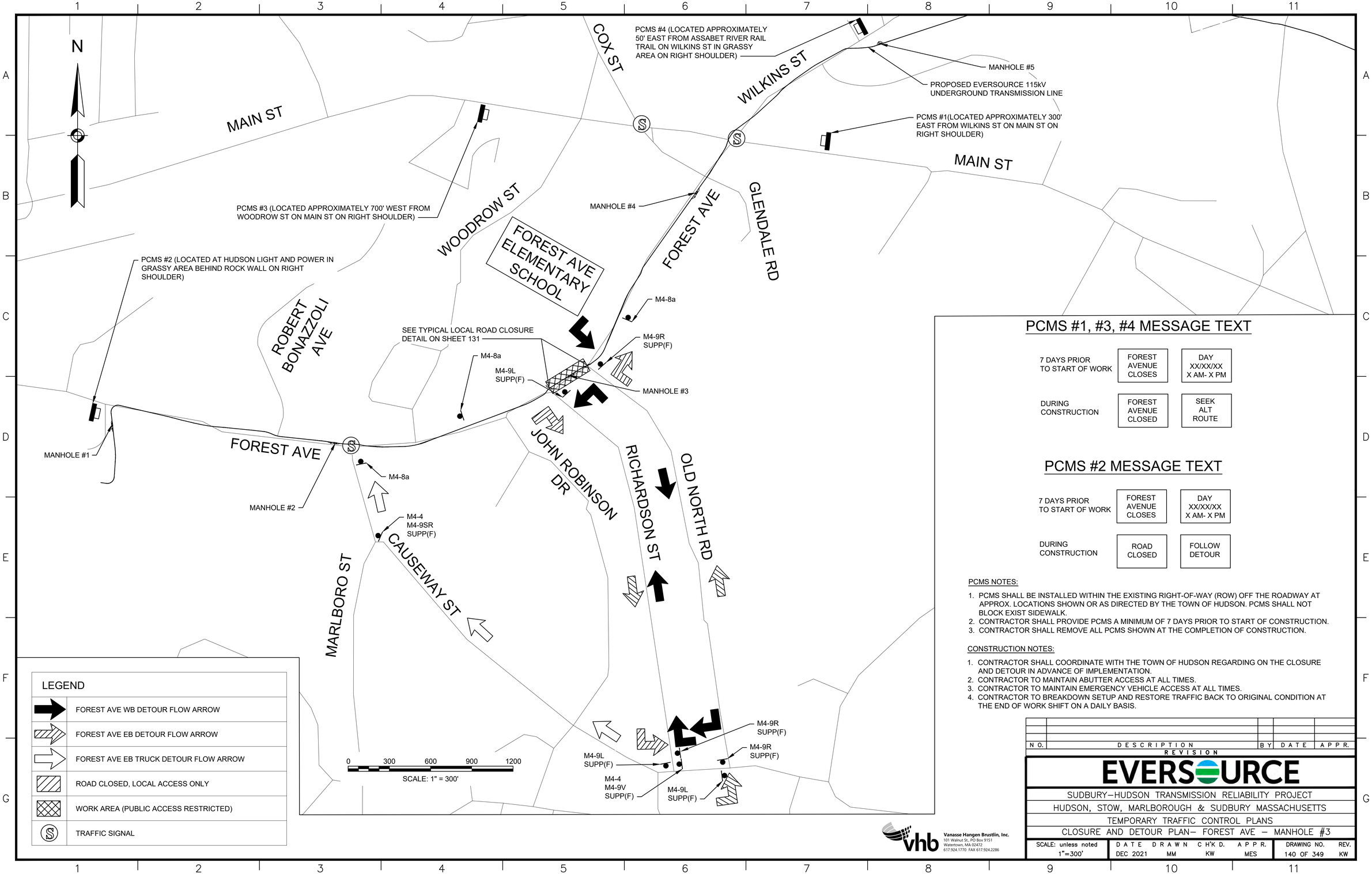
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
TEMPORARY TRAFFIC CONTROL PLANS
CLOSURE AND DETOUR PLAN– JOHN ROBINSON DR

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=300'	DEC 2021	MM	KW	MES	139 OF 349	.



PCMS #1, #3, #4 MESSAGE TEXT

7 DAYS PRIOR TO START OF WORK	FOREST AVENUE CLOSES	DAY XX/XX/XX X AM- X PM
DURING CONSTRUCTION	FOREST AVENUE CLOSED	SEEK ALT ROUTE

PCMS #2 MESSAGE TEXT

7 DAYS PRIOR TO START OF WORK	FOREST AVENUE CLOSES	DAY XX/XX/XX X AM- X PM
DURING CONSTRUCTION	ROAD CLOSED	FOLLOW DETOUR

LEGEND

- FOREST AVE WB DETOUR FLOW ARROW
- FOREST AVE EB DETOUR FLOW ARROW
- FOREST AVE EB TRUCK DETOUR FLOW ARROW
- ROAD CLOSED, LOCAL ACCESS ONLY
- WORK AREA (PUBLIC ACCESS RESTRICTED)
- TRAFFIC SIGNAL

PCMS NOTES:

1. PCMS SHALL BE INSTALLED WITHIN THE EXISTING RIGHT-OF-WAY (ROW) OFF THE ROADWAY AT APPROX. LOCATIONS SHOWN OR AS DIRECTED BY THE TOWN OF HUDSON. PCMS SHALL NOT BLOCK EXIST SIDEWALK.
2. CONTRACTOR SHALL PROVIDE PCMS A MINIMUM OF 7 DAYS PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR SHALL REMOVE ALL PCMS SHOWN AT THE COMPLETION OF CONSTRUCTION.

CONSTRUCTION NOTES:

1. CONTRACTOR SHALL COORDINATE WITH THE TOWN OF HUDSON REGARDING ON THE CLOSURE AND DETOUR IN ADVANCE OF IMPLEMENTATION.
2. CONTRACTOR TO MAINTAIN ABUTTER ACCESS AT ALL TIMES.
3. CONTRACTOR TO MAINTAIN EMERGENCY VEHICLE ACCESS AT ALL TIMES.
4. CONTRACTOR TO BREAKDOWN SETUP AND RESTORE TRAFFIC BACK TO ORIGINAL CONDITION AT THE END OF WORK SHIFT ON A DAILY BASIS.

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

CLOSURE AND DETOUR PLAN– FOREST AVE – MANHOLE #3

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=300'	DEC 2021	MM	KW	MES	140 OF 349	KW

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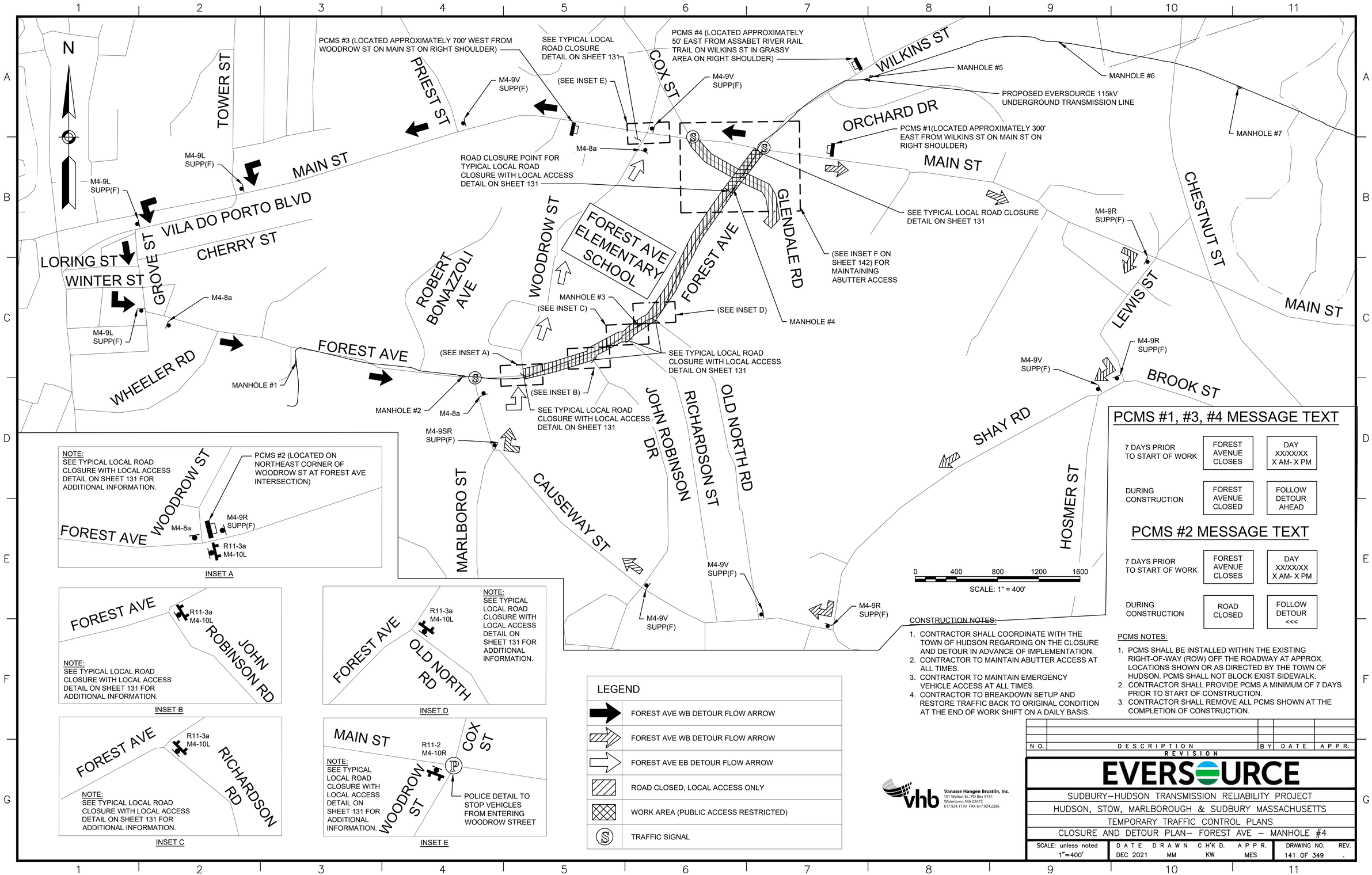

NOTE:
SEE TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 131 FOR ADDITIONAL INFORMATION.

INSET A

NOTE:
SEE TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 131 FOR ADDITIONAL INFORMATION.

INSET B

NOTE:
SEE TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 131 FOR ADDITIONAL INFORMATION.

INSET C

NOTE:
SEE TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 131 FOR ADDITIONAL INFORMATION.

INSET D

NOTE:
SEE TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 131 FOR ADDITIONAL INFORMATION.

INSET E

LEGEND

	FOREST AVE WB DETOUR FLOW ARROW
	FOREST AVE WB DETOUR FLOW ARROW
	FOREST AVE EB DETOUR FLOW ARROW
	ROAD CLOSED, LOCAL ACCESS ONLY
	WORK AREA (PUBLIC ACCESS RESTRICTED)
S	TRAFFIC SIGNAL

PCMS #1, #3, #4 MESSAGE TEXT

7 DAYS PRIOR TO START OF WORK	FOREST AVENUE CLOSES	DAY XX/XX/XX X AM- X PM
DURING CONSTRUCTION	FOREST AVENUE CLOSED	FOLLOW DETOUR AHEAD

PCMS #2 MESSAGE TEXT

7 DAYS PRIOR TO START OF WORK	FOREST AVENUE CLOSES	DAY XX/XX/XX X AM- X PM
DURING CONSTRUCTION	ROAD CLOSED	FOLLOW DETOUR <<<

CONSTRUCTION NOTES:

1. CONTRACTOR SHALL COORDINATE WITH THE TOWN OF HUDSON REGARDING ON THE CLOSURE AND DETOUR IN ADVANCE OF IMPLEMENTATION.
2. CONTRACTOR TO MAINTAIN ABUTTER ACCESS AT ALL TIMES.
3. CONTRACTOR TO MAINTAIN EMERGENCY VEHICLE ACCESS AT ALL TIMES.
4. CONTRACTOR TO BREAKDOWN SETUP AND RESTORE TRAFFIC BACK TO ORIGINAL CONDITION AT THE END OF WORK SHIFT ON A DAILY BASIS.

PCMS NOTES:

1. PCMS SHALL BE INSTALLED WITHIN THE EXISTING RIGHT-OF-WAY (ROW) OFF THE ROADWAY AT APPROX. LOCATIONS SHOWN OR AS DIRECTED BY THE TOWN OF HUDSON. PCMS SHALL NOT BLOCK EXIST SIDEWALK.
2. CONTRACTOR SHALL PROVIDE PCMS A MINIMUM OF 7 DAYS PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR SHALL REMOVE ALL PCMS SHOWN AT THE COMPLETION OF CONSTRUCTION.

NO.	DESCRIPTION	BY	DATE	APPR.
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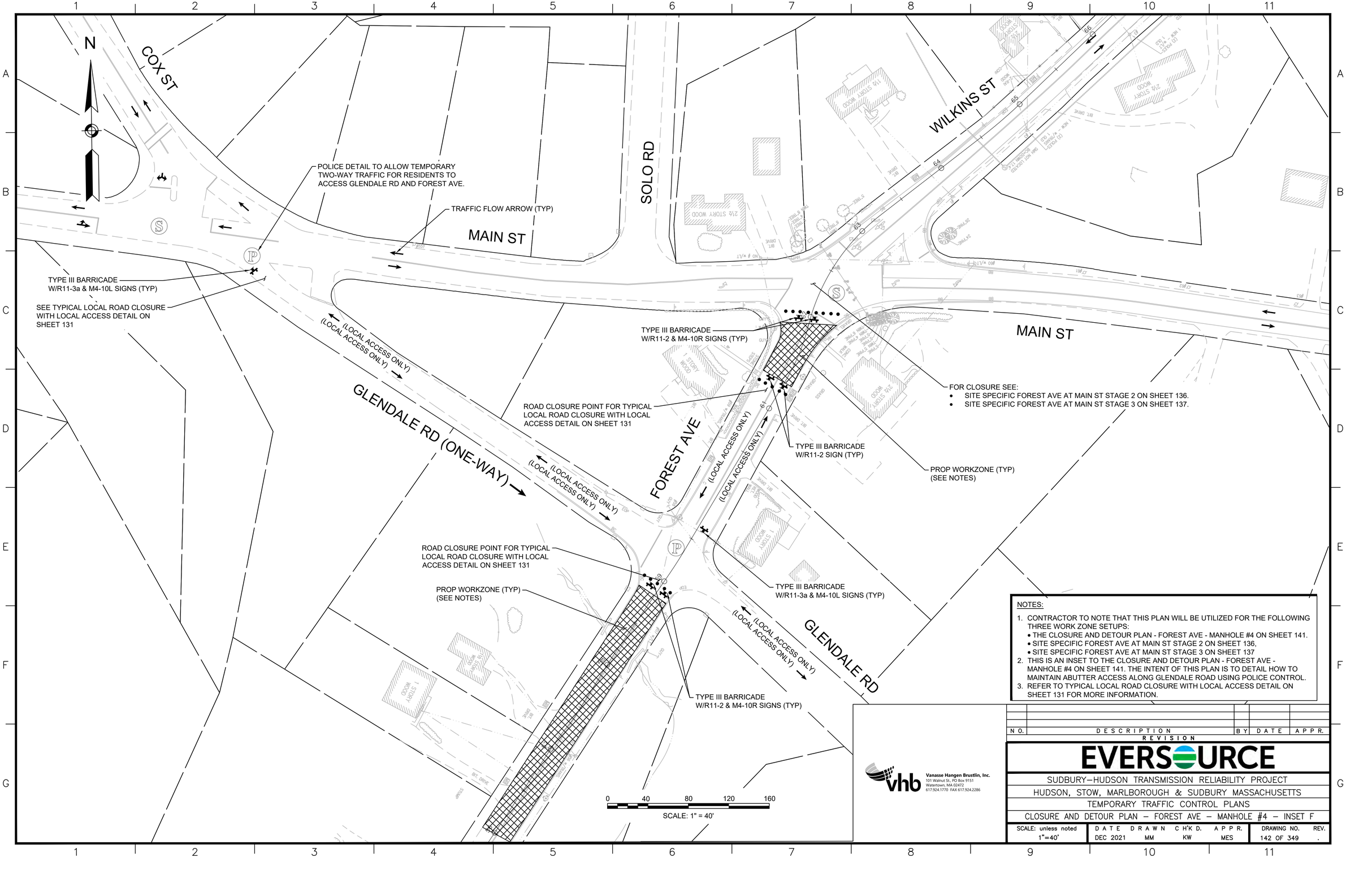
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

CLOSURE AND DETOUR PLAN– FOREST AVE – MANHOLE #4

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=400'	DEC 2021	MM	KW	MES	141 OF 349	.



NOTES:

1. CONTRACTOR TO NOTE THAT THIS PLAN WILL BE UTILIZED FOR THE FOLLOWING THREE WORK ZONE SETUPS:
   - THE CLOSURE AND DETOUR PLAN - FOREST AVE - MANHOLE #4 ON SHEET 141.
   - SITE SPECIFIC FOREST AVE AT MAIN ST STAGE 2 ON SHEET 136,
   - SITE SPECIFIC FOREST AVE AT MAIN ST STAGE 3 ON SHEET 137
2. THIS IS AN INSET TO THE CLOSURE AND DETOUR PLAN - FOREST AVE - MANHOLE #4 ON SHEET 141. THE INTENT OF THIS PLAN IS TO DETAIL HOW TO MAINTAIN ABUTTER ACCESS ALONG GLENDALE ROAD USING POLICE CONTROL.
3. REFER TO TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 131 FOR MORE INFORMATION.

NO.	DESCRIPTION	BY	DATE	APPR.
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

CLOSURE AND DETOUR PLAN – FOREST AVE – MANHOLE #4 – INSET F

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=40'	DEC 2021	MM	KW	MES	142 OF 349	.

N

PCMS #2 (LOCATED APPROXIMATELY 300' NORTH OF ROCKBOTTOM RD ON GLEASONDALE RD IN GRASSY AREA ON LEFT)

M4-9SR SUPP(A) SUPP(B)

M4-9L SUPP(A) SUPP(B)

R11-3a

M4-8a

M4-9V SUPP(A) SUPP(B)

R11-3a

M4-9L SUPP(A) SUPP(B)

HIGH ST

WILKINS ST

MARLBORO RD

STOW

HUDSON

SEE TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 131

PROPOSED EVERSOURCE 115 kV UNDERGROUND TRANSMISSION LINE

ROAD CLOSURE POINT FOR TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 131

M4-9L SUPP(A) SUPP(B)

MANHOLE #5

MANHOLE #6

MANHOLE #7

MANHOLE #8

MANHOLE #9

MANHOLE #4

M4-9R SUPP(A) SUPP(B)

FOREST AVE

MAIN ST

SEE TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 131

CHESTNUT ST

M4-9R SUPP(A) SUPP(B)

R11-3a

M4-9R SUPP(A) SUPP(B)

M4-9V SUPP(A) SUPP(B)

PCMS #1 (LOCATED APPROXIMATELY 200' EAST OF MAIN ST AT CHESTNUT ST INTERSECTION IN GRASSY AREA ON RIGHT)

R11-3a

M4-8a

LEWIS ST

MAIN ST

0 300 600 900 1200

SCALE: 1" = 300'

PCMS #1 MESSAGE TEXT

7 DAYS PRIOR TO START OF WORK	CHESTNUT STREET CLOSES	DAY XX/XX/XX X AM- X PM
DURING CONSTRUCTION	CHESTNUT STREET CLOSED	FOLLOW DETOUR

PCMS #2 MESSAGE TEXT

7 DAYS PRIOR TO START OF WORK	MARLBORO ROAD CLOSES	DAY XX/XX/XX X AM- X PM
DURING CONSTRUCTION	MARLBORO ROAD CLOSED	FOLLOW DETOUR

PCMS NOTES:

1. PCMS SHALL BE INSTALLED WITHIN THE EXISTING RIGHT-OF-WAY (ROW) OFF THE ROADWAY AT APPROX. LOCATIONS SHOWN OR AS DIRECTED BY THE TOWN OF HUDSON. PCMS SHALL NOT BLOCK EXIST SIDEWALK.
2. CONTRACTOR SHALL PROVIDE PCMS A MINIMUM OF 7 DAYS PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR SHALL REMOVE ALL PCMS SHOWN AT THE COMPLETION OF CONSTRUCTION.

CONSTRUCTION NOTES:

1. CONTRACTOR SHALL COORDINATE WITH THE TOWNS OF STOW AND HUDSON REGARDING ON THE CLOSURE AND DETOUR OF MARLBORO RD AND CHESTNUT STREET IN ADVANCE OF IMPLEMENTATION.
2. CONTRACTOR TO MAINTAIN ABUTTER ACCESS AT ALL TIMES.
3. CONTRACTOR TO MAINTAIN EMERGENCY VEHICLE ACCESS AT ALL TIMES.

LEGEND

	MARLBOROUGH RD SB DETOUR FLOW ARROW
	CHESTNUT ST NB DETOUR FLOW ARROW
	ROAD CLOSED, LOCAL ACCESS ONLY
	WORK AREA (PUBLIC ACCESS RESTRICTED)
S	TRAFFIC SIGNAL

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NO.	DESCRIPTION	BY	DATE	APPR.

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

CLOSURE AND DETOUR PLAN– CHESTNUT ST AND MARLBORO RD

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=300'	DEC 2021	MM	KW	MES	143 OF 349	.

N

MAIN ST

PCMS #3 (LOCATED APPROXIMATELY 650' WEST OF PARMENTER RD ON MAIN ST IN GRASSY AREA ON RIGHT)

M4-9L
SUPP(D)
SUPP(E)

M4-9R
SUPP(E)

MANHOLE #10

PROPOSED EVERSOURCE 115 kV UNDERGROUND TRANSMISSION LINE

MANHOLE #11

PARMENTER RD

MANHOLE #12

MANHOLE #13

MANHOLE #14

SEE TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 131

(SEE INSET B)

PCMS #1 (LOCATED APPROXIMATELY 200' EAST OF WHITE POND RD ON MAIN ST IN GRASSY AREA ON RIGHT)

MAIN ST

WHITE POND RD

SUDBURY RD

HUDSON RD

STOW
HUDSON

BRUEN RD

STOW
SUDBURY

BRUEN RD

HUDSON
SUDBURY

ROAD CLOSURE POINT FOR TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 131

HEMENWAY ST

WHITE POND RD

HUDSON
MARLBOROUGH

CONCORD RD

(SEE INSET A)

W4-8a

SEE TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 131 (SEE CONSTRUCTION NOTE 1)

PCMS #2 (LOCATED APPROXIMATELY 150' WEST OF HEMINGWAY ST ON CONCORD RD IN GRASSY AREA ON RIGHT)

CONCORD RD

GOODALE ST

0 400 800 1200 1600

SCALE: 1" = 400'

INSET B

R11-3a
M4-10R

MAIN ST

WHITE POND RD

NOTE:
SEE TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 131 FOR ADDITIONAL INFORMATION.

INSET A

HEMENWAY ST

CONCORD RD

M4-9R
SUPP(D)
SUPP(E)

R11-3a
M4-10L

M4-9SL
SUPP(D)
SUPP(E)

NOTE:
SEE TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 131 FOR ADDITIONAL INFORMATION.

LEGEND

	WHITE POND RD SB DETOUR FLOW ARROW
	CONCORD RD EB/ WHITE POND RD DETOUR FLOW ARROW
	ROAD CLOSED, LOCAL ACCESS ONLY
	WORK AREA (PUBLIC ACCESS RESTRICTED)

PCMS #1 MESSAGE TEXT

7 DAYS PRIOR TO START OF WORK	WHITE POND RD CLOSES	DAY XX/XX/XX X AM- X PM
DURING CONSTRUCTION	WHITE POND RD CLOSED	FOLLOW DETOUR

PCMS #2 MESSAGE TEXT

7 DAYS PRIOR TO START OF WORK	CONCORD ROAD CLOSES	DAY XX/XX/XX X AM- X PM
DURING CONSTRUCTION	CONCORD ROAD CLOSED	FOLLOW DETOUR

PCMS #3 MESSAGE TEXT

7 DAYS PRIOR TO START OF WORK	WHITE POND RD CLOSES	DAY XX/XX/XX X AM- X PM
DURING CONSTRUCTION	WHITE POND RD CLOSED	DETOUR NEXT RIGHT

PCMS NOTES:

1. PCMS SHALL BE INSTALLED WITHIN THE EXISTING RIGHT-OF-WAY (ROW) OFF THE ROADWAY AT APPROX. LOCATIONS SHOWN OR AS DIRECTED BY THE TOWN OF HUDSON. PCMS SHALL NOT BLOCK EXIST SIDEWALK.
2. CONTRACTOR SHALL PROVIDE PCMS A MINIMUM OF 7 DAYS PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR SHALL REMOVE ALL PCMS SHOWN AT THE COMPLETION OF CONSTRUCTION.

CONSTRUCTION NOTES:

1. CONTRACTOR SHALL COORDINATE WITH THE CITY OF MARLBORO AND THE TOWN OF HUDSON REGARDING THE CLOSURE AND DETOUR OF CONCORD RD AND WHITE POND ROAD IN ADVANCE OF IMPLEMENTATION.
2. CONTRACTOR TO MAINTAIN ABUTTER ACCESS AT ALL TIMES.
3. CONTRACTOR TO MAINTAIN EMERGENCY VEHICLE ACCESS AT ALL TIMES.
4. CONTRACTOR TO BREAKDOWN SETUP AND RESTORE TRAFFIC BACK TO ORIGINAL CONDITION AT THE END OF WORK SHIFT ON A DAILY BASIS.

NO.	DESCRIPTION	BY	DATE	APPR.
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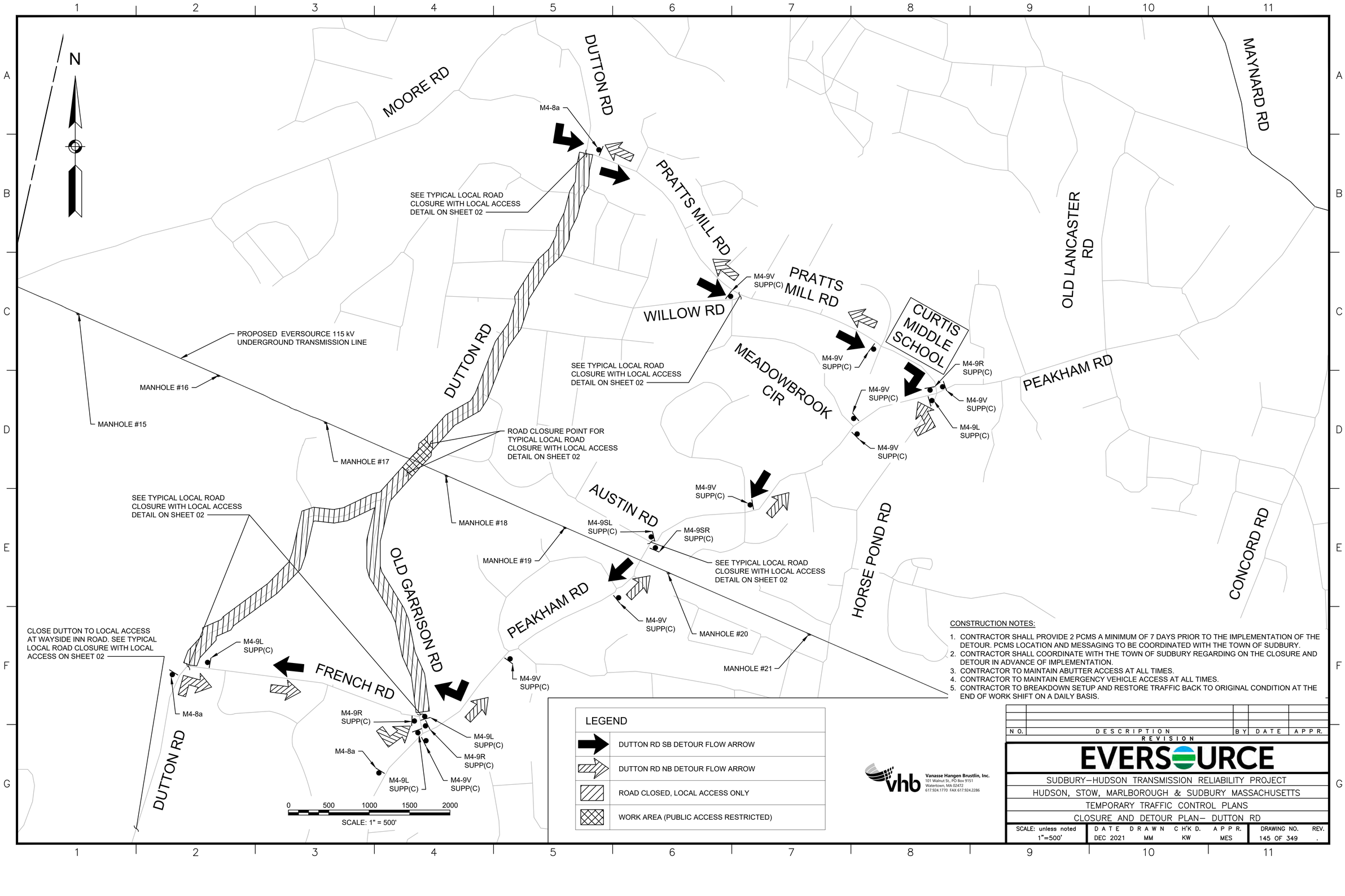
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

CLOSURE AND DETOUR PLAN– WHITE POND RD

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=400'	DEC 2021	MM	KW	MES	144 OF 349	.



CONSTRUCTION NOTES:

1. CONTRACTOR SHALL PROVIDE 2 PCMS A MINIMUM OF 7 DAYS PRIOR TO THE IMPLEMENTATION OF THE DETOUR. PCMS LOCATION AND MESSAGING TO BE COORDINATED WITH THE TOWN OF SUDBURY.
2. CONTRACTOR SHALL COORDINATE WITH THE TOWN OF SUDBURY REGARDING ON THE CLOSURE AND DETOUR IN ADVANCE OF IMPLEMENTATION.
3. CONTRACTOR TO MAINTAIN ABUTTER ACCESS AT ALL TIMES.
4. CONTRACTOR TO MAINTAIN EMERGENCY VEHICLE ACCESS AT ALL TIMES.
5. CONTRACTOR TO BREAKDOWN SETUP AND RESTORE TRAFFIC BACK TO ORIGINAL CONDITION AT THE END OF WORK SHIFT ON A DAILY BASIS.

LEGEND

	DUTTON RD SB DETOUR FLOW ARROW
	DUTTON RD NB DETOUR FLOW ARROW
	ROAD CLOSED, LOCAL ACCESS ONLY
	WORK AREA (PUBLIC ACCESS RESTRICTED)

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NO.	DESCRIPTION	BY	DATE	APPR.
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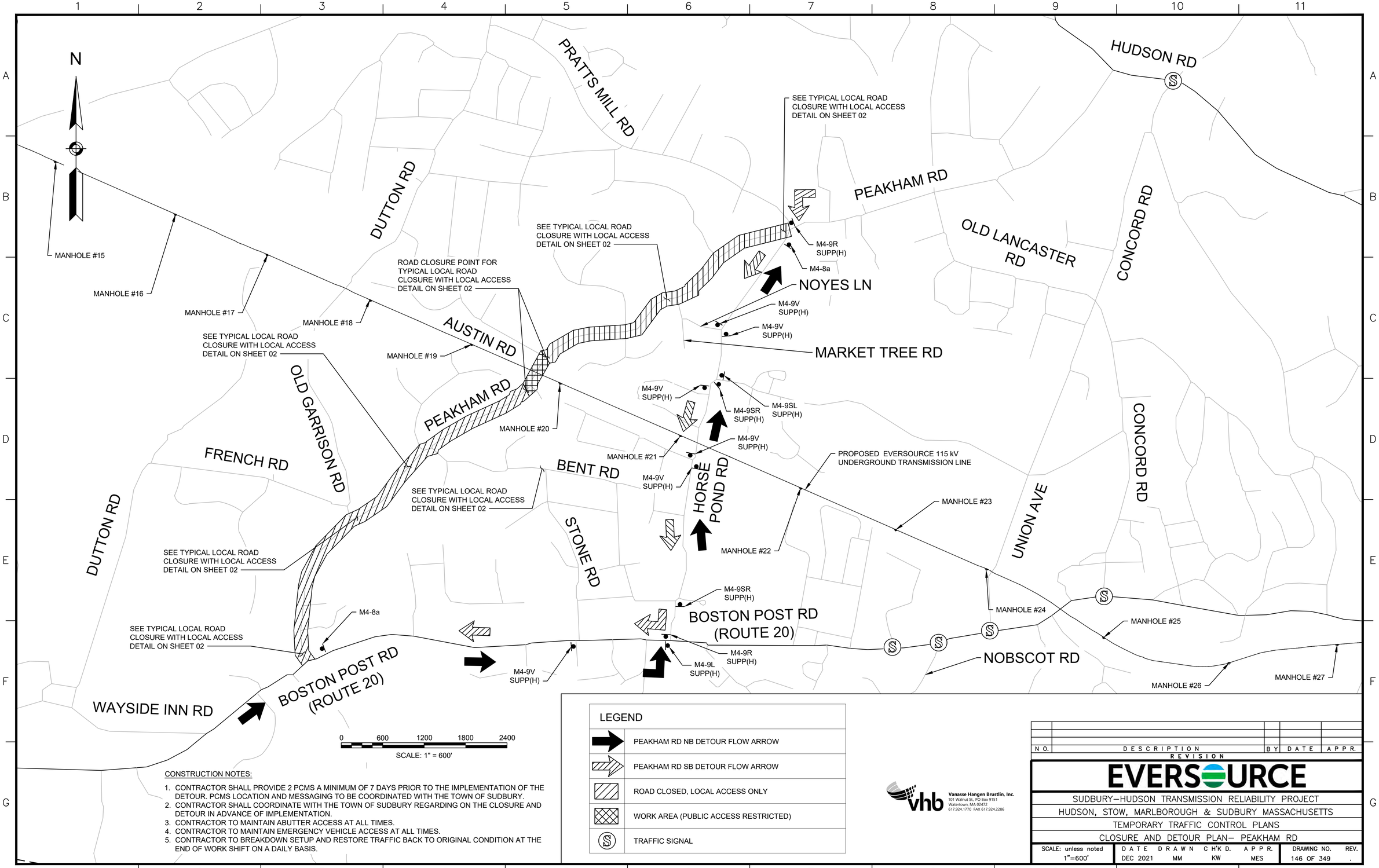
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

CLOSURE AND DETOUR PLAN– DUTTON RD

SCALE: unless noted	DATE DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=500'	DEC 2021 MM	KW	MES	145 OF 349	.



CONSTRUCTION NOTES:

1. CONTRACTOR SHALL PROVIDE 2 PCMS A MINIMUM OF 7 DAYS PRIOR TO THE IMPLEMENTATION OF THE DETOUR. PCMS LOCATION AND MESSAGING TO BE COORDINATED WITH THE TOWN OF SUDBURY.
2. CONTRACTOR SHALL COORDINATE WITH THE TOWN OF SUDBURY REGARDING ON THE CLOSURE AND DETOUR IN ADVANCE OF IMPLEMENTATION.
3. CONTRACTOR TO MAINTAIN ABUTTER ACCESS AT ALL TIMES.
4. CONTRACTOR TO MAINTAIN EMERGENCY VEHICLE ACCESS AT ALL TIMES.
5. CONTRACTOR TO BREAKDOWN SETUP AND RESTORE TRAFFIC BACK TO ORIGINAL CONDITION AT THE END OF WORK SHIFT ON A DAILY BASIS.

LEGEND	
	PEAKHAM RD NB DETOUR FLOW ARROW
	PEAKHAM RD SB DETOUR FLOW ARROW
	ROAD CLOSED, LOCAL ACCESS ONLY
	WORK AREA (PUBLIC ACCESS RESTRICTED)
S	TRAFFIC SIGNAL

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101 Walnut St, PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
TEMPORARY TRAFFIC CONTROL PLANS
CLOSURE AND DETOUR PLAN– PEAKHAM RD

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=600'	DEC 2021	MM	KW	MES	146 OF 349	.

N

PRATTS MILL RD

PEAKHAM RD

OLD LANCASTER RD

CONCORD RD

HORSE POND RD

NOYES LN

OLD GARRISON RD

FRENCH RD

UNION AVE

BOSTON POST RD (ROUTE 20)

NOBSCOT RD

MANHOLE #16

MANHOLE #17

MANHOLE #18

MANHOLE #19

MANHOLE #20

MANHOLE #21

MANHOLE #22

MANHOLE #23

MANHOLE #24

MANHOLE #25

MANHOLE #26

PROPOSED EVERSOURCE 115 kV UNDERGROUND TRANSMISSION LINE

M4-8a

M4-9V SUPP(J)

M4-9SL SUPP(J)

M4-9SR SUPP(J)

SEE TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 02

ROAD CLOSURE POINT FOR TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL ON SHEET 02

0 500 1000 1500 2000

SCALE: 1" = 500'

CONSTRUCTION NOTES:

1. CONTRACTOR SHALL PROVIDE 2 PCMS A MINIMUM OF 7 DAYS PRIOR TO THE IMPLEMENTATION OF THE DETOUR. PCMS LOCATION AND MESSAGING TO BE COORDINATED WITH THE TOWN OF SUDBURY.
2. CONTRACTOR SHALL COORDINATE WITH THE TOWN OF SUDBURY REGARDING ON THE CLOSURE AND DETOUR IN ADVANCE OF IMPLEMENTATION.
3. CONTRACTOR TO MAINTAIN ABUTTER ACCESS AT ALL TIMES.
4. CONTRACTOR TO MAINTAIN EMERGENCY VEHICLE ACCESS AT ALL TIMES.
5. CONTRACTOR TO BREAKDOWN SETUP AND RESTORE TRAFFIC BACK TO ORIGINAL CONDITION AT THE END OF WORK SHIFT ON A DAILY BASIS.

LEGEND

	HORSE POND RD NB DETOUR FLOW ARROW
	HORSE POND RD SB DETOUR FLOW ARROW
	ROAD CLOSED, LOCAL ACCESS ONLY
	WORK AREA (PUBLIC ACCESS RESTRICTED)
S	TRAFFIC SIGNAL

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NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

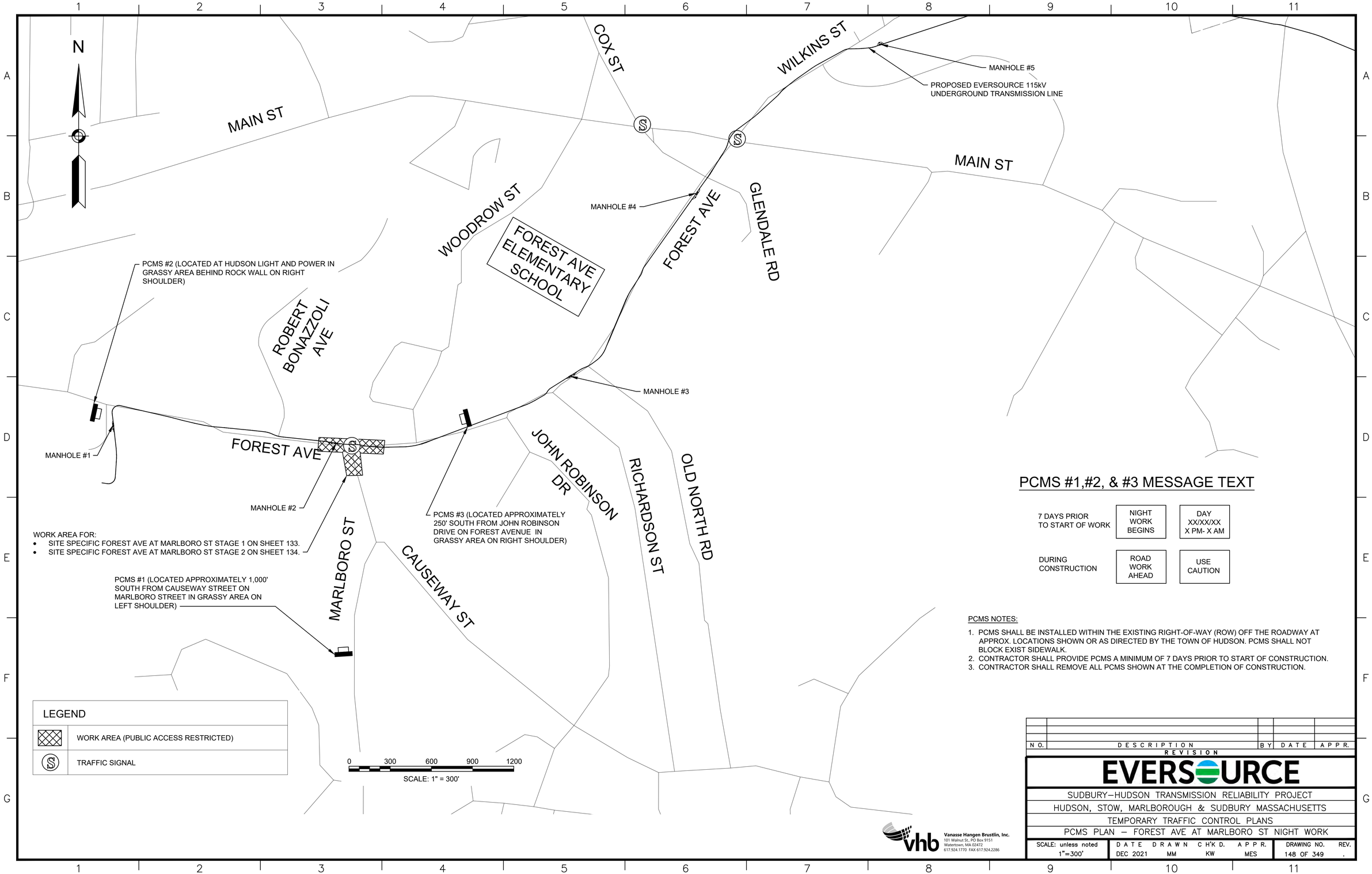
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

CLOSURE AND DETOUR PLAN– HORSE POND RD

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=500'	DEC 2021	MM	KW	AA	147 OF 349	.



PCMS #1,#2, & #3 MESSAGE TEXT

7 DAYS PRIOR TO START OF WORK	NIGHT WORK BEGINS	DAY XX/XX/XX X PM- X AM
DURING CONSTRUCTION	ROAD WORK AHEAD	USE CAUTION

PCMS NOTES:

1. PCMS SHALL BE INSTALLED WITHIN THE EXISTING RIGHT-OF-WAY (ROW) OFF THE ROADWAY AT APPROX. LOCATIONS SHOWN OR AS DIRECTED BY THE TOWN OF HUDSON. PCMS SHALL NOT BLOCK EXIST SIDEWALK.
2. CONTRACTOR SHALL PROVIDE PCMS A MINIMUM OF 7 DAYS PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR SHALL REMOVE ALL PCMS SHOWN AT THE COMPLETION OF CONSTRUCTION.

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

TEMPORARY TRAFFIC CONTROL PLANS

PCMS PLAN – FOREST AVE AT MARLBORO ST NIGHT WORK

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=300'	DEC 2021	MM	KW	MES	148 OF 349	.

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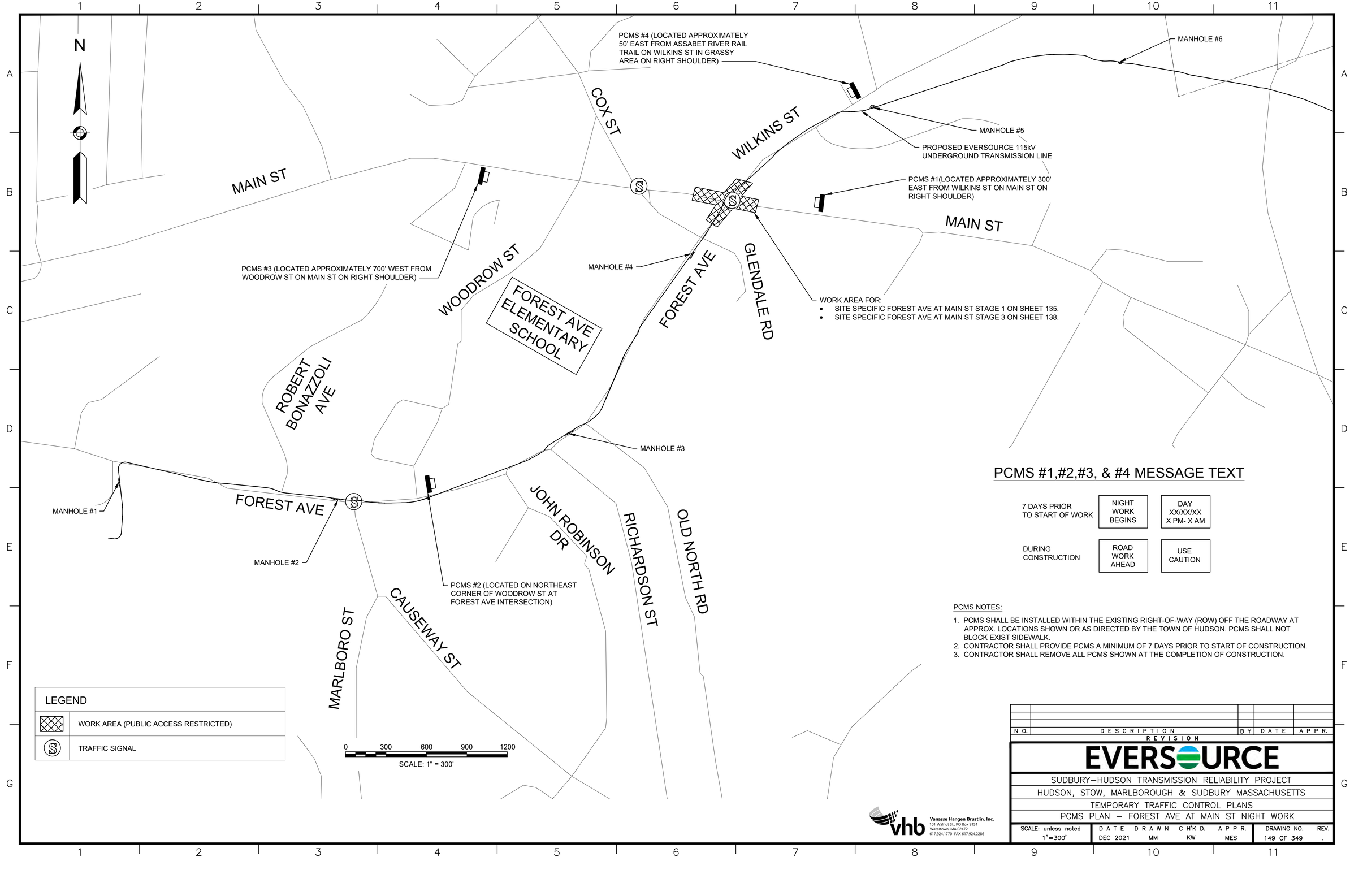

PCMS #1,#2,#3, & #4 MESSAGE TEXT

7 DAYS PRIOR TO START OF WORK	NIGHT WORK BEGINS	DAY XX/XX/XX X PM- X AM
DURING CONSTRUCTION	ROAD WORK AHEAD	USE CAUTION

PCMS NOTES:

1. PCMS SHALL BE INSTALLED WITHIN THE EXISTING RIGHT-OF-WAY (ROW) OFF THE ROADWAY AT APPROX. LOCATIONS SHOWN OR AS DIRECTED BY THE TOWN OF HUDSON. PCMS SHALL NOT BLOCK EXIST SIDEWALK.
2. CONTRACTOR SHALL PROVIDE PCMS A MINIMUM OF 7 DAYS PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR SHALL REMOVE ALL PCMS SHOWN AT THE COMPLETION OF CONSTRUCTION.

NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
TEMPORARY TRAFFIC CONTROL PLANS
PCMS PLAN – FOREST AVE AT MAIN ST NIGHT WORK

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=300'	DEC 2021	MM	KW	MES	149 OF 349	.

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TEMPORARY TRAFFIC CONTROL SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			COLOR		
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	BACK-GROUND	LEGEND	BORDER
R1-1	36"	36"	STOP	SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			RED	WHITE	WHITE
MA-R2-10a	48"	36"	WORK ZONE / SPEEDING FINES DOUBLED	AS PER MASSDOT STANDARD			FLUOR-ESCENT ORANGE / WHITE	BLACK	BLACK
MA-R2-10e	36"	48"	END ROAD WORK / DOUBLE FINES END				FLUOR-ESCENT ORANGE / WHITE	BLACK	BLACK
R3-1	24"	24"		SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			WHITE	RED/ BLACK	BLACK
R3-2	24"	24"					WHITE	RED/ BLACK	BLACK
R4-7b	24"	30"	KEEP RIGHT				WHITE	BLACK	BLACK
R9-9	24"	12"	SIDEWALK CLOSED				WHITE	BLACK	BLACK
R11-2	48"	30"	ROAD CLOSED				WHITE	BLACK	BLACK
R11-3a	60"	30"	ROAD CLOSED AHEAD LOCAL TRAFFIC ONLY				WHITE	BLACK	BLACK
W1-4L	36"	36"					FLUOR-ESCENT ORANGE	BLACK	BLACK
W1-4R	36"	36"					FLUOR-ESCENT ORANGE	BLACK	BLACK
W3-1	36"	36"					FLUOR-ESCENT ORANGE	BLACK / RED/ BLACK	BLACK
W5-1	36"	36"	ROAD NARROWS				FLUOR-ESCENT ORANGE	BLACK	BLACK
W8-1	36"	36"	BUMP				FLUOR-ESCENT ORANGE	BLACK	BLACK
W8-8	36"	36"	ROUGH ROAD				FLUOR-ESCENT ORANGE	BLACK	BLACK
W8-9	36"	36"	LOW SHOULDER				FLUOR-ESCENT ORANGE	BLACK	BLACK
W20-1c	36"	36"	ROAD WORK AHEAD				FLUOR-ESCENT ORANGE	BLACK	BLACK

TEMPORARY TRAFFIC CONTROL SIGN SUMMARY (CONTINUED)

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)				COLOR	
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	BACK-GROUND	LEGEND	BORDER
W20-2c	36"	36"	DETOUR AHEAD	SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			FLUOR-ESCENT ORANGE	BLACK	BLACK
W20-3c	36"	36"	ROAD CLOSED AHEAD				FLUOR-ESCENT ORANGE	BLACK	BLACK
W20-4c	36"	36"	ONE LANE ROAD AHEAD				FLUOR-ESCENT ORANGE	BLACK	BLACK
MA-W20-7b	36"	36"	POLICE OFFICER AHEAD	AS PER MASSDOT STANDARD			FLUOR-ESCENT ORANGE	BLACK	BLACK
W24-2 (MOD)	36"	36"	LANE SHIFT AHEAD	AS PER MASSDOT STANDARD			FLUOR-ESCENT ORANGE	BLACK	BLACK
M4-4	24"	12"	TRUCK	SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			WHITE	BLACK	BLACK
M4-8a	24"	18"	END DETOUR				FLUOR-ESCENT ORANGE	BLACK	BLACK
M4-9L	30"	24"	DETOUR ←				FLUOR-ESCENT ORANGE	BLACK	BLACK
M4-9R	30"	24"	DETOUR →				FLUOR-ESCENT ORANGE	BLACK	BLACK
M4-9SL	30"	24"	DETOUR ↖				FLUOR-ESCENT ORANGE	BLACK	BLACK
M4-9SR	30"	24"	DETOUR ↗				FLUOR-ESCENT ORANGE	BLACK	BLACK
M4-9V	30"	24"	DETOUR ↑				FLUOR-ESCENT ORANGE	BLACK	BLACK
M4-10L	48"	18"	← DETOUR				FLUOR-ESCENT ORANGE	BLACK	---
M4-10R	48"	18"	DETOUR →				FLUOR-ESCENT ORANGE	BLACK	---

NOTES:
1. HIGH INTENSITY REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION" FOR TEXT DIMENSIONS, AS AMENDED; THE 1977 MASSHIGHWAY DEPARTMENT CONSTRUCTION AND TRAFFIC STANDARD DETAILS, AS AMENDED, FOR SIGNS AND SUPPORTS; THE MASSHIGHWAY DEPARTMENT SIGN LISTINGS 1993 EDITION, AS AMENDED; THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR MOUNTING REQUIREMENTS; AND THE 2017 MassDOT STANDARD SIGNS BOOK, AS AMENDED.
2. ALL SIGNS SHOWN GRAPHICALLY FOR INFORMATION ONLY. SIGN VENDOR SHALL FABRICATE ALL SIGNS IN ACCORDANCE WITH THE APPLICABLE STANDARDS.

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617.924.1770 FAX 617.924.2286

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
TEMPORARY TRAFFIC CONTROL PLANS
SIGN SUMMARY

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
NTS	DEC 2021	MM	KW	MES	150 OF 349	.

TEMPORARY TRAFFIC CONTROL SIGN SUMMARY (CONTINUED)

IDENTIFI-CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)				COLOR	
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	BACK-GROUND	LEGEND	BORDER
SUPP(A)	48"	12"	MARLBORO RD	6"C	3" 3"	N/A	FLUOR-ESCENT ORANGE	BLACK	BLACK
SUPP(B)	48"	12"	CHESTNUT ST	6"C	3" 3"	N/A	FLUOR-ESCENT ORANGE	BLACK	BLACK
SUPP(C)	42"	12"	DUTTON RD	6"C	3" 3"	N/A	FLUOR-ESCENT ORANGE	BLACK	BLACK
SUPP(D)	36"	24"	WHITE POND RD	6"C 6"C	4" 4" 4"	N/A	FLUOR-ESCENT ORANGE	BLACK	BLACK
SUPP(E)	48"	12"	CONCORD RD	6"C	3" 3"	N/A	FLUOR-ESCENT ORANGE	BLACK	BLACK
SUPP(F)	42"	12"	FOREST AVE	6"C	3" 3"	N/A	FLUOR-ESCENT ORANGE	BLACK	BLACK
SUPP(G)	48"	24"	JOHN ROBINSON DR	6"C 6"C	4" 4" 4"	N/A	FLUOR-ESCENT ORANGE	BLACK	BLACK
SUPP(H)	48"	12"	PEAKHAM RD	6"C	3" 3"	N/A	FLUOR-ESCENT ORANGE	BLACK	BLACK
SUPP(J)	60"	12"	HORSE POND RD	6"C	3" 3"	N/A	FLUOR-ESCENT ORANGE	BLACK	BLACK
SP-1	36"	36"	CAUTION VEHICLES ENTERING	6"C 6"C 6"C	3.5" 3.5"	N/A	FLUOR-ESCENT ORANGE	BLACK	BLACK
SP-2	36"	36"	ROAD CROSSING AHEAD	6"C 6"C 6"C	3.5" 3.5"	N/A	FLUOR-ESCENT ORANGE	BLACK	BLACK

NOTES:
1. HIGH INTENSITY REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION" FOR TEXT DIMENSIONS, AS AMENDED; THE 1977 MASSHIGHWAY DEPARTMENT CONSTRUCTION AND TRAFFIC STANDARD DETAILS, AS AMENDED, FOR SIGNS AND SUPPORTS; THE MASSHIGHWAY DEPARTMENT SIGN LISTINGS 1993 EDITION, AS AMENDED; THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR MOUNTING REQUIREMENTS; AND THE 2017 MassDOT STANDARD SIGNS BOOK, AS AMENDED.
2. ALL SIGNS SHOWN GRAPHICALLY FOR INFORMATION ONLY. SIGN VENDOR SHALL FABRICATE ALL SIGNS IN ACCORDANCE WITH THE APPLICABLE STANDARDS.

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

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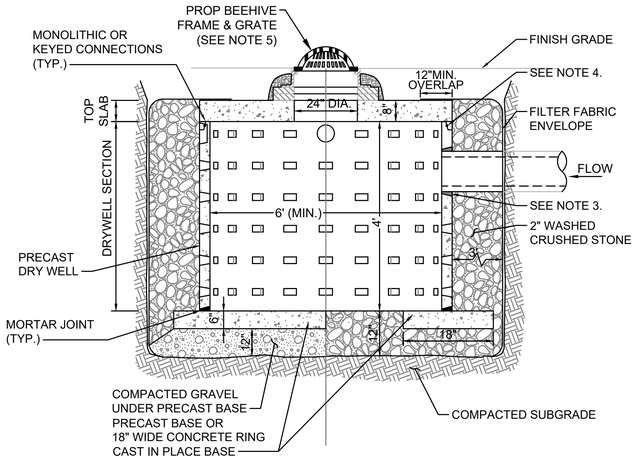
EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
TEMPORARY TRAFFIC CONTROL PLANS
SIGN SUMMARY

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
NTS	DEC 2021	MM	KW	MES	151 OF 349	.

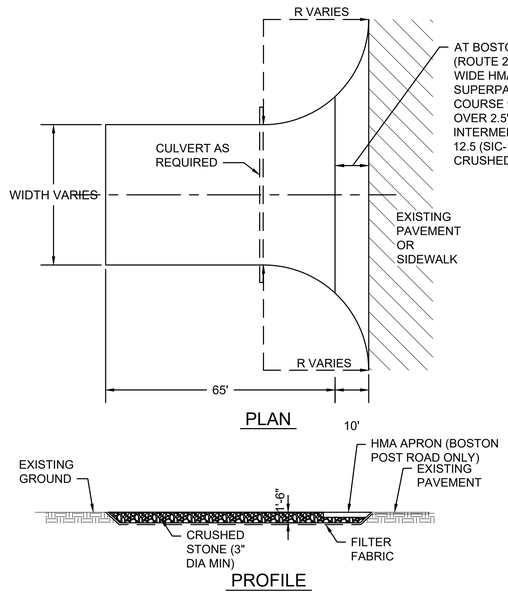


NOTES

1. BASE SECTION SHALL BE PRECAST CONCRETE WITH MORTARED JOINTS OR CAST IN PLACE.
2. ALL COMPONENTS SHALL BE DESIGNED FOR HS-20 LOADING.
3. PROVIDE PRECAST OPENINGS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
5. BEEHIVE FRAME AND GRATE SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSE MINIMUM, 5 BRICK COURSE MAXIMUM)

LEACHING CATCH BASIN

SCALE: N.T.S.



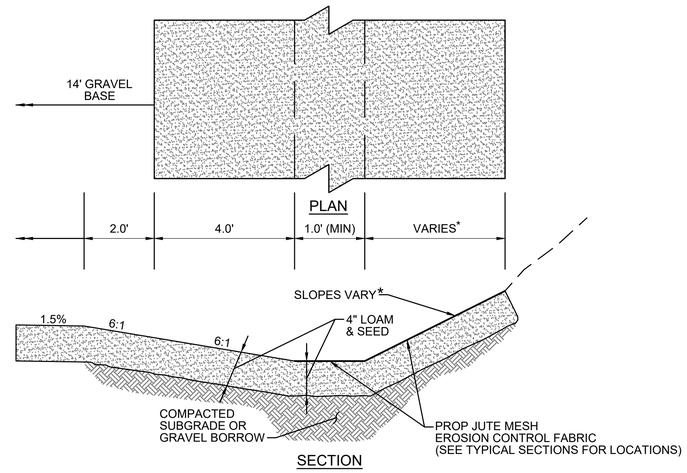
STABILIZED CONSTRUCTION ENTRANCE LOCATIONS
WILKINS STREET
MAIN STREET
PARMENTER ROAD
WHITE POND ROAD
DUTTON ROAD
PEAKHAM ROAD
HORSE POND ROAD
UNION AVENUE
BOSTON POST ROAD
SUDBURY SUBSTATION DRIVEWAY

NOTES:

1. ALL STABILIZED CONSTRUCTION ENTRANCES SHALL BE WITHIN LIMITS OF GRADING SHOWN ON CONSTRUCTION PLANS.
2. CONSTRUCTION ENTRANCES TO BE REMOVED AFTER CONSTRUCTION IS COMPLETED AND DISTURBED AREA OUTSIDE OF 14' GRAVEL BASE TO BE LOAMED AND SEEDED AS SHOWN ON CONSTRUCTION PLANS.
3. CONTRACTOR SHALL SWEEP PAVED AREAS ADJACENT TO THE SITE ON A DAILY BASIS.
4. ALL PEDESTRIAN CROSSINGS MUST BE MAINTAINED AT ALL TIMES.
5. CONTRACTOR TO REPLACE CRUSHED STONE WITH CLEAN STONE AS REQUIRED.

STABILIZED CONSTRUCTION ENTRANCE

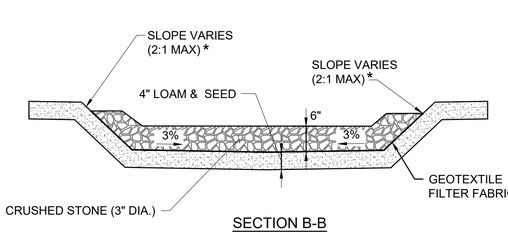
SCALE: N.T.S.

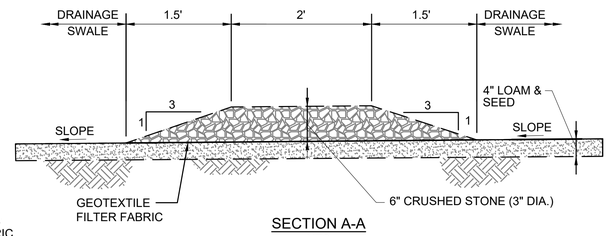


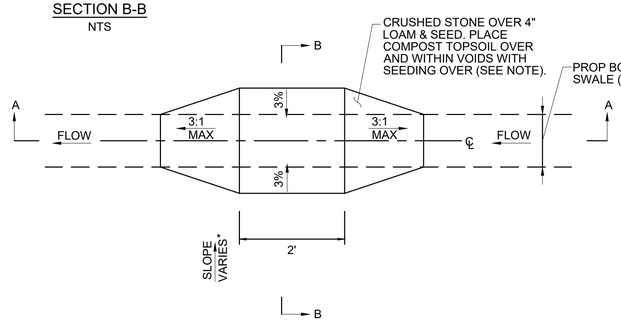
*SEE TYPICAL SECTIONS & CROSS SECTIONS FOR ADDITIONAL INFORMATION

SWALE/AREA OF INCREASED INFILTRATION

SCALE: N.T.S.





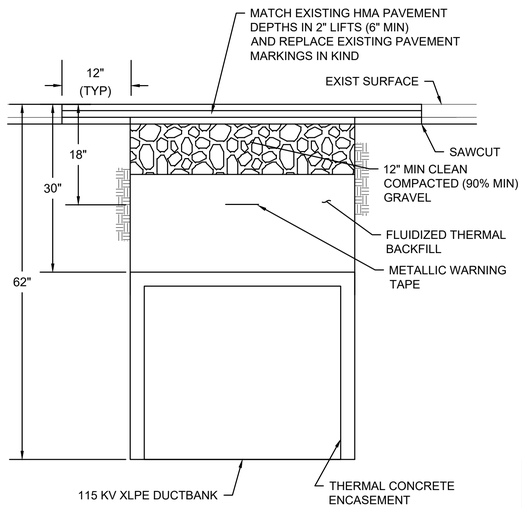


SEE CROSS SECTIONS FOR ADDITIONAL INFORMATION

NOTE:
CRUSHED STONE TO BE PLACED IN TWO LIFTS TO ALLOW FOR THE APPLICATION OF COMPOST TOPSOIL. APPLY COMPOST TOPSOIL OVER AND WITHIN THE CRUSHED STONE. MATERIAL SHOULD BE PLACED SUCH THAT SETTLED MATERIAL IS AT OR SLIGHTLY BELOW SURFACE PLANE OF STONE AND SHALL BE WORKED INTO THE VOIDS OF THE CRUSHED STONE. COMPOST TOPSOIL SHALL BE RAKED BY HAND.

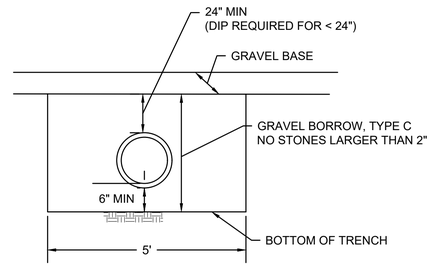
CHECK DAM

SCALE: N.T.S.



DUCTBANK CROSSING ROADWAY

SCALE: N.T.S.



NOTE:

1. GRAVEL BORROW FOR TRENCH BACKFILL MUST BE NEW MATERIAL. EXCESS FILL MATERIAL FROM SITE CANNOT BE USED.

TRENCH DETAIL

SCALE: N.T.S.

NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

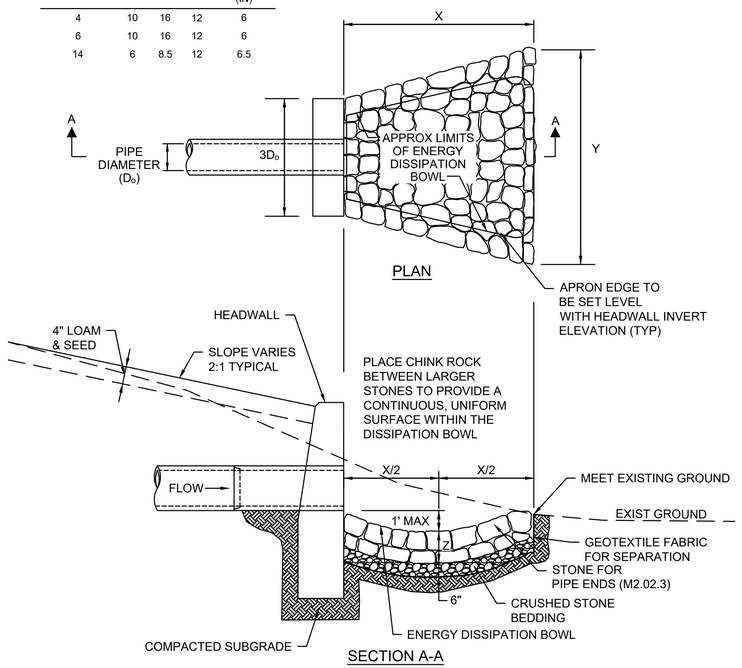
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

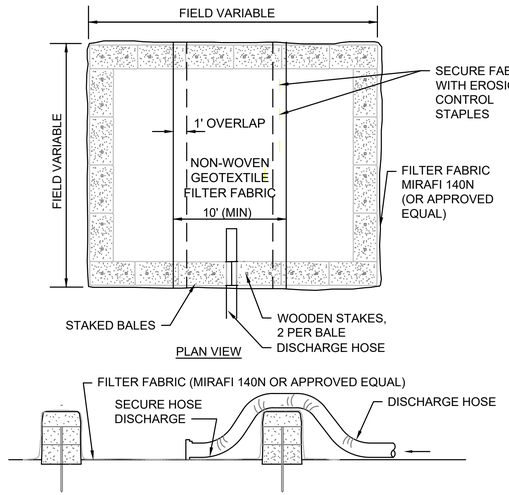
CONSTRUCTION DETAILS

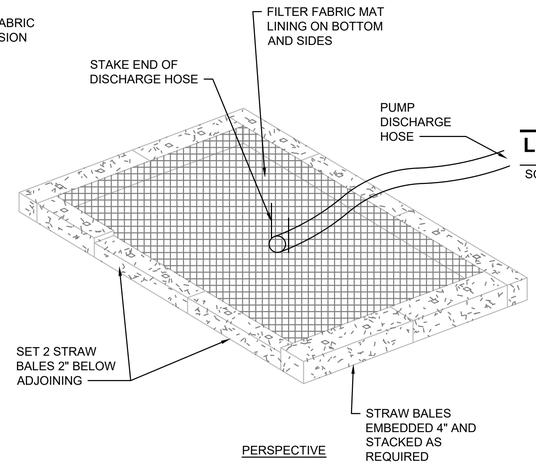
PLAN 152 OF 349

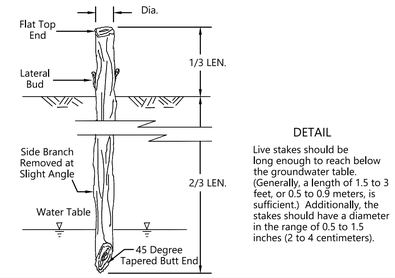
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
NTS	DEC 2021	MS	SK	MES	.	.

RIPRAP STONE				
STRUCTURE NUMBER	X (FT)	Y (FT)	Z (IN)	STONE DIA. (D_{50}) (IN)
4	10	16	12	6
6	10	16	12	6
14	6	8.5	12	6.5









NOTES:
1. NUMBER OF BALES MAY VARY DEPENDING ON SITE CONDITIONS.
2. THE BASIN TO BE SIZED TO PREVENT DISCHARGE WATER FROM OVERTOPPING BASIN.
3. WITHIN THE TOWN OF HUDSON, STOW AND SUDBURY, THE CONTRACTOR SHALL NOTIFY THE PROPER TOWN'S CONSERVATION COMMISSION PRIOR TO ANY PLANNED DEWATERING AND THE CONSERVATION COMMISSION MUST APPROVE THIS WORK IN THE FIELD PRIOR TO COMMENCEMENT.

DEWATERING STRAW BALE BASIN

SCALE: N.T.S.

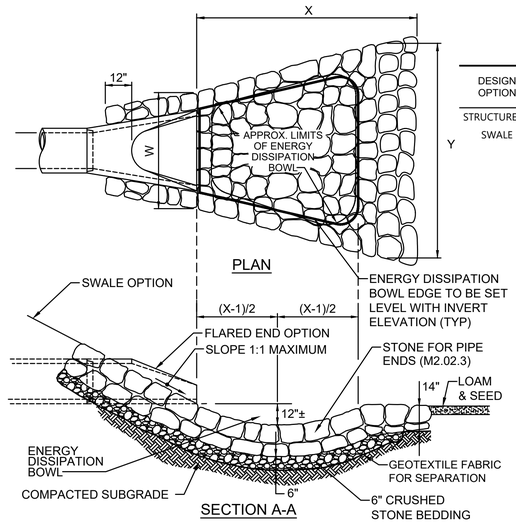
LIVE STAKE

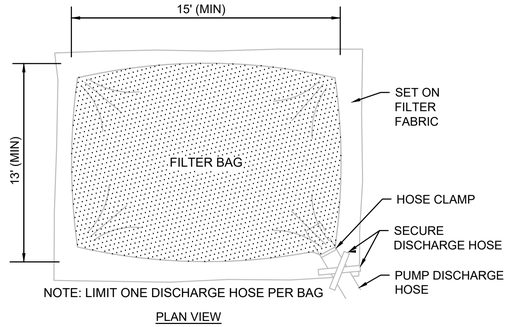
SCALE: N.T.S.

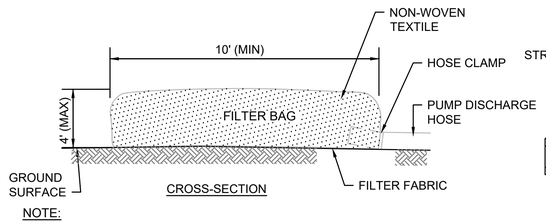
STONE FOR PIPE ENDS

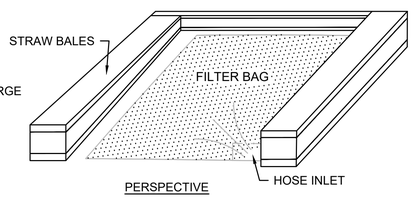
SCALE: N.T.S.

RIPRAP STONE				
DESIGN OPTION	W (FT)	X (FT)	Y (FT)	STONE DIA. (D_{50}) (IN)
STRUCTURE 10	3	4	5	6.5
SWALE	7	6	8	6.5





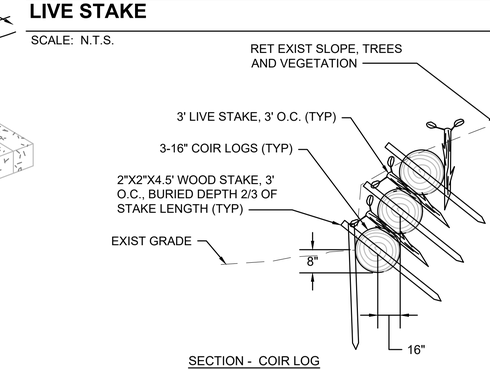




NOTE:
1. BAG TO BE USED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
2. WITHIN THE TOWN OF HUDSON, STOW AND SUDBURY, THE CONTRACTOR SHALL NOTIFY THE PROPER TOWN'S CONSERVATION COMMISSION PRIOR TO ANY PLANNED DEWATERING AND THE CONSERVATION COMMISSION MUST APPROVE THIS WORK IN THE FIELD PRIOR TO COMMENCEMENT.

DEWATERING FILTER BAG

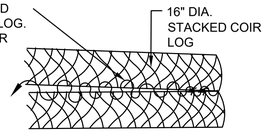
SCALE: N.T.S.



NOTE
FIELD VERIFY THE EXISTING SLOPE AND INSTALL THE COIR LOG AS REQUIRED BASED ON THE EXISTING SLOPE. CONTRACTOR TO VERIFY SLOPE STABILITY WITH COIR LOG MANUFACTURER PRIOR TO INSTALLATION.

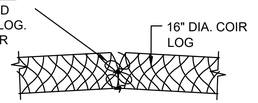
ELEVATION VIEW: LATERAL TYING

COCONUT FIBER CORD LACED THROUGH OUTER WRAP OF LOG. TIE 10 OVERHAND KNOTS PER COIR LOG, MIN.



PLAN VIEW: END-TO-END TYING

COCONUT FIBER CORD LACED THROUGH OUTER WRAP OF LOG. TIE 10 OVERHAND KNOTS PER COIR LOG, MIN.



COIR LOG NOTES:

1. DETAIL IS REPRESENTATIVE ONLY. PURPOSE IS TO SHOW DESIGN INTENT. PRIOR TO PLANT INSTALLATION PLANT LAYOUT SHALL BE STAKED OUT BY CONTRACTOR AND APPROVED BY OWNER'S REPRESENTATIVE.

COIR LOG

SCALE: N.T.S.

STONE PROTECTION AT SWALE/FLARED END (STRUCTURE NUMBER 10)

SCALE: N.T.S.

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION DETAILS

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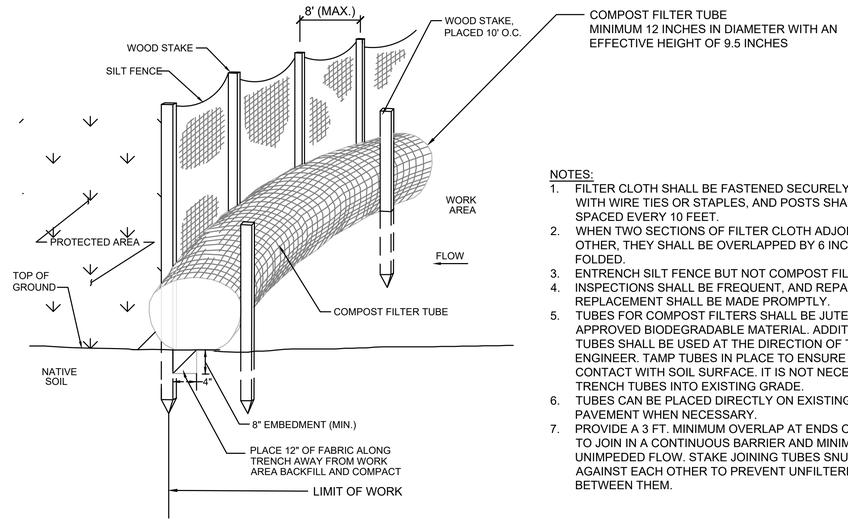
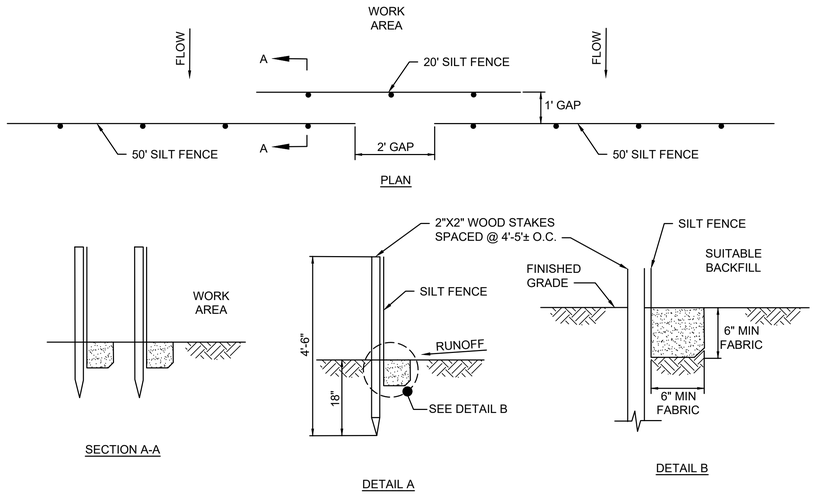
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
NTS	DEC 2021	MS	SK	MES	.	.



NOTES:
1. FILTER CLOTH SHALL BE FASTENED SECURELY TO POSTS WITH WIRE TIES OR STAPLES, AND POSTS SHALL BE SPACED EVERY 10 FEET.
2. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6 INCHES AND FOLDED.
3. ENTRENCH SILT FENCE BUT NOT COMPOST FILTER TUBE.
4. INSPECTIONS SHALL BE FREQUENT, AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY.
5. TUBES FOR COMPOST FILTERS SHALL BE JUTE MESH OR APPROVED BIODEGRADABLE MATERIAL. ADDITIONAL TUBES SHALL BE USED AT THE DIRECTION OF THE ENGINEER. TAMP TUBES IN PLACE TO ENSURE GOOD CONTACT WITH SOIL SURFACE. IT IS NOT NECESSARY TO TRENCH TUBES INTO EXISTING GRADE.
6. TUBES CAN BE PLACED DIRECTLY ON EXISTING PAVEMENT WHEN NECESSARY.
7. PROVIDE A 3 FT. MINIMUM OVERLAP AT ENDS OF TUBES TO JOIN IN A CONTINUOUS BARRIER AND MINIMIZE UNIMPEDED FLOW. STAKE JOINING TUBES SNUGLY AGAINST EACH OTHER TO PREVENT UNFILTERED FLOW BETWEEN THEM.

COMPOST FILTER TUBE AND SILT FENCE DETAIL - TYPE A EROSION CONTROL BARRIER

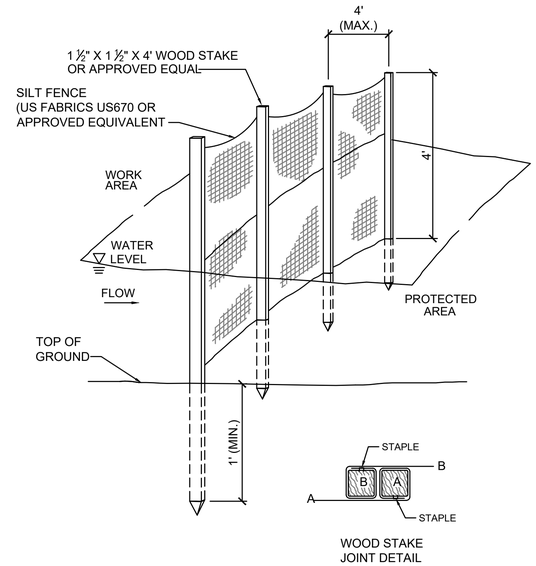
SCALE: NTS



NOTES:
1. SYNCOPATED SILT FENCE SHALL BE USED WITHIN ALL PRIORITY HABITAT AREAS AND WITHIN 450' OF VERNAL POOLS.
2. INSTALL GAP AFTER EVERY 50' OF EROSION CONTROL BARRIER.

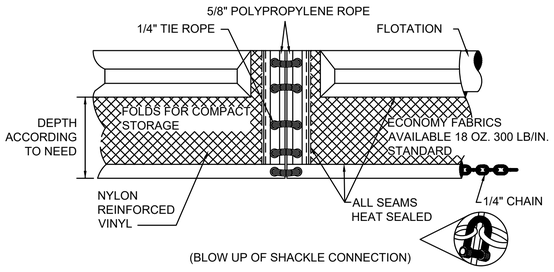
SYNCOPATED SILT FENCE DETAIL - TYPE B EROSION CONTROL BARRIER

SCALE: N.T.S.



4' HIGH SILT FENCE BARRIER DETAIL - EROSION CONTROL BARRIER TYPE C (OPTION 1)

SCALE: N.T.S.



TURBIDITY CURTAIN DETAIL - EROSION CONTROL BARRIER TYPE C (OPTION 2)

SCALE: N.T.S.

NO.	DESCRIPTION	BY	DATE	APPR.
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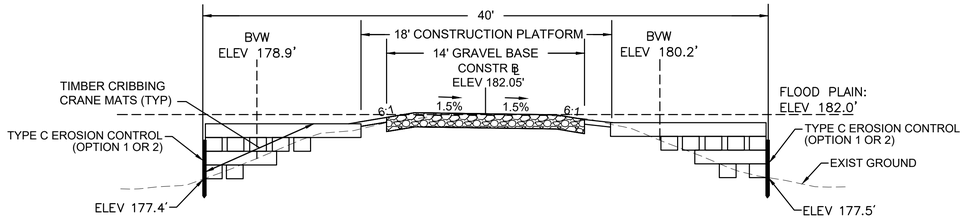
NTS	DEC 2021	MS	SK	MES	.	.

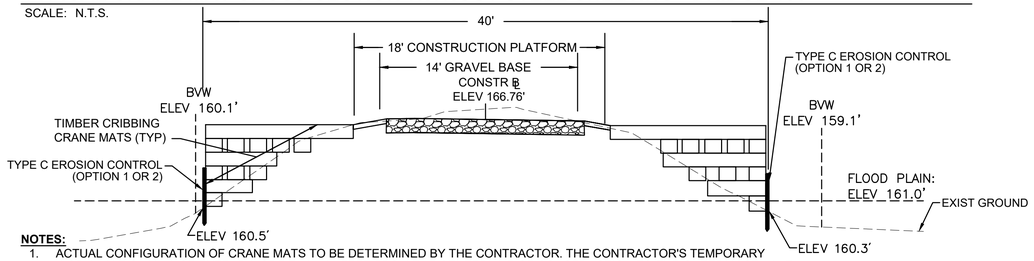


NOTES:

1. ACTUAL CONFIGURATION OF CRANE MATS TO BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR'S TEMPORARY WORK LIMIT SHALL NOT EXTEND MORE THAN 20 FEET FROM THE CENTERLINE OF CONSTRUCTION TO THE OUTERMOST LIMIT ON EACH SIDE WHERE CRANE MATTING IS PERMITTED.
2. AREA DISTURBED BY CRANE MATS OUTSIDE THE LIMITS OF THE 18' CONSTRUCTION PLATFORM TO BE RESTORED. SEE CRANE MAT RESTORATION DETAILS ON SHEET 130.
3. GEOTEXTILE FABRIC TO BE INSTALLED UNDERNEATH AND WRAPPED AROUND CRANE MATS. GEOTEXTILE FABRIC MUST OVERLAP AT THE EDGES AND BE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS.
4. THE CROSS-SECTION FOR STATION 148+00 IS USED AS A REPRESENTATIVE AREA FOR THE PURPOSES OF THIS DETAIL.

TYPICAL CRANE MAT CROSS-SECTION WITHOUT STEEL SHEETING - BRIDGE 130

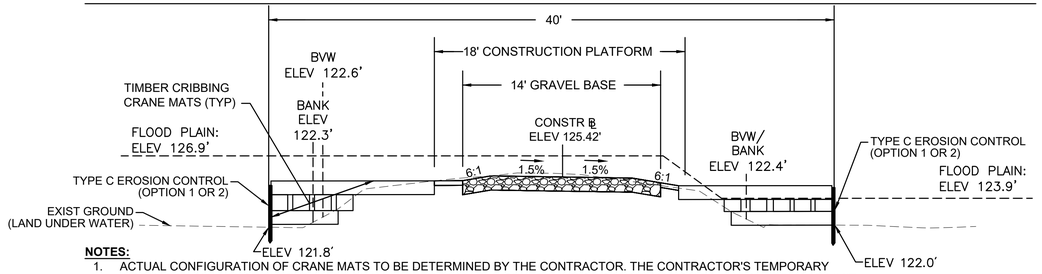
SCALE: N.T.S.



NOTES:

1. ACTUAL CONFIGURATION OF CRANE MATS TO BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR'S TEMPORARY WORK LIMIT SHALL NOT EXTEND MORE THAN 20 FEET FROM THE CENTERLINE OF CONSTRUCTION TO THE OUTERMOST LIMIT ON EACH SIDE WHERE CRANE MATTING IS PERMITTED.
2. AREA DISTURBED BY CRANE MATS OUTSIDE THE LIMITS OF THE 18' CONSTRUCTION PLATFORM TO BE RESTORED. SEE CRANE MAT RESTORATION DETAILS ON SHEET 130.
3. GEOTEXTILE FABRIC TO BE INSTALLED UNDERNEATH AND WRAPPED AROUND CRANE MATS. GEOTEXTILE FABRIC MUST OVERLAP AT THE EDGES AND BE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS.
4. THE CROSS-SECTION FOR STATION 401+50 IS USED AS A REPRESENTATIVE AREA FOR THE PURPOSES OF THIS DETAIL.

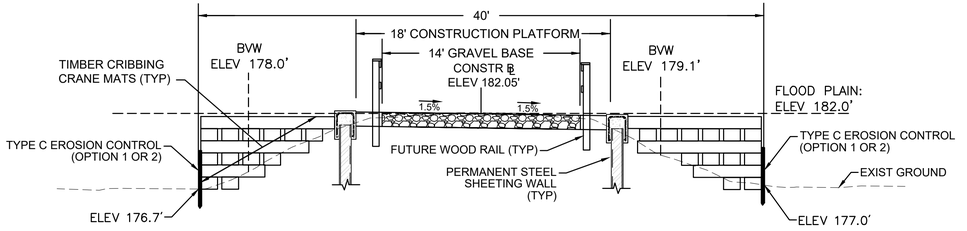
TYPICAL CRANE MAT CROSS-SECTION WITHOUT STEEL SHEETING - BRIDGE 128



NOTES:

1. ACTUAL CONFIGURATION OF CRANE MATS TO BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR'S TEMPORARY WORK LIMIT SHALL NOT EXTEND MORE THAN 20 FEET FROM THE CENTERLINE OF CONSTRUCTION TO THE OUTERMOST LIMIT ON EACH SIDE WHERE CRANE MATTING IS PERMITTED.
2. AREA DISTURBED BY CRANE MATS OUTSIDE THE LIMITS OF THE 18' CONSTRUCTION PLATFORM TO BE RESTORED. SEE CRANE MAT RESTORATION DETAILS ON SHEET 130.
3. GEOTEXTILE FABRIC TO BE INSTALLED UNDERNEATH AND WRAPPED AROUND CRANE MATS. GEOTEXTILE FABRIC MUST OVERLAP AT THE EDGES AND BE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS.
4. THE CROSS-SECTION FOR STATION 726+00 IS USED AS A REPRESENTATIVE AREA FOR THE PURPOSES OF THIS DETAIL.

TYPICAL CRANE MAT CROSS-SECTION WITHOUT STEEL SHEETING - BRIDGE 127

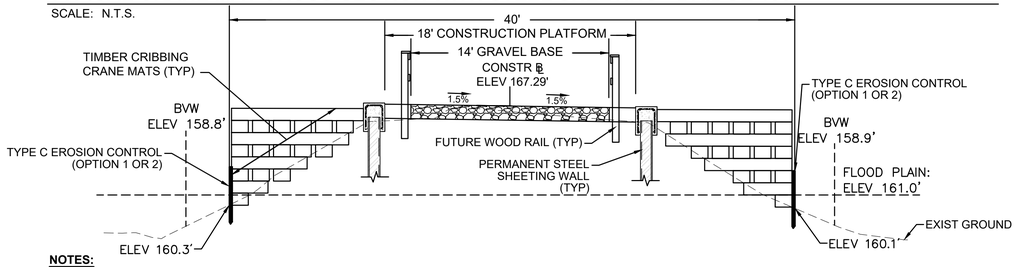


NOTES:

1. ACTUAL CONFIGURATION OF CRANE MATS TO BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR'S TEMPORARY WORK LIMIT SHALL NOT EXTEND MORE THAN 20 FEET FROM THE CENTERLINE OF CONSTRUCTION TO THE OUTERMOST LIMIT ON EACH SIDE WHERE CRANE MATTING IS PERMITTED.
2. AREA DISTURBED BY CRANE MATS OUTSIDE THE LIMITS OF THE 18' CONSTRUCTION PLATFORM TO BE RESTORED. SEE CRANE MAT RESTORATION DETAILS ON SHEET 130.
3. GEOTEXTILE FABRIC TO BE INSTALLED UNDERNEATH AND WRAPPED AROUND CRANE MATS. GEOTEXTILE FABRIC MUST OVERLAP AT THE EDGES AND BE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS.
4. THE CROSS-SECTION FOR STATION 148+25 IS USED AS A REPRESENTATIVE AREA FOR THE PURPOSES OF THIS DETAIL.

TYPICAL CRANE MAT CROSS-SECTION WITH STEEL SHEETING - BRIDGE 130

SCALE: N.T.S.

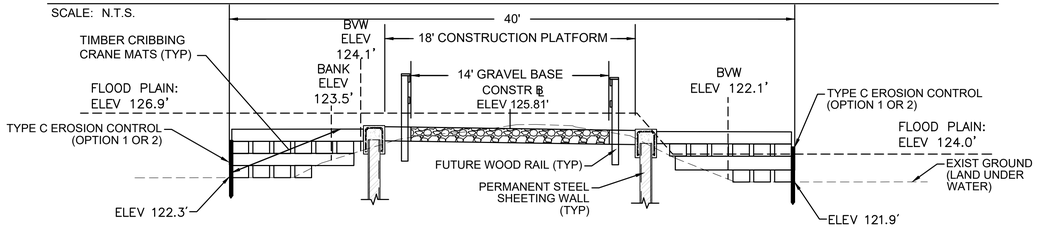


NOTES:

1. ACTUAL CONFIGURATION OF CRANE MATS TO BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR'S TEMPORARY WORK LIMIT SHALL NOT EXTEND MORE THAN 20 FEET FROM THE CENTERLINE OF CONSTRUCTION TO THE OUTERMOST LIMIT ON EACH SIDE WHERE CRANE MATTING IS PERMITTED.
2. AREA DISTURBED BY CRANE MATS OUTSIDE THE LIMITS OF THE 18' CONSTRUCTION PLATFORM TO BE RESTORED. SEE CRANE MAT RESTORATION DETAILS ON SHEET 130.
3. GEOTEXTILE FABRIC TO BE INSTALLED UNDERNEATH AND WRAPPED AROUND CRANE MATS. GEOTEXTILE FABRIC MUST OVERLAP AT THE EDGES AND BE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS.
4. THE CROSS-SECTION FOR STATION 401+00 IS USED AS A REPRESENTATIVE AREA FOR THE PURPOSES OF THIS DETAIL.

TYPICAL CRANE MAT CROSS-SECTION WITH STEEL SHEETING - BRIDGE 128

SCALE: N.T.S.



NOTES:

1. ACTUAL CONFIGURATION OF CRANE MATS TO BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR'S TEMPORARY WORK LIMIT SHALL NOT EXTEND MORE THAN 20 FEET FROM THE CENTERLINE OF CONSTRUCTION TO THE OUTERMOST LIMIT ON EACH SIDE WHERE CRANE MATTING IS PERMITTED.
2. AREA DISTURBED BY CRANE MATS OUTSIDE THE LIMITS OF THE 18' CONSTRUCTION PLATFORM TO BE RESTORED. SEE CRANE MAT RESTORATION DETAILS ON SHEET 130.
3. GEOTEXTILE FABRIC TO BE INSTALLED UNDERNEATH AND WRAPPED AROUND CRANE MATS. GEOTEXTILE FABRIC MUST OVERLAP AT THE EDGES AND BE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS.
4. THE CROSS-SECTION FOR STATION 724+90 IS USED AS A REPRESENTATIVE AREA FOR THE PURPOSES OF THIS DETAIL.

TYPICAL CRANE MAT CROSS-SECTION WITH STEEL SHEETING - BRIDGE 127

SCALE: N.T.S.

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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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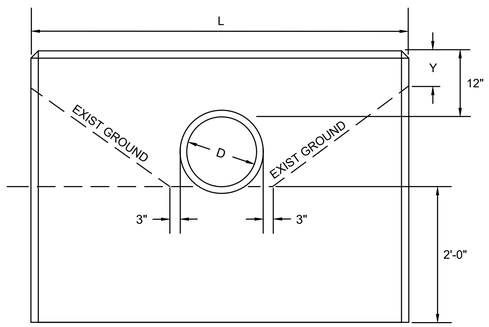
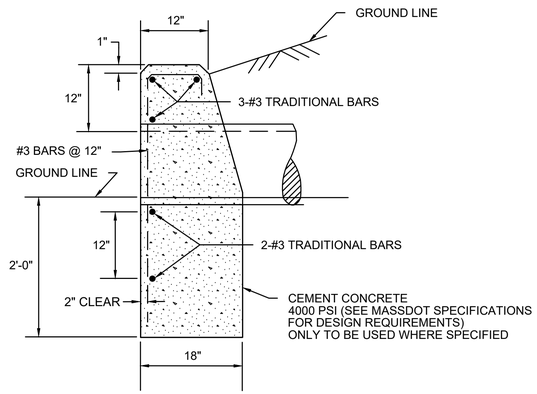
NTS	DEC 2021	MS	SK	MES	.	.



FRONT ELEVATION

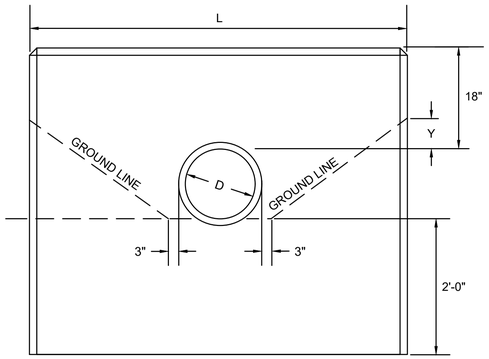


END ELEVATION

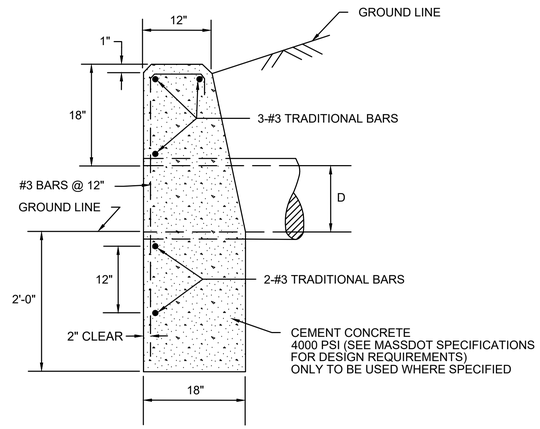
NOTES:
1. THIS DETAIL SHALL BE APPLIED TO THE PROPOSED 18" DRAINAGE PIPE AT STATION 738+77.
2. SEE MASSDOT CONST STD 206.4.1 FOR THE VALUES OF L AND Y FOR VARIOUS PIPE DIAMETERS.

HEADWALL WITH 12" REVEAL ABOVE PIPE

SCALE: N.T.S.



FRONT ELEVATION

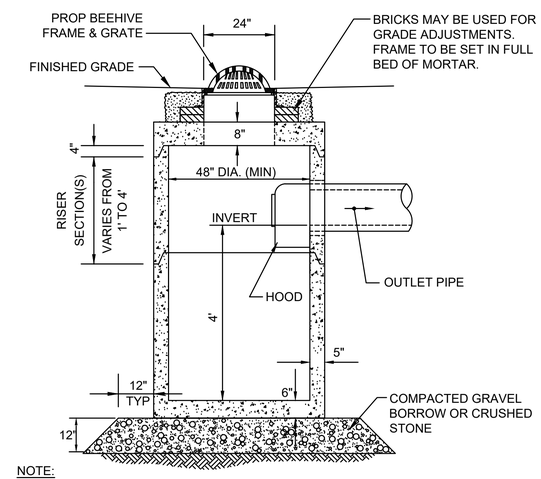


END ELEVATION

NOTES:
1. THIS DETAIL SHALL BE APPLIED TO THE PROPOSED 24" DRAINAGE PIPE AT STATION 713+63.
2. SEE MASSDOT CONST STD 206.4.1 FOR THE VALUES OF L AND Y FOR VARIOUS PIPE DIAMETERS.

HEADWALL WITH 18" REVEAL ABOVE PIPE

SCALE: N.T.S.

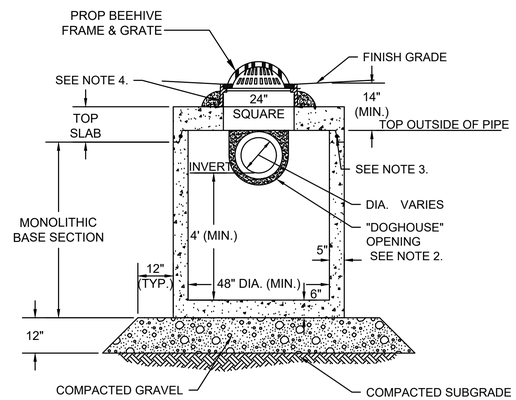


NOTE:

6" MINIMUM SPACE FROM TOP OF KNOCKOUT TO BOTTOM OF ROOF SLAB JOINT REQUIRED WHEN USING HOODS.

DEEP SUMP CATCH BASIN WITH HOOD (CB)

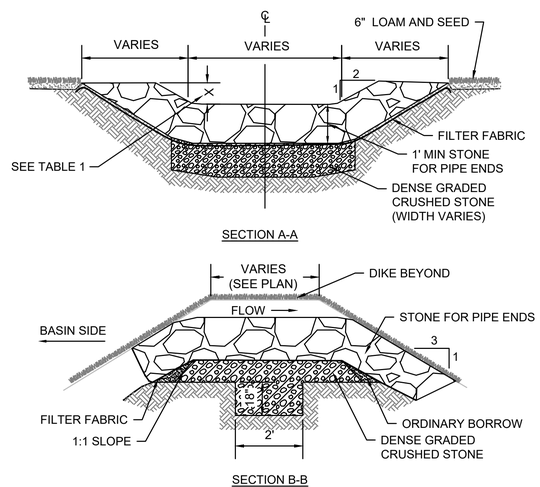
SCALE: N.T.S.



NOTES:
1. ALL SECTIONS SHALL BE DESIGNED FOR HS-10 LOADING.
2. PROVIDE DOGHOUSE OPENING FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. TOP SLAB SHALL NOT REST DIRECTLY ON PIPE. GROUT ALL PIPE CONNECTIONS (NON-SHRINK GROUT).
3. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
4. CATCH BASIN FRAME (4" DEPTH) SHALL BE SET IN FULL MORTAR BED.
5. ADJUST TO FINISH GRADE WITH CLAY BRICK AND MORTAR AS REQUIRED.

CATCH BASIN WITH SHALLOW COVER (SHALLOW CB)

SCALE: N.T.S.



SECTION A-A

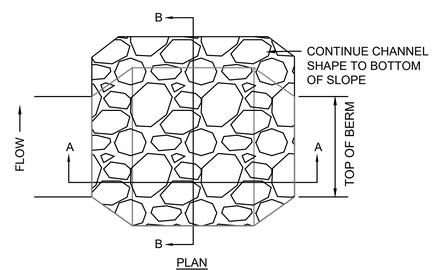
SECTION B-B

OVERFLOW STONE SWALE

SCALE: N.T.S.

TABLE 1

BMP NUMBER	X (FT)
P-6.2	0.2
P-7.1	0.5



PLAN

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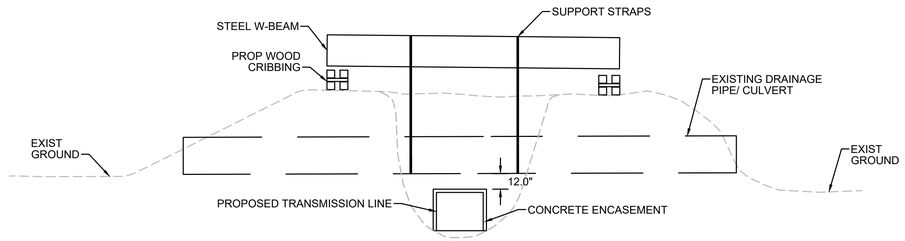
METHOD OF PIPE SUPPORT DURING CONSTRUCTION

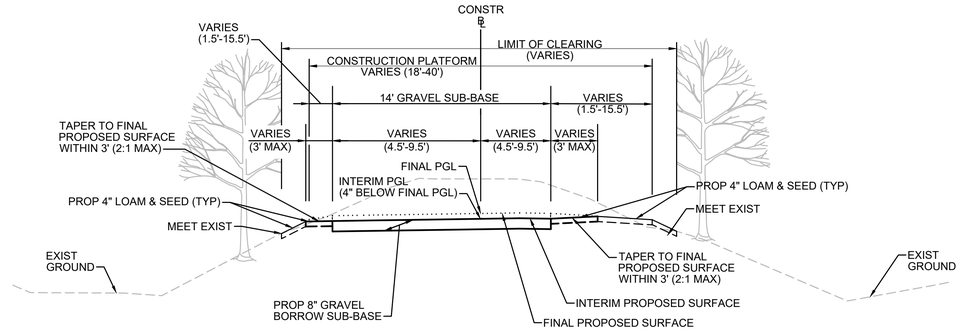
SCALE: N.T.S.



NOTES:
1. CONTRACTOR TO EXCAVATE GROUND SURROUNDING EXISTING PIPE SUCH THAT NO DAMAGE TO THE PIPE IS INCURRED.
2. EXISTING PIPE TO BE STABILIZED IN PLACE DURING CONSTRUCTION USING A STRAP SUPPORTED BY AN W-BEAM.
3. TRANSMISSION LINE TO BE INSTALLED UNDER EXISTING PIPE WITH A MINIMUM CLEARANCE OF 12".
4. AFTER INSTALLATION OF THE TRANSMISSION LINE IS COMPLETE, CONTRACTOR TO FILL IN THE EXCAVATED AREA WITH ORDINARY BORROW OR EXCAVATED MATERIAL AND CONSTRUCT ACCESS ROAD AS SHOWN ON THE PLANS AND CROSS-SECTIONS.

INTERIM TYPICAL SECTION

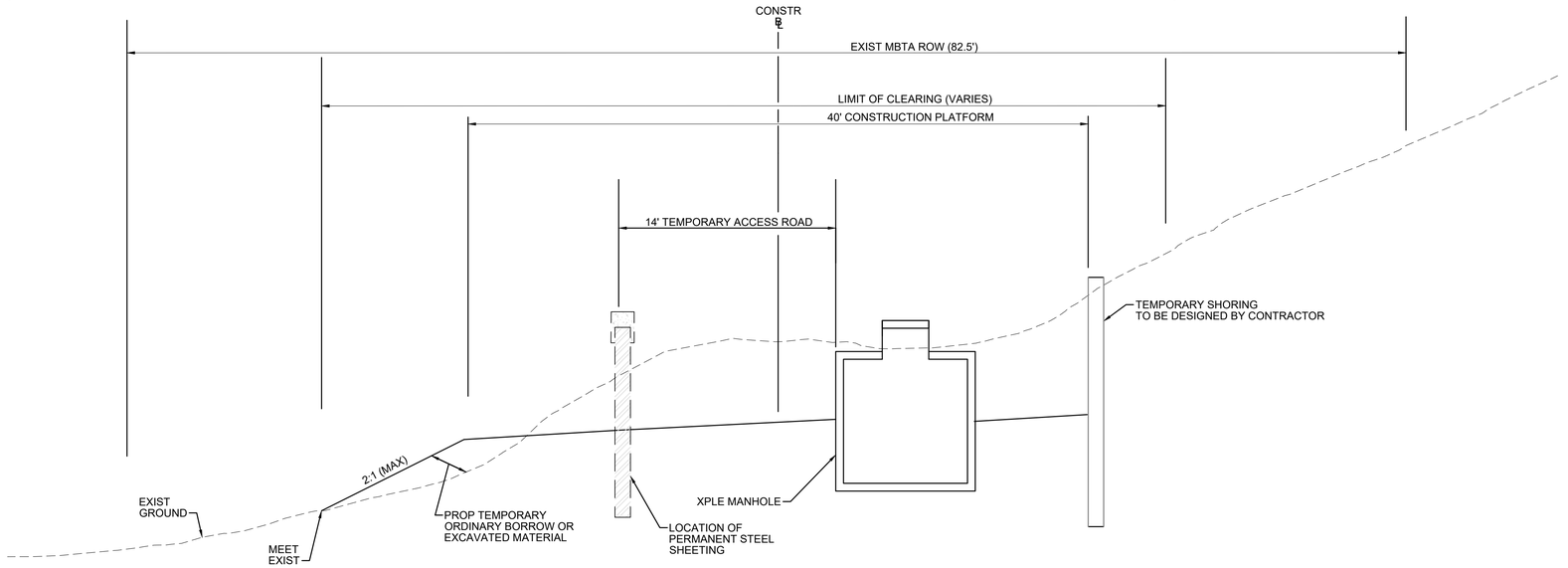
SCALE: N.T.S.



NOTES:
1. THIS INTERIM TYPICAL SECTION SHOWS THE TAPERING TO BE PERFORMED TO CONNECT THE GRAVEL ACCESS ROAD BEING CONSTRUCTED BY EVERSOURCE TO THE FINAL PROPOSED SURFACE FOR THE DCR MASS CENTRAL RAIL TRAIL.
2. AT ALL ROADWAY CROSSINGS AND VEHICLE ACCESS POINTS, THE CONTRACTOR SHALL TAPER FROM 8" UP TO 12" OF GRAVEL BORROW SUB-BASE OVER A LENGTH OF 50' SUCH THAT THE INTERIM PGL MATCHES THE FINAL PGL.

TEMPORARY GRADING AT STA 120+75 TO STA 121+25

SCALE: N.T.S.



NOTES:
1. THE LONGITUDINAL GRADIENT OF THE TEMPORARY ACCESS ROAD SHALL BE NO GREATER THAN 6%.
2. ALL TEMPORARY GRADING ACTIVITIES SHALL STAY WITHIN LIMITS OF GRADING SHOWN ON THE PLANS.
3. AFTER CONSTRUCTION OF THE TRANSMISSION LINE AND ACCESS ROAD IS COMPLETED, CONTRACTOR TO STOCKPILE ANY REMAINING TEMPORARY FILL MATERIAL AND REGRADE TO MATCH EXISTING CONDITIONS OUTSIDE OF THE PERMANENT LIMITS OF GRADING SHOWN ON THE PLANS AND CROSS-SECTIONS.
4. CONTRACTOR TO STABILIZE ANY EXPOSED SLOPES WITH JUTE MESH FABRIC UNTIL SUCH TIME THAT THEY CAN BE RESTORED.

NO.	DESCRIPTION	BY	DATE	APP'R.
	REVISION			

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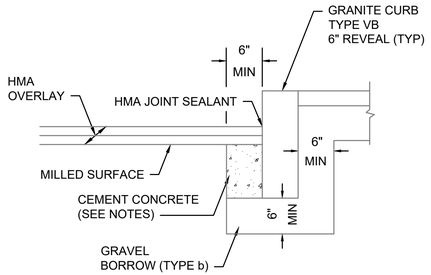
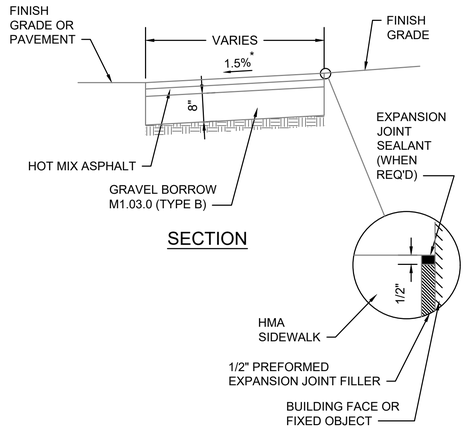
SCALE: unless noted	DATE	DRAWN	CH'K D.	APP'R.	DRAWING NO.	REV.
NTS	DEC 2021	MS	SK	MES	.	.



NOTES:
1. CONCRETE SHALL BE INCLUDED IN PRICE BID FOR GRANITE CURB.
2. ANY DESIGNATED CEMENT CONCRETE THAT IS ACCEPTABLE UNDER SECTION M4 OF THE STANDARD SPECIFICATIONS MAY BE USED. ALL TEST REQUIREMENTS ARE WAIVED. HOT MIX ASPHALT SHALL NOT BE USED AS A SUBSTITUTE.

GRANITE CURB IN MILL & OVERLAY

SCALE: N.T.S.

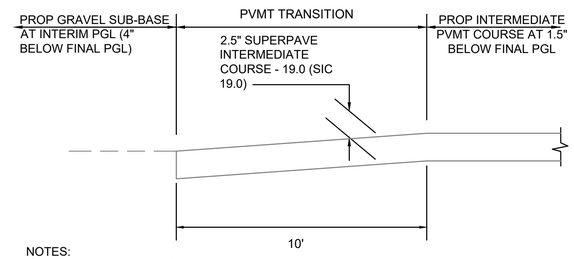


SECTION

* TOLERANCE FOR CONSTRUCTION ±0.5%

HOT MIX ASPHALT SIDEWALK

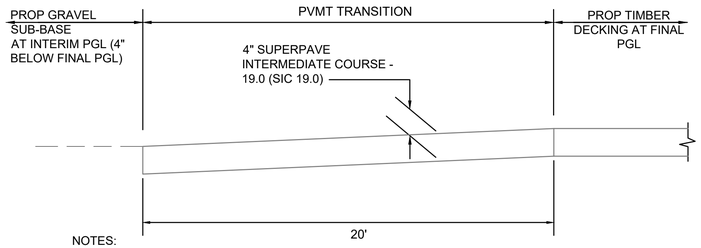
SCALE: N.T.S. DWG: WALK-01 DATE: MARCH 2013



NOTES:
1. DEPTH OF GRAVEL SUB-BASE UNDER PVMT TO BE ADJUSTED SUCH THAT DATUM SURFACE REMAINS AT 12" BELOW FINAL PGL THROUGH PVMT TRANSITION.

LONGITUDINAL SECTION OF PVMT TRANSITION AT CATTLE CROSSING

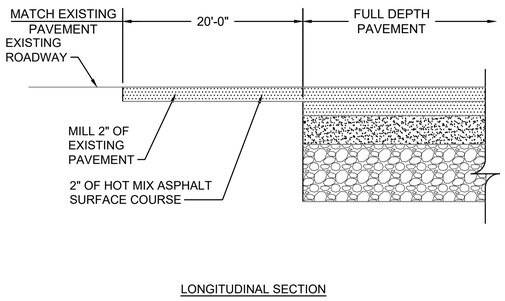
SCALE: N.T.S.



NOTES:
1. DEPTH OF GRAVEL SUB-BASE UNDER PVMT TO BE ADJUSTED SUCH THAT DATUM SURFACE REMAINS AT 12" BELOW FINAL PGL THROUGH PVMT TRANSITION.

LONGITUDINAL SECTION OF PVMT TRANSITION AT BRIDGES

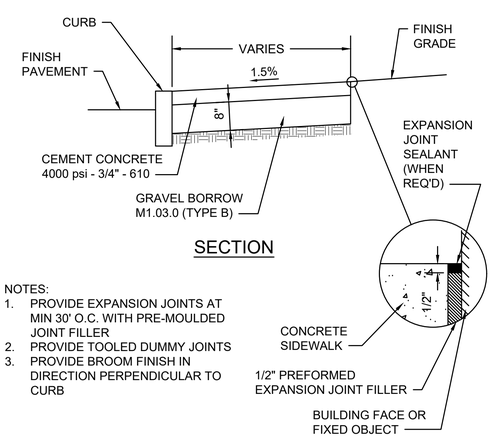
SCALE: N.T.S.



LONGITUDINAL SECTION

FULL DEPTH PAVEMENT TRANSITION

SCALE: N.T.S.

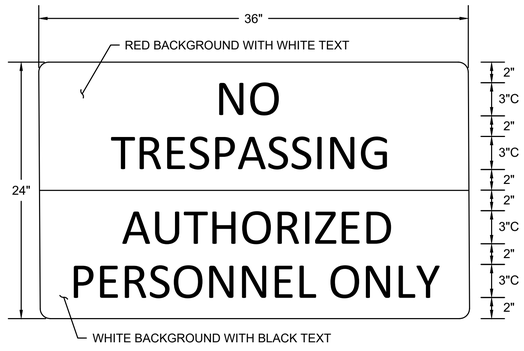


SECTION

NOTES:
1. PROVIDE EXPANSION JOINTS AT MIN 30' O.C. WITH PRE-MOULDED JOINT FILLER
2. PROVIDE TOOLED DUMMY JOINTS
3. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB

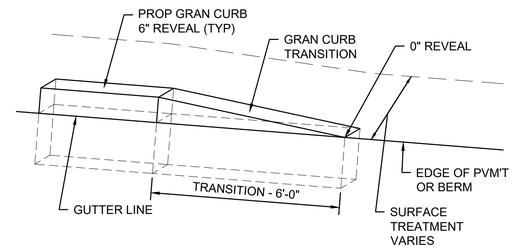
CEMENT CONCRETE SIDEWALK

SCALE: N.T.S.



- NO BORDER
- MATERIAL - FLAT SHEET ALUMINUM 0.08" INCHES THICK
- SIGN SHALL BE MOUNTED ON P5 POST AT ALL WORK ZONE ACCESS POINTS AND ON CONSTRUCTION FENCE FACING CONSTRUCTION PLATFORM AS NOTED ON THE PLANS.

NO TRESPASSING SIGN



GRANITE CURB TRANSITION PIECE

SCALE: N.T.S.

NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
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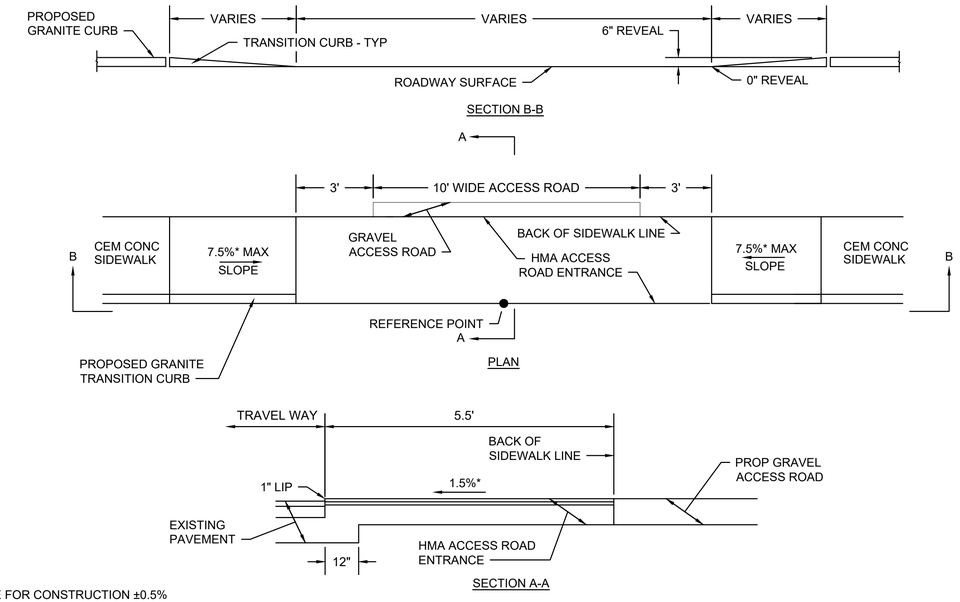
NTS	DEC 2021	MS	SK	MES	.	.

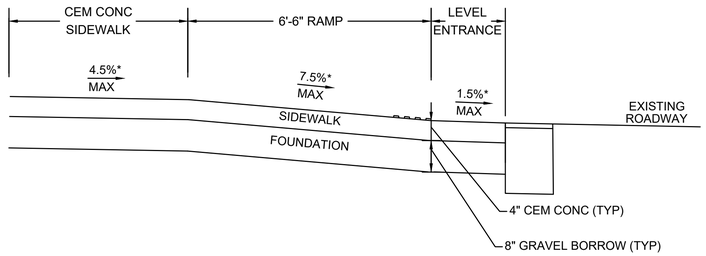
ACCESS ROAD CROSSING DATA									
NO.	LOCATION (REF POINT)	ROADWAY GUTTER	SIDEWALK WIDTH	LEFT SIDE		RIGHT SIDE		OPENING ELEVATION	COMMENTS
				REVEAL	TRANS	REVEAL	TRANS		
BOSTON POST ROAD (ROUTE 20) STATE HIGHWAY LAYOUT									
(1)	182+61.6, 9.6' LT	5.2%	5'-6"	6"	9'-0"	6"	7'-8"	134.31'	



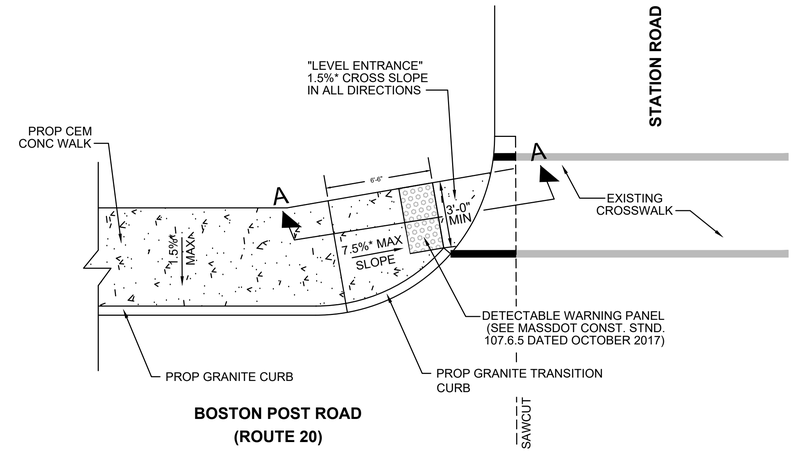
*TOLERANCE FOR CONSTRUCTION ±0.5%

TYPICAL ACCESS ROAD CROSSING WITH SIDEWALK AND WITHOUT CURB RETURNS

SCALE: N.T.S.



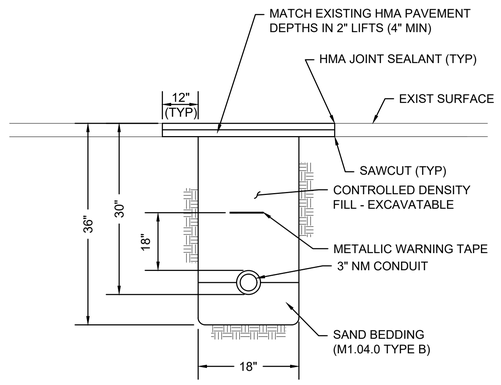
SECTION A-A



*TOLERANCE FOR CONSTRUCTION ±0.5%

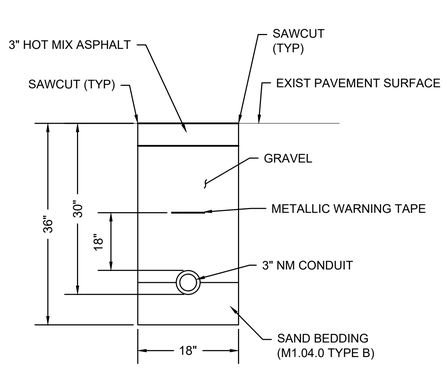
WHEELCHAIR RAMP #1

SCALE: N.T.S.



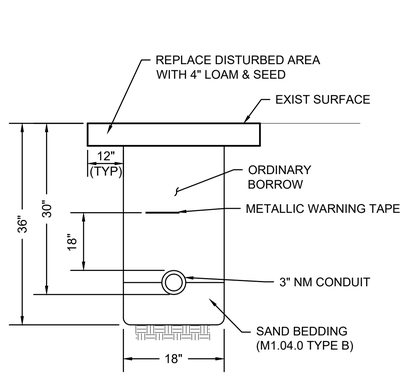
CONDUIT CROSSING ROADWAY/DRIVEWAY

SCALE: N.T.S.



CONDUIT IN SIDEWALK

SCALE: N.T.S.



CONDUIT IN GRASS

SCALE: N.T.S.

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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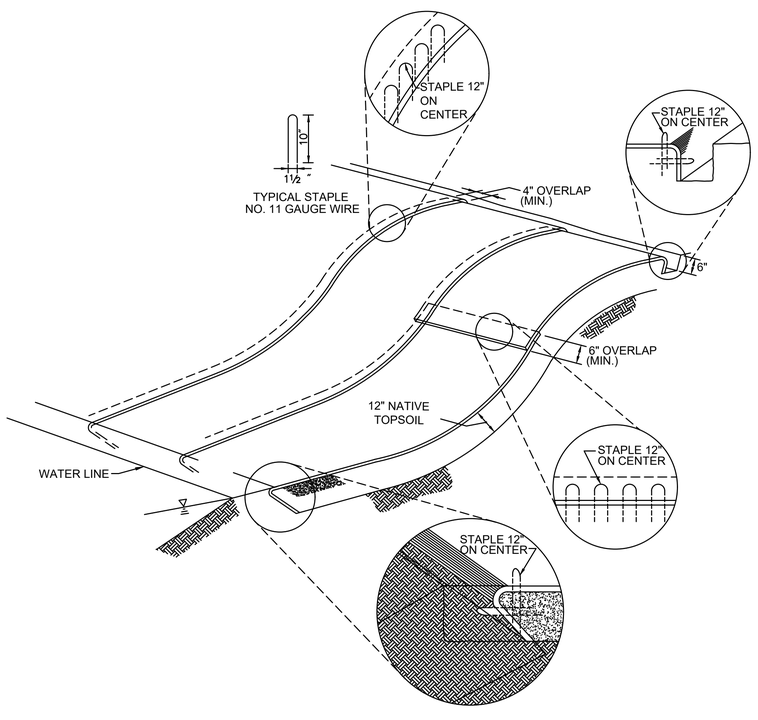
NOTES FOR BIONET C700BN EROSION CONTROL BLANKET:

1. METHOD OF INSTALLATION SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS.

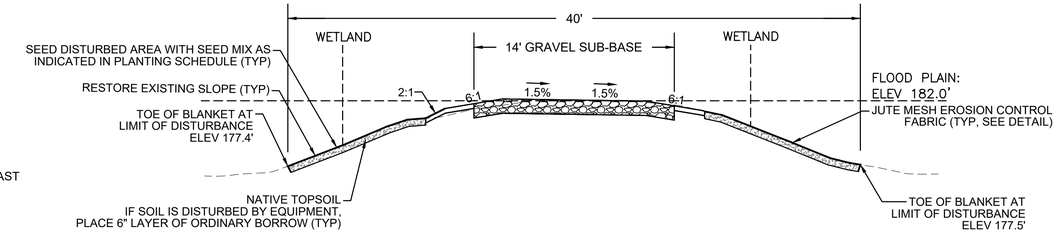
NOTES FOR JUTE MESH EROSION CONTROL FABRIC:

1. EROSION CONTROL FABRIC SHALL BE WESTERN EXCELSIOR CC-4 ALL-NATURAL OR SIMILAR. FABRIC MUST BE COMPOSED OF 100% BIODEGRADABLE MATERIAL, WITH NO SYNTHETIC NETTING OR STITCHING. NETTING SHALL BE JUTE, MATRIX FILLING SHALL BE EXCELSIOR, STRAW, OR COCONUT, AND STITCHING SHALL BE BIODEGRADABLE. FABRIC SHOULD BE RATED FOR SLOPES OF AT LEAST 2:1 AND LONGEVITY OF AT LEAST 12 MONTHS.
2. PREPARE SOIL BEFORE INSTALLING FABRIC, INCLUDING ANY NECESSARY APPLICATION OF LIME, AND SEED.
3. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE FABRIC IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF FABRIC EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE FABRIC WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF FABRIC BACK OVER SEED AND COMPACTED SOIL. SECURE FABRIC OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE FABRIC.
4. ROLL FABRIC FROM TOP OF SLOPE TO BOTTOM. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE.
5. INSTALL TREE, SHRUB, AND/OR PLUG PLANTINGS AT THE LOCATIONS INDICATED IN THE PLANTING SCHEDULE ON SHEET 161 OR AS DIRECTED BY THE WETLAND SCIENTIST AFTER UNROLLING FABRIC. LOCATE PLANTINGS AT ROLL SEAMS OR CUT SLIT IN BLANKET PERPENDICULAR TO ACCESS ROAD TO ACCOMMODATE PLANTING. PLANTING HOLES SHOULD BE HAND-DUG.
6. SECURE FABRIC AFTER PLANTINGS ARE INSTALLED. ALL FABRIC MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. DO NOT PLACE STAPLES OR STAKES WITHIN 2 FEET OF PLANTINGS. WHEN USING OPTIONAL DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
7. PLACE CONSECUTIVE FABRICS END OVER END (SHINGLE STYLE) WITH A 4"-6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE FABRIC.
8. FULL LENGTH EDGE OF FABRIC AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
9. ADJACENT FABRICS MUST BE OVERLAPPED APPROXIMATELY 2"-5" (DEPENDING ON FABRIC TYPE) AND STAPLED. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING FABRIC (FABRIC BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE FABRIC BEING OVERLAPPED.
10. FULL LENGTH EDGE OF FABRIC AT BOTTOM OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART. FABRIC SHALL HAVE A MINIMUM 6" RUNOUT LENGTH UNDER GEOWEB.
11. A MINIMUM OF 4 NOTCHED WOOD STAKES SHALL BE INSTALLED TO SECURE EACH FABRIC, ONE AT EACH CORNER.
12. THE TERMINAL END OF THE FABRIC MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.



JUTE MESH EROSION CONTROL FABRIC & BIONET C700BN EROSION CONTROL BLANKET

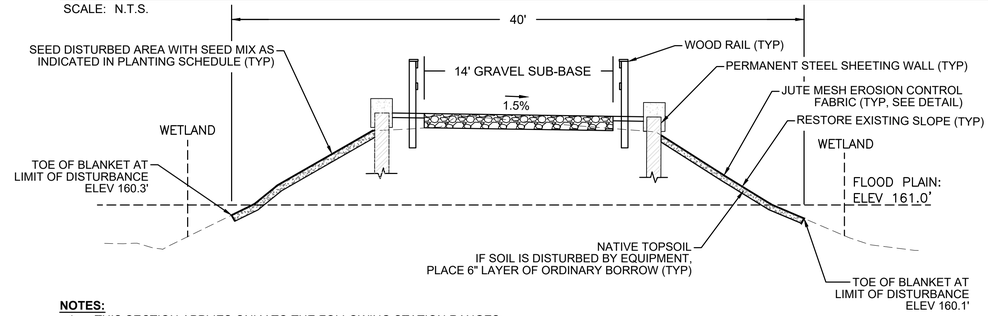
SCALE: N.T.S.



NOTES:
1. THIS SECTION APPLIES ONLY TO THE FOLLOWING STATION RANGES:
   STA 147+75 TO 148+50
   STA 149+00 TO 150+25
2. THE CROSS-SECTION FOR STATION 148+00 IS USED AS A REPRESENTATIVE AREA FOR THE PURPOSES OF THIS DETAIL.

TYPICAL CRANE MAT RESTORATION CROSS-SECTION - BRIDGE 130

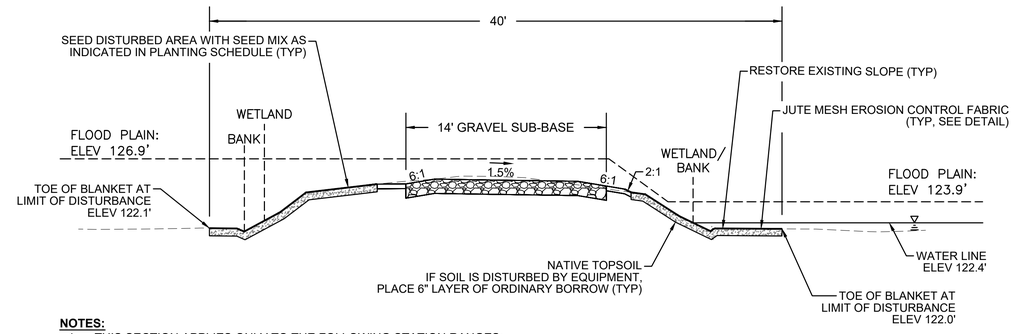
SCALE: N.T.S.



NOTES:
1. THIS SECTION APPLIES ONLY TO THE FOLLOWING STATION RANGES:
   STA 399+10 TO 400+20
   STA 400+75 TO 401+75
2. THE CROSS-SECTION FOR STATION 401+00 IS USED AS A REPRESENTATIVE AREA FOR THE PURPOSES OF THIS DETAIL.

TYPICAL CRANE MAT RESTORATION CROSS-SECTION - BRIDGE 128

SCALE: N.T.S.



NOTES:
1. THIS SECTION APPLIES ONLY TO THE FOLLOWING STATION RANGES:
   STA 724+40 TO 725+00
   STA 725+70 TO 726+40
2. THE CROSS-SECTION FOR STATION 726+00 IS USED AS A REPRESENTATIVE AREA FOR THE PURPOSES OF THIS DETAIL.

TYPICAL CRANE MAT RESTORATION CROSS-SECTION - BRIDGE 127

SCALE: N.T.S.

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
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PLANTING SCHEDULE A: GENERAL CONSTRUCTION CORRIDOR

HERBACEOUS SEED MIX		
SPECIES	WETLAND STATUS	%
VIRGINIA WILD RYE (*ELYMUS VIRGINICUS*)	FACW	25.00
CANADA WILD RYE (*ELYMUS CANADENSIS*)	FACU	25.00
LITTLE BLUESTEM (*SCHIZACHYRIUM SCOPARIUM*)	FACU	25.00
DEER-TONGUE GRASS (*DICHANTHELIUM CLANDESTINUM*)	FACW	8.00
UPLAND BENTGRASS (*AGROSTIS PERENNANS*)	FACU	8.00
FOX SEDGE (*CAREX VULPINOIDEA*)	OBL	2.00
PATH RUSH (*JUNCUS TENUIS*)	FAC	2.00
SOFT RUSH (*JUNCUS EFFUSUS*)	OBL	0.10
BEARD-TONGUE (*PENSTEMON DIGITALIS*)	FAC	2.00
NEW ENGLAND ASTER (*SYMPHYOTRICHUM NOVAE-ANGLIAE*)	FACW	1.00
WOODLAND GOLDENROD (*SOLIDAGO CAESIA*)	FACU	0.50
BLUE WOOD ASTER (*SYMPHYOTRICHUM CORDIFOLIUM*)	UPL	0.50
JOE-PYE WEED (*EUTROCHIUM MACULATUM*)	OBL	0.30
WHITE AVENS (*GEUM CANADENSE*)	FAC	0.30
RIGID GOLDENROD (*OLIGONEURON RIGIDUM*)	UPL	0.30

SHRUB SEED MIX		
SPECIES	WETLAND STATUS	LBS/AC
ALTERNATE-LEAVED DOGWOOD (*SWIDA ALTERNIFOLIA)*	FACU	2.00
AMERICAN HAZELNUT (*CORYLUS AMERICANA)*	FACU	2.00
ARROWWOOD (*VIBURNUM DENTATUM)*	FAC	2.00
NANNYBERRY (*VIBURNUM LENTAGO)*	FAC	2.00

NOTE: HERBACEOUS AND SHRUB SEED MIXES TO BE APPLIED AT AN APPLICATION RATE RECOMMENDED BY THE SUPPLIER

SOD SEED MIX	
SPECIES	%
KENTUCKY BLUEGRASS (*POA PRATENSIS)*	60-75
PERENNIAL RYEGRASS (*LOLIUM PERENNE)*	10-20
TALL FESCUE (*SCHEDONORUS ARUNDINACEUS)*	15

NOTE: SOD SEED MIX TO BE USED INSTEAD OF HERBACEOUS SEED MIX AND SHRUB SEED MIX FOR AREA OF INCREASED INFILTRATION P-10.13A (STA 753+50 TO STA 756+50)

PLANTING NOTES:

1. ALL PROPOSED PLANTING LOCATIONS SHALL BE STAKED AS SHOWN ON THE PLANS FOR FIELD REVIEW AND APPROVAL BY THE LANDSCAPE ARCHITECT OR ENVIRONMENTAL MONITOR PRIOR TO INSTALLATION.
2. ANY PROPOSED PLANT SUBSTITUTIONS MUST BE REVIEWED BY LANDSCAPE ARCHITECT AND APPROVED IN WRITING BY THE ENVIRONMENTAL MONITOR.
3. ONLY SPECIES ARE ALLOWED (NO HORTICULTURAL CULTIVARS OR VARIETIES).
4. SEED MIX AND PLANT STOCK SHALL BE OBTAINED FROM A NURSERY THAT SPECIALIZES IN NATIVE ECOLOGICAL PLANTINGS. PLANT STOCK SHALL BE SUPPLIED IN A PLANTING-READY CONDITION. ALL MATERIALS MUST BE INSPECTED AND APPROVED BY THE ENVIRONMENTAL MONITOR PRIOR TO BEING PLANTED. IF NOT PLANTED WITHIN 12 HOURS FROM WHEN THEY WERE COLLECTED, PLANTS SHALL BE STORED IN ACCORDANCE WITH RECOMMENDATIONS PROVIDED BY THE NURSERY.
5. PLANT STOCK WILL BE INSTALLED IN HAND-DUG HOLES IN LOCATIONS TO BE DETERMINED BY ENVIRONMENTAL MONITOR.
6. A 3-INCH DEEP MULCH PER SPECIFICATION SHALL BE INSTALLED UNDER ALL TREES AND SHRUBS, AND IN ALL PLANTINGS BEDS, UNLESS OTHERWISE INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENVIRONMENTAL MONITOR.
7. NO FERTILIZERS SHALL BE APPLIED.
7. NO PLANT MATERIALS SHALL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA. CONTRACTOR SHALL NOTIFY THE ENVIRONMENTAL MONITOR OF ANY CONFLICT.
8. ALL PLANT MATERIALS INSTALLED SHALL MEET THE SPECIFICATIONS OF THE "AMERICAN STANDARDS FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN AND CONTRACT DOCUMENTS.
9. ALL PLANT MATERIALS SHALL BE GUARANTEED FOR ONE YEAR FOLLOWING DATE OF FINAL ACCEPTANCE.
10. ALL TREES SHALL BE BALLED AND BURLAPPED, UNLESS OTHERWISE NOTED IN THE DRAWINGS OR SPECIFICATION, OR APPROVED BY THE ENVIRONMENTAL MONITOR.
11. FINAL QUANTITY FOR EACH PLANT TYPE SHALL BE AS GRAPHICALLY SHOWN ON THE PLAN. THIS NUMBER SHALL TAKE PRECEDENCE IN CASE OF ANY DISCREPANCY BETWEEN QUANTITIES SHOWN ON THE PLANT LIST AND ON THE PLAN. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES BETWEEN THE NUMBER OF PLANS SHOWN ON THE PLANT LIST AND PLANT LABELS PRIOR TO BIDDING.
12. AREAS DESIGNATED AS "LOAM & SEED" SHALL RECEIVE MINIMUM 4" OF LOAM AND SPECIFIED SEED MIX.
13. THIS PLAN IS INTENDED FOR PLANTING PURPOSES. REFER TO SITE/CIVIL DRAWINGS FOR ALL OTHER SITE CONSTRUCTION INFORMATION.

PLANT MAINTENANCE NOTES:

1. CONTRACTOR SHALL PROVIDE COMPLETE MAINTENANCE OF SEEDED AREAS AND PLANTINGS. NO IRRIGATION IS PROPOSED FOR THIS SITE. THE CONTRACTOR SHALL SUPPLY SUPPLEMENTAL WATERING FOR SEEDED AREAS AND PLANTINGS DURING THE ONE YEAR PLANT GUARANTEE PERIOD.
2. CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, AND EQUIPMENT FOR THE COMPLETE LANDSCAPE MAINTENANCE WORK. WATER SHALL BE PROVIDED BY THE CONTRACTOR.
3. WATERING SHALL BE REQUIRED DURING THE GROWING SEASON, WHEN NATURAL RAINFALL IS BELOW ONE INCH PER WEEK.
4. WATER SHALL BE APPLIED IN SUFFICIENT QUANTITY TO THOROUGHLY SATURATE THE SOIL IN THE ROOT ZONE OF EACH PLANT.
5. PROTECT PLANTING AREAS AND PLANTS AGAINST TRESPASSING AND DAMAGE OF ALL KINDS FOR THE DURATION OF THE MAINTENANCE PERIOD. IF ANY PLANTS BECOME DAMAGED OR INJURED, THEY SHALL BE TREATED OR REPLACED AS REQUIRED.
6. CONTRACTOR SHALL REPLACE DEAD OR DYING PLANTS AT THE END OF THE ONE YEAR GUARANTEE PERIOD. CONTRACTOR SHALL TURN OVER MAINTENANCE TO THE FACILITY MAINTENANCE STAFF AT THAT TIME.

NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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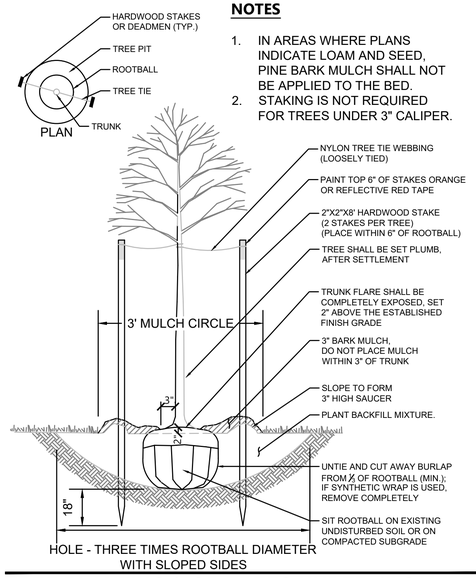
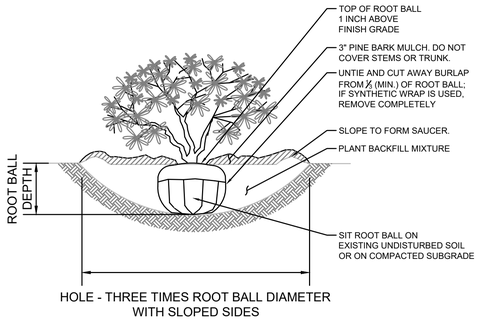


NOTES

1. IN AREAS WHERE PLANS INDICATE LOAM AND SEED, PINE BARK MULCH SHALL NOT BE APPLIED TO THE BED.
2. STAKING IS NOT REQUIRED FOR TREES UNDER 3" CALIPER.

TREE PLANTING (FOR TREES UNDER 4" CALIPER)

SCALE: NTS



NOTES

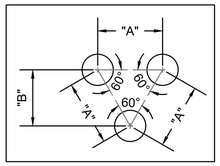
1. IN AREAS WHERE PLANS INDICATE LOAM AND SEED, PINE BARK MULCH SHALL NOT BE APPLIED TO THE BED.
2. LOOSEN ROOTS AT THE OUTER EDGE OF ROOTBALL OF CONTAINER GROWN SHRUBS.

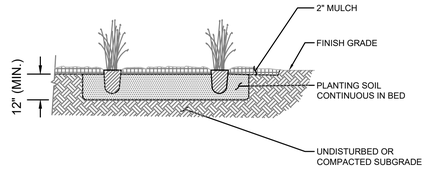
SHRUB PLANTING

SCALE: NTS

PLANT SPACING

PLANT SPACING("A")	ROW SPACING ("B")
6 IN. O.C.	5 IN. O.C.
8 IN. O.C.	7 IN. O.C.
10 IN. O.C.	8 ½ IN. O.C.
12 IN. O.C.	10 ½ IN. O.C.
15 IN. O.C.	13 IN. O.C.
18 IN. O.C.	16 IN. O.C.
24 IN. O.C.	21 IN. O.C.
30 IN. O.C.	26 IN. O.C.
36 IN. O.C.	30 IN. O.C.
48 IN. O.C.	42 IN. O.C.
54 IN. O.C.	48 IN. O.C.
60 IN. O.C.	54 IN. O.C.



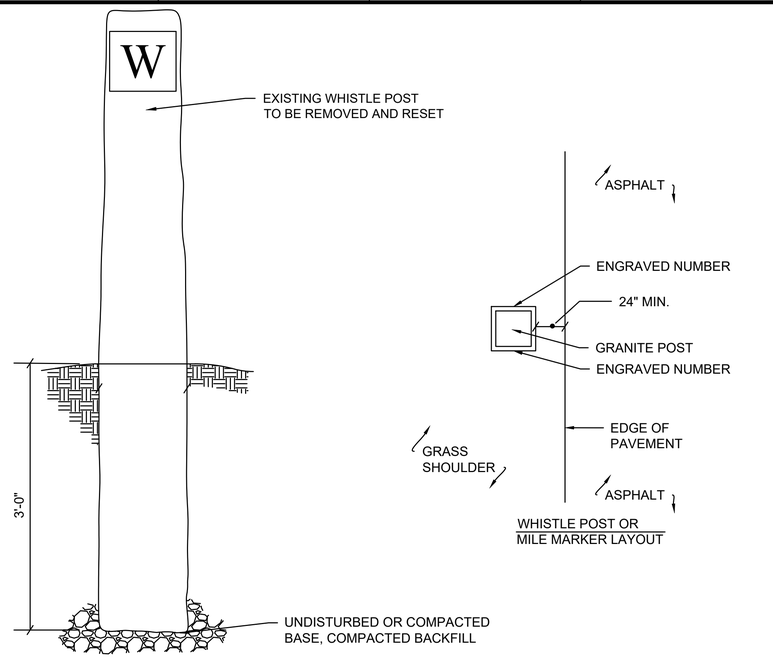


NOTES

1. IN AREAS WHERE PLANS INDICATE LOAM AND SEED, PINE BARK MULCH SHALL NOT BE APPLIED TO THE BED.

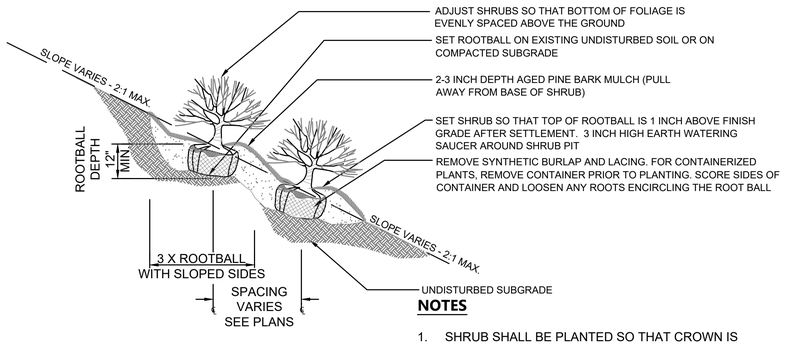
PERENNIAL PLANTING

SCALE: NTS



WHISTLE POST OR MILE MARKER DETAIL

SCALE: NTS

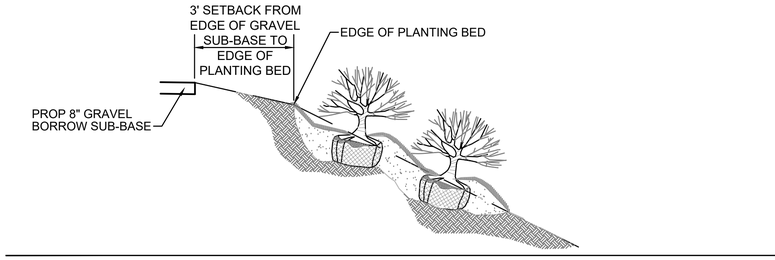


NOTES

1. SHRUB SHALL BE PLANTED SO THAT CROWN IS 2 INCHES ABOVE GRADE AFTER SETTLEMENT.

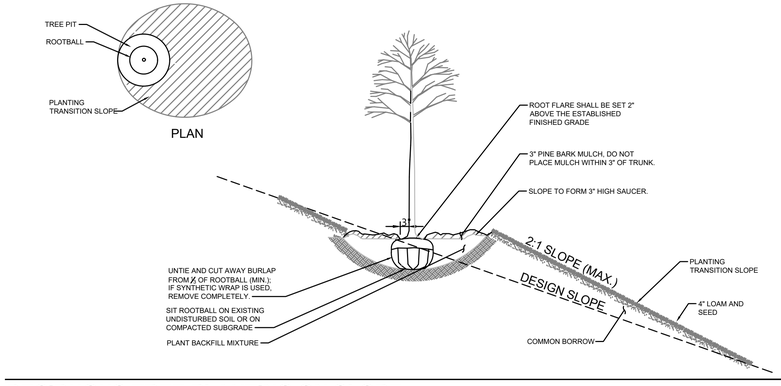
SHRUB PLANTING ON SLOPE

SCALE: N.T.S.



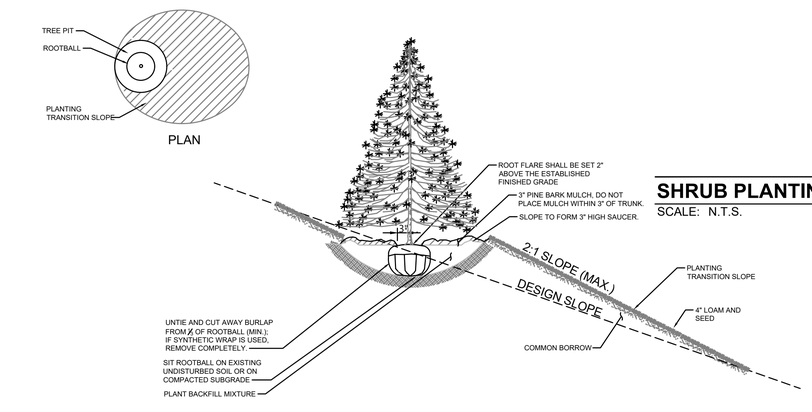
3' PLANTING BED SETBACK FROM GRAVEL SUB-BASE

SCALE: N.T.S.



DECIDUOUS TREE PLANTING ON SLOPE

SCALE: N.T.S.



EVERGREEN TREE PLANTING ON SLOPE

SCALE: N.T.S.

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

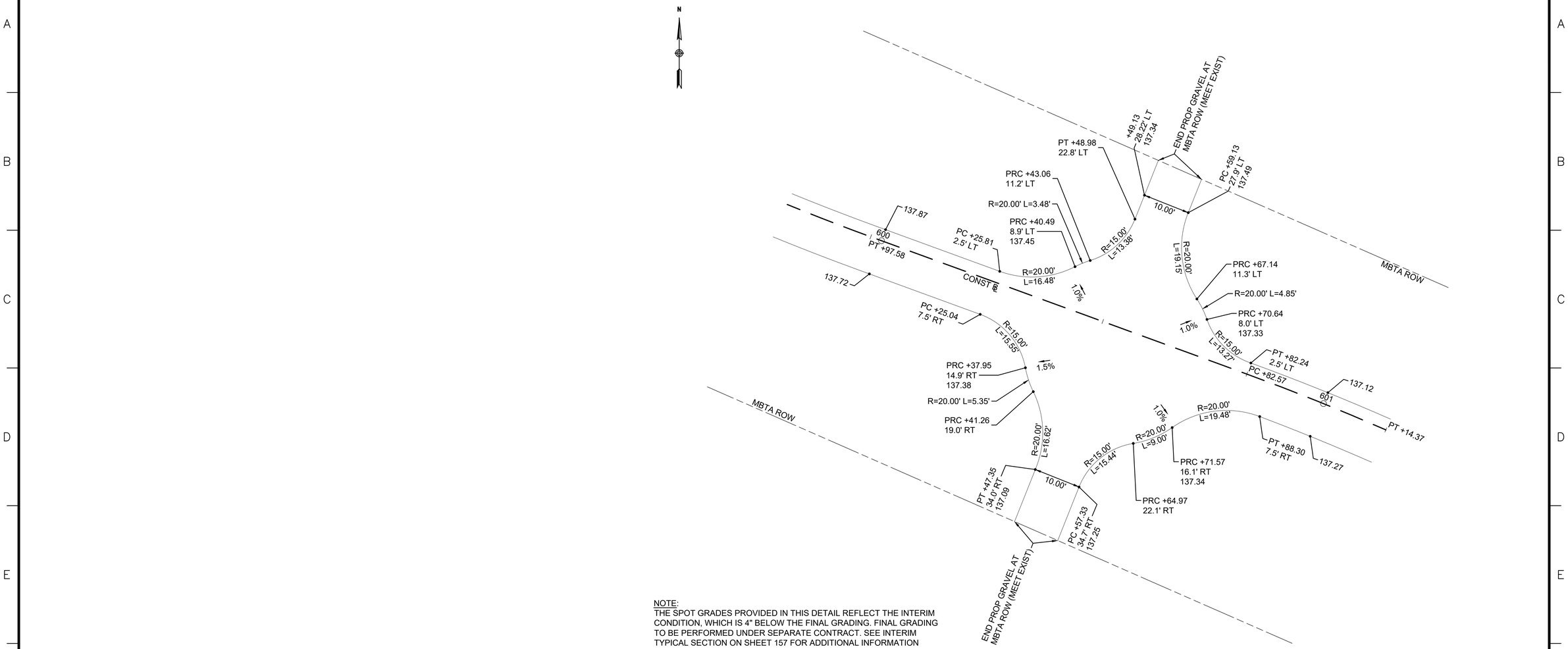
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CONSTRUCTION DETAILS

PLAN 162 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
NTS	DEC 2021	MS	SK	MES	.	.



NOTE:
THE SPOT GRADES PROVIDED IN THIS DETAIL REFLECT THE INTERIM CONDITION, WHICH IS 4" BELOW THE FINAL GRADING. FINAL GRADING TO BE PERFORMED UNDER SEPARATE CONTRACT. SEE INTERIM TYPICAL SECTION ON SHEET 157 FOR ADDITIONAL INFORMATION

ROUNDABOUT

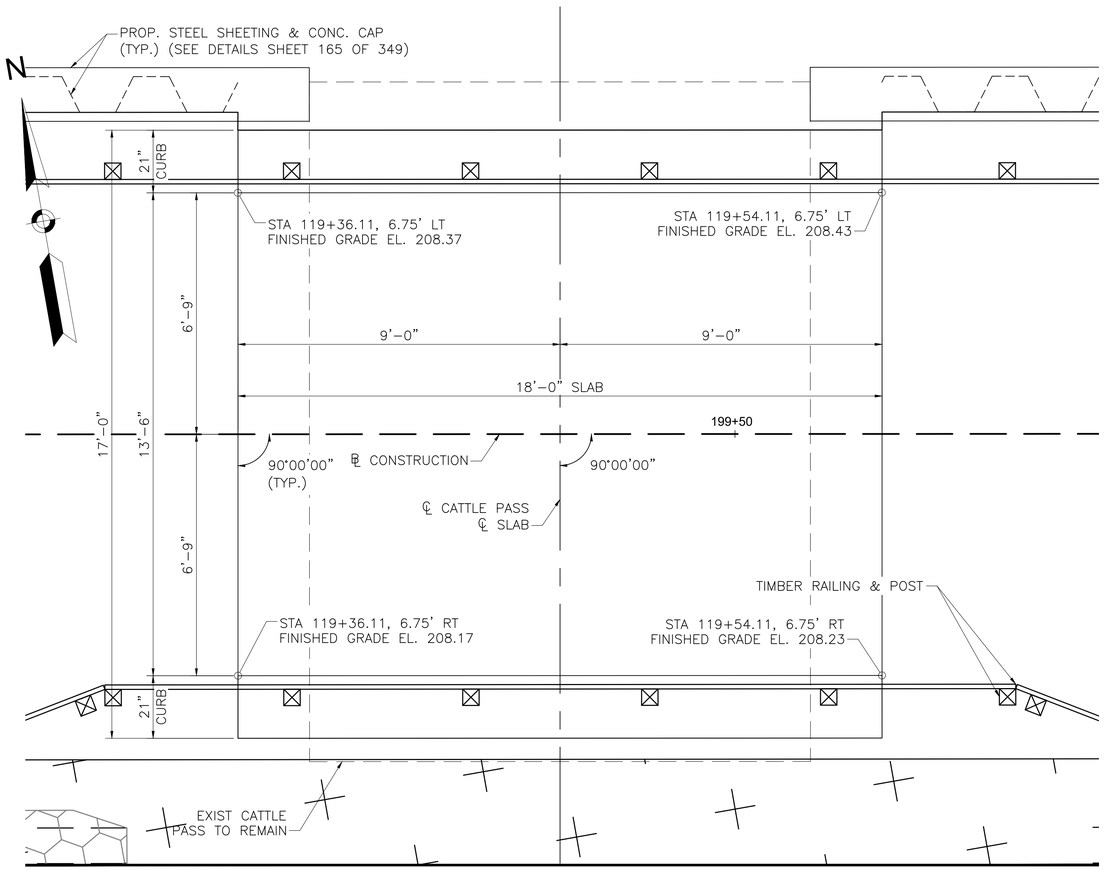
SCALE: 1"=10'

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

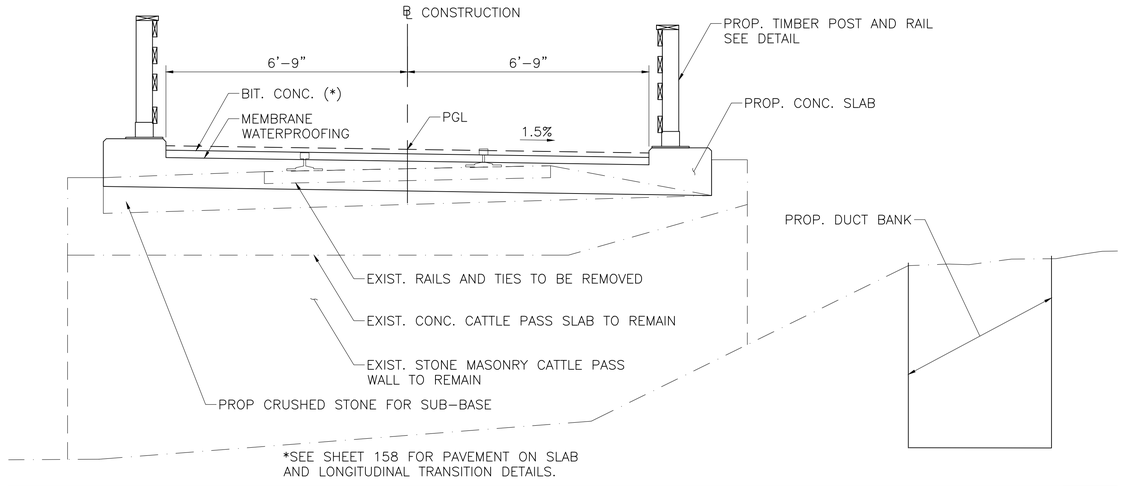
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CONSTRUCTION DETAILS
PLAN 163 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
NTS	DEC 2021	MS	SK	MES	.	.



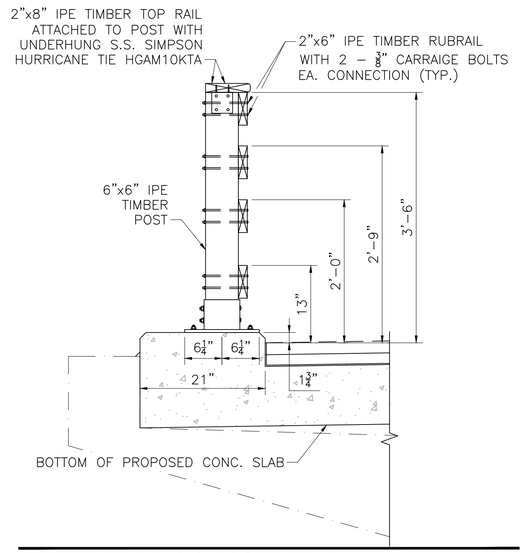
CATTLE PASS PLAN

SCALE: $\frac{1}{2}$"=1'-0"



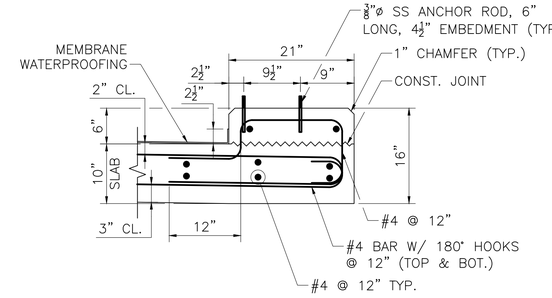
CATTLE PASS SECTION

SCALE: $\frac{1}{2}$"=1'-0"



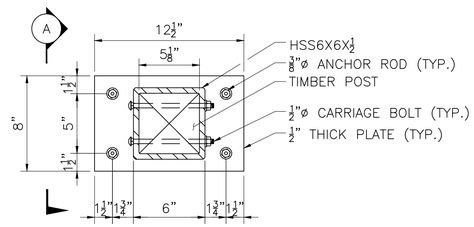
TIMBER RAILING & POST DETAIL

SCALE: $\frac{1}{2}$"=1'-0"



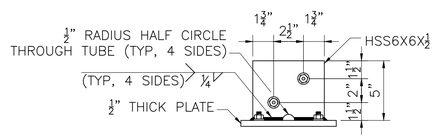
SLAB REINFORCING DETAIL

SCALE: $\frac{1}{2}$"=1'-0"



POST BASE DETAIL

SCALE: 1"=0'-6"



SECTION A

SCALE: 1"=0'-6"

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

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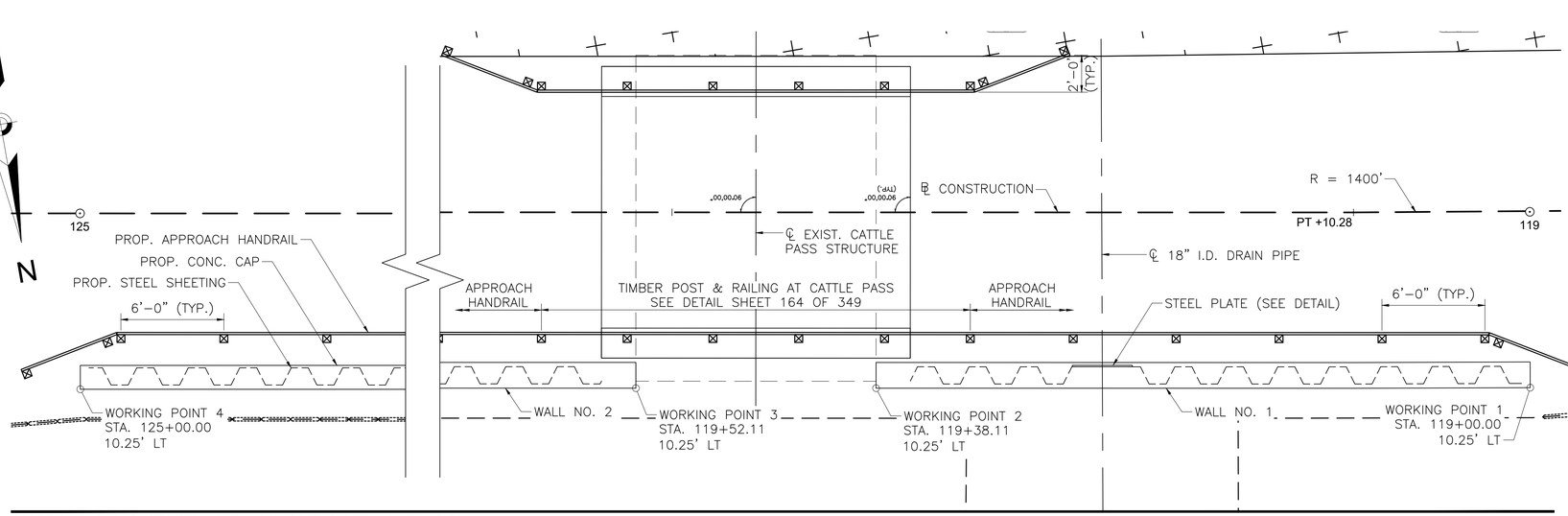
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH, & SUDBURY MASSACHUSETTS

CONSTRUCTION DETAILS

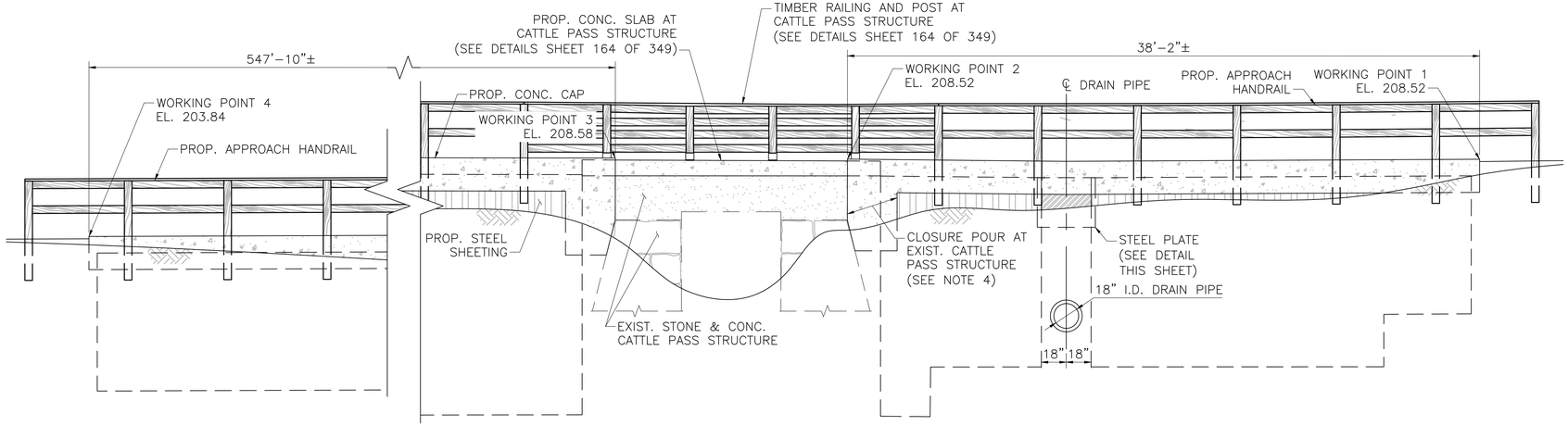
PLAN 164 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
VARIES	DEC 2021	AMS	SBK	KGK	.	.



WALL 1 & 2 SHEETING PLAN (AT CATTLE PASS)

SCALE: $\frac{1}{4}$"=1'-0"

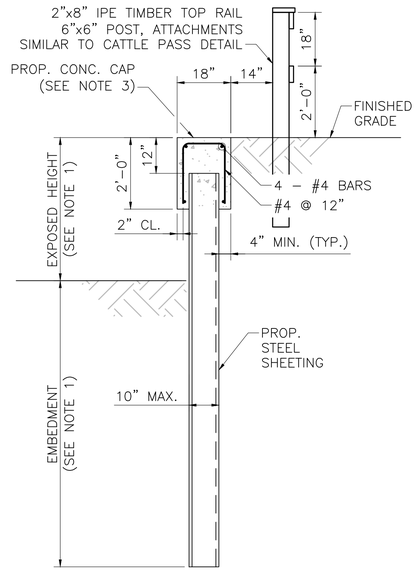


WALL 1 & 2 ELEVATION (AT CATTLE PASS)

SCALE: $\frac{1}{4}$"=1'-0"

NOTES:

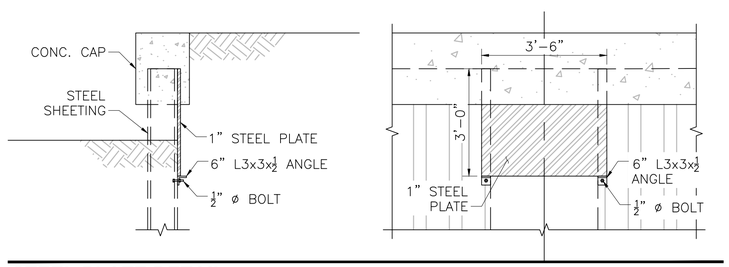
1. WALL EXPOSED HEIGHT TO BE VERIFIED IN FIELD. SHEETING EMBEDMENT DEPTH VARIES WITH WALL EXPOSED HEIGHT. SEE SHEETING EMBEDMENT TABLE BELOW.
2. SHEETING SECTION SHALL BE SELECTED BY CONTRACTOR. STEEL SHEETING SHALL BE GRADE 50 STEEL IN ACCORDANCE WITH ASTM A328 WITH A MINIMUM SECTION MODULUS (S_X) OF 7.08 IN^3 PER FOOT.
3. CONC. CAP SHALL BE 4000 PSI, $\frac{3}{4}$", 610 CEMENT CONCRETE. REINFORCING STEEL SHALL BE GRADE 60 EPOXY COATED STEEL IN ACCORDANCE WITH AASHTO M31. CONSTRUCTION JOINTS IN CAP SHALL BE SPACED AT 24'-0" MAX. CONTRACTOR SHALL SUBMIT JOINT LAYOUT PLAN TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. REINFORCEMENT SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINT.
4. CONTRACTOR SHALL DETERMINE LIMITS OF EXISTING STONE BLOCK CATTLE PASS STRUCTURE PRIOR TO DRIVING SHEETING. SHEETING SHALL BE DRIVEN AS CLOSE TO THE BACK OF THE EXISTING ABUTMENTS AS PRACTICAL. WORKING POINT STATION/OFFSET AT THESE LOCATIONS (3, 6, 7, AND 10) IS SUBJECT TO CHANGE BASED ON CONDITIONS ENCOUNTERED IN THE FIELD. CONCRETE CAP SHALL BE EXTENDED AS NEEDED TO FORM A CLOSURE POUR BETWEEN END OF SHEETING AND BACK OF EXISTING ABUTMENT. HEIGHT OF CAP SHALL BE INCREASED AT CLOSURE POUR AS NEEDED TO MAINTAIN REQUIRED GRADE SEPARATION.



TYPICAL SHEETING SECTION

SCALE: $\frac{1}{2}$"=1'-0"

SHEETING EMBEDMENT TABLE	
EXPOSED HEIGHT	EMBEDMENT
2'-0" (MAX.)	7'-4" (MIN.)
3'-0" (MAX.)	9'-5" (MIN.)
4'-0" (MAX.)	11'-6" (MIN.)
5'-0" (MAX.)	13'-7" (MIN.)
6'-0" (MAX.)	15'-7" (MIN.)
7'-0" (MAX.)	17'-7" (MIN.)



STEEL PLATE DETAIL

SCALE: $\frac{1}{2}$"=1'-0"

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	REVISION			

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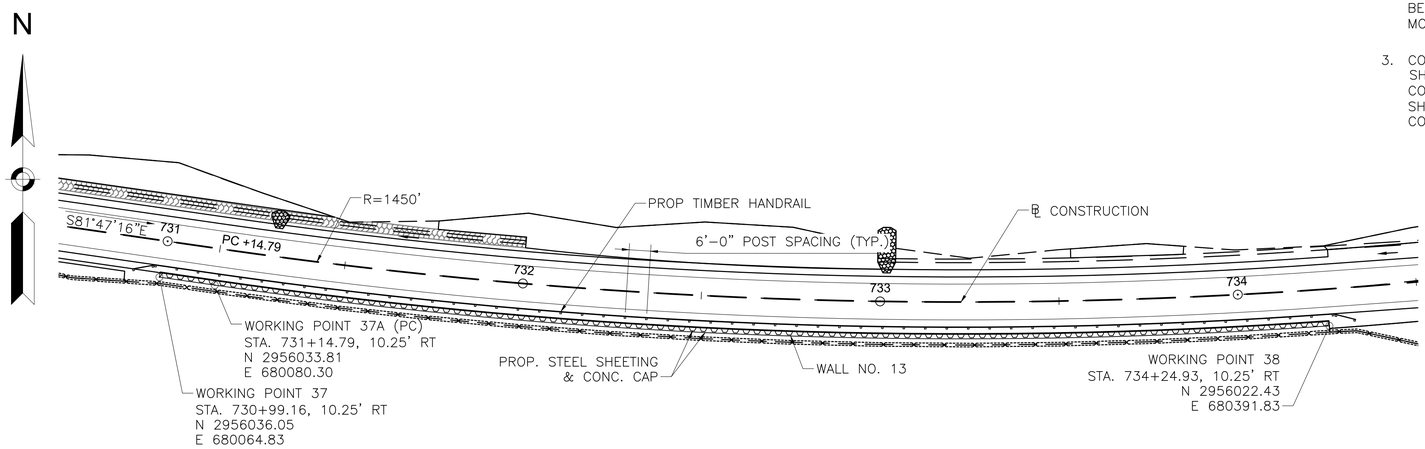
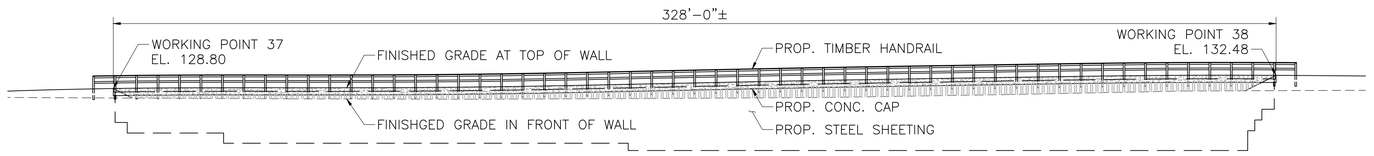
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH, & SUDBURY MASSACHUSETTS
CONSTRUCTION DETAILS
PLAN 165 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
VARIES	DEC 2021	AMS	SBK	KGK	.	.



WALL 13 SHEETING PLAN

SCALE: 1"=20'-0"



WALL 13 ELEVATION

SCALE: $\frac{1}{4}$"=1'-0"

NOTES:

1. WALL EXPOSED HEIGHT TO BE VERIFIED IN FIELD. SHEETING EMBEDMENT DEPTH VARIES WITH WALL EXPOSED HEIGHT. SEE TYPICAL SHEETING SECTION AND SHEETING EMBEDMENT TABLE SHEET 165 OF 349.
2. SHEETING SECTION SHALL BE SELECTED BY CONTRACTOR. STEEL SHEETING SHALL BE GRADE 50 STEEL IN ACCORDANCE WITH ASTM A328 WITH A MINIMUM SECTION MODULUS (S_X) OF 7.08 IN^3 PER FOOT.
3. CONC. CAP SHALL BE 4000 PSI, $\frac{3}{4}$", 610 CEMENT CONCRETE. REINFORCING STEEL SHALL BE GRADE 60 EPOXY COATED STEEL IN ACCORDANCE WITH AASHTO M31. CONSTRUCTION JOINTS IN CAP SHALL BE SPACED AT 24'-0" MAX. CONTRACTOR SHALL SUBMIT JOINT LAYOUT PLAN TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. REINFORCEMENT SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINT.

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NO.	DESCRIPTION	BY	DATE	APPR.
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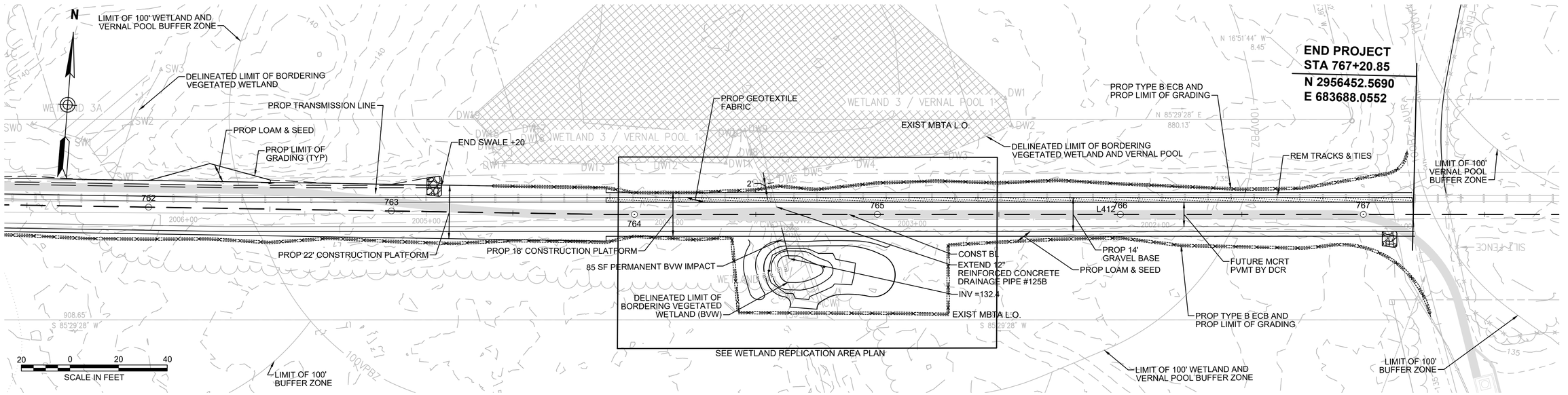
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

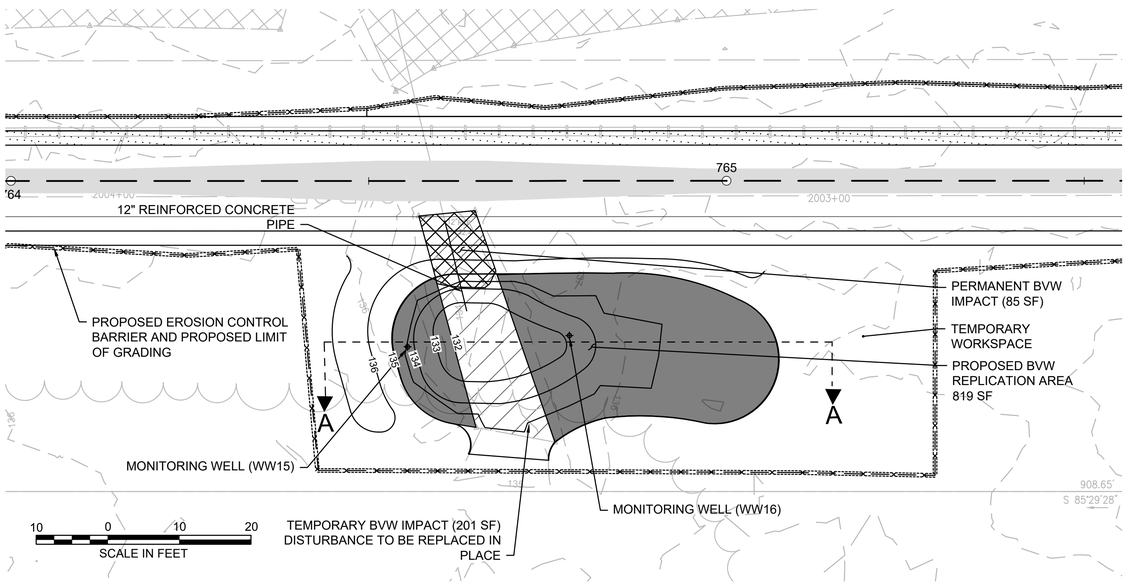
HUDSON, STOW, MARLBOROUGH, & SUDBURY MASSACHUSETTS

CONSTRUCTION DETAILS

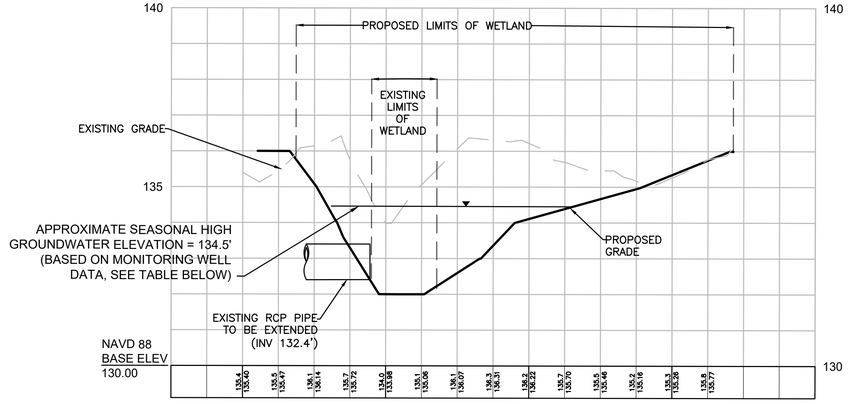
PLAN 166 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
VARIES	DEC 2021	AMS	SBK	KGK	.	.





WETLAND REPLICATION AREA PLAN
SCALE 1"= 10'



SECTION A-A
VERTICAL SCALE 1"= 5'
HORIZONTAL SCALE 1"= 30'

LEGEND

TEMPORARY BVW IMPACTS (201 SF)

PERMANENT BVW IMPACTS (85 SF)

PROPOSED BVW REPLICATION AREA (819 SF)

GROUNDWATER DEPTH (FT)

DATE	WW15*	WW16*
12/5/2018	1.50	1.46
1/10/2019	1.55	1.58
2/12/2019	1.60	N/A
3/27/2019	1.56	1.55
4/18/2019	1.57	1.54
4/25/2019	1.48	1.46
5/23/2019	1.58	1.62

*WW15 AND WW16 LOCATED AT APPROXIMATELY ELEV 136'

NOTES:
1. WETLAND BOUNDARIES SHOWN HEREIN ARE THE SAME AS THOSE SHOWN ON HUDSON AND SUDBURY ANRAD PLANS (2018).
2. CONTRACTOR TO INSTALL GEOTEXTILE FABRIC UNDERNEATH 12" GRAVEL BORROW WITHIN LIMITS SHOWN.

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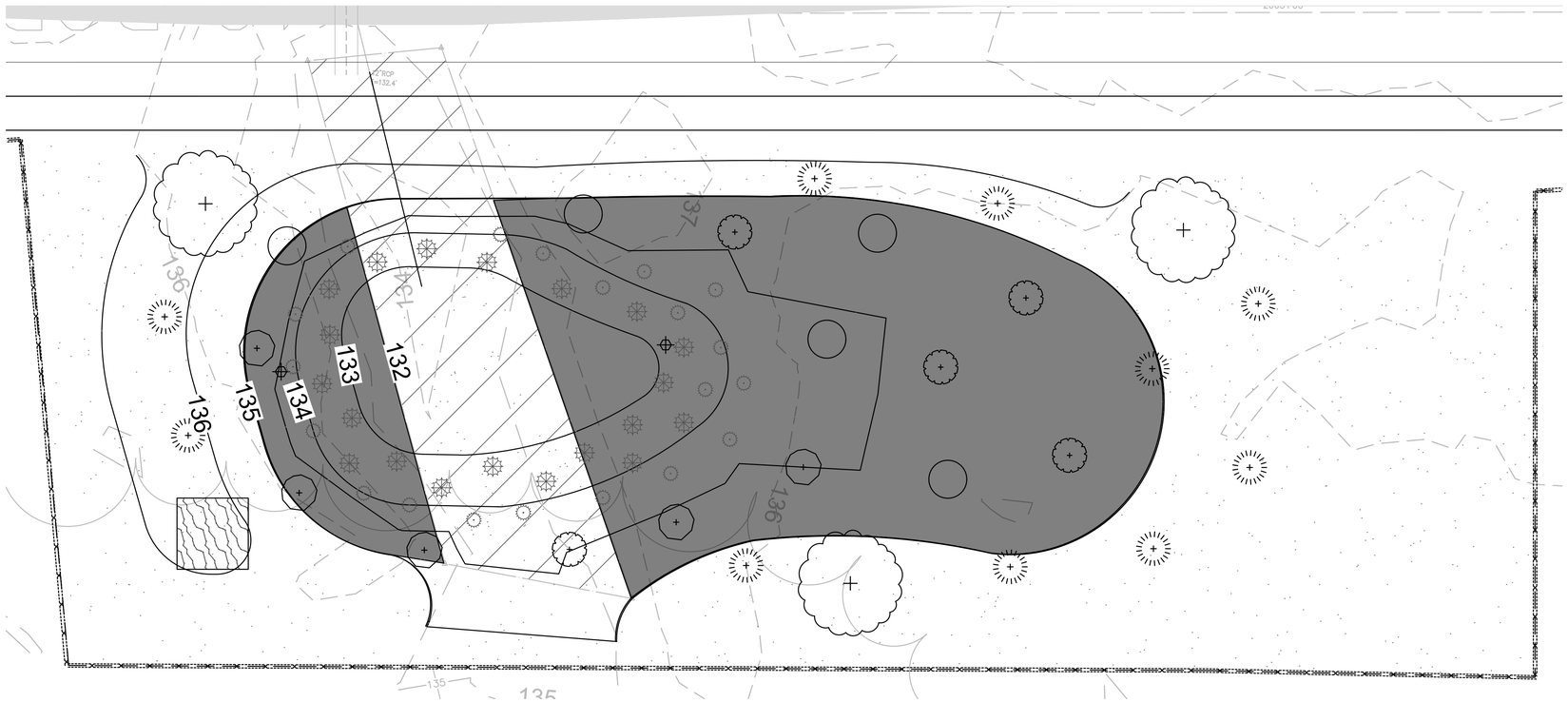
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
WETLAND REPLICATION GRADING PLAN
PLAN 167 OF 349

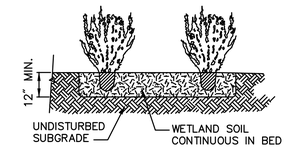
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=20'	DEC 2021	MBB	EJM	MAC		



WETLAND REPLICATION PLANTING PLAN
SCALE 1"= 4'

Specimen	Wetland Status	Plant Type	Plant Size	Quantity	Density/Spacing
Basin Embankment:					
buttonbush (*Cephalanthus occidentalis*)	OBL	Shrub	18-24 inches	5	6-8 ft. on center
arrow arum (*Peltandra virginica*)	OBL	Herbaceous	2" plug	20	2-3 ft. on center
swamp rose	OBL	Shrub	18-24 inches	5	6 ft. on center
giant bur-reed (*Sparganium eurycarpum*)	OBL	Herbaceous	2" plug	20	2-3 ft. on center
silky dogwood (*Swida amomum*)	FACW	Shrub	18-24 inches	5	6 ft. on center
Wetland seed mix[1]	--	Herbaceous	--		18 lb./ac
Surrounding Buffer Zone:					
red maple (*Acer rubrum*)	FAC	Tree	1-2" caliper	3	15 ft. on center
sweet pepperbush (*Clethra alnifolia*)	FAC	Shrub	18-24 inches	10	6 ft. on center
Wetland seed mix[1]	--	Herbaceous	--		18 lb./ac

[1]Wetland seed mix "New England Wetmix" from New England Wetland Plants, Inc. or similar. Typical species: fox sedge (Carex vulpinoidea), sallow sedge (Carex lurida), broom sedge (Carex scoparia), sensitive fern (Onoclea sensibilis), blue vervain (Verbena hastata), hop sedge (Carex lupulina), dark-green bulrush (Scirpus atrovirens), nodding bur-marigold (Bidens cernua), bristly sedge (Carex comosa), fringed sedge (Carex crinita), tall mannagrass (Glyceria grandis), wool-grass (Scirpus cyperinus), soft rush (Juncus effusus), spotted Joe-Pye-weed (Eutrochium maculatum), boneset (Eupatorium perfoliatum), American water-plantain (Alisma subcordatum), New England aster (Symphyotrichum novae-angliae), rattlesnake mannagrass (Glyceria canadensis), purple-stem aster (Symphyotrichum puniceum), soft-stemmed bulrush (Schoenoplectus tabernaemontani), blueflag (Iris versicolor), swamp milkweed (Asclepias incarnata), and Allegheny monkey-flower (Mimulus ringens).



Shrub Planting 6/08
N.T.S. Source: VHB LD_691

NOTES:

1. CONSTRUCTION OF THE WETLAND REPLICATION AREA WILL INCLUDE GRADING, SOILS PLACEMENT, AND PLANTING, AND ALL WORK SHALL BE PERFORMED UNDER THE SUPERVISION OF AN EXPERIENCED WETLAND SCIENTIST. ALL PLANTINGS SHALL BE PERFORMED IN SPRING (APRIL 15 TO JUNE 15) OR FALL (SEPTEMBER 1 TO OCTOBER 31).
2. AN EROSION CONTROL BARRIER WILL CONSIST OF SYNCOPATED SILT FENCE (TYPE B EROSION CONTROL BARRIER) AND SHALL BE INSTALLED ALONG THE ENTIRE PERIMETER OF THE REPLICATION AREA EXCEPT AT THE UPGRADIENT EDGE TO ALLOW ACCESS TO MACHINERY.
3. ALL AREAS TO BE PLANTED AS PART OF THE REPLICATION AREA SHALL BE CLEARED AND GRUBBED (AS NEEDED) AND SHALL BE EXCAVATED TO A DEPTH OF 12 INCHES BELOW THE FINAL DESIGN ELEVATIONS. MINOR MODIFICATIONS TO THE GRADING PLAN MAY BE MADE IN THE FIELD BY THE SUPERVISING WETLAND SCIENTIST IN RESPONSE TO HYDROLOGIC CONDITIONS. THE SUPERVISING WETLAND SCIENTIST WILL INSPECT THE FINAL SUB-GRADE OF THE REPLICATION AREA TO ENSURE THAT THE PROPER HYDROLOGY HAS BEEN ESTABLISHED.
4. THE TWELVE-INCH DBH SNAG THAT WILL BE REMOVED DURING CONSTRUCTION WILL BE REINSTALLED WITH A SIGNIFICANT PORTION OF THE ROOT MASS INTACT. THE SNAG WILL BE FIRMLY ENTRENCHED TO PREVENT FUTURE WINDTHROW.
5. THE REPLICATION AREA WILL THEN BE BACKFILLED WITH PREPARED WETLAND SOIL. PREPARED SOILS SHALL CONSIST OF A 1:1 MIXTURE (OR EQUAL VOLUMES) OF ORGANIC AND MINERAL MATERIALS (IN THE SILT LOAM, LOAM, OR LOAMY SAND RANGE) TO INCREASE THE ORGANIC CARBON CONTENT TO BETWEEN 4 AND 12 PERCENT BY WEIGHT. CLEAN LEAF OR COMMERCIALLY AVAILABLE COMPOST IS THE PREFERRED AMENDMENT TO ACHIEVE THIS STANDARD, ALTHOUGH OTHER MATERIALS MAY BE USED IF APPROVED BY THE SUPERVISING WETLAND SCIENTIST. AREAS TO BE PLANTED AS BVW SHOULD BE GRADED IN A SLIGHTLY IRREGULAR FASHION TO ALLOW FOR SMALL HUMMOCKS AND HOLLOWS APPROXIMATELY 6 INCHES ABOVE AND BELOW GRADE TO CREATE A PIT AND MOUND TOPOGRAPHY.
6. FALLEN LOGS, BRANCHES, AND OTHER NATURAL MATERIALS SHALL BE DISTRIBUTED IN THE REPLICATION AREA TO PROVIDE ADDITIONAL WILDLIFE HABITAT. THESE MATERIALS SHALL COVER 2 TO 4 PERCENT OF THE REPLICATION AREA'S SURFACE AND SHALL NOT INCLUDE ANY KNOWN INVASIVE SPECIES. WOODY MATERIAL SHOULD VARY IN SIZE AND DEGREE OF DECOMPOSITION.
7. ONCE WETLAND SOILS AND ANY NATURAL MATERIALS HAVE BEEN PLACED, ANY EQUIPMENT OR VEHICLES EXERTING A GROUND PRESSURE OF 3 PSI OR GREATER SHALL NO LONGER BE ALLOWED IN THE REPLICATION AREA TO AVOID COMPACTING THE WETLAND SOILS.
8. PLANTINGS WILL BE INSTALLED ONCE THE ABOVE TASKS HAVE BEEN COMPLETED. ALL SHRUB PLANTING WORK SHALL BE PERFORMED BY HAND USING HAND TOOLS ONLY. THE SPECIES, SIZE, AND QUANTITY OF PLANTINGS SHALL FOLLOW THE PLANTING SCHEDULE. ONLY PLANT MATERIALS NATIVE TO THE REGION SHALL BE USED. IN THE EVENT THAT PLANT SUBSTITUTIONS ARE NECESSARY, THE SUPERVISING WETLAND SCIENTIST OR ANOTHER QUALIFIED WETLAND SCIENTIST OR BOTANIST SHALL BE CONSULTED. ALL WOODY PLANT STOCK SHALL EITHER BE BARE-ROOT OR CONTAINER-GROWN. PLANTINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE DESIGN SPECIFIED ON THE PLAN, ALTHOUGH THE SUPERVISING WETLAND SCIENTIST MAY DIRECT THE PROJECT CONTRACTOR TO RELOCATE PLANTINGS BASED ON FIELD CONDITIONS.
9. FOLLOWING SHRUB PLANTINGS, THE AREA WILL BE SEEDED WITH A NATIVE WETLAND SEED MIX AS SPECIFIED IN THE PLANTING SCHEDULE OR A SIMILAR MIX. THE SEED MIX SHALL BE APPLIED AT A RATE AND IN A MANNER ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.
10. FOLLOWING COMPLETION OF PLANTING AND SEEDING, A LINE OF EROSION CONTROLS WILL BE INSTALLED ALONG THE UPGRADIENT EDGE OF THE REPLICATION AREA. ALL EROSION CONTROLS AROUND THE REPLICATION AREA SHALL REMAIN IN PLACE UNTIL VEGETATION IS WELL-ESTABLISHED AND SOILS HAVE STABILIZED. EROSION CONTROLS WILL REMAIN IN PLACE UNTIL REMOVAL HAS BEEN APPROVED BY THE ENVIRONMENTAL MONITOR.
11. THE REPLICATION AREA WILL BE MONITORED FOR TWO FULL GROWING SEASONS AFTER PLANTING. THE AREA WILL BE INSPECTED TWICE PER YEAR TO ASSESS WHETHER THE AREA HAS ACHIEVED 75 PERCENT COVER BY REGIONAL INDIGENOUS WETLAND SPECIES. CONSIDERATION WILL BE GIVEN TO OTHER NATIVE WETLAND PLANT SPECIES THAT BECOME ESTABLISHED IN THE REPLICATION.
12. INVASIVE SPECIES WITHIN THE REPLICATION AREA SHALL BE REMOVED BY HAND FOR TWO GROWING SEASONS AFTER PLANTING. IF NECESSARY ANY AREAS WHERE INVASIVE SPECIES HAVE BEEN REMOVED WILL BE RESEEDED WITH A SUITABLE WETLAND SEED MIX.
13. SHRUBS AND SEED MIX ARE SUBJECT TO CHANGE OR SUBSTITUTION PENDING AVAILABILITY AND ACTUAL SITE CONDITIONS.

LEGEND

WETLAND SEED MIX
REPLICATION AREA/WETLAND SEED MIX
RED MAPLE
BUTTONBUSH
SWEET PEPPERBUSH
SILKY DOGWOOD
SWAMP ROSE
GIANT BUR-REED
ARROW ARUM
TREE SNAG

NO.	DESCRIPTION	BY	DATE	APPR.

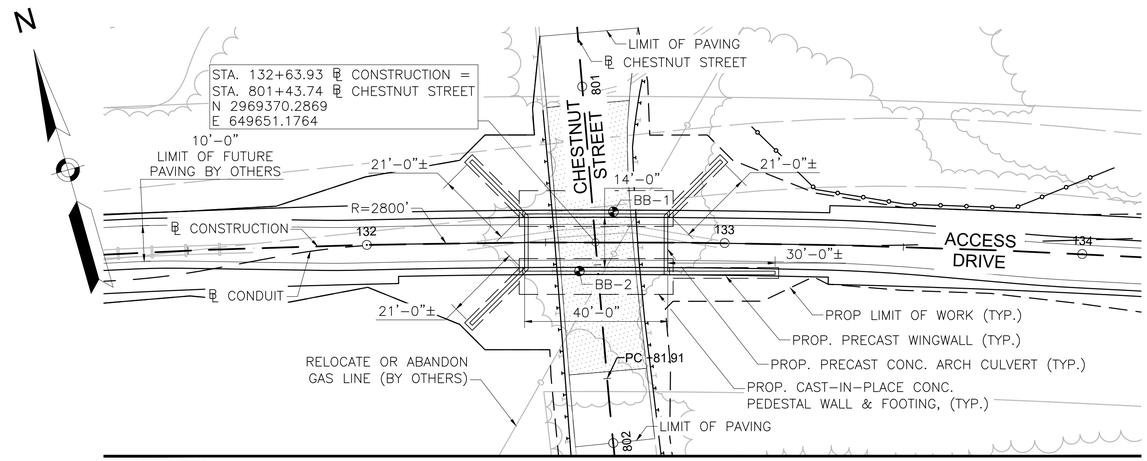
REVISION

Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

EVERSOURCE

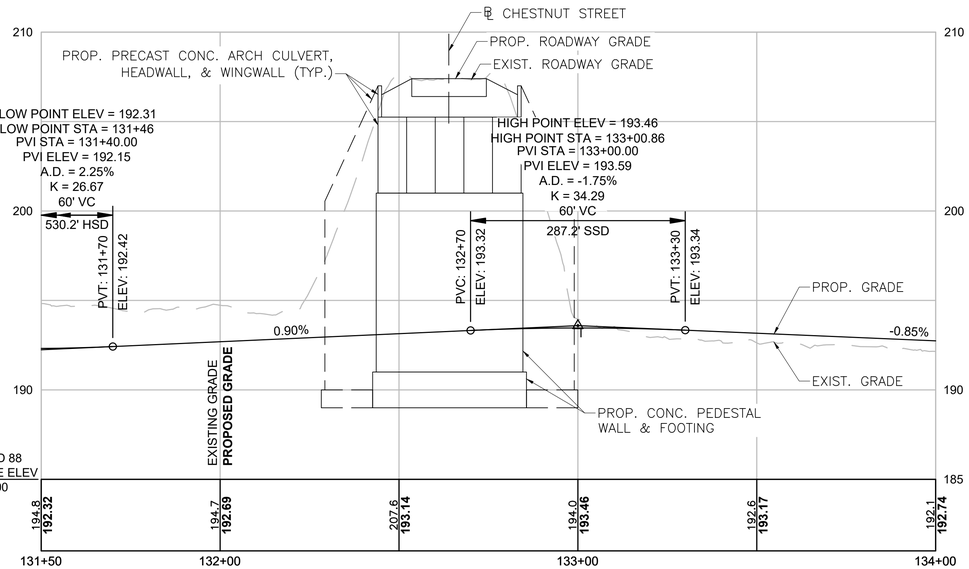
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
WETLAND REPLICATION PLANTING PLAN
PLAN 168 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=4'	DEC 2021	MBB	EJM	MAC		



KEY PLAN

SCALE: 1"=20'



PROFILE - ACCESS DRIVE

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: $\frac{1}{4}$"=1'-0"

GENERAL NOTES: CHESTNUT STREET

DESIGN:
IN ACCORDANCE WITH 2020 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR HL-93 LOADING.

CONCRETE:
ALL CAST IN PLACE CONCRETE SHALL BE 4000 PSI $\frac{3}{4}$", 610 CEMENT CONCRETE.
ALL PRECAST CONCRETE SHALL BE 5000 PSI, $\frac{3}{4}$", 705 CEMENT CONCRETE.

REINFORCEMENT:
REINFORCING STEEL SHALL BE EPOXY COATED AND SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M31 GRADE 60.

SUBSTRUCTURE DESIGN:
PROPOSED BRIDGE SUBSTRUCTURES INCLUDING FOOTINGS AND PEDESTAL WALLS ARE SHOWN AS PRELIMINARY ONLY. FINAL FOOTING DESIGN BY CULVERT MANUFACTURER. SEE GEOTECH RECOMMENDATIONS.

SURVEY AND EXISTING CONDITIONS:
THE EXISTING CONDITIONS SHOWN ON THIS PLAN WERE DEVELOPED FROM A COMBINED EFFORT OF AERIAL PHOTOGRAMMETRIC MAPPING BY EASTERN TOPOGRAPHICS, INC., BASED ON AERIAL PHOTOGRAPHS TAKEN ON FEBRUARY 22, 2013, AND AUGMENTED BY AN ON-THE-GROUND SURVEY PERFORMED BY VHB DURING 2015 AND 2017.
THE HORIZONTAL CONTROL IS BASED ON THE MASSACHUSETTS MAINLAND STATE PLANE COORDINATE SYSTEM AND THE NATIONAL GEODETIC SURVEY (NAD83). ALL ELEVATION IS US FEET, REFERENCED TO THE NORTH AMERICA VERTICAL DATUM OF 1988 (NAVD88).

DEMOLITION AND CONSTRUCTION:
ALL EXISTING MATERIALS REMOVED AND NOT REUSED AND ALL WASTE MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR. CONTAMINATED WASTE SHALL BE DISPOSED OF OFF SITE AT AN APPROVED FACILITY.
ALL UNSUITABLE MATERIALS SHALL BE REMOVED WITHIN THE LIMITS OF THE FOUNDATIONS OF THE STRUCTURE, AS DIRECTED BY THE RESIDENT ENGINEER. BACKFILL WITH GRAVEL BORROW FOR BRIDGE FOUNDATIONS.
BURIED EXISTING BRIDGE COMPONENTS MAY BE ENCOUNTERED DURING EXCAVATION AND SHALL BE REMOVED AS UNCLASSIFIED EXCAVATION.
TEMPORARY SHEETING MAY BE REQUIRED AT THE OPTION OF THE CONTRACTOR.
BACKFILL AROUND PROPOSED SUBSTRUCTURE SHALL BE GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES.
THE CONTRACTOR SHALL TAKE THE PROPER PRECAUTIONS TO ENSURE THE STABILITY AND SAFE PERFORMANCE OF ALL STRUCTURAL ELEMENTS DURING DEMOLITION AND CONSTRUCTION.
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ADEQUATE SHIELDING DURING DEMOLITION AND CONSTRUCTION TO ADEQUATELY PROTECT WORKERS.
ANY DAMAGE TO REMAINING EXISTING COMPONENTS THAT IS CAUSED BY THE CONTRACTOR'S ACTIVITY SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR, AT NO ADDITIONAL EXPENSE.

HEADWALL TEXT:
THE TEXT "MASS CENTRAL RAIL TRAIL" SHALL BE EMBEDDED INTO THE OUTSIDE FACE OF BOTH CONCRETE HEADWALLS OF THE CULVERT STRUCTURE, CENTERED BOTH WAYS. THE SIZE AND STYLE OF THE TEXT SHALL MATCH THAT OF THE STRUCTURE CARRYING CONANT STREET OVER THE MCRT IN WESTON.

CHESTNUT STREET:
SEE SHEET 95 FOR PROFILE OF CHESTNUT STREET.

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

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EVERSOURCE

SUDBURY-HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
BRIDGE NO. H-25-011 (CHESTNUT STREET) - KEY PLAN & PROFILE
PLAN 169 OF 349

SCALE: unless noted	DATE	DRAWN	CH'KD.	APPR.	DRAWING NO.	REV.
H: 1"=20' V: 1"=4'	DEC 2021	AMS	SBK	KGK	.	.

BORING BB–1
STATION: 132+68.90
OFFSET: 8.52' LT
N: 2969377.1
E: 649658.3
GROUND ELEVATION: 207.0'
(SEE NOTE 10)

APPROX. BOTTOM OF FOOTING EL. 188.5

BORING LOG — B-BB-1 PAGE 1 OF 3

LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Chestnut Street Bridge
LGCI PROJECT NUMBER: 1753-01
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/11/18 **DATE COMPLETED:** 6/13/18
BORING LOCATION: Northern edge of proposed Chestnut St. bridge
COORDINATES: NA
SURFACE El.: 207 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 62 ft.
WEATHER: 70s / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** -
▼ **AT END OF DRILLING:** 27.0 ft. / El. 180.0 ft.
▽ **OTHER:** -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Justin Emma / Kenny Bylund
DRILLING METHOD: HSA 4-1/4" I.D. to 14 feet then 3-inch casing
DRILL RIG TYPE/MODEL: CME 55 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth (ft.) / El. (ft.)	Material Description
		0.6					Asphalt	0.6 / 206.4	Drilled through 7 inches of asphalt
	205.0		G1						G1 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 35-40% fine to coarse subangular gravel, trace organic fines, trace asphalt, light brown, moist
5		3.5	G2						G2 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium, 5-10% fines, 10-15% fine subangular gravel, trace organic fines, trace wood, brown, moist
		5.5	G3						G3 - Silty SAND (SM), fine to medium, trace coarse, ~15% fines, ~10% fine subangular gravel, brown, moist REMARK 1: Vacuum exploration to 6 feet on 6/6/2018.
	200.0	6	S1	6-8-8-9 (14)	24/12	1	Fill		S1 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, ~10% fines, ~20% fine to coarse subangular gravel, trace asphalt, brown, moist
10		8	S2	8-6-7-5 (13)	24/9				S2 - Poorly Graded SAND with Silt (SP-SM), fine to medium, ~10% fines, 10-15% fine to coarse subangular gravel, trace asphalt, brown, moist
		10	S3	5-6-6-5 (12)	24/7				S3 - Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 10-15% fines, ~10% fine subangular gravel, trace organic fines, brown to orange, moist
15	195.0	12				2		13.0 / 194.0	REMARK 2: Heavy drill chatter from 13 to 18 feet due to possible boulder; could not sample.
							Boulder		
	190.0	18	S4	20-10-13-12 (23)	24/13		Fill	18.0 / 189.0	S4 - Well Graded SAND (SW), fine to coarse, ~5% fines, trace fine subangular gravel, brown, moist
20		20	S5	8-6-21-26 (27)	24/15		Sand	20.0 / 187.0	S5 - Well Graded SAND (SW), fine to coarse, 0-5% fines, ~5% fine subrounded gravel, light brown, moist
	185.0	22							
25									

GENERAL NOTES:
1. The ground surface elevation was interpolated to the nearest foot from a plan titled: "Proposed Conditions Plan for Notice of Intent Submittal, Sudbury-Hudson Trasmission Reliabailty Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc. and dated February 14, 2018.

BORING BB–1 (CONTINUED)

BORING LOG — B-BB-1 PAGE 2 OF 3

LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Chestnut Street Bridge
LGCI PROJECT NUMBER: 1753-01
PROJECT LOCATION: Hudson, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth (ft.) / El. (ft.)	Material Description
		26	S6	43-23-22-22 (45)	24/11			27.0 / 180.0	S6 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium to coarse, ~10% fines, trace fine subrounded gravel, light brown, wet
	180.0	28	S7	25-25-20-21 (45)	24/12				S7 - Well Graded SAND with Silt (SW-SM), fine to medium, trace coarse, 5-10% fines, light brown, wet
30		30	S8	15-17-19-19 (36)	24/15				S8 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium, 5-10% fines, light brown, wet
	175.0	32	S9	6-10-16-15 (26)	24/14				S9 - Poorly Graded SAND with Silt (SP-SM), fine, 5-10% fines, light brown, wet
35		34							
	170.0	35	S10	11-13-15-17 (28)	24/14				S10 - Similar to S9
40		37							
	165.0	40	S11	14-17-19-19 (36)	24/15				S11 - Similar to S9
45		42					Sand		
	160.0	45	S12	11-16-18-24 (34)	24/16				S12 - Similar to S9
50		47							
	155.0	50	S13	12-18-23-29 (41)	24/8				S13 - Similar to S9, light brown to gray
55		52							
	150.0	55	S14	26-34-40-47 (74)	24/16				S14 - Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, ~5% fine subrounded gravel, light brown to gray, wet
60		57							
		60							S15 - Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse,

BORING BB–1 (CONTINUED)

BORING LOG — B-BB-1 PAGE 3 OF 3

LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Chestnut Street Bridge
LGCI PROJECT NUMBER: 1753-01
PROJECT LOCATION: Hudson, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth (ft.) / El. (ft.)	Material Description
		60	S15	16-18-25-25 (43)	24/14		Sand	60.0 / 147.0	5-10% fines, ~5% fine subrounded gravel, light brown, wet
	145.0	62						62.0 / 145.0	Bottom of borehole at 62.0 feet. Backfilled borehole with drill cuttings, 5 bags of sand, and 2 bags of cement mix. Ground surface restored with asphalt cold patch.
65									
	140.0								
70									
	135.0								
75									
	130.0								
80									
	125.0								
85									
	120.0								
90									
	115.0								
95									

BORING NOTES:

1. LOCATION OF BORINGS SHOWN ON THE KEY PLAN THUS: ⊕ .
2. BORINGS ARE TAKEN FOR PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
3. WATER LEVELS SHOWN ON THE BORING LOGS ARE ASSUMED BASED ON BORINGS PERFORMED FOR THE EXISTING BRIDGE, AS NOTED IN THE GEOTECHNICAL REPORT DATED SEPTEMBER 2018.
4. FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A $1\frac{3}{8}$" I.D. SPLIT SPOON SAMPLER 6" USING A 140 POUND WEIGHT FALLING 30".
5. ALL BORINGS WERE MADE IN JUNE OF 2018
6. BORINGS WERE MADE BY GEOLOGIC EARTH EXPLORATION, INC., 7 SHERWOOD DR., NORFOLK, MA 02056.
7. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.
8. BORING LOCATIONS AND ELEVATIONS ARE APPROXIMATE ONLY.

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

vhb Vanasse Hangen Brustlin, Inc.
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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH, & SUDBURY MASSACHUSETTS
BRIDGE H–25–011 (CHESTNUT STREET BRIDGE) BORING LOGS
PLAN 170 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
N/A	DEC 2021	AMS	SBK	KGK	.	.

BORING BB-2
STATION: 132+59.41
OFFSET: 8.06' RT
N: 2969363.8
E: 649644.7
GROUND ELEVATION: 208.0'
(SEE NOTE 10, SHEET 170 OF 349)

APPROX. BOTTOM OF FOOTING EL. 188.5

BORING LOG — B-BB-2 PAGE 1 OF 2

LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Chestnut Street Bridge
LGCI PROJECT NUMBER: 1753-01
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/13/18 **DATE COMPLETED:** 6/13/18
BORING LOCATION: Southern age of proposed Chestnut St. bridge
COORDINATES: NA
SURFACE EI.: 208 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 52 ft.
WEATHER: 70s / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** -
▼ **AT END OF DRILLING:** 29.0 ft. / El. 179.0 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: HSA 4-1/4" I.D. to 16 feet then 3-inch casing
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Strata Depth (ft.)	Material Description
0	208.0	0.6	G1				Asphalt	0.6	Drilled through 7 inches of asphalt
									G1 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine, 5-10% fines, ~15% fine to coarse subangular gravel, brown, moist Encountered cobbles up to 10-inches in diameter from 2.5 feet to 6 feet.
5	205.0	4	G2						G2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 25-30% fine to coarse subangular gravel, trace organic fines, trace asphalt, brown, moist
		6	S1	3-5-19-15 (24)	24/13	1			REMARK 1: Vacuum exploration to 6 feet on 6/6/2018. S1 - Silty SAND (SM), fine, trace medium to coarse, ~15% fines, ~5% fine subrounded gravel, trace organic fines, trace roots, trace asphalt, trace coal, brown, moist
	200.0	8	S2	21-26-39-27 (65)	24/19				S2 - Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, ~10% fines, trace organic fines, trace roots, trace asphalt, trace coal, brown, moist
10		10	S3	6-7-8-20 (15)	24/15		Fill		S3 - Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 5-10% fines, ~10% fine subrounded gravel, trace coal, brown, moist
	195.0	12	S4	6-15-11-11 (26)	24/12				S4 - Similar to S3, no coal
15		14	S5	7-5-9-12 (14)	24/18				S5 - Top 11": Coal Bot. 7": Poorly Graded SAND with Silt and Gravel (SP-SM), fine to coarse, trace coarse, 5-10% fines, ~15% fine subangular gravel, light brown, moist
		16	S6	12-14-15-22 (29)	24/12				S6 - Poorly Graded SAND with Gravel (SP), fine to medium, trace coarse, 0-5% fines, ~20% fine to coarse subrounded gravel, light brown, moist
	190.0	18	S7	15-15-10-11 (25)	24/16			18.0	S7 - Poorly Graded SAND (SP), fine, 0-5% fines, light brown, moist
20		20	S8	5-7-10-12 (17)	24/8		Sand		S8 - Similar to S7, 10-15% fine to coarse subrounded gravel
	185.0	22							
25									

GENERAL NOTES:
1. The ground surface elevation was interpolated to the nearest foot from a plan titled: "Proposed Conditions Plan for Notice of Intent Submittal, Sudbury-Hudson Trasmission Reliabaility Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc. and dated February 14, 2018.

BORING BB-2 (CONTINUED)

BORING LOG — B-BB-2 PAGE 2 OF 2

LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Chestnut Street Bridge
LGCI PROJECT NUMBER: 1753-01
PROJECT LOCATION: Hudson, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Strata Depth (ft.)	Material Description
25	183.0	25	S9	11-14-22-22 (36)	24/15		Sand		S9 - Poorly Graded SAND (SP), fine to medium, trace coarse, ~5% fines, trace fine subrounded gravel, light brown, moist
		27							▼
30	180.0	30	S10	12-14-14-12 (28)	24/14				S10 - Similar to S9
		32							
35	175.0	35	S11	11-14-9-14 (23)	24/11				S11 - Poorly Graded SAND (SP), fine, 0-5% fines, light brown to gray, wet
		37							
40	170.0	40	S12	9-12-13-13 (25)	24/13				S12 - Similar to S11
		42							
45	165.0	45	S13	11-11-14-12 (25)	24/12				S13 - Similar to S11, gray
		47							
50	160.0	50	S14	8-10-13-22 (23)	24/20				S14 - Similar to S13
		52						52.0	
55	155.0								Bottom of borehole at 52.0 feet. Backfilled borehole with drill cuttings. Ground surface restored with asphalt cold patch.
60	150.0								

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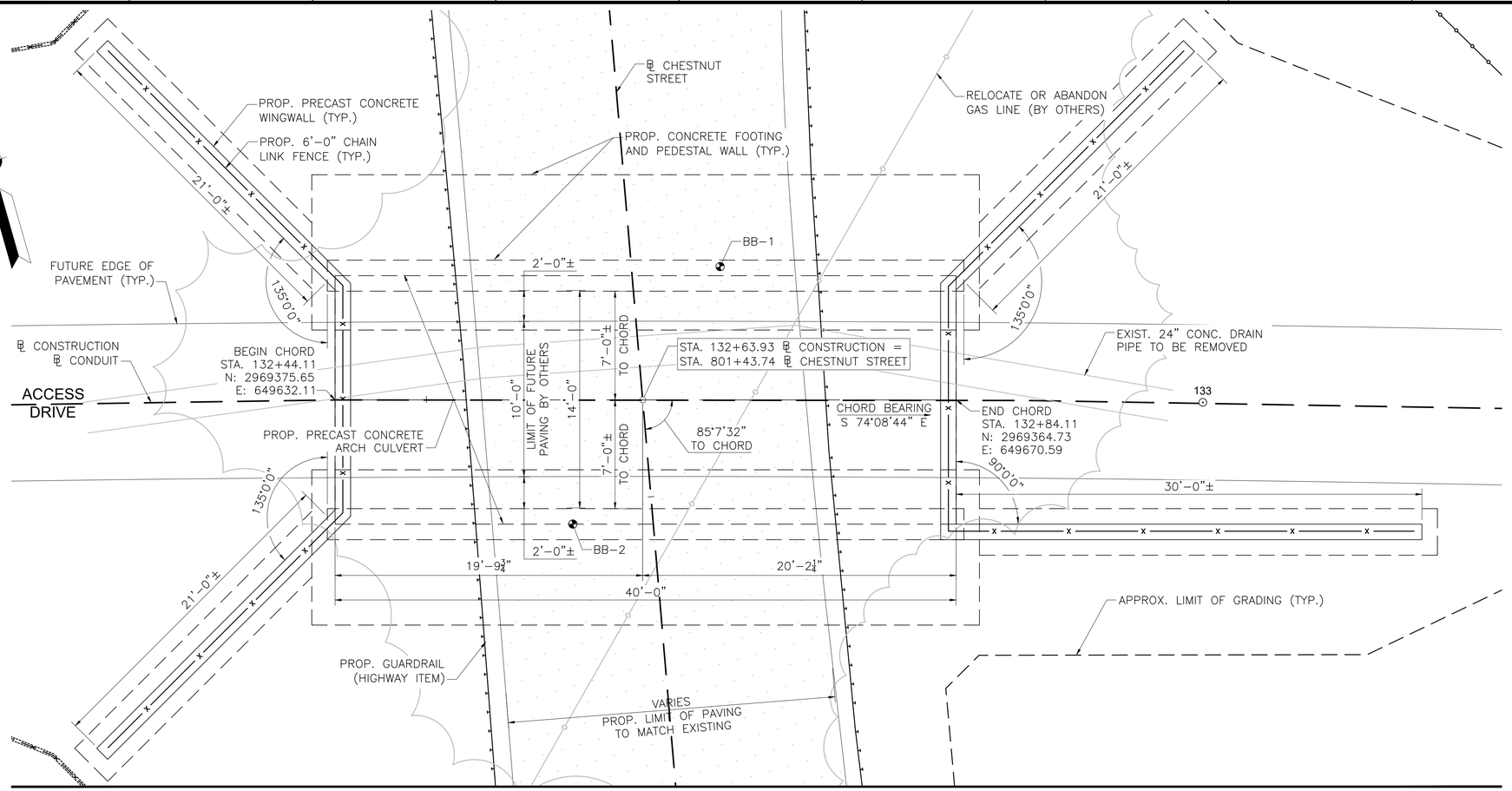
NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

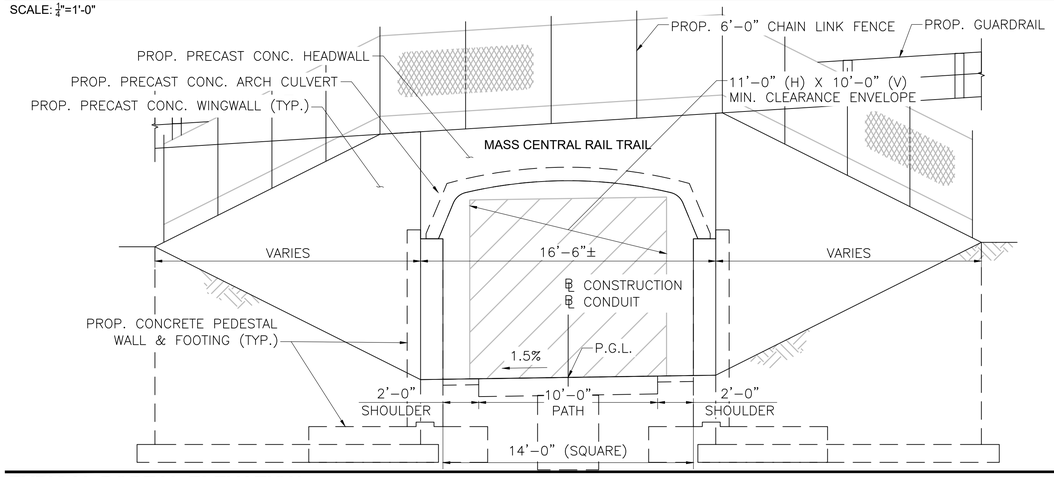
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH, & SUDBURY MASSACHUSETTS
BRIDGE H-25-011 (CHESTNUT STREET BRIDGE) – BORING LOGS
PLAN 171 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
N/A	DEC 2021	AMS	SBK	KGK	.	.



CULVERT PLAN

SCALE: ¼"=1'-0"



TYPICAL PORTAL ELEVATION

SCALE: ¼"=1'-0"

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NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

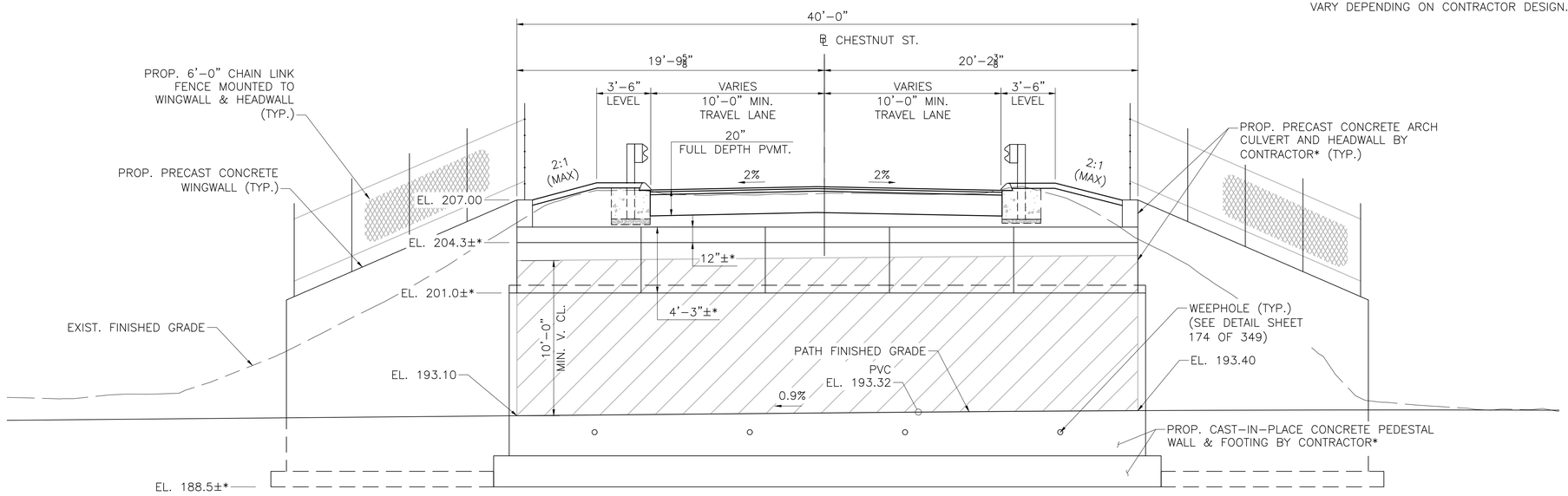
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE NO. H–25–011 (CHESTNUT STREET) – PLAN & ELEVATION

PLAN 172 OF 349

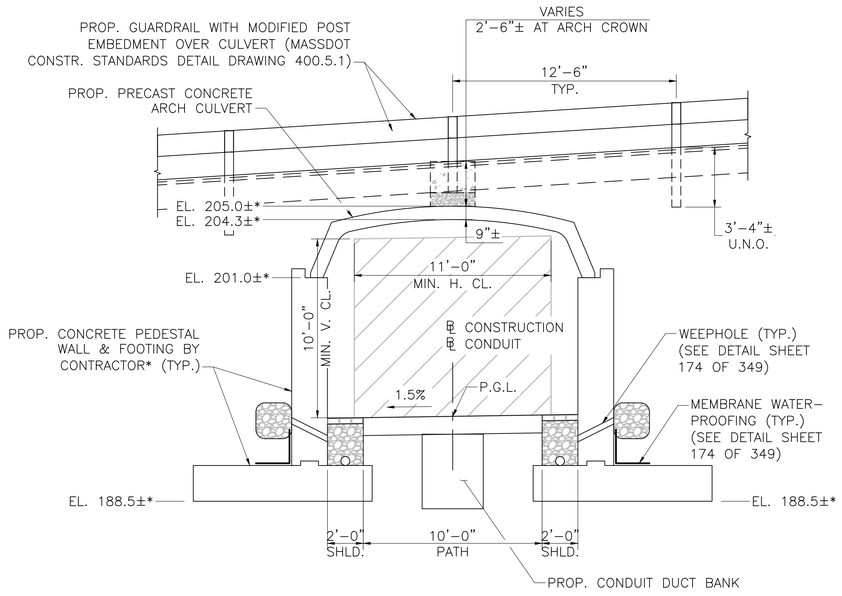
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=4'	DEC 2021	AMS	SBK	KGK	.	.

*NOTE: PRECAST CONCRETE ARCH CULVERT, PEDESTAL WALLS, AND FOOTINGS TO BE DESIGNED BY CONTRACTOR. ELEVATIONS MAY VARY DEPENDING ON CONTRACTOR DESIGN.



CULVERT LONGITUDINAL SECTION

SCALE: $\frac{1}{4}$"=1'-0"



CULVERT TRANSVERSE SECTION

SCALE: $\frac{1}{4}$"=1'-0"

*NOTE: PRECAST CONCRETE ARCH CULVERT, PEDESTAL WALLS, AND FOOTINGS TO BE DESIGNED BY CONTRACTOR. ELEVATIONS MAY VARY DEPENDING ON CONTRACTOR DESIGN.

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NO.	DESCRIPTION	BY	DATE	APP'R.

REVISION

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

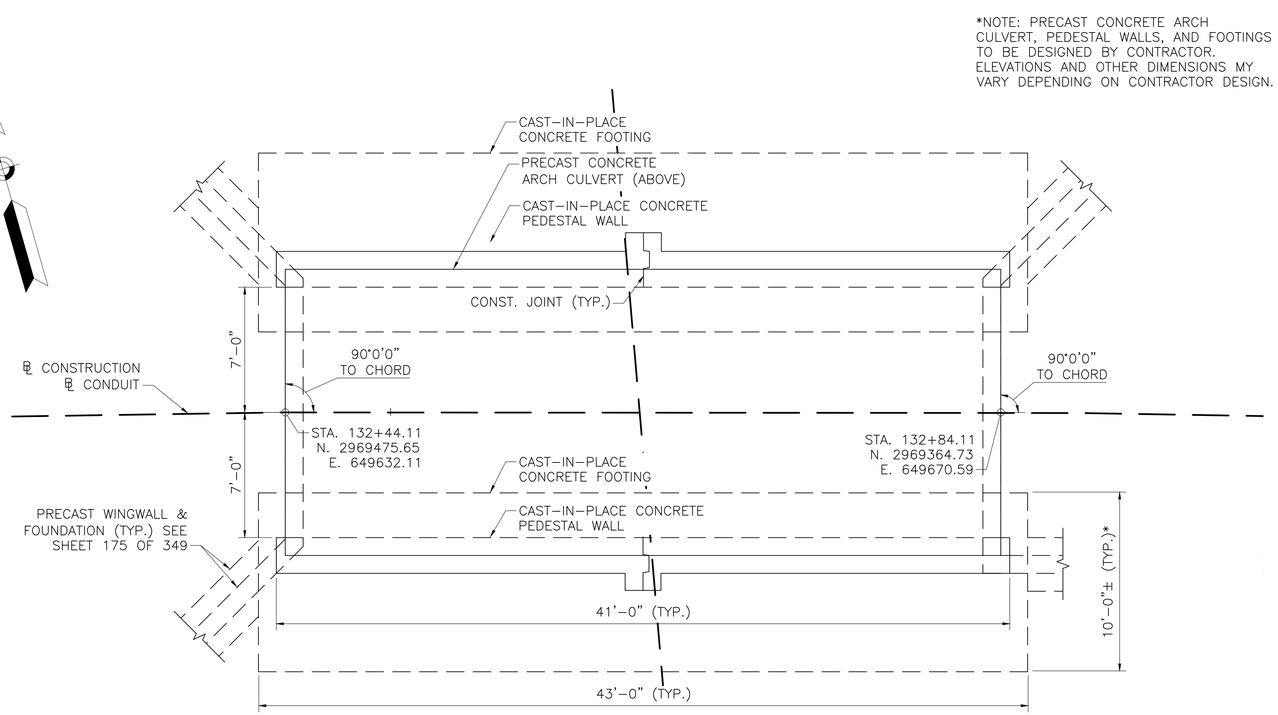
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE NO. H–25–011 (CHESTNUT STREET) – SECTIONS

PLAN 173 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APP'R.	DRAWING NO.	REV.
1"=4'	DEC 2021	AMS	SBK	KGK	.	.

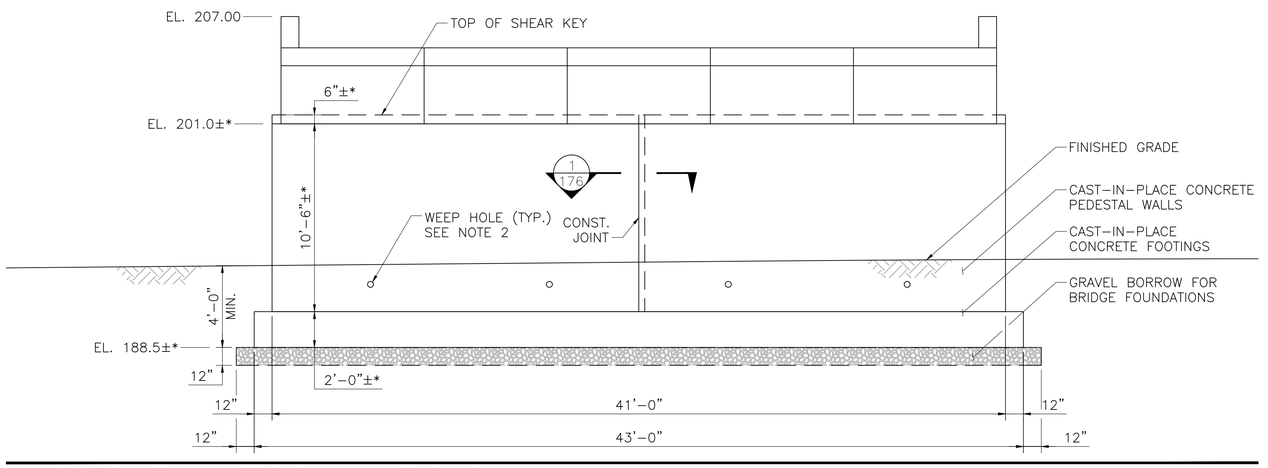
*NOTE: PRECAST CONCRETE ARCH CULVERT, PEDESTAL WALLS, AND FOOTINGS TO BE DESIGNED BY CONTRACTOR. ELEVATIONS AND OTHER DIMENSIONS MY VARY DEPENDING ON CONTRACTOR DESIGN.



CULVERT FOOTING & PEDESTAL WALL PLAN

SCALE: $\frac{1}{4}$"=1'-0"

*NOTE: PRECAST CONCRETE ARCH CULVERT, PEDESTAL WALLS, AND FOOTINGS TO BE DESIGNED BY CONTRACTOR. ELEVATIONS AND OTHER DIMENSIONS MY VARY DEPENDING ON CONTRACTOR DESIGN.



CULVERT FOOTING & PEDESTAL WALL ELEVATION

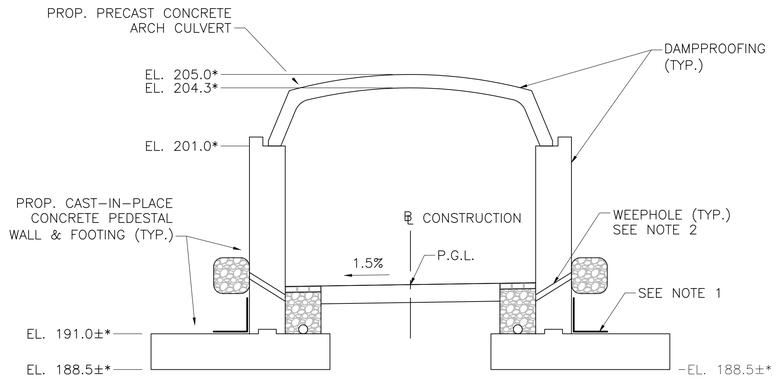
SCALE: $\frac{1}{4}$"=1'-0"

NOTES:

1. MEMBRANE WATERPROOFING AND 8"x16"x2", 4000 PSI, $\frac{3}{4}$ IN, 610 CEMENT CONCRETE BLOCKS LAID IN MORTAR OR OTHER WATERPROOFING PROTECTIVE COURSE, MIN. 2" THICK AS SPECIFIED IN MASSDOT STANDARD SPECIFICATIONS.
2. 4" ø WEEP HOLES 10'-0" O.C. (JUST ABOVE PROTECTIVE COURSE). PROVIDE 1 CUBIC YARD OF CRUSHED STONE AT EACH END OF WEEP HOLE.
3. ALL CAST-IN-PLACE CONCRETE SHALL BE 4000 PSI, $\frac{3}{4}$ IN, 610 CEMENT CONCRETE. ALL PRECAST CONCRETE SHALL BE 4000 PSI, $\frac{3}{4}$ IN, 610 CEMENT CONCRETE.
4. THE FACTORED BEARING PRESSURE SHALL BE DETERMINED BY THE CONTRACTOR PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

   THE FACTORED BEARING RESISTANCE SHALL BE CALCULATED AS A FUNCTION OF THE WIDTH OF THE FOOTING AS DESCRIBED IN THE GEOTECHNICAL REPORT DATED SEPTEMBER 12, 2018. FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE AND A RESISTANCE FACTOR OF 0.45.

*NOTE: PRECAST CONCRETE ARCH CULVERT, PEDESTAL WALLS, AND FOOTINGS TO BE DESIGNED BY CONTRACTOR. ELEVATIONS AND OTHER DIMENSIONS MY VARY DEPENDING ON CONTRACTOR DESIGN.



CULVERT FOOTING & PEDESTAL WALL SECTION

SCALE: $\frac{1}{4}$"=1'-0"

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE NO. H-25-011 (CHESTNUT STREET) – SUBSTRUCTURE DETAILS

PLAN 174 OF 349

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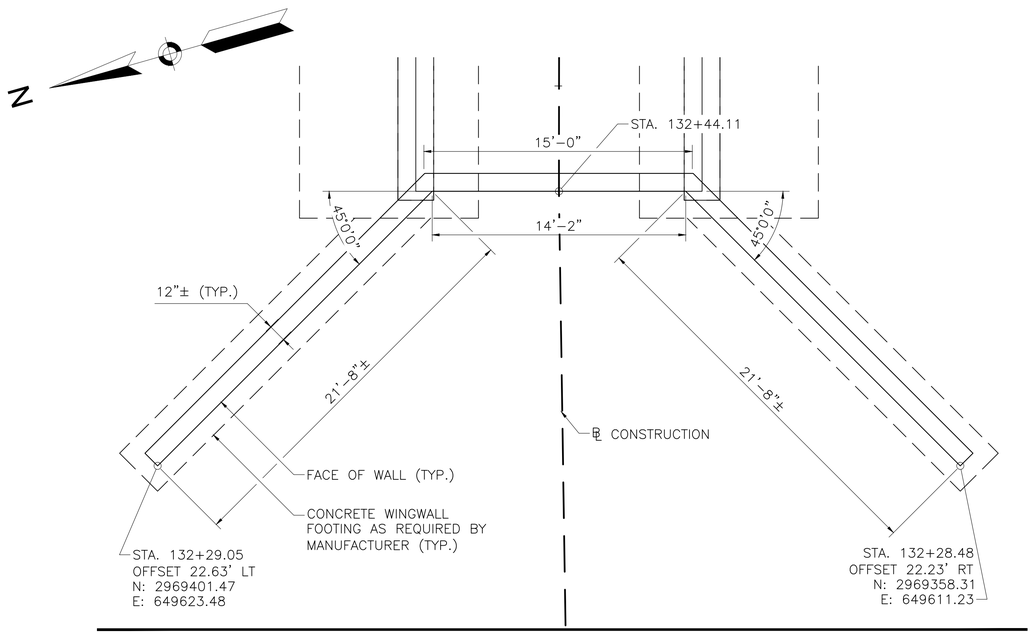
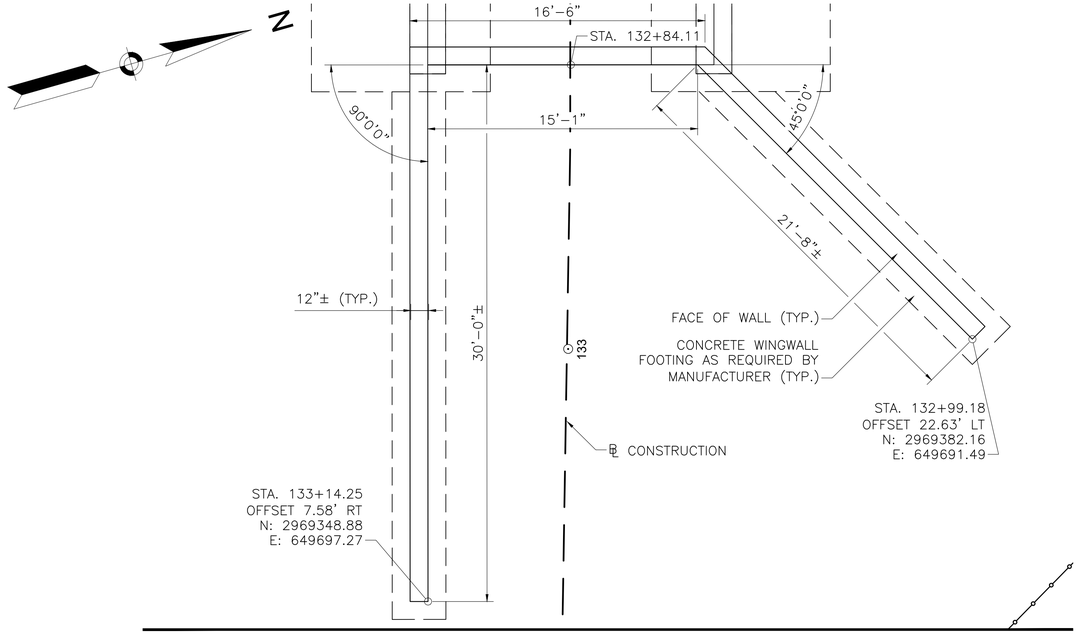
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

SCALE: unless noted	DATE	DRAWN	CH'KD.	APPR.	DRAWING NO.	REV.
1"=4'	DEC 2021	AMS	SBK	KGK	.	.



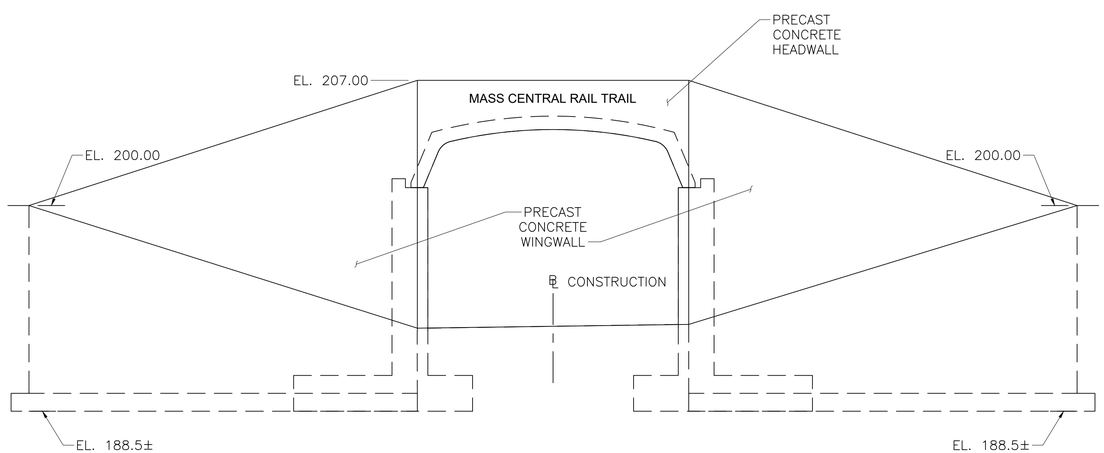
WINGWALL PLAN AT WEST PORTAL

SCALE: 1/4"=1'-0"



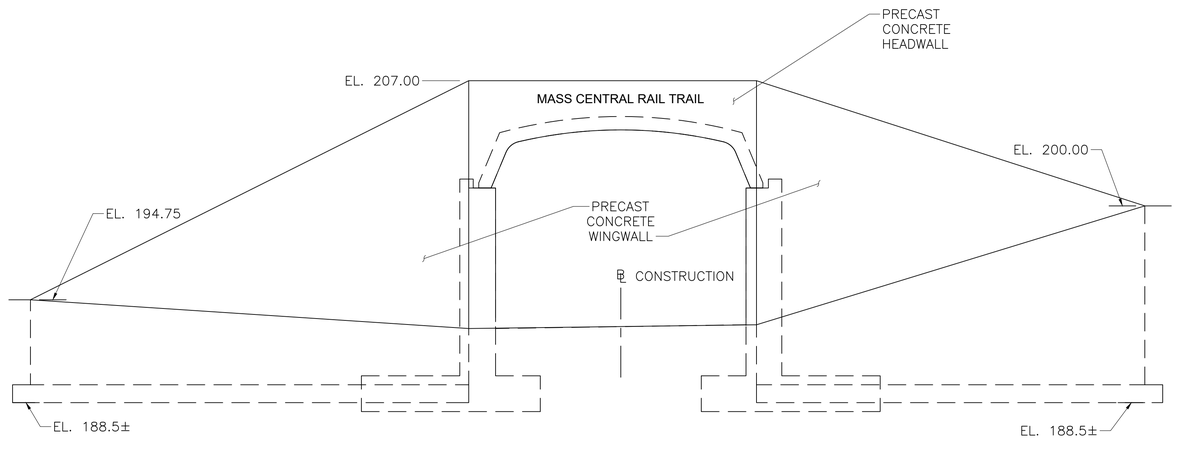
WINGWALL PLAN AT EAST PORTAL

SCALE: 1/4"=1'-0"



WINGWALL DEVELOPED ELEVATION AT WEST PORTAL

SCALE: 1/4"=1'-0"



WINGWALL DEVELOPED ELEVATION AT EAST PORTAL

SCALE: 1/4"=1'-0"

NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

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EVERSOURCE

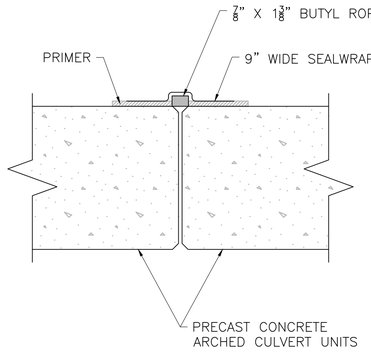
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE NO. H–25–011 (CHESTNUT STREET) – WINGWALL DETAILS

PLAN 75 OF 349

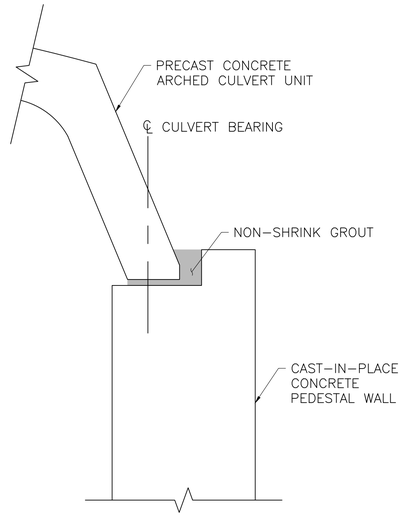
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=4'	DEC 2021	AMS	SBK	KGK	.	.



CULVERT JOINT DETAIL

SCALE: 1"=0'-6"

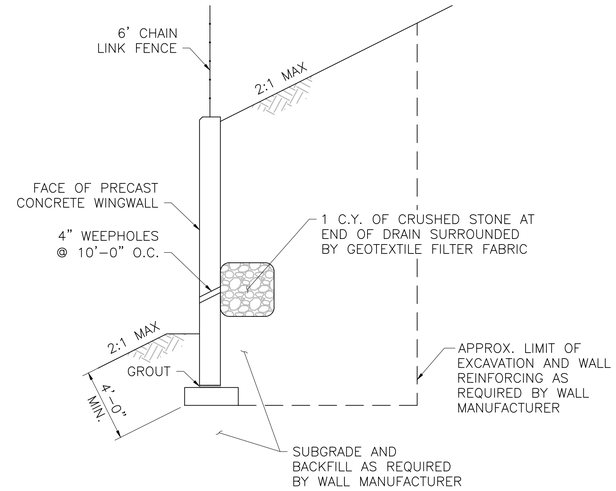
NOTE: CULVERT BEARING DETAIL SHOWN IS PRELIMINARY ONLY. ALTERNATE DETAILS SHALL REQUIRE APPROVAL BY THE ENGINEER.



CULVERT BEARING DETAIL

SCALE: 1"=1'-0"

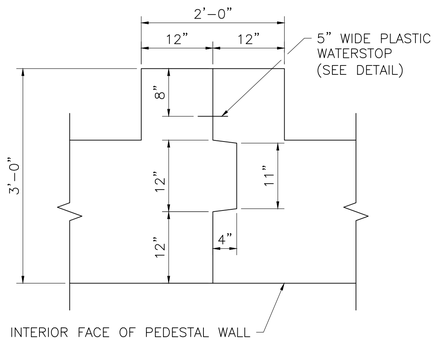
NOTE: RET. WALL TYPE SHOWN IS PRELIMINARY ONLY. ALTERNATE PREFABRICATED WALL TYPES SHALL REQUIRE APPROVAL BY THE ENGINEER.



TYPICAL WINGWALL SECTION

SCALE: 1/4"=1'-0"

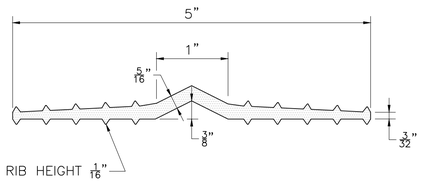
NOTE: CONSTRUCTION JOINT DETAIL SHOWN IS DIMENSIONED IN ACCORDANCE WITH MASSDOT STANDARD DETAILS. ALTERNATE DETAILS SHALL REQUIRE APPROVAL BY THE ENGINEER.



SECTION 1 - CONSTRUCTION JOINT DETAIL

SCALE: 1"=0'-6"

NOTE: PLASTIC WATERSTOP DETAIL SHOWN IS DIMENSIONED IN ACCORDANCE WITH MASSDOT STANDARD DETAILS. ALTERNATE DETAILS SHALL REQUIRE APPROVAL BY THE ENGINEER.



PLASTIC WATERSTOP DETAIL

SCALE: 1"=1'-0"

NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

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EVERSOURCE

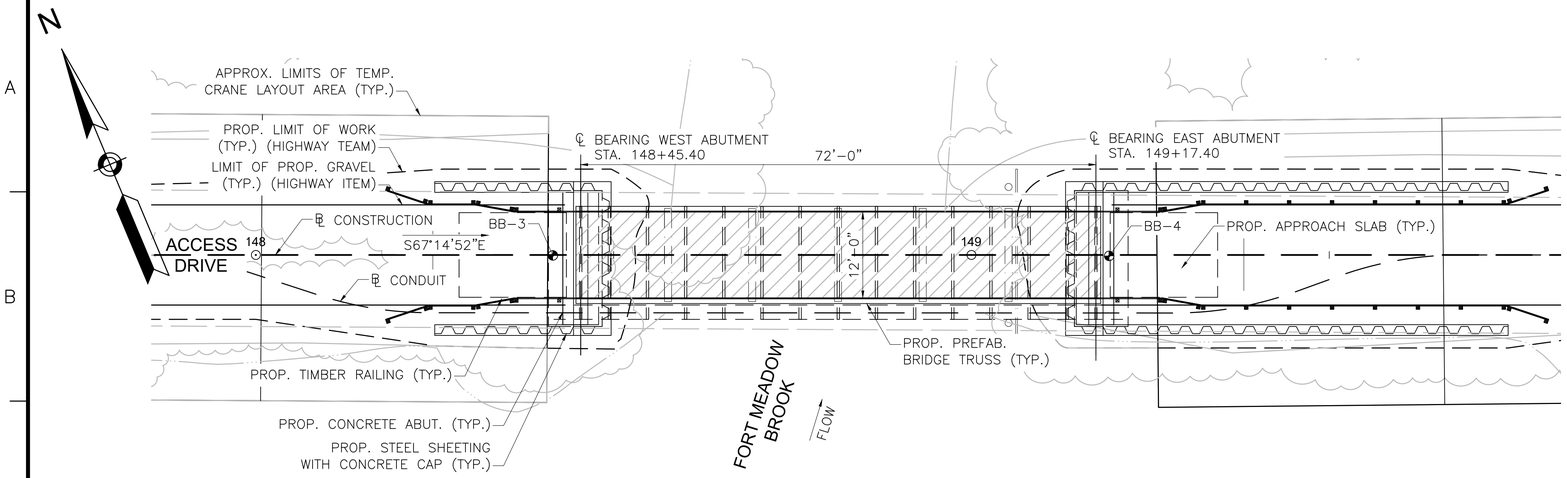
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE NO. H–25–011 (CHESTNUT STREET) – DETAILS

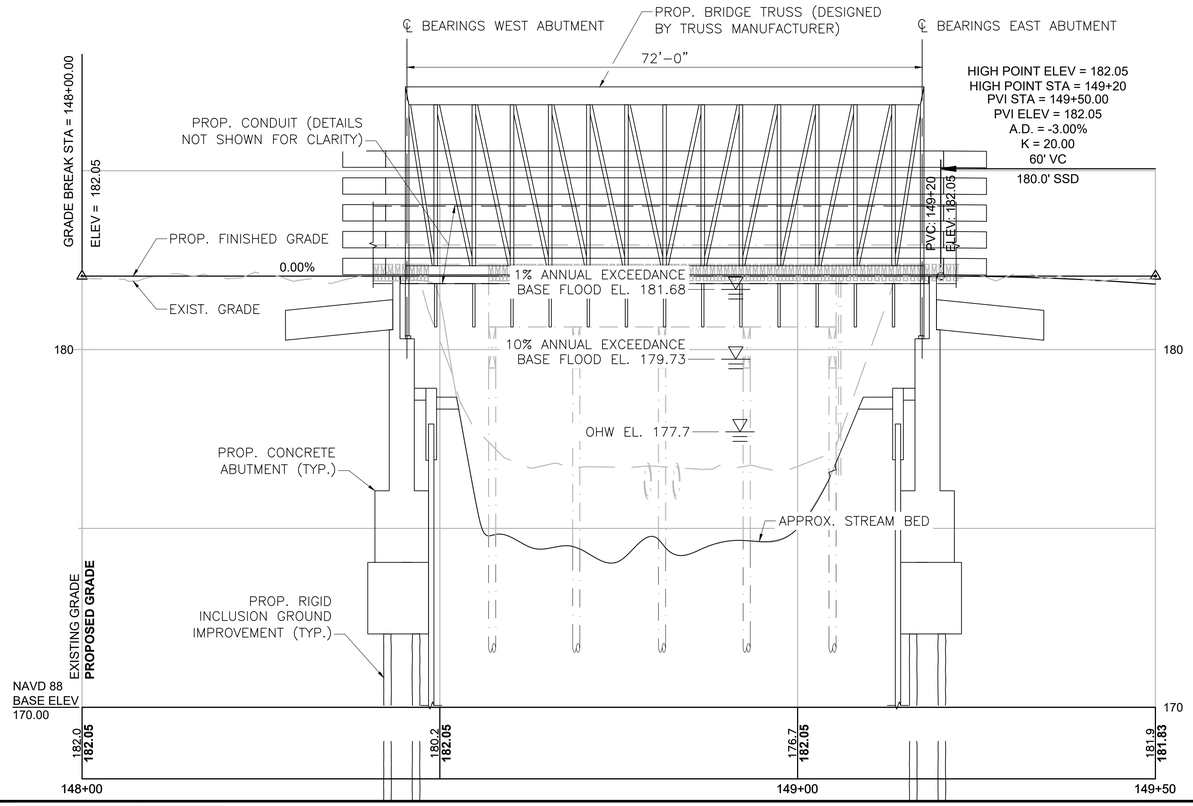
PLAN 176 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
VARIES	DEC 2021	AMS	SBK	KGK	.	.



BRIDGE KEY PLAN

SCALE: 1"=10'-0"



PROFILE - ACCESS DRIVE

HORIZONTAL SCALE: 1"=10'-0"
VERTICAL SCALE: 1"=2'-0"

GENERAL NOTES: BRIDGE 130

DESIGN:
IN ACCORDANCE WITH THE 2009 AASHTO GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES (WITH 2015 INTERIM REVISIONS) FOR H10 LOADING WITHOUT IMPACT AND 90 PSF PEDESTRIAN LOADING, WHICHEVER CONTROLS. DESIGNED FOR TEMPORARY H20 LOADING DURING CONSTRUCTION ONLY. RAILING DESIGNED FOR PEDESTRIAN LOADING ONLY.

CONCRETE:
ALL CAST IN PLACE CONCRETE SHALL BE 4000 PSI, ¾", 610 CEMENT CONCRETE.
GROUT TO BE USED FOR DRILLING AND GROUTING DOWELS INTO EXISTING SUBSTRUCTURES SHALL BE A CEMENTITIOUS GROUT LISTED ON THE MASSDOT QUALIFIED CONSTRUCTION MATERIALS LIST.

REINFORCEMENT:
REINFORCING STEEL SHALL BE EPOXY COATED AND SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M31 GRADE 60.

FOUNDATION DESIGN:
GROUND IMPROVEMENT SHALL BE DESIGNED BY CONTRACTOR. SEE GEOTECHNICAL REPORT.

STEEL:
ALL STRUCTURAL STEEL OTHER THAN STRUCTURAL TUBING SHALL BE AASHTO M270 GRADE 50 GALVANIZED AND PAINTED. STRUCTURAL TUBING SHALL BE HEAT TREATED ASTM A1085 GRADE A, WITH THE SUPPLEMENTAL REQUIREMENTS S1, GALVANIZED AND PAINTED.
BOLTS THAT FASTEN TO STEEL ONLY SHALL BE AASHTO M1644 (ASTM 325) HIGH STRENGTH BOLTS, GALVANIZED.

TIMBER:
DECK PLANKING AND RAILINGS: IPE, F_b min = 22,000 psi.
ALL NAILS, SCREWS, BOLTS, WASHERS, CONNECTORS, FASTENERS AND HARDWARE FOR WOOD CONNECTIONS SHALL BE STAINLESS STEEL TYPE 304 OR TYPE 316.
WHERE TREATED TIMBER MEMBERS ARE IN DIRECT CONTACT WITH STEEL PROVIDE VYCOR DECK PROTECTOR BARRIER MEMBRANE BY W.R. GRACE & CO. OR APPROVED EQUAL.

SURVEY AND EXISTING CONDITIONS:
THE EXISTING CONDITIONS SHOWN ON THIS PLAN WERE DEVELOPED FROM A COMBINED EFFORT OF AERIAL PHOTOGRAMMETRIC MAPPING BY EASTERN TOPOGRAPHICS, INC., BASED ON AERIAL PHOTOGRAPHS TAKEN ON FEBRUARY 22, 2013, AND AUGMENTED BY AN ON-THE-GROUND SURVEY PERFORMED BY VHB DURING 2015 AND 2017.
THE HORIZONTAL CONTROL IS BASED ON THE MASSACHUSETTS MAINLAND STATE PLANE COORDINATE SYSTEM AND THE NATIONAL GEODETIC SURVEY (NAD83). ALL ELEVATION IS US FEET, REFERENCED TO THE NORTH AMERICA VERTICAL DATUM OF 1988 (NAVD88).

DEMOLITION AND CONSTRUCTION:
ALL EXISTING MATERIALS REMOVED AND NOT REUSED AND ALL WASTE MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR.
TREATED TIMBER AND CONTAMINATED WASTE SHALL BE DISPOSED OF OFF SITE AT AN APPROVED FACILITY.
ALL UNSUITABLE MATERIALS SHALL BE REMOVED WITHIN THE LIMITS OF THE FOUNDATIONS OF THE STRUCTURE, AS DIRECTED BY THE RESIDENT ENGINEER. BACKFILL WITH GRAVEL BORROW FOR BRIDGE FOUNDATIONS.
BACKFILL AROUND PROPOSED SUBSTRUCTURE SHALL BE GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES.
THE CONTRACTOR SHALL TAKE THE PROPER PRECAUTIONS TO ENSURE THE STABILITY AND SAFE PERFORMANCE OF ALL STRUCTURAL ELEMENTS DURING DEMOLITION AND CONSTRUCTION.
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ADEQUATE SHIELDING OR NETTING DURING DEMOLITION AND CONSTRUCTION TO ADEQUATELY PROTECT WORKERS AND TO PREVENT DEBRIS AND MATERIALS FROM ENTERING THE WATERWAY.
ANY DAMAGE TO REMAINING EXISTING COMPONENTS THAT IS CAUSED BY THE CONTRACTOR'S ACTIVITY SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR, AT NO ADDITIONAL EXPENSE.

NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

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EVERSOURCE

SUDBURY-HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
BRIDGE H-25-027 (BRIDGE 130) - KEY PLAN & PROFILE
PLAN177 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
H: 1"=10' V: 1"=2'	DEC 2021	AMS	SBK	KGK	.	.

BORING BB–3
STATION: 148+41.50
OFFSET: 0.07' RT
N: 2968779.2
E: 651113.0
GROUND ELEVATION: 182.0'
(SEE NOTE 10)

BOTTOM OF FOOTING EL. 174.05

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BORING LOG — **B-BB-3** PAGE 1 OF 4

CLIENT: Vanasse Hangen Brustlin, Inc.
LGCI PROJECT NUMBER: 1753-01
PROJECT NAME: Proposed Fort Meadow Brook Bridge
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 05/23/18 **DATE COMPLETED:** 05/30/18
BORING LOCATION: Western side of Fort Meadow Brook bridge
COORDINATES: NA
SURFACE EI.: 182 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 101 ft.
WEATHER: 80s / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** -
▼ **AT END OF DRILLING:** 6.0 ft. / El. 176.0 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: See note 2
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Strata Depth El (ft.)	Material Description
0	180.0	0	S1	5-5-5-4 (10)	24/15		Fill	182.0	S1 - Coal ash, trace fine subangular gravel, trace roots, trace brick
2		2	S2	10-8-17-12 (25)	24/11				S2 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 5-10% fines, ~15% fine to coarse subangular gravel, brown, moist
4		4	S3	7-10-7-8 (17)	24/20				S3 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 35-40% fine subangular gravel, trace organic fines, brown, moist
5		6	S4	6-2-2-1 (4)	24/1				▼ S4 - Similar to S3, ~20% fine subangular gravel, trace roots
6	175.0	8	S5	0-0-0-3 (0)	24/15		Buried Organic Soil	176.0	S5 - Silty SAND (SM), fine, ~40% fines, gray, wet
8		10	S6	2-2-3-2 (5)	24/11				S6 - Silty SAND (SM), fine to coarse, ~25% fines, trace organic fines, trace roots, gray to brown, wet
10	170.0	12	S7	0-0-1-1 (1)	24/21	1			REMARK 1: Switched to 4-inch casing at 12 feet. S7 - PEAT (PT), fibrous, trace roots, black, wet
12		14	S8	0-0-3-3 (3)	24/17				S8 - Silty SAND (SM), fine to medium, 25-30% fines, trace peat fibers, trace roots, black, wet
14	165.0	16	S9	3-2-3-3 (5)	24/12				S9 - Poorly Graded SAND with Silt (SP-SM), fine to medium, ~10% fines, ~5% fine subrounded gravel, trace wood, dark brown, wet
15		18	S10	3-4-3-4 (7)	24/11				S10 - Similar to S9, no wood
16		20	S11	2-1-4-4 (5)	24/15		Sand	167.0	S11 - Well Graded SAND with Silt (SW-SM), fine to coarse, ~10% fines, trace fine subrounded gravel, gray to black, wet
18	160.0	22	S12	3-5-5-5 (10)	24/20				S12 - Similar to S11, 10-15% fine subrounded gravel
20		24	S13	7-7-5-6 (12)	24/8				S13 - Similar to S12, angular stone fragments

GENERAL NOTES:
1. The ground surface elevation was interpolated to the nearest foot from a plan titled: "Proposed Conditions Plan for Notice of Intent Submittal, Sudbury-Hudson Trasmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc. and dated February 14, 2018.
2. The drilling method used was: HSA 1-1/4" I.D. to 12 feet, drive and wash with 4 inch casing to 29 feet, and drive and wash with 3 inch casing.

BORING BB–3 (CONTINUED)

BOTTOM OF GROUND IMPROVEMENT EL. 151.41

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BORING LOG — **B-BB-3** PAGE 2 OF 4

CLIENT: Vanasse Hangen Brustlin, Inc.
LGCI PROJECT NUMBER: 1753-01
PROJECT NAME: Proposed Fort Meadow Brook Bridge
PROJECT LOCATION: Hudson, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Strata Depth El (ft.)	Material Description
25	157.0	24	S13	(12)	24/8		Sand	157.0	
26	155.0								
29		2	S14	7-6-6-6 (12)	24/3				REMARK 2: Switched to 3-inch casing at 29 feet. S14 - Well Graded Gravel with Silt and Sand (GW-GM), fine to coarse, subrounded, 10-15% fines, 35-40% fine to coarse sand, gray, wet
30	150.0								
31									
34			S15	7-8-5-4 (13)	24/10				S15 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, ~15% fine to coarse subrounded gravel, gray, wet
35	145.0								
36									
39			S16	12-6-11-16 (17)	24/18				S16 - Well Graded SAND (SW), fine to coarse, 0-5% fines, gray, wet
40	140.0								
41									
44			S17	3-3-5-5 (8)	24/10				S17 - Similar to S16
45	135.0								
46									
49			S18	6-10-8-8 (18)	24/6				S18 - Poorly Graded SAND (SP), fine to medium, trace coarse, 0-5% fines, gray, wet
50	130.0								
51									
54			S19	6-3-7-10 (10)	24/17				S19 - Poorly Graded SAND with Silt (SP-SM), fine, ~10% fines, gray, wet
55	125.0								
56									
59			S20	8-2-6-7 (8)	24/10				S20 - Similar to S19, 10-15% fines
60									

BORING NOTES:

1. LOCATION OF BORINGS SHOWN ON THE KEY PLAN THUS: ◔ .
2. BORINGS ARE TAKEN FOR PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
3. WATER LEVELS SHOWN ON THE BORING LOGS ARE ASSUMED BASED ON BORINGS PERFORMED FOR THE EXISTING BRIDGE, AS NOTED IN THE GEOTECHNICAL REPORT DATED OCTOBER 2018.
4. FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 1⅜" I.D. SPLIT SPOON SAMPLER 6" USING A 140 POUND WEIGHT FALLING 30".
5. ALL BORINGS WERE MADE IN MAY OF 2018.
6. BORINGS WERE MADE BY GEOLOGIC EARTH EXPLORATION, INC., 7 SHERWOOD DR., NORFOLK, MA 02056.
7. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.
8. BORING LOCATIONS AND ELEVATIONS ARE APPROXIMATE ONLY.

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NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH, & SUDBURY MASSACHUSETTS
BRIDGE H–25–011 (BRIDGE 130) – BORING LOGS
PLAN 178 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
N/A	DEC 2021	AMS	KGK	KGK	.	.

BORING BB–3 (CONTINUED)

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100 Chelmsford Road, Suite 2
Billerica, MA 01862
Telephone: (978) 330-5912
Fax: (978) 330-5056

BORING LOG **B-BB-3**
PAGE 3 OF 4

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Fort Meadow Brook Bridge
LGCI PROJECT NUMBER: 1753-01
PROJECT LOCATION: Hudson, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Material Description
		62					Depth 61.0 ft.	
	120.0							
65		64	S21	2-4-7-11 (11)	24/16			S21 - Similar to S20
	115.0	65						
70						3		REMARK 3: Issues with bottom blow in encountered; sample at 69 to 71 feet could not be taken.
	110.0							
75		74	S22	8-7-12-24 (19)	24/15			S22 - Similar to S20
	105.0	76						
80		79	S23	3-14-15-23 (29)	24/10		Sand	S23 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, ~10% fines, ~30% fine to coarse subangular gravel, gray, wet
	100.0	81						
85		84	S24	8-8-13-14 (21)	24/12			S24 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, ~30% fine to coarse subangular gravel, gray, wet
	95.0	86						
90		89	S25	25-32-13-15 (45)	24/9			S25 - Well Graded SAND and Gravel (SW), fine to coarse, ~5% fines, 20-25% fine to coarse subrounded gravel, gray, wet
	90.0	91						
95		94	S26	32-48-21-15 (69)	24/4			S26 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 20-25% fine to coarse subrounded gravel, gray, wet

BORING BB–3 (CONTINUED)

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BORING LOG **B-BB-3**
PAGE 4 OF 4

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Fort Meadow Brook Bridge
LGCI PROJECT NUMBER: 1753-01
PROJECT LOCATION: Hudson, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Material Description
		96					Depth 81.0 ft.	
	85.0						Sand	S27 - Silty SAND with Gravel (SM), fine to coarse, ~20 fines, 25-30% fine to coarse subangular gravel, gray, wet
100		99	S27	22-57-59-56 (116)	24/6			
	80.0	101					Depth 101.0 ft.	Bottom of borehole at 101.0 feet. Backfilled borehole with drill cuttings.
105								
	75.0							
110								
	70.0							
115								
	65.0							
120								
	60.0							
125								
	55.0							
130								

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NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH, & SUDBURY MASSACHUSETTS
BRIDGE H–25–011 (BRIDGE 130) – BORING LOGS
PLAN 179 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
N/A	DEC 2021	AMS	KGK	KGK	.	.

BORING BB-4
STATION: 149+19.24
OFFSET: 0.13' RT
N: 2968749.1
E: 651184.7
GROUND ELEVATION: 182.0'
(SEE NOTE 10, SHEET 178 OF 349)

BOTTOM OF FOOTING EL. 174.05

BORING LOG — B-BB-4 PAGE 1 OF 4

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CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Fort Meadow Brook Bridge
LGCI PROJECT NUMBER: 1753-01
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 06/18/18 **DATE COMPLETED:** 06/25/18
BORING LOCATION: Eastern side of Fort Meadow Brook bridge
COORDINATES: NA
SURFACE EI.: 182 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 102 ft.
WEATHER: 80s / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** -
▼ **AT END OF DRILLING:** 6.0 ft. / El. 176.0 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: HSA 4-1/4" I.D. to 6 feet then 3-inch casing
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth (ft.)	Material Description
0	182.0	0	S1	7-4-5-4 (9)	24/13		Fill		S1 - Coal ash
2		2	S2	5-5-8-8 (13)	24/15				S2 - Top 9": Similar to S1 Bot. 6": Well Graded SAND (SW), fine to coarse, 0-5% fines, ~5% fine subangular gravel, light brown, moist
5		4	S3	9-5-5-10 (10)	24/13				S3 - Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 25-30% fine subangular gravel, trace organic fines, brown, moist
6	175.0	6	S4	9-9-4-1 (13)	24/6	1		6.0	REMARK 1: Switched to 3-inch casing at 6 feet. S4 - Silty SAND (SM), fine, trace medium, 35-40% fines, trace organic fines, gray, wet
8		8	S5	0-0-0-3 (0)	24/12		Buried Organic Soil		S5 - SILT with Sand (ML), slightly plastic, ~25% fine sand, trace organic fines, gray, wet
10		10	S6	2-1-2-1 (3)	24/0				S6 - No recovery
	170.0	12	S7	0-0-2-2 (2)	24/15				S7 - PEAT (PT), fibrous, trace roots, black, wet
15		14	S8	0-0-0-0 (0)	24/14				S8 - Similar to S7
	165.0	16	S9	0-0-0-2 (0)	24/15				S9 - Similar to S7
20		18	S10	0-0-0-0 (0)	24/16				S10 - Similar to S7
		20	S11	10-6-18-10 (24)	24/15				S11 - Silty SAND (SM), fine, trace medium to coarse, 15-20% fines, trace fine subrounded gravel, trace organic fines, black, wet
	160.0	22	S12	9-5-6-5 (11)	24/7				S12 - Similar to S11
25		24		16-7-3-4			Sand	24.0	S13 - Poorly Graded SAND with Silt (SP-SM), fine, 5-10% fines, gray, wet

GENERAL NOTES:
1. The ground surface elevation was interpolated to the nearest foot from a plan titled: "Proposed Conditions Plan for Notice of Intent Submittal, Sudbury-Hudson Trasmission Reliabaility Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc. and dated February 14, 2018.

BOTTOM OF GROUND IMPROVEMENT EL. 151.41

BORING BB-4 (CONTINUED)

BORING LOG — B-BB-4 PAGE 2 OF 4

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CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Fort Meadow Brook Bridge
LGCI PROJECT NUMBER: 1753-01
PROJECT LOCATION: Hudson, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth (ft.)	Material Description
24			S13	(10)	24/10				
26	155.0		S14	9-8-6-10 (14)	24/9				S14 - Similar to S13, ~5% fine subrounded gravel
28			S15	16-16-12-9 (28)	24/4				S15 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subrounded, 5-10% fines, 35-40% fine to coarse sand, gray, wet
30	150.0		S16	7-10-8-10 (18)	24/10				S16 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, light brown to gray, wet
32									
35	145.0		S17	16-5-6-13 (11)	24/16				S17 - Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, trace fine subrounded gravel, light brown to gray, wet
37									
40	140.0		S18	2-3-3-15 (6)	24/18		Sand		S18 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, gray, wet
42									
45	135.0		S19	3-3-7-6 (10)	24/9				S19 - Well Graded SAND (SW), fine to coarse, 0-5% fines, trace fine subrounded gravel, gray, wet
47									
50	130.0		S20	5-5-11-51 (16)	24/18				S20 - Similar to S19
52									
55	125.0		S21	5-3-3-3 (6)	24/8				S21 - Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, ~25% fine subrounded gravel, gray, wet
57									
60									S22 - Similar to S21, ~15% fine subrounded gravel

NO.	DESCRIPTION	BY	DATE	APPR.
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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH, & SUDBURY MASSACHUSETTS
BRIDGE H-25-011 (BRIDGE 130) – BORING LOGS
PLAN 180 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
N/A	DEC 2021	AMS	SBK	KGK	.	.

BORING BB–4 (CONTINUED)

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BORING LOG **B-BB-4** PAGE 3 OF 4

CLIENT: Vanasse Hangen Brustlin, Inc. **PROJECT NAME:** Proposed Fort Meadow Brook Bridge
LGCI PROJECT NUMBER: 1753-01 **PROJECT LOCATION:** Hudson, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth (ft.)	Material Description
60	120.0	60 – 62	S22	10-5-6-10 (11)	24/12				
65	115.0	65 – 67	S23	8-8-24-48 (32)	24/15				S23 - Similar to S22
70	110.0					2			REMARK 2: Issues with bottom blow in encountered; sample at 70 to 72 feet could not be taken.
75	105.0					3			REMARK 3: Issues with bottom blow in encountered; sample at 75 to 77 feet could not be taken.
80	100.0	80 – 82	S24	8-9-11-20 (20)	24/17		Sand		S24 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, gray, wet
85	95.0	85 – 87	S25	12-13-12-12 (25)	24/7				S25 - Similar to S24, light brown to gray
90	90.0	90 – 92	S26	37-46-62-52 (108)	24/18				S26 - Poorly Graded SAND (SP), fine, 0-5% fines, gray, wet
95		95		22-13-18-15					S27 - Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, ~15% fine to coarse gravel, gray, wet

BORING BB–4 (CONTINUED)

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BORING LOG **B-BB-4** PAGE 4 OF 4

CLIENT: Vanasse Hangen Brustlin, Inc. **PROJECT NAME:** Proposed Fort Meadow Brook Bridge
LGCI PROJECT NUMBER: 1753-01 **PROJECT LOCATION:** Hudson, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth (ft.)	Material Description
85	95	95 – 97	S27	(31)	24/7				
100	80.0	100 – 102	S28	17-14-18-27 (32)	24/0		Sand		S28 - No recovery
105	75.0							102.0	Bottom of borehole at 102.0 feet. Backfilled borehole with drill cuttings.
110	70.0								
115	65.0								
120	60.0								
125	55.0								
130									

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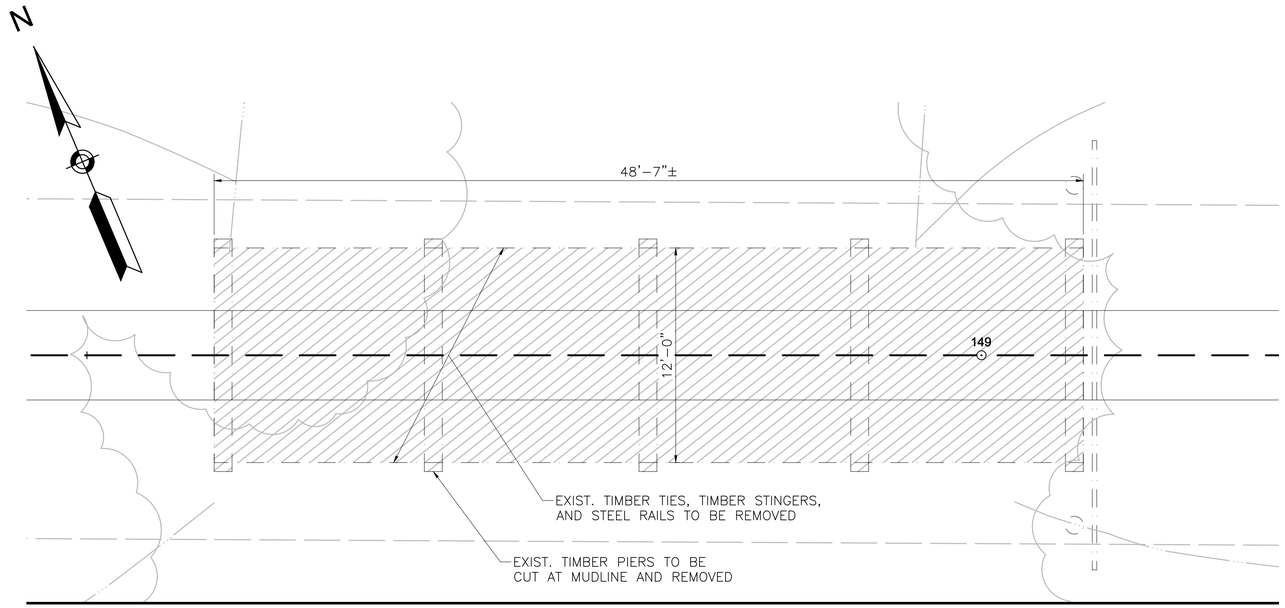
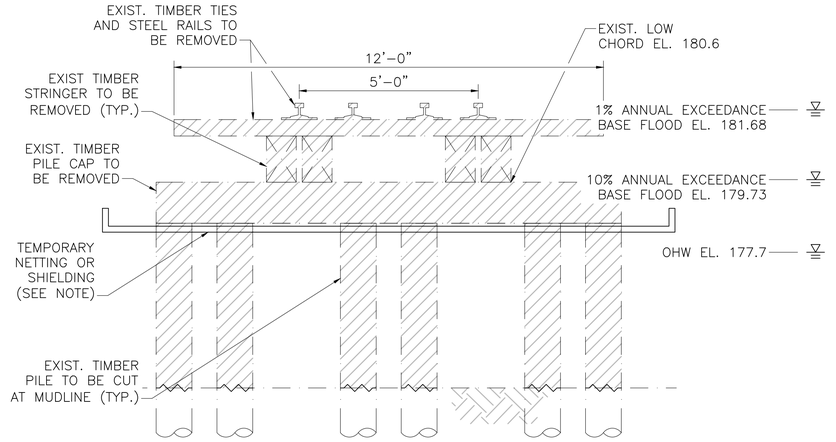
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH, & SUDBURY MASSACHUSETTS
BRIDGE H–25–011 (BRIDGE 130) – BORING LOGS
PLAN 181 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
N/A	DEC 2021	AMS	SBK	KGK	.	.



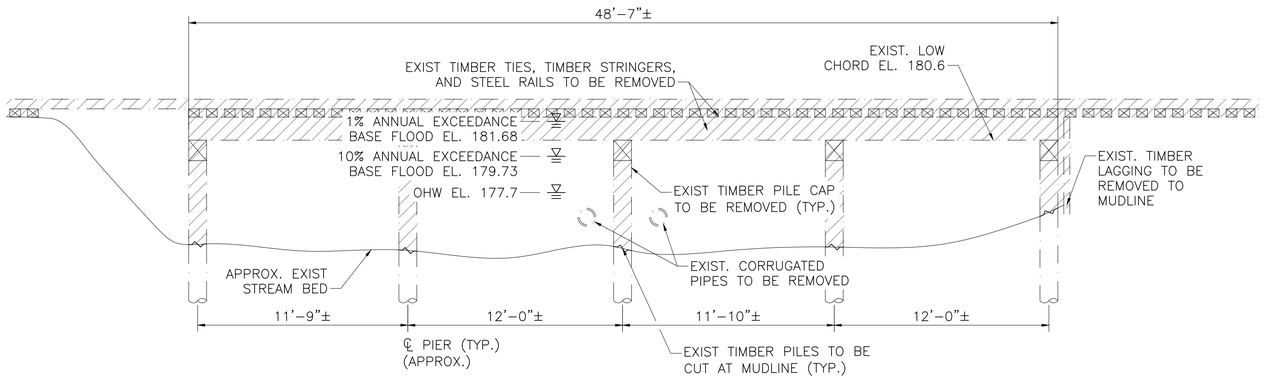
BRIDGE PLAN

SCALE: $\frac{1}{4}$"=1'-0"



BRIDGE SECTION

SCALE: $\frac{1}{2}$"=1'-0"



BRIDGE ELEVATION

SCALE: $\frac{1}{4}$"=1'-0"

NOTE: CONTRACTOR SHALL DESIGN AND INSTALL TEMPORARY PROTECTIVE SHIELDING OR NETTING DURING DEMOLITION OF BRIDGE AND AS NEEDED DURING CONSTRUCTION OF NEW BRIDGE TO PREVENT CONSTRUCTION DEBRIS FROM FALLING INTO THE WATER BODIES BELOW. SEE PROJECT SPECIFICATIONS AND PERMITTING DOCUMENTS FOR ADDITIONAL REQUIREMENTS AND INFORMATION.

NO.	DESCRIPTION	BY	DATE	APPR.

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE H–25–027 (BRIDGE 130) – DEMOLITION PLAN

PLAN 182 OF 349

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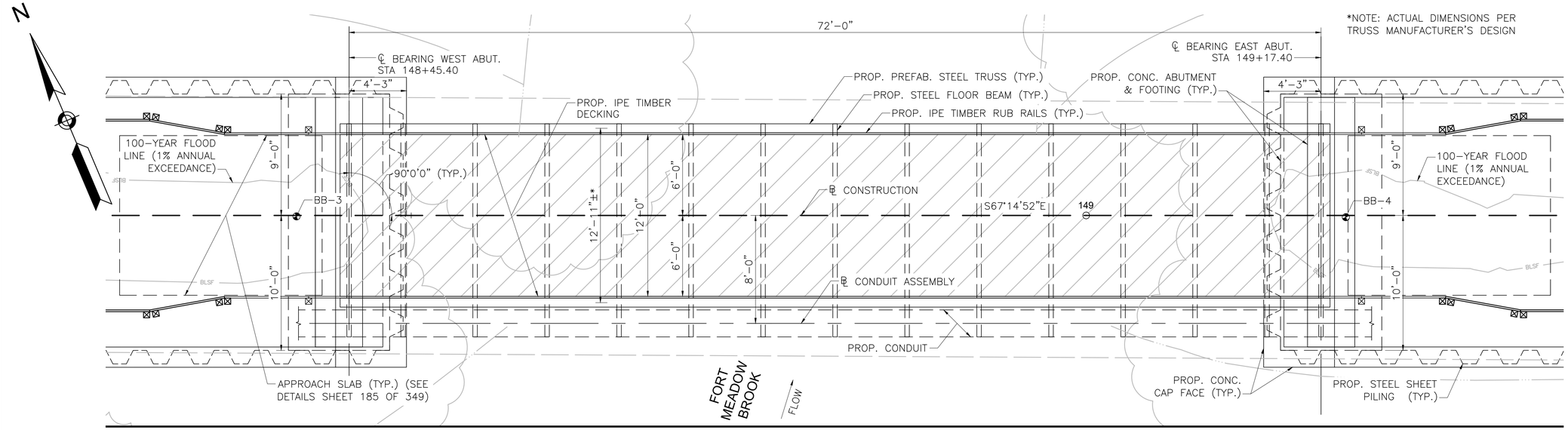
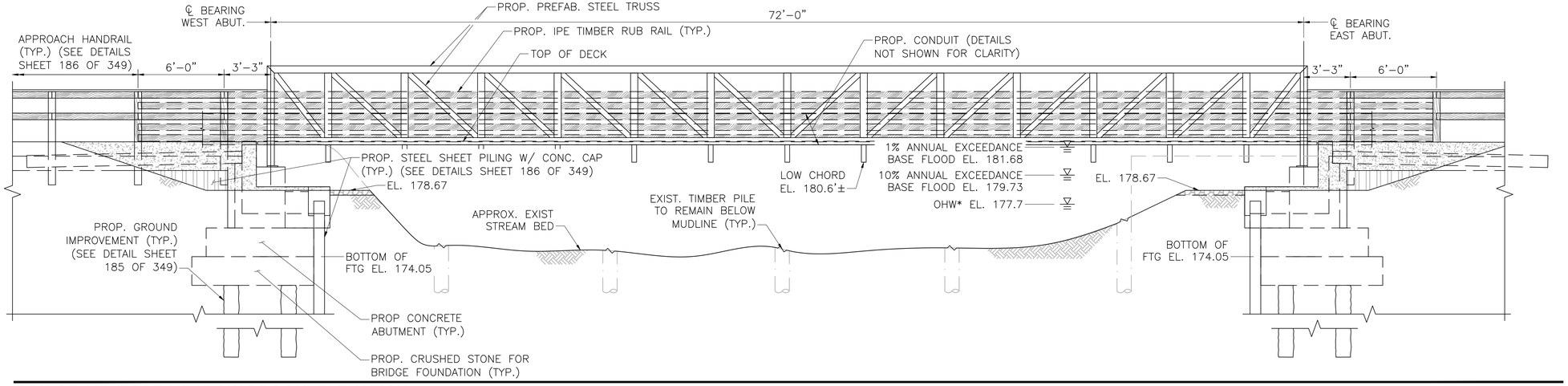
VARIES	DEC 2021	AMS	SBK	KGK	.	.



BRIDGE 130 (FORT MEADOW BROOK) PLAN

SCALE: $\frac{1}{4}$"=1'-0"

*NOTE: OHW = ESTIMATED ORDINARY HIGH WATER



BRIDGE 130 (FORT MEADOW BROOK) ELEVATION

SCALE: $\frac{1}{4}$"=1'-0"

NO.	DESCRIPTION	BY	DATE	APPR.
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE H–25–027 (BRIDGE 130) – PLAN & ELEVATION

PLAN183 OF 349

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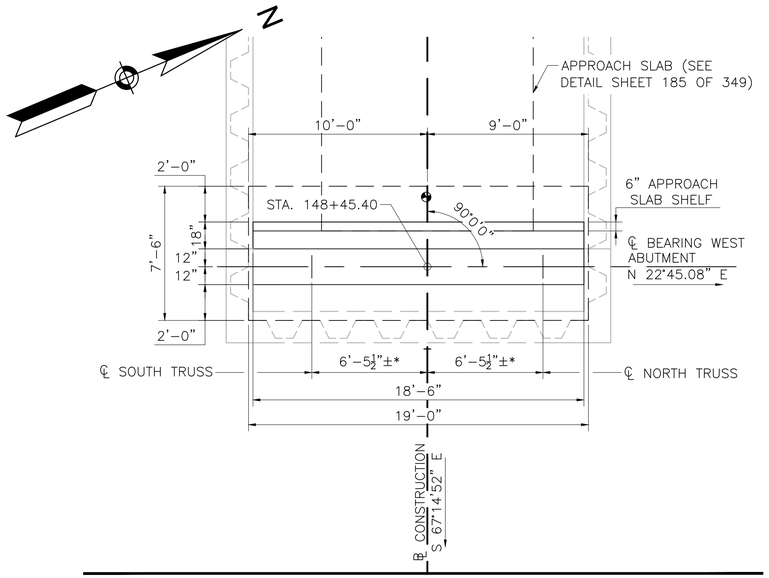
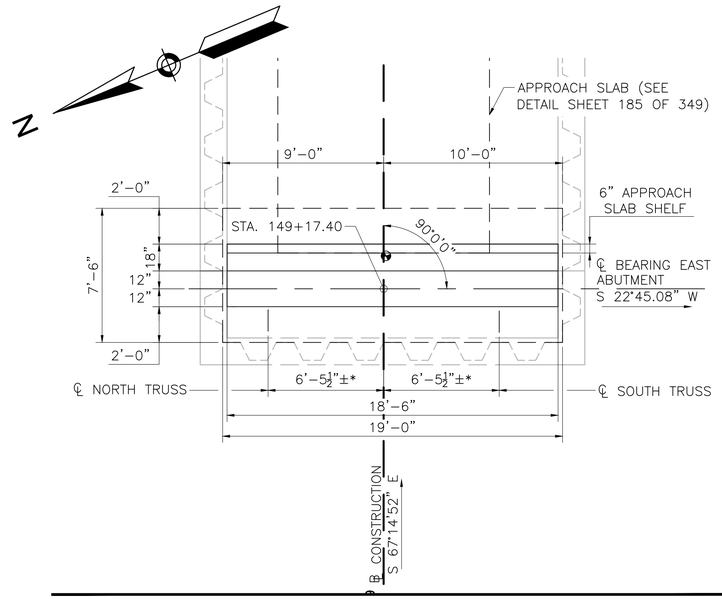
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=4'	DEC 2021	AMS	SBK	KGK	.	.



WEST ABUTMENT PLAN

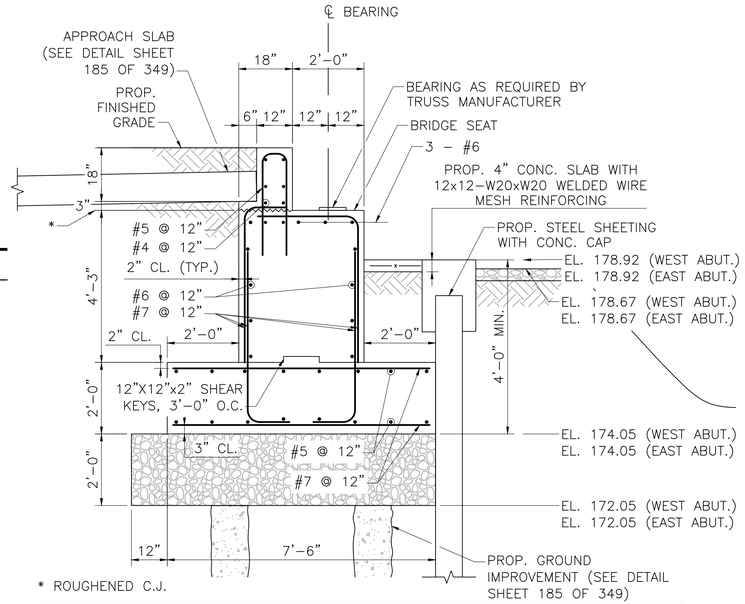
SCALE: $\frac{1}{4}$"=1'-0"



EAST ABUTMENT PLAN

SCALE: $\frac{1}{4}$"=1'-0"

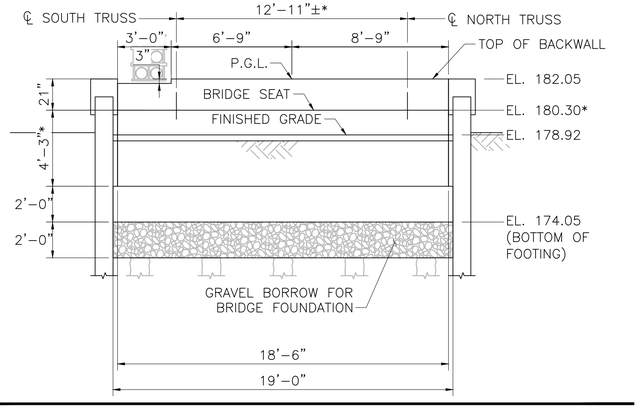
*NOTE: ACTUAL DIMENSIONS PER TRUSS MANUFACTURER'S DESIGN



* ROUGHENED C.J.

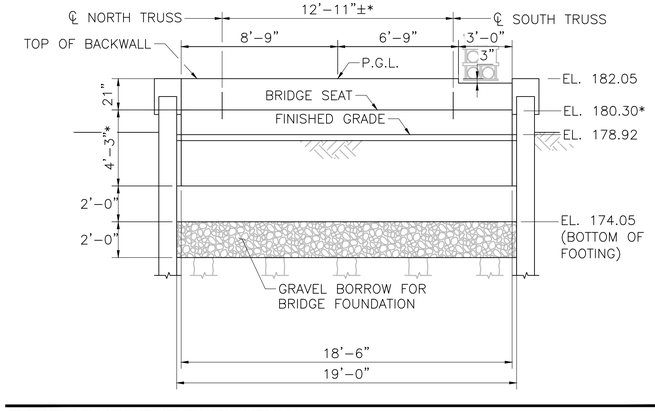
TYPICAL ABUTMENT SECTION

SCALE: $\frac{1}{2}$"=1'-0"



WEST ABUTMENT ELEVATION

SCALE: $\frac{1}{4}$"=1'-0"



EAST ABUTMENT ELEVATION

SCALE: $\frac{1}{4}$"=1'-0"

NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE H–25–027 (BRIDGE 130) – SUBSTRUCTURE DETAILS

PLAN 184 OF 349

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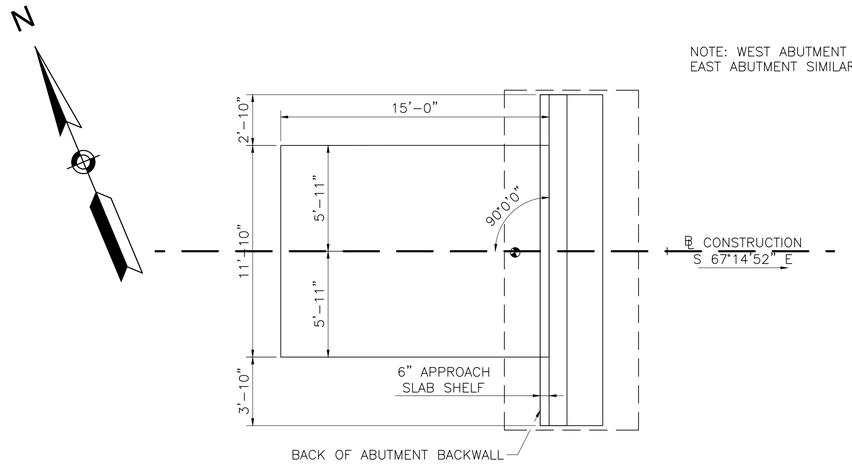
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
VARIES	DEC 2021	AMS	SBK	KGK	.	.

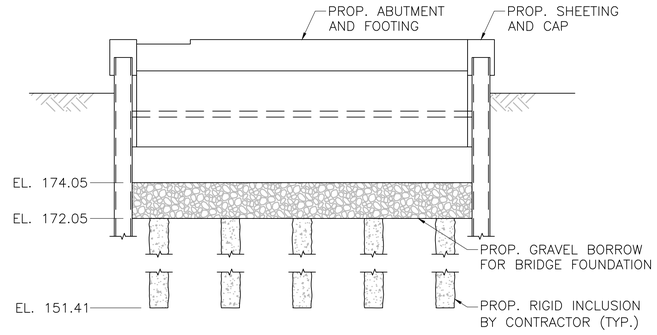
NOTE: WEST ABUTMENT SHOWN.
EAST ABUTMENT SIMILAR



APPROACH SLAB PLAN

SCALE: $\frac{1}{4}$"=1'-0"

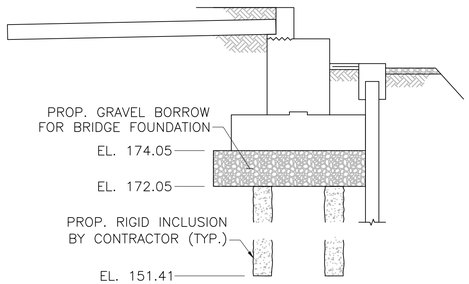
NOTE: WEST ABUTMENT SHOWN.
EAST ABUTMENT SIMILAR



GROUND IMPROVEMENT ELEVATION

SCALE: $\frac{1}{4}$"=1'-0"

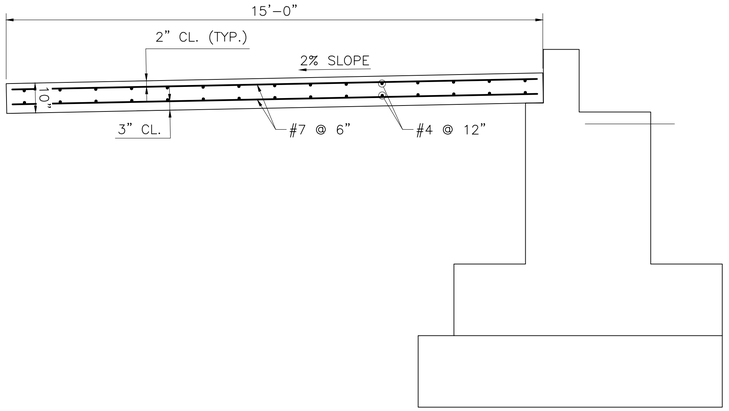
NOTE: WEST ABUTMENT SHOWN.
EAST ABUTMENT SIMILAR



GROUND IMPROVEMENT SECTION

SCALE: $\frac{1}{4}$"=1'-0"

NOTE: WEST ABUTMENT SHOWN.
EAST ABUTMENT SIMILAR



APPROACH SLAB DETAIL

SCALE: $\frac{1}{2}$"=1'-0"

NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
BRIDGE H–25–027 (BRIDGE 130) – SUBSTRUCTURE DETAILS
PLAN 85 OF 349

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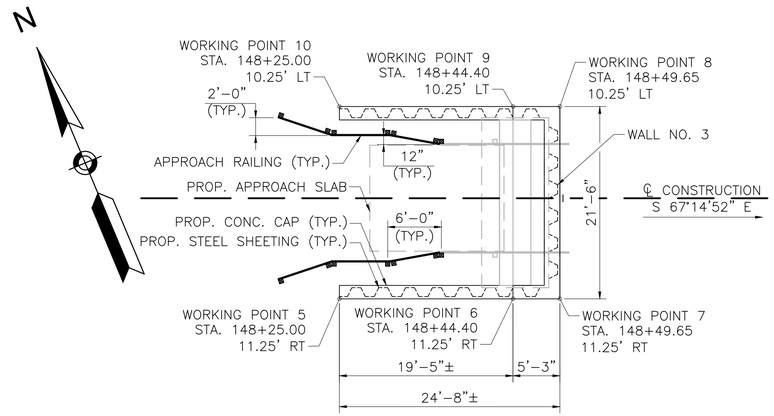
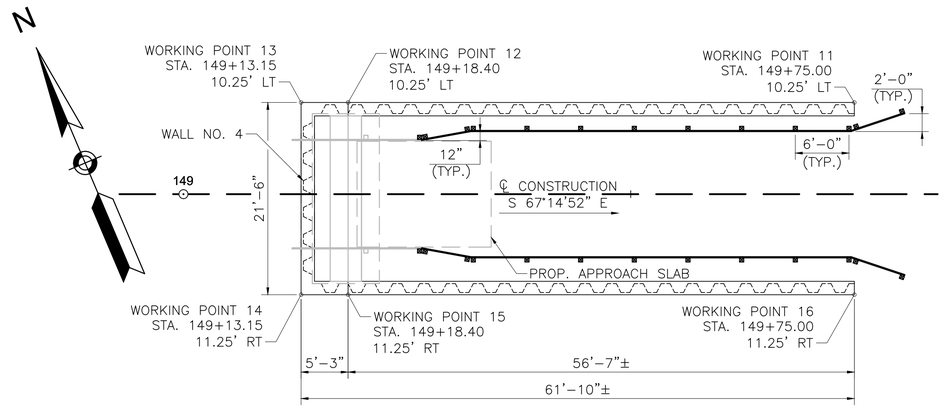
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
VARIES	DEC 2021	AMS	SBK	KGK	.	.



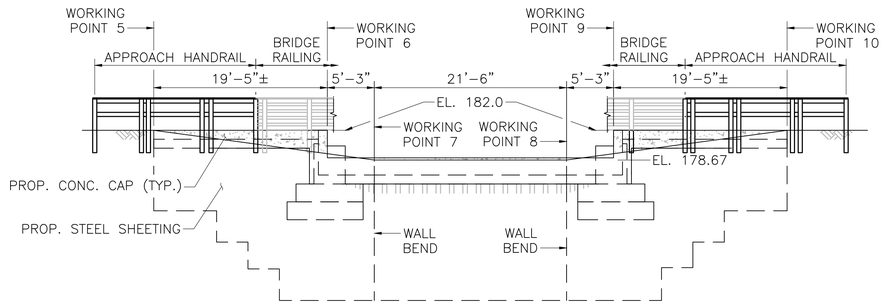
WALL 3 SHEETING PLAN (WEST APPROACH)

SCALE: $\frac{1}{8}$"=1'-0"



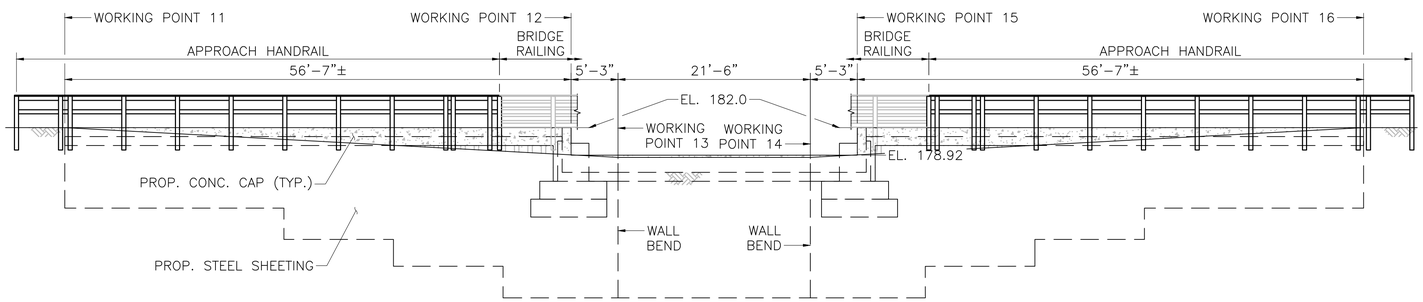
WALL 4 SHEETING PLAN (EAST APPROACH)

SCALE: $\frac{1}{8}$"=1'-0"



WALL 3 DEVELOPED ELEVATION (WEST APPROACH SHEETING WALL) (ALONG FACE OF COPING)

SCALE: $\frac{1}{8}$"=1'-0"

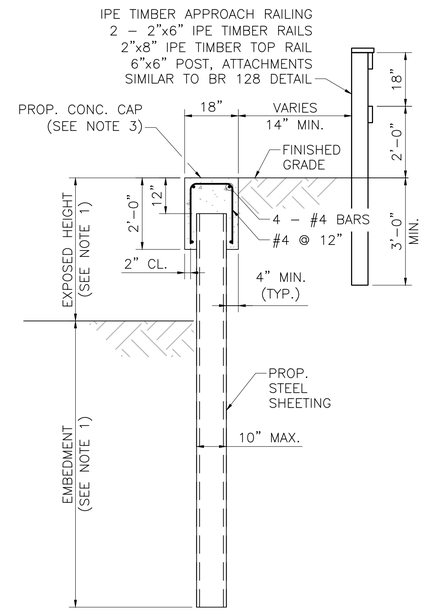


WALL 4 DEVELOPED ELEVATION (EAST APPROACH SHEETING WALL) (ALONG FACE OF COPING)

SCALE: $\frac{1}{8}$"=1'-0"

NOTES:

1. WALL EXPOSED HEIGHT TO BE VERIFIED IN FIELD. SHEETING EMBEDMENT DEPTH VARIES WITH WALL EXPOSED HEIGHT. SEE SHEETING EMBEDMENT TABLE BELOW.
2. SHEETING SECTION SHALL BE SELECTED BY CONTRACTOR. STEEL SHEETING SHALL BE GRADE 50 STEEL IN ACCORDANCE WITH ASTM A328 WITH A SECTION MODULUS (S_X) OF 7.08 IN^3 PER FOOT.
3. CONC. CAP SHALL BE 4000 PSI, $\frac{3}{4}$", 610 CEMENT CONCRETE. REINFORCING STEEL SHALL BE GRADE 60 EPOXY COATED STEEL IN ACCORDANCE WITH AASHTO M31. CONSTRUCTION JOINTS IN CAP SHALL BE SPACED AT 24'-0" MAX. CONTRACTOR SHALL SUBMIT JOINT LAYOUT PLAN TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. REINFORCEMENT SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINT.



TYPICAL SHEETING SECTION

SCALE: $\frac{1}{2}$"=1'-0"

SHEETING EMBEDMENT TABLE	
EXPOSED HEIGHT	EMBEDMENT
2'–0" (MAX.)	7'–4" (MIN.)
3'–0" (MAX.)	9'–5" (MIN.)
4'–0" (MAX.)	11'–6" (MIN.)
5'–0" (MAX.)	13'–7" (MIN.)
6'–0" (MAX.)	15'–7" (MIN.)
7'–0" (MAX.)	17'–7" (MIN.)

NO.	DESCRIPTION	BY	DATE	APPR.
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EVERSOURCE

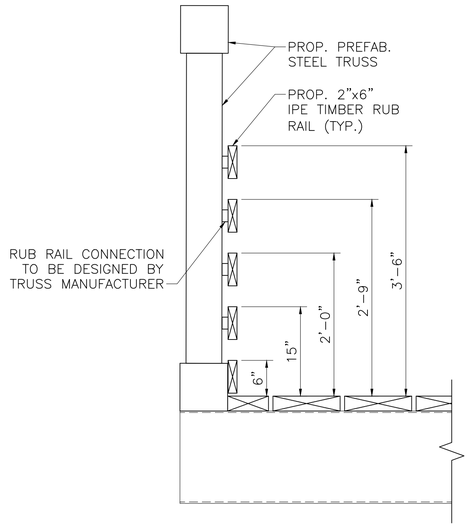
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE H–25–027 (BRIDGE 130) SHEETING PLAN

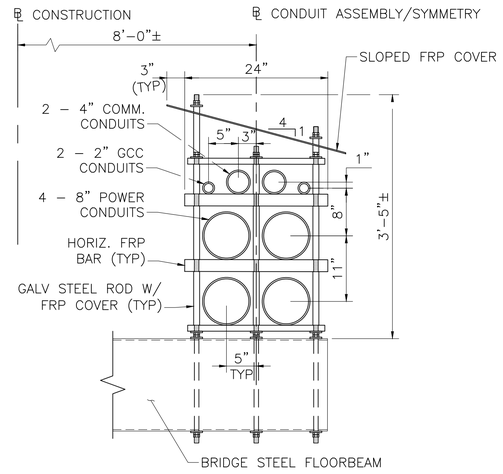
PLAN 186 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
VARIES	DEC 2021	AMS	SBK	KGK	.	.



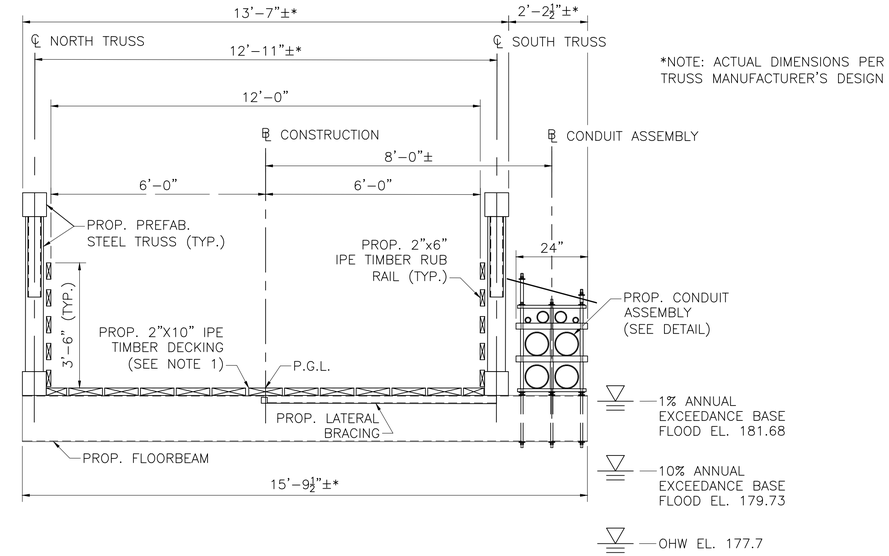
RAILING CONNECTION DETAIL

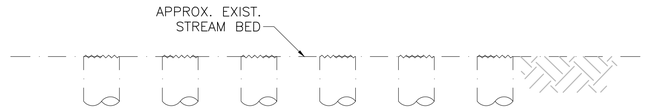
SCALE: 1"=1'-0"



CONDUIT ASSEMBLY DETAIL

SCALE: 1"=1'-0"





BRIDGE TRANSVERSE SECTION

SCALE: ¾"=1'-0"

NOTES:

1. TRUSS SHALL BE DESIGNED FOR TEMPORARY H20 LOADING DURING CONSTRUCTION. TIMBER DECKING IS DESIGNED FOR H10 LOADING WITHOUT IMPACT AND 90 PSF PEDESTRIAN LOADING, WHICHEVER CONTROLS. CONTRACTOR SHALL DESIGN TEMPORARY DECKING IF BRIDGE IS INTENDED TO BE USED FOR CONSTRUCTION VEHICLES.

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE H–25–027 (BRIDGE 130) – SECTION & DETAILS

PLAN 87 OF 349

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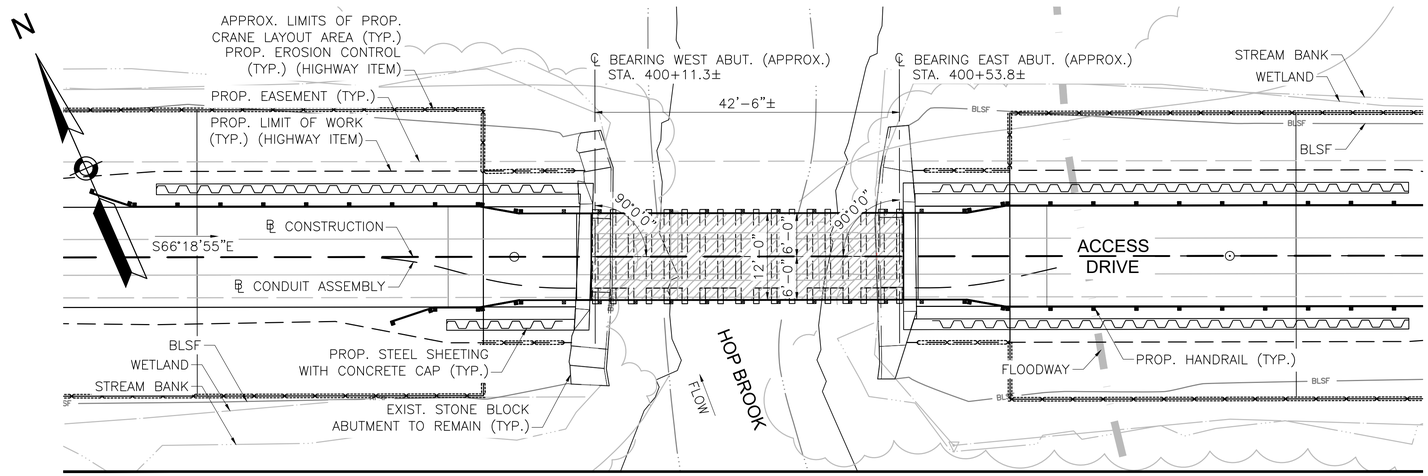
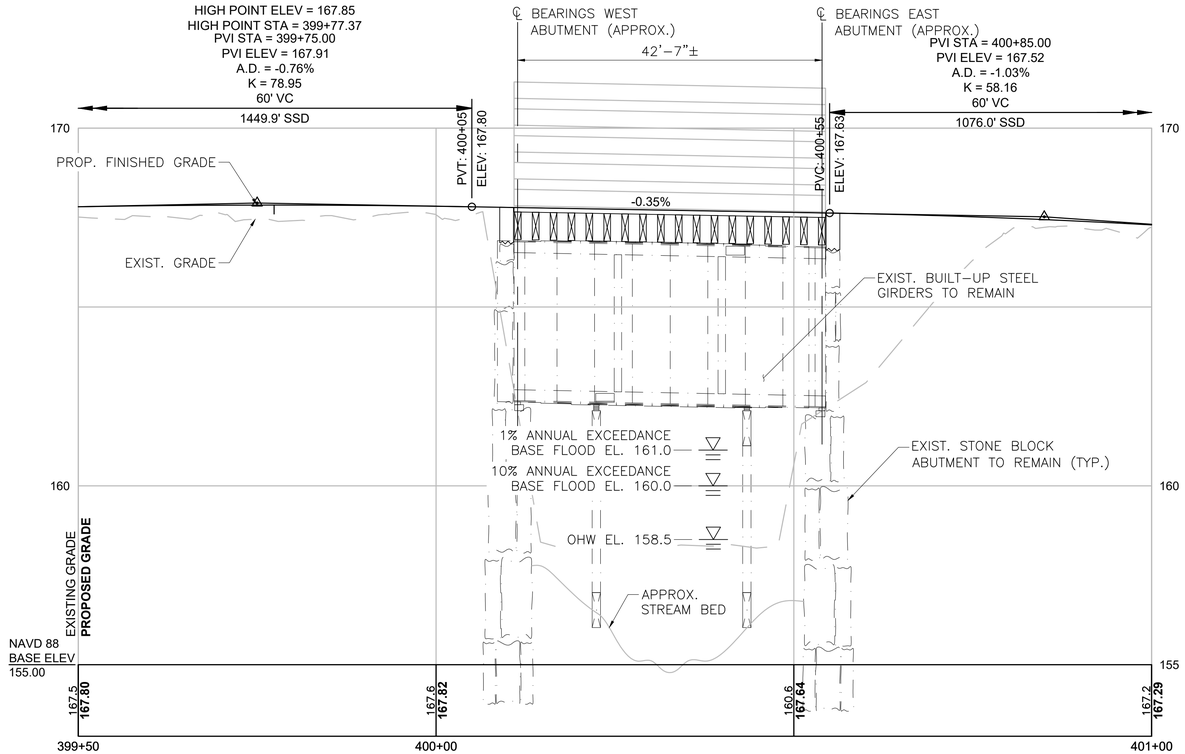
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
VARIES	DEC 2021	AMS	SBK	KGK	.	.



BRIDGE KEY PLAN

SCALE: 1"=10'



PROFILE - ACCESS DRIVE

HORIZONTAL SCALE: 1"=10'
VERTICAL SCALE: ½"=1'-0"

GENERAL NOTES: BRIDGE 128

DESIGN:
IN ACCORDANCE WITH THE 2009 AASHTO GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES (WITH 2015 INTERIM REVISIONS) FOR H10 LOADING WITHOUT IMPACT AND 90 PSF PEDESTRIAN LOADING, WHICHEVER CONTROLS. DESIGNED FOR TEMPORARY H20 LOADING DURING CONSTRUCTION ONLY. RAILING DESIGNED FOR PEDESTRIAN LOADING ONLY.

CONCRETE:
ALL CAST IN PLACE CONCRETE SHALL BE 4000 PSI, ⅜", 660 CEMENT CONCRETE.
GROUT TO BE USED FOR DRILLING AND GROUTING DOWELS INTO EXISTING SUBSTRUCTURES SHALL BE A CEMENTITIOUS GROUT LISTED ON THE MASSDOT QUALIFIED CONSTRUCTION MATERIALS LIST.

REINFORCEMENT:
REINFORCING STEEL SHALL BE EPOXY COATED AND SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M31 GRADE 60.

STEEL:
NEW STEEL PLATES AND SHAPES SHALL BE NEW MATERIAL MEETING THE REQUIREMENTS OF AASHTO M270 GRADE 50, PAINTED.
BOLTS THAT FASTEN TO STEEL ONLY SHALL BE AASHTO M1644 (ASTM 325) HIGH STRENGTH BOLTS, GALVANIZED.

TIMBER:
DECK PLANKING AND RAILINGS: IPE, F_b min = 22,000 psi.
FLOOR BEAMS: SYP NO. 1 OR BETTER, F_b min = 1,050 psi.
SYP TIMBER SHALL BE TREATED WITH ACQ-D WITH 0.60 PCF RETENTION.
ALL NAILS, SCREWS, BOLTS, WASHERS, CONNECTORS, FASTENERS AND HARDWARE FOR WOOD CONNECTIONS SHALL BE STAINLESS STEEL TYPE 304 OR TYPE 316.
WHERE TREATED TIMBER MEMBERS ARE IN DIRECT CONTACT WITH STEEL PROVIDE VYCOR DECK PROTECTOR BARRIER MEMBRANE BY W.R. GRACE & CO. OR APPROVED EQUAL.
BETWEEN THE TIMBER TRANSVERSE FLOOR BEAMS AND THE DECK PLANKING, PROVIDE A LAYER OF GRACE ICE & WATER SHIELD BY W.R. GRACE & CO. OR APPROVED EQUAL.

SURVEY AND EXISTING CONDITIONS:
THE EXISTING CONDITIONS SHOWN ON THIS PLAN WERE DEVELOPED FROM A COMBINED EFFORT OF AERIAL PHOTOGRAMMETRIC MAPPING BY EASTERN TOPOGRAPHICS, INC., BASED ON AERIAL PHOTOGRAPHS TAKEN ON FEBRUARY 22, 2013, AND AUGMENTED BY AN ON-THE-GROUND SURVEY PERFORMED BY VHB DURING 2015 AND 2017.
THE HORIZONTAL CONTROL IS BASED ON THE MASSACHUSETTS MAINLAND STATE PLANE COORDINATE SYSTEM AND THE NATIONAL GEODETIC SURVEY (NAD83). ALL ELEVATION IS US FEET, REFERENCED TO THE NORTH AMERICA VERTICAL DATUM OF 1988 (NAVD88).

DEMOLITION AND CONSTRUCTION:
ALL EXISTING MATERIALS REMOVED AND NOT REUSED AND ALL WASTE MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR.
TREATED TIMBER AND CONTAMINATED WASTE SHALL BE DISPOSED OF OFF SITE AT AN APPROVED FACILITY.
BACKFILL AROUND ABUTMENTS SHALL BE GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES.
THE CONTRACTOR SHALL TAKE THE PROPER PRECAUTIONS TO ENSURE THE STABILITY AND SAFE PERFORMANCE OF ALL STRUCTURAL ELEMENTS DURING DEMOLITION AND CONSTRUCTION.
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ADEQUATE SHIELDING OR NETTING DURING DEMOLITION AND CONSTRUCTION TO ADEQUATELY PROTECT WORKERS AND TO PREVENT DEBRIS AND MATERIALS FROM ENTERING THE WATERWAY.
ANY DAMAGE TO REMAINING EXISTING COMPONENTS THAT IS CAUSED BY THE CONTRACTOR'S ACTIVITY SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR, AT NO ADDITIONAL EXPENSE.

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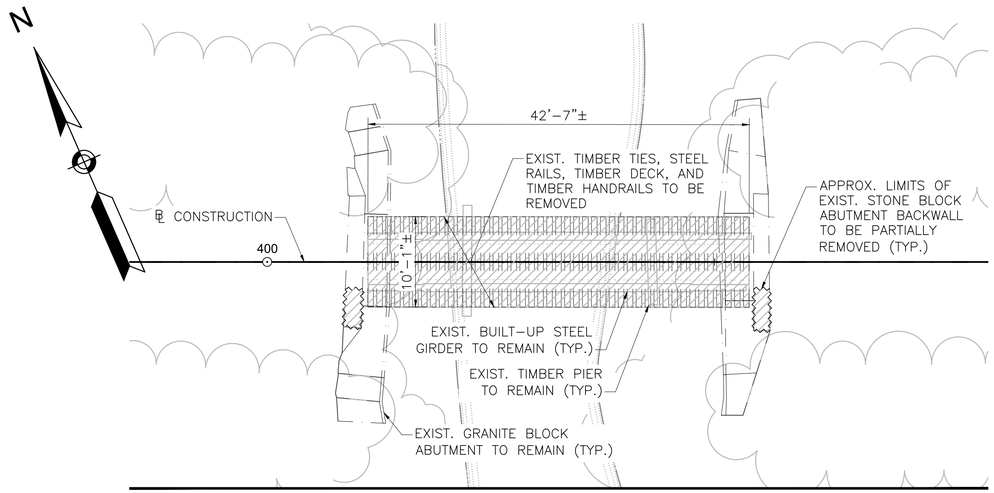
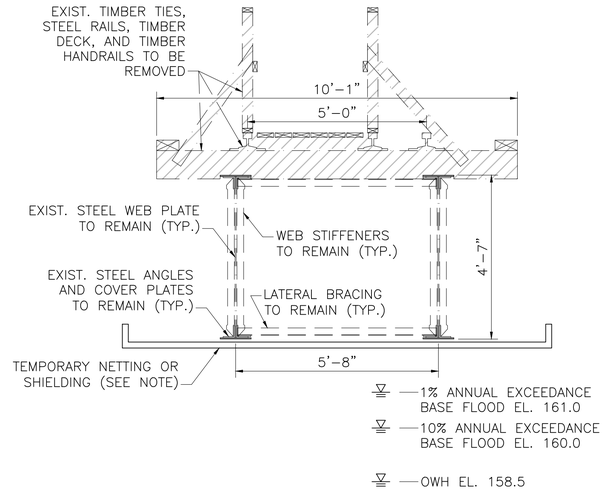
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
BRIDGE S-31-017 (BRIDGE 128) – KEY PLAN & PROFILE
PLAN 188 OF 349

SCALE: unless noted	DATE	DRAWN	CH'KD.	APPR.	DRAWING NO.	REV.
H: 1"=10' V: 1"=2'	DEC 2021	AMS	SBK	KGK	.	.



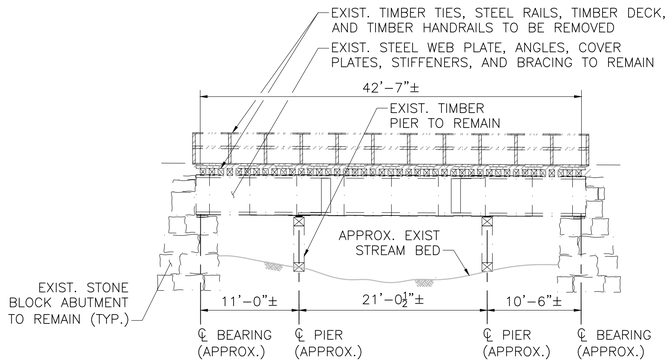
BRIDGE PLAN

SCALE: $\frac{3}{8}$"=1'-0"



BRIDGE TRANSVERSE SECTION

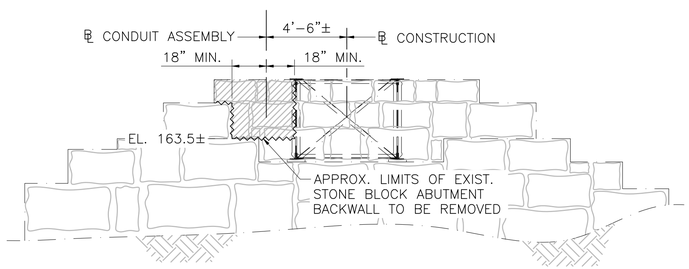
SCALE: $\frac{1}{2}$"=1'-0"



BRIDGE ELEVATION

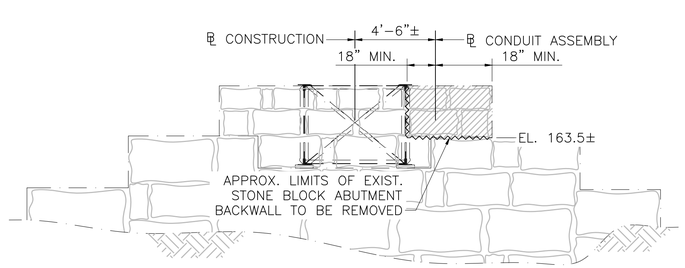
SCALE: $\frac{3}{8}$"=1'-0"

NOTE: CONTRACTOR SHALL DESIGN AND INSTALL TEMPORARY PROTECTIVE SHIELDING OR NETTING DURING DEMOLITION OF BRIDGE AND AS NEEDED DURING CONSTRUCTION OF NEW BRIDGE TO PREVENT CONSTRUCTION DEBRIS FROM FALLING INTO THE WATER BODIES BELOW. SEE PROJECT SPECIFICATIONS AND PERMITTING DOCUMENTS FOR ADDITIONAL REQUIREMENTS AND INFORMATION.



WEST ABUTMENT ELEVATION

SCALE: $\frac{1}{4}$"=1'-0"



EAST ABUTMENT ELEVATION

SCALE: $\frac{1}{4}$"=1'-0"

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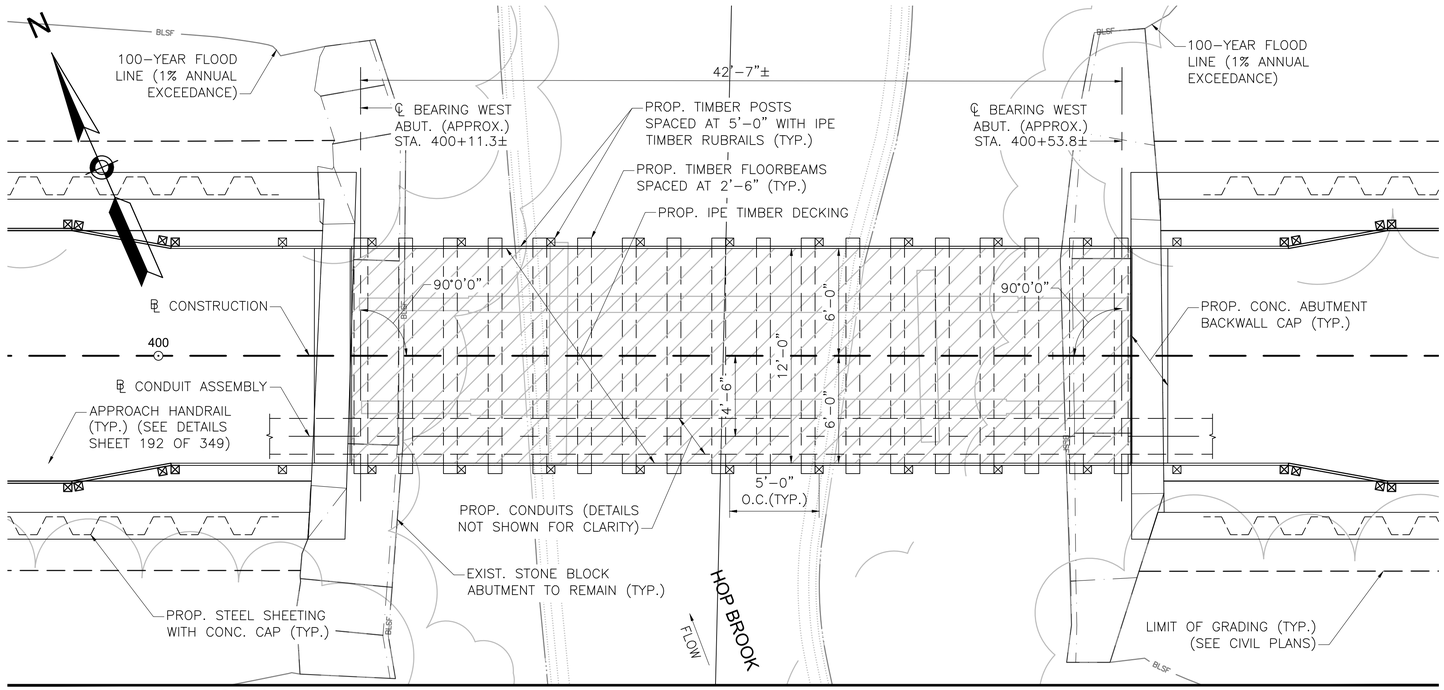
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE S–31–017 (BRIDGE 128) – DEMOLITION PLAN

PLAN 189 OF 349

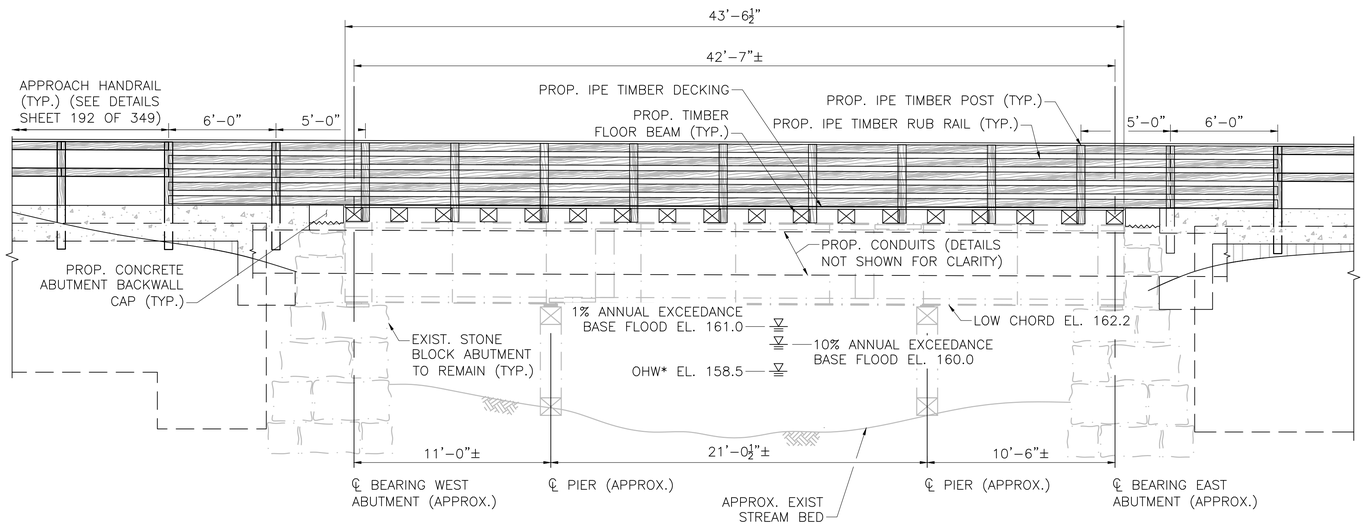
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
VARIES	DEC 2021	AMS	SBK	KGK	.	.



BRIDGE 128 (HOP BROOK) PLAN

SCALE: $\frac{1}{4}$"=1'-0"

*NOTE: OHW = ESTIMATED ORDINARY HIGH WATER



BRIDGE 128 (HOP BROOK) ELEVATION

SCALE: $\frac{1}{4}$"=1'-0"

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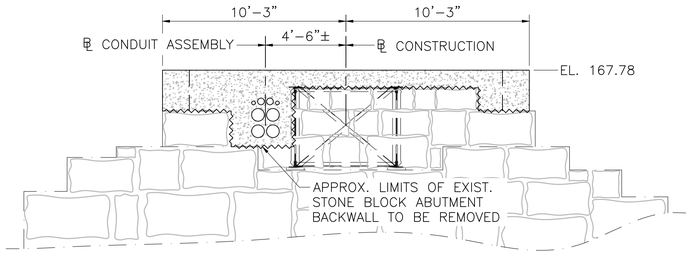
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE S–31–017 (BRIDGE 128) – PLAN & ELEVATION

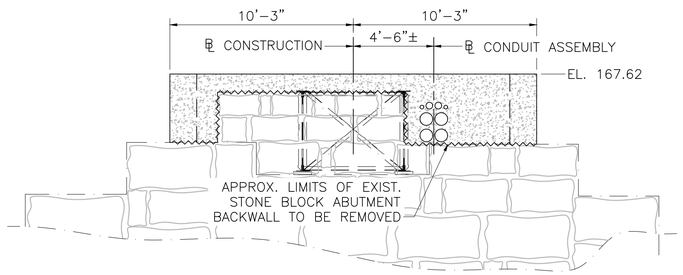
PLAN190 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=4'	DEC 2021	AMS	SBK	KGK	.	.



WEST ABUTMENT ELEVATION

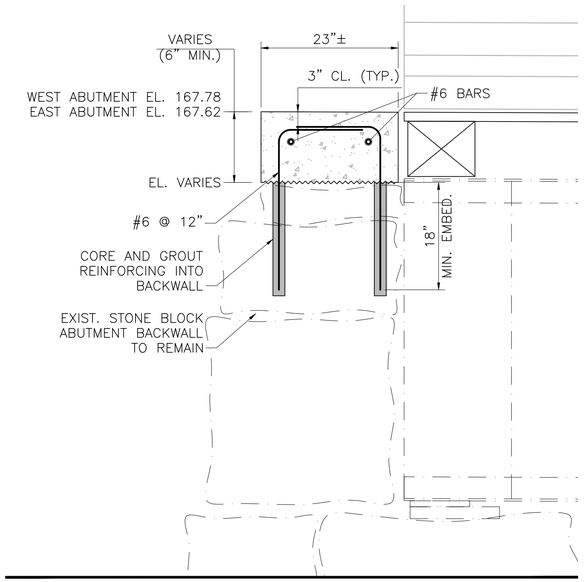
SCALE: $\frac{1}{4}$"=1'-0"



EAST ABUTMENT ELEVATION

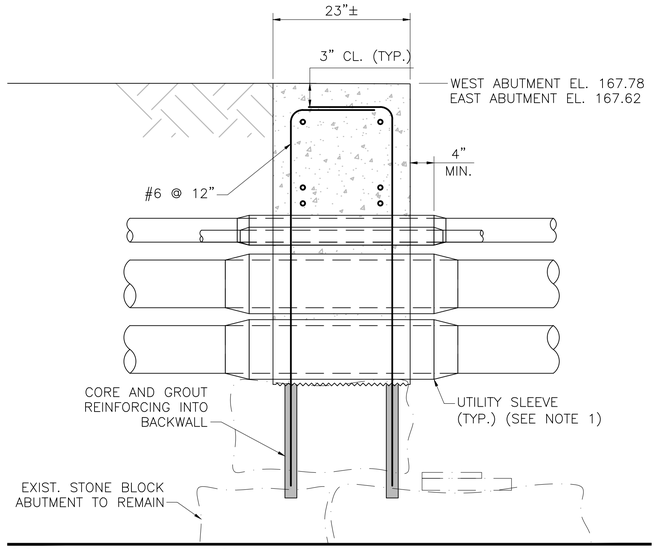
SCALE: $\frac{1}{4}$"=1'-0"

NOTES:
1. UTILITY SLEEVES SHALL BE STEEL PIPE CONFORMING TO ASTM A-53, TYPE S, GRADE B, STANDARD WEIGHT, PLAIN ENDS, HOT-DIP GALVANIZED AND SHALL BE SET IN THE FORMS PRIOR TO PLACING CONCRETE.



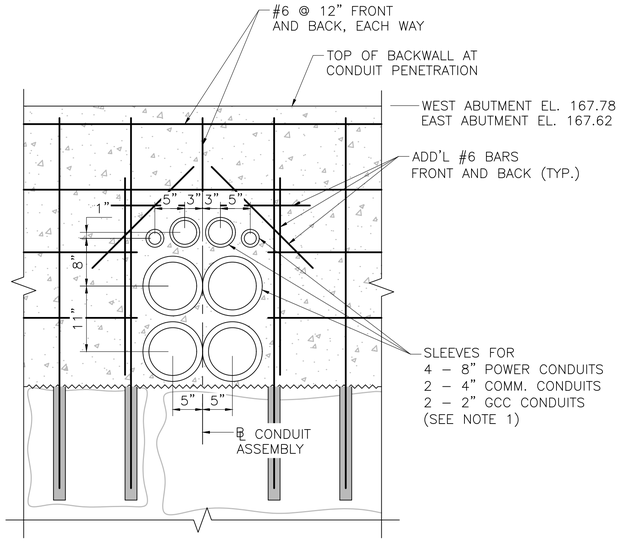
BACKWALL CAP DETAIL

SCALE: 1"=1'-0"



CONDUIT PENETRATION DETAIL

SCALE: 1"=1'-0"



CONDUIT PENETRATION SECTION

SCALE: 1"=1'-0"

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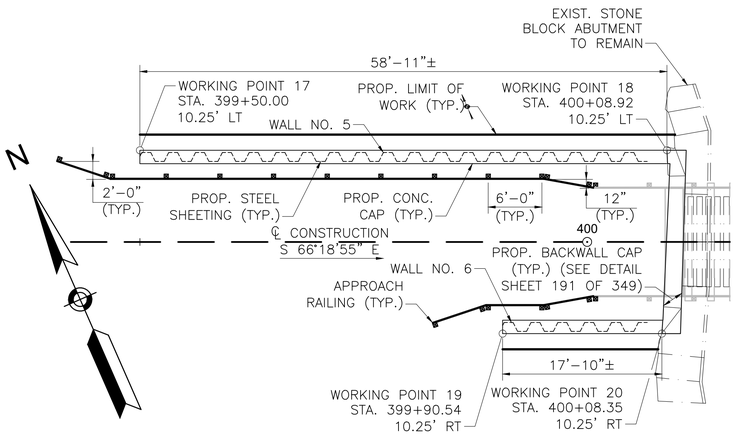
SUDBURY-HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE S-31-017 (BRIDGE 128) - ABUTMENT DETAILS

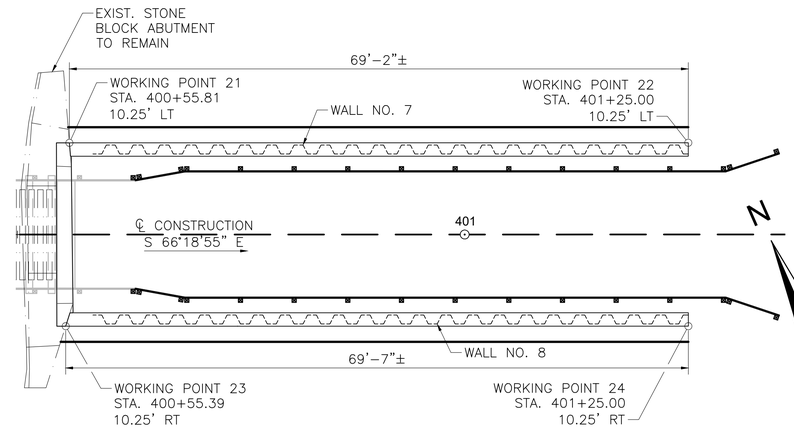
PLAN 1910F 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
VARIES	DEC 2021	AMS	SBK	KGK	.	.



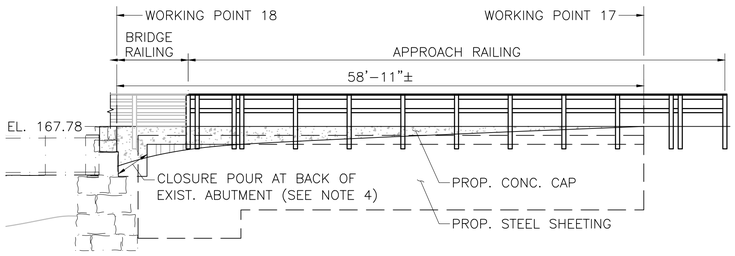
WALL 5 & 6 SHEETING PLAN (WEST APPROACH)

SCALE: $\frac{1}{8}$"=1'-0"



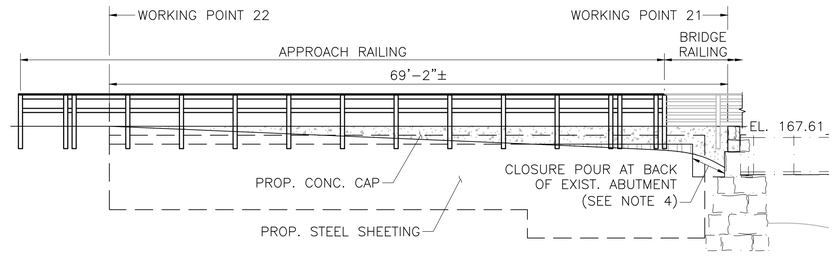
WALL 7 & 8 SHEETING PLAN (EAST APPROACH)

SCALE: $\frac{1}{8}$"=1'-0"



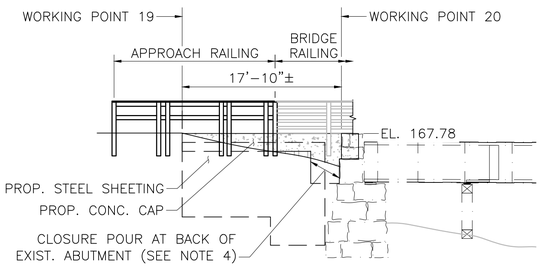
WALL 5 ELEVATION (WEST APPROACH NORTH SHEETING WALL)

SCALE: $\frac{1}{8}$"=1'-0"



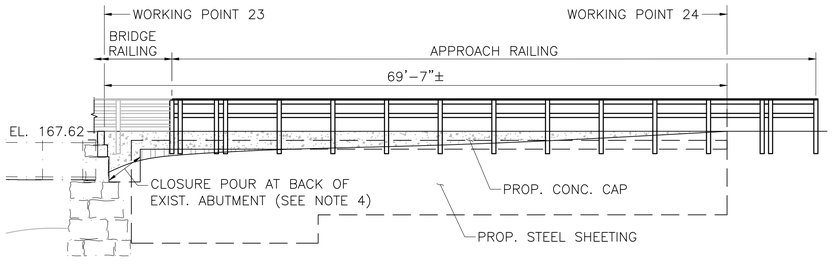
WALL 7 (EAST APPROACH NORTH SHEETING WALL)

SCALE: $\frac{1}{8}$"=1'-0"



WALL 6 ELEVATION (WEST APPROACH SOUTH SHEETING WALL)

SCALE: $\frac{1}{8}$"=1'-0"

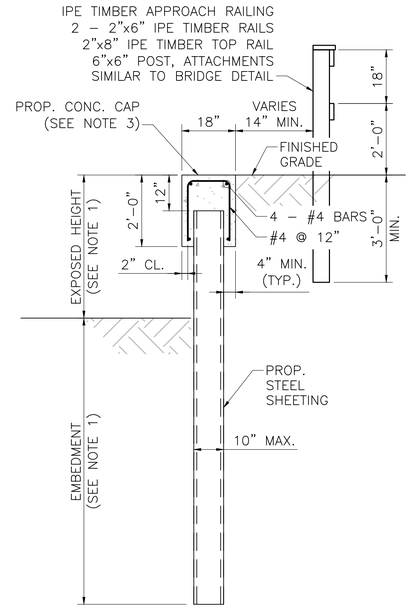


WALL 8 ELEVATION (EAST APPROACH SOUTH SHEETING WALL)

SCALE: $\frac{1}{8}$"=1'-0"

NOTES:

1. WALL EXPOSED HEIGHT TO BE VERIFIED IN FIELD. SHEETING EMBEDMENT DEPTH VARIES WITH WALL EXPOSED HEIGHT. SEE SHEETING EMBEDMENT TABLE BELOW.
2. SHEETING SECTION SHALL BE SELECTED BY CONTRACTOR. STEEL SHEETING SHALL BE GRADE 50 STEEL IN ACCORDANCE WITH ASTM A328 WITH A SECTION MODULUS (S_X) OF 7.08 IN^3 PER FOOT.
3. CONC. CAP SHALL BE 4000 PSI, $\frac{3}{4}$", 610 CEMENT CONCRETE. REINFORCING STEEL SHALL BE GRADE 60 EPOXY COATED STEEL IN ACCORDANCE WITH AASHTO M31. CONSTRUCTION JOINTS IN CAP SHALL BE SPACED AT 24'–0" MAX. CONTRACTOR SHALL SUBMIT JOINT LAYOUT PLAN TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. REINFORCEMENT SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINT.
4. CONTRACTOR SHALL DETERMINE LIMITS OF EXISTING STONE BLOCK ABUTMENTS PRIOR TO DRIVING SHEETING. SHEETING SHALL BE DRIVEN AS CLOSE TO THE BACK OF THE EXISTING ABUTMENTS AS PRACTICAL. WORKING POINT STATION/OFFSET AT THESE LOCATIONS (3, 6, 7, AND 10) IS SUBJECT TO CHANGE BASED ON CONDITIONS ENCOUNTERED IN THE FIELD. CONCRETE CAP SHALL BE EXTENDED AS NEEDED TO FORM A CLOSURE POUR BETWEEN END OF SHEETING AND BACK OF EXISTING ABUTMENT. HEIGHT OF CAP SHALL BE INCREASED AT CLOSURE POUR AS NEEDED TO MAINTAIN REQUIRED GRADE SEPARATION.



TYPICAL SHEETING SECTION

SCALE: $\frac{1}{2}$"=1'-0"

SHEETING EMBEDMENT TABLE	
EXPOSED HEIGHT	EMBEDMENT
2'–0" (MAX.)	7'–4" (MIN.)
3'–0" (MAX.)	9'–5" (MIN.)
4'–0" (MAX.)	13'–8" (MIN.)
6'–0" (MAX.)	15'–7" (MIN.)
7'–0" (MAX.)	17'–7" (MIN.)

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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

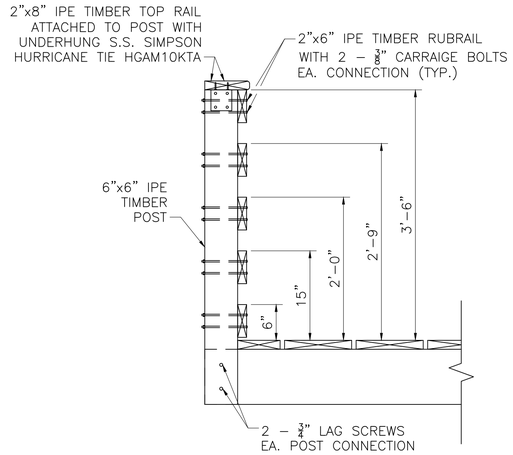
BRIDGE H–25–017 (BRIDGE 128) – SHEETING PLAN

PLAN 192 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	AMS	SBK	KGK	.	.

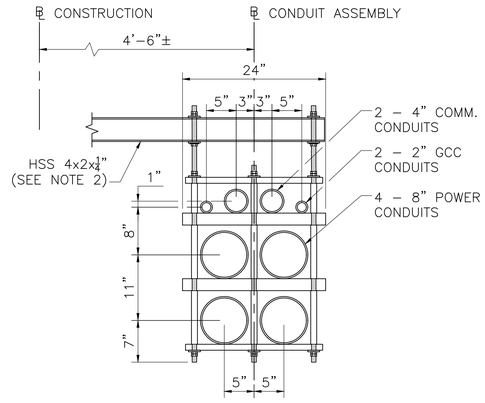
NOTES:

1. EXIST. STEEL GIRDERS CAN SUPPORT TEMPORARY H20 LOADING DURING CONSTRUCTION. TIMBER DECKING IS DESIGNED FOR H10 LOADING WITHOUT IMPACT AND 90 PSF PEDESTRIAN LOADING, WHICHEVER CONTROLS. CONTRACTOR SHALL DESIGN TEMPORARY DECKING IF BRIDGE IS INTENDED TO BE USED FOR CONSTRUCTION VEHICLES.
2. HSS CONDUIT SUPPORT MEMBERS SHALL BE STRUCTURAL STEEL IN ACCORDANCE WITH MASSDOT STANDARD SPECIFICATIONS SECTION M8.05.0 AND SHALL BE PAINTED IN ACCORDANCE WITH MASSDOT STANDARD SPECIFICATIONS SECTION M7.02. PAINT COLOR FOR HSS SUPPORT MEMBER SHALL MATCH COLOR OF CONDUIT HANGER ASSEMBLY.



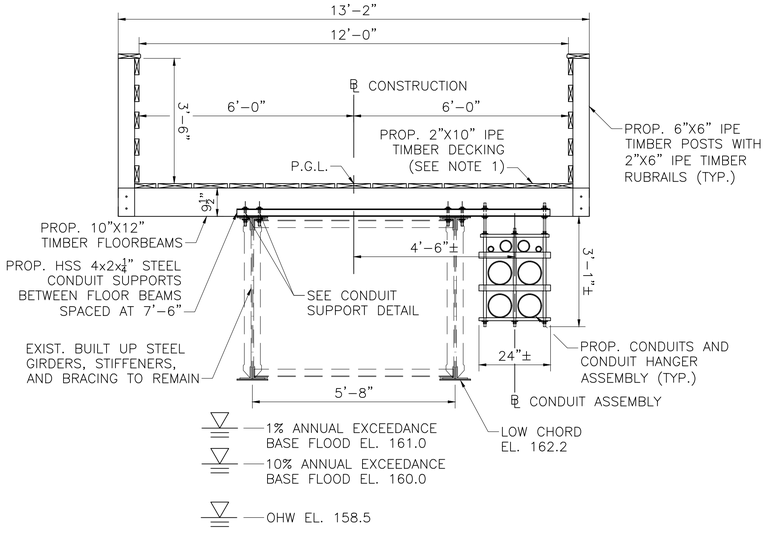
RAILING CONNECTION DETAIL

SCALE: 1"=1'-0"



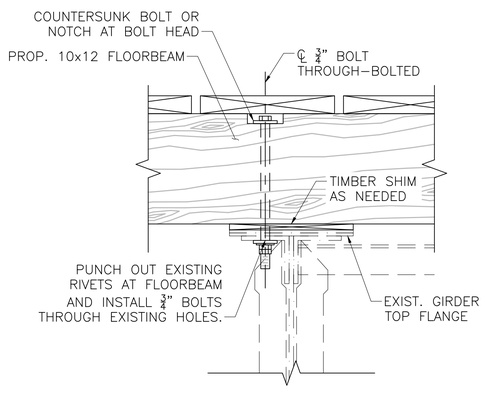
CONDUIT ASSEMBLY DETAIL

SCALE: 1"=1'-0"

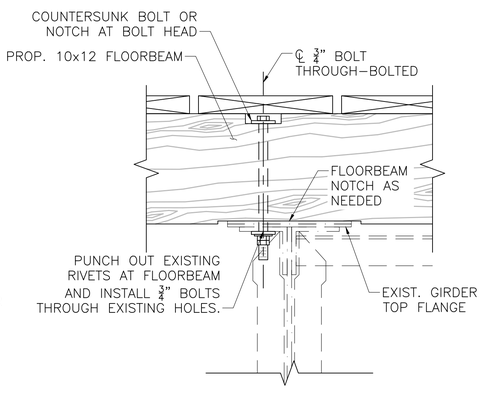


BRIDGE TRANSVERSE SECTION

SCALE: ½"=1'-0"



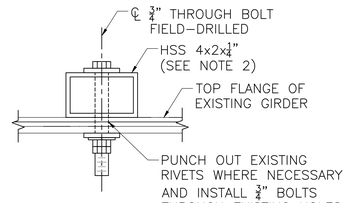
AT BUILD-UP



AT CUT-OUT

FLOORBREAM CONNECTION DETAIL

SCALE: 2"=1'-0"



CONDUIT SUPPORT DETAIL

SCALE: 3"=1'-0"

NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

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EVERSOURCE

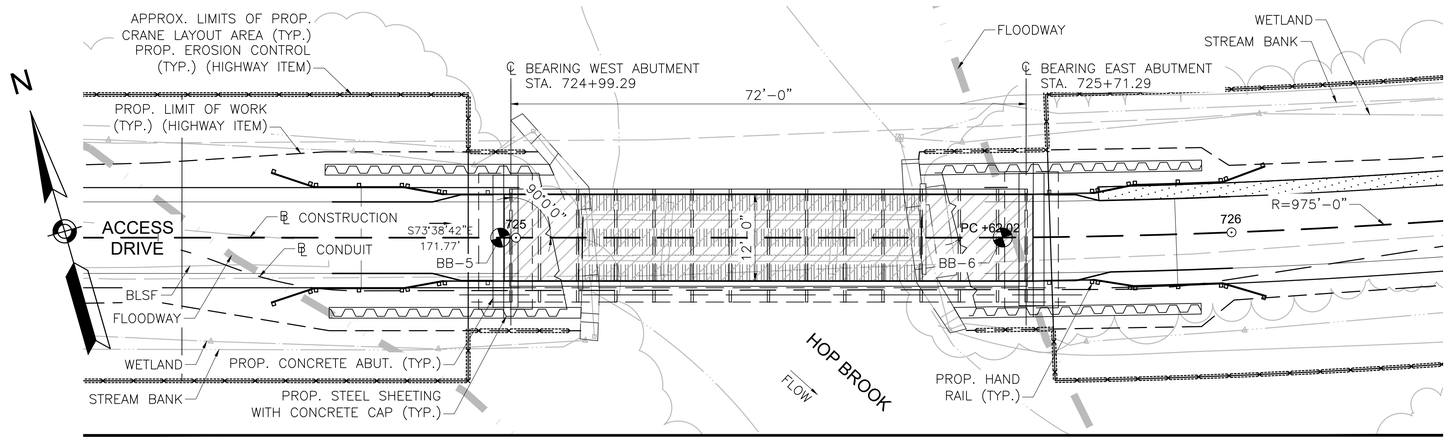
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE S–31–017 (BRIDGE 128) – SECTION & DETAILS

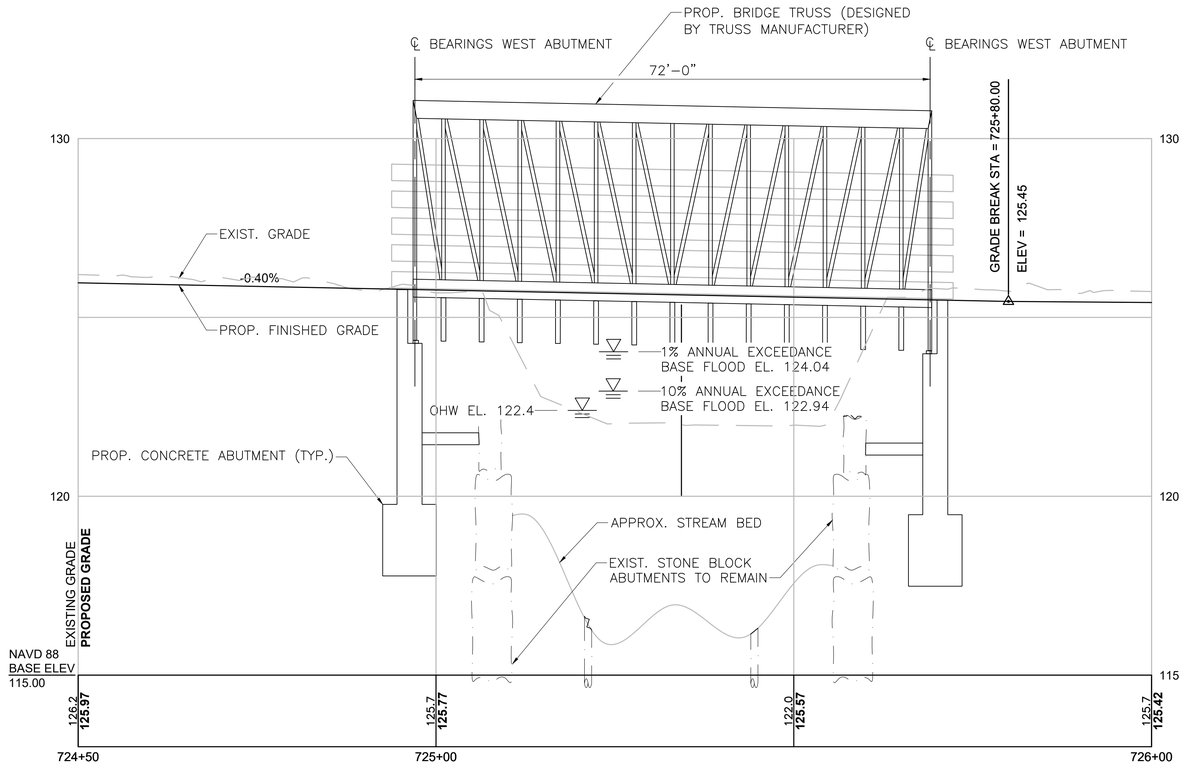
PLAN 193OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
VARIES	DEC 2021	AMS	SBK	KGK	.	.



BRIDGE KEY PLAN

SCALE: 1"=10'-0"



PROFILE - ACCESS DRIVE

HORIZONTAL SCALE: 1"=10'-0"
VERTICAL SCALE: 1"=2'-0"

GENERAL NOTES: BRIDGE 127

DESIGN:
IN ACCORDANCE WITH THE 2009 AASHTO GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES (WITH 2015 INTERIM REVISIONS) FOR H10 LOADING WITHOUT IMPACT AND 90 PSF PEDESTRIAN LOADING, WHICHEVER CONTROLS. DESIGNED FOR TEMPORARY H20 LOADING DURING CONSTRUCTION ONLY. RAILING DESIGNED FOR PEDESTRIAN LOADING ONLY.

CONCRETE:
ALL CAST IN PLACE CONCRETE SHALL BE 4000 PSI, 1½", 565 CEMENT CONCRETE.
GROUT TO BE USED FOR DRILLING AND GROUTING DOWELS INTO EXISTING SUBSTRUCTURES SHALL BE A CEMENTITIOUS GROUT LISTED ON THE MASSDOT QUALIFIED CONSTRUCTION MATERIALS LIST.

REINFORCEMENT:
REINFORCING STEEL SHALL BE EPOXY COATED AND SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M31 GRADE 60.

STEEL:
ALL STRUCTURAL STEEL OTHER THAN STRUCTURAL TUBING SHALL BE AASHTO M270 GRADE 50 GALVANIZED AND PAINTED. STRUCTURAL TUBING SHALL BE HEAT TREATED ASTM A1085 GRADE A, WITH THE SUPPLEMENTAL REQUIREMENTS S1, GALVANIZED AND PAINTED.
BOLTS THAT FASTEN TO STEEL ONLY SHALL BE AASHTO M1644 (ASTM 325) HIGH STRENGTH BOLTS, GALVANIZED.

TIMBER:
DECK PLANKING AND RAILINGS: IPE, F_b min = 22,000 psi.
ALL NAILS, SCREWS, BOLTS, WASHERS, CONNECTORS, FASTENERS AND HARDWARE FOR WOOD CONNECTIONS SHALL BE STAINLESS STEEL TYPE 304 OR TYPE 316.
WHERE TREATED TIMBER MEMBERS ARE IN DIRECT CONTACT WITH STEEL PROVIDE VYCOR DECK PROTECTOR BARRIER MEMBRANE BY W.R. GRACE & CO. OR APPROVED EQUAL.

SURVEY AND EXISTING CONDITIONS:
THE EXISTING CONDITIONS SHOWN ON THIS PLAN WERE DEVELOPED FROM A COMBINED EFFORT OF AERIAL PHOTOGRAMMETRIC MAPPING BY EASTERN TOPOGRAPHICS, INC., BASED ON AERIAL PHOTOGRAPHS TAKEN ON FEBRUARY 22, 2013, AND AUGMENTED BY AN ON-THE-GROUND SURVEY PERFORMED BY VHB DURING 2015 AND 2017.
THE HORIZONTAL CONTROL IS BASED ON THE MASSACHUSETTS MAINLAND STATE PLANE COORDINATE SYSTEM AND THE NATIONAL GEODETIC SURVEY (NAD83). ALL ELEVATION IS US FEET, REFERENCED TO THE NORTH AMERICA VERTICAL DATUM OF 1988 (NAVD88).

DEMOLITION AND CONSTRUCTION:
ALL EXISTING MATERIALS REMOVED AND NOT REUSED AND ALL WASTE MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR.
TREATED TIMBER AND CONTAMINATED WASTE SHALL BE DISPOSED OF OFF SITE AT AN APPROVED FACILITY.
ALL UNSUITABLE MATERIALS SHALL BE REMOVED WITHIN THE LIMITS OF THE FOUNDATIONS OF THE STRUCTURE, AS DIRECTED BY THE RESIDENT ENGINEER. BACKFILL WITH GRAVEL BORROW FOR BRIDGE FOUNDATIONS.
BACKFILL AROUND PROPOSED SUBSTRUCTURE SHALL BE GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES.
THE CONTRACTOR SHALL TAKE THE PROPER PRECAUTIONS TO ENSURE THE STABILITY AND SAFE PERFORMANCE OF ALL STRUCTURAL ELEMENTS DURING DEMOLITION AND CONSTRUCTION.
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ADEQUATE SHIELDING OR NETTING DURING DEMOLITION AND CONSTRUCTION TO ADEQUATELY PROTECT WORKERS AND TO PREVENT DEBRIS AND MATERIALS FROM ENTERING THE WATERWAY.
ANY DAMAGE TO REMAINING EXISTING COMPONENTS THAT IS CAUSED BY THE CONTRACTOR'S ACTIVITY SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR, AT NO ADDITIONAL EXPENSE.

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NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY-HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
BRIDGE S-31-016 (BRIDGE 127) - KEY PLAN & PROFILE
PLAN 194 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APP R.	DRAWING NO.	REV.
H: 1"=10' V: 1"=2'	DEC 2021	AMS	SBK	KGK	.	.

BORING BB–5
STATION: 724+98
OFFSET: 0.0' LT
N: 2956151.0
E: 679475.0
GROUND ELEVATION: 125.0'
(SEE NOTE 10)

BOTTOM OF FOOTING EL. 117.76

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BORING LOG

B-BB-5
PAGE 1 OF 2

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Hop Brook Bridge
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 10/08/18 **DATE COMPLETED:** 10/10/18
BORING LOCATION: Western side of Hop Brook Bridge
COORDINATES: NA
SURFACE EL.: 125 ft. (see note 1) **TOTAL DEPTH:** 54 ft.
WEATHER: 70s / Partly Cloudy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** 4.0 ft. / El. 121.0 ft. measured on 10/9/18
▼ **AT END OF DRILLING:** 3.5 ft. / El. 121.5 ft.
▼ **OTHER:** 3.2 ft. / El. 121.8 ft. measured on 10/10/18

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Drive and wash with 4-inch casing, then 3" casing
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS / KD **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Ordinal (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Strata	Depth (ft.) / Elev.	Remark	Material Description
		0	S1	4-3-5-4 (8)	24/24	Forest Mat / Fill	0.2 / 124.8		S1 - Top 2": Forest material Bot. 22": Silty SAND (SM), fine to medium, trace coarse, ~20% fines, 5-10% fine subangular gravel, trace organic fines, trace roots, brown, moist
		2	S2	3-1-1-1 (2)	24/13		1.9 / 123.1		S2 - Silty SAND (SM), fine, trace medium, 25-30% fines, trace fine subangular gravel, trace organic fines, trace roots, trace wood, dark brown, wet
		4	S3	3-1-3-3 (4)	24/14	Swamp Deposits			S3 - Similar to S2, ~35% fines
5	120.0	6	S4	3-2-4-4 (6)	24/11				S4 - Similar to S2, 35-40% fines
		8	S5	4-2-5-5 (7)	24/15				S5 - Similar to S2, ~25% fines
10	115.0	10	S6	3-3-6-7 (9)	24/15				S6 - Top 12": Silty SAND (SM), fine to medium, trace coarse, ~15% fines, trace fine subangular gravel, trace organic fines, trace roots, dark brown, wet Bot. 3": Well Graded SAND with Silt (SW-SM), fine to medium, trace coarse, 5-10% fines, light brown to gray, wet
		12							
		13	S7	3-1-1-3 (2)	24/11				S7 - Silty SAND (SM), fine to medium, trace coarse, 20-25% fines, trace fine angular gravel, trace roots, orange to brown, wet
15	110.0	15	S8	0-3-6-16 (9)	24/13		14.8 / 110.2		S8 - Silty GRAVEL with Sand (GM), coarse, subangular, 15-20% fines, 20-25% fine to medium sand, brown to orange, wet
		17	S9	16-16-15-17 (31)	24/16	Sand			S9 - Silty SAND (SM), fine, ~20% fines, light brown, wet
		19	S10	12-8-10-14 (18)	24/18				S10 - Similar to S9
20	105.0	21							
25	100.0	24	S11	68-33-33-38					S11 - Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, ~20% fine to coarse subangular gravel, light brown to gray, wet

GENERAL NOTES:
1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

BORING BB–5 (CONTINUED)

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BORING LOG

B-BB-5
PAGE 2 OF 2

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Hop Brook Bridge
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

Depth (ft.)	El. (ft.)	Sample Ordinal (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth (ft.) / Elev.	Material Description
		24	S11	(66)	24/9				
		26							
		29	S12	60-120/4"	10/5	1			REMARK 1: Switched to 3-inch casing at 29 feet. S12 - Silty GRAVEL with Sand (GM), fine to coarse, subangular to rounded, ~15% fines, ~15% fine to coarse sand, light brown to gray, wet
30	95.0	29.8							
35	90.0	34	S13	23-46-32-22 (78)	24/10				S13 - Similar to S12
		36							
		39	S14	20-60-50-38 (110)	24/23		Sand		S14 - Top 17": Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, trace fine subangular gravel, light brown, wet Bot. 6": Silty GRAVEL with Sand (GM), fine to coarse, 15-20% fines, 15-20% fine to coarse sand, light brown, wet
40	85.0	41							
		44	S15	8-20-100/3"	15/7				S15 - Silty SAND with Gravel (SM), fine to coarse, ~25% fines, 15-20% fine subrounded gravel, light brown to gray, wet
45	80.0	45.3							
		49	S16	120/0"	0/0	2 3			REMARK 2: Open hole drive and wash technique used at 47 feet. REMARK 3: Attempted to obtain a core sample at 49 feet. Core barrel advanced ~5 feet in ~10 seconds, indicating that the material was not rock. S16 - No recovery
50	75.0	49							
		54	S17	120/0"	0/0				S17 - No recovery Bottom of borehole at 54.0 feet. Backfilled borehole with drill cuttings.
55	70.0							54.0 / 71.0	
60	65.0								

BORING NOTES:

1. LOCATION OF BORINGS SHOWN ON THE KEY PLAN THUS: ◔ .
2. BORINGS ARE TAKEN FOR PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
3. WATER LEVELS SHOWN ON THE BORING LOGS ARE ASSUMED BASED ON BORINGS PERFORMED FOR THE EXISTING BRIDGE, AS NOTED IN THE GEOTECHNICAL REPORT DATED DECEMBER 2018.
4. FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 1⅜" I.D. SPLIT SPOON SAMPLER 6" USING A 140 POUND WEIGHT FALLING 30".
5. ALL BORINGS WERE MADE IN OCTOBER OF 2018.
6. BORINGS WERE MADE BY GEOLOGIC EARTH EXPLORATION, INC., 7 SHERWOOD DR., NORFOLK, MA 02056.
7. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.
8. BORING LOCATIONS AND ELEVATIONS ARE APPROXIMATE ONLY.

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NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH, & SUDBURY MASSACHUSETTS
BRIDGE S–31–016 (BRIDGE 127) – BORING LOGS
PLAN 195 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
N/A	DEC 2021	AMS	SBK	KGK	.	.

BORING BB-6
STATION: 725+68.0
OFFSET: 0.0' LT
N: 2956131.0
E: 679542.0
GROUND ELEVATION: 124.0'
(SEE NOTE 10, SHEET 195 OF 349)

BOTTOM OF FOOTING EL. 117.47

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BORING LOG

B-BB-6
PAGE 1 OF 2

CLIENT: Vanasse Hangen Brustlin, Inc.
LGCI PROJECT NUMBER: 1836
PROJECT NAME: Proposed Hop Brook Bridge
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 10/15/18 **DATE COMPLETED:** 10/17/18
BORING LOCATION: Eastern side of Hop Brook Bridge
COORDINATES: NA
SURFACE El.: 124 ft. (see note 1) **TOTAL DEPTH:** 51 ft.
WEATHER: 60s / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** 4.0 ft. / El. 120.0 ft. measured on 10/16/18
▼ **AT END OF DRILLING:** 6.8 ft. / El. 117.2 ft.
▼ **OTHER:** 3.3 ft. / El. 120.7 ft. measured on 10/17/18

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Drive and wash with 4-inch casing, then 3" casing
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth (ft.)	Material Description
0			S1	2-2-2-2 (4)	24/16		Forest Mat		S1 - Top 2": Forest Material
2	120.0		S2	2-2-3-3 (5)	24/13		Fill		Mid. 4": Silty SAND (SM), fine, ~25% fines, trace fine subangular gravel, trace organic fines, trace roots, dark brown, moist Bot. 10": Silty SAND (SM), fine, trace medium, ~20% fines, trace organic fines, trace roots, brown, moist S2 - Silty SAND (SM), fine, trace medium, ~45% fines, trace fine angular gravel, trace organic fines, trace roots, brown, wet
4	5		S3	3-2-2-3 (4)	24/15				S3 - Top 6": Silty SAND (SM), fine, trace medium, 25-30% fines, trace organic fines, trace roots, light brown, wet Bot. 9": Silty SAND (SM), fine, ~35% fines, trace organic fines, trace roots, light brown, wet
6			S4	2-3-2-3 (5)	24/24		Swamp Deposits	6.0	S4 - Silty SAND (SM), fine, 35-40% fines, trace organic fines, trace roots, trace peat fibers, trace wood, dark brown, wet
8	115.0		S5	2-2-1-2 (3)	24/17				S5 - Similar to S4
10	10		S6	0-2-5-7 (7)	24/19				S6 - Top 14": Similar to S4
12			S7	3-5-4-5 (9)	24/12			11.6	Bot. 5": Poorly Graded SAND with Silt (SP-SM), fine, 10-15% fines, trace roots, gray, wet S7 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium, 5-10% fines, light brown to gray, wet
14	110.0								
15									
19	105.0		S8	120/0"	0/0	1	Sand		REMARK 1: Open hole drive and wash technique used at 19 feet. S8 - No recovery
20			S9	120/5"	5/5				S9 - Silty SAND with Gravel (SM), fine to coarse, ~30% fines, ~20% fine to coarse subangular gravel, brown, wet
24	100.0			13-11-13-14					S10 - Similar to S9

GENERAL NOTES:
1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

BORING BB-6 (CONTINUED)

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BORING LOG

B-BB-6
PAGE 2 OF 2

CLIENT: Vanasse Hangen Brustlin, Inc.
LGCI PROJECT NUMBER: 1836
PROJECT NAME: Proposed Hop Brook Bridge
PROJECT LOCATION: Sudbury, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth (ft.)	Material Description
24			S10	(24)	24/6				
26	95.0								
29	30		S11	11-10-13-13 (23)	24/13	2			REMARK 2: Switched to 3-inch casing at 29 feet. S11 - Top 9": Silty SAND (SM), fine, 15-20% fines, light brown, wet Bot. 4": Similar to Top 9", ~35% fines
31									
34	90.0		S12	15-17-18-22 (35)	24/24				S12 - Top 13": Silty SAND (SM), fine to medium, trace coarse, 30-35% fines, 5-10% fine subangular gravel, light brown, wet Mid. 4": Silty SAND (SM), fine to medium, ~20% fines, light brown to orange, wet Bot. 7": Silty SAND (SM), fine, ~35% fines, light brown, wet
35									
36									
39	85.0		S13	10-15-14-14 (29)	24/24		Sand		S13 - Top 19": Silty SAND (SM), fine to medium, 15-20% fines, ~5% fine to coarse subangular gravel, brown, wet Bot. 5": Silty SAND (SM), fine, ~20% fines, brown, wet
40									
41									
44	80.0		S14	120/4"	4/4	3			REMARK 3: Open hole drive and wash technique used at 44 feet. S14 - Silty SAND (SM), fine to medium, trace coarse, 15-20% fines, ~5% fine subangular gravel, brown, wet
44.3									
45									
49	75.0		S15	16-17-26-26 (43)	24/18				S15 - Top 12": Silty SAND with Gravel (SM), fine to coarse, ~20% fines, 15-20% fine to coarse subangular gravel, light brown, wet Bot. 6": Similar to Top 12", 20-25% fine to coarse subangular gravel
50									
51								51.0	Bottom of borehole at 51.0 feet. Backfilled borehole with drill cuttings.
	70.0								
55									
	65.0								
60									

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

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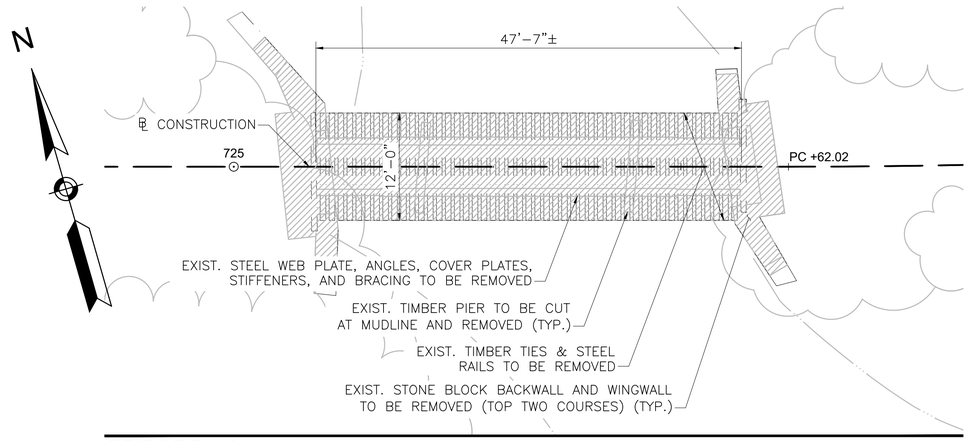
EVERSOURCE

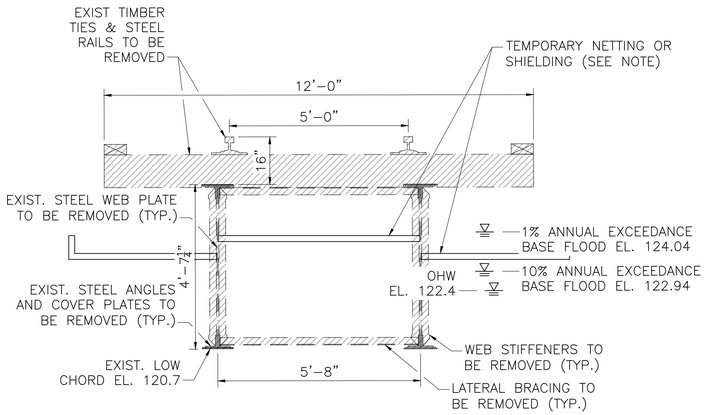
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH, & SUDBURY MASSACHUSETTS
BRIDGE S–31–016 (BRIDGE 127) – BORING LOGS
PLAN 196 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
N/A	DEC 2021	AMS	SBK	KGK	.	.



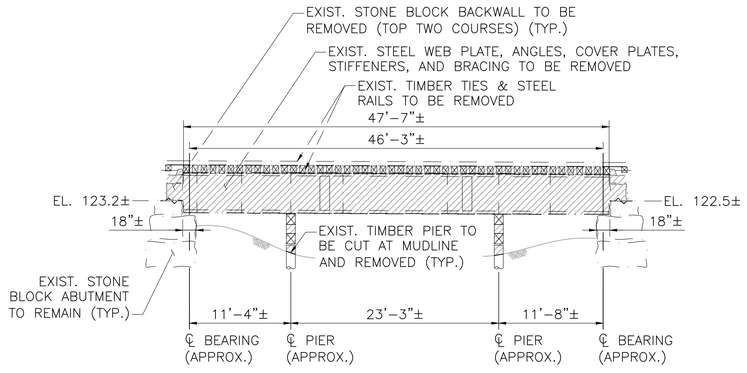
BRIDGE PLAN

SCALE: $\frac{1}{8}$"=1'-0"



BRIDGE TRANSVERSE SECTION

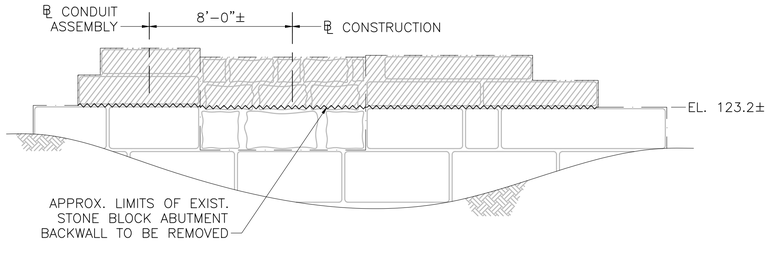
SCALE: $\frac{1}{2}$"=1'-0"



BRIDGE ELEVATION

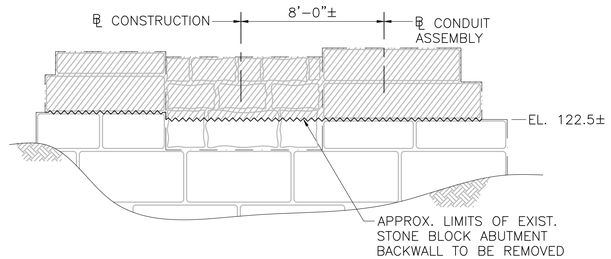
SCALE: $\frac{1}{8}$"=1'-0"

NOTE: CONTRACTOR SHALL DESIGN AND INSTALL TEMPORARY PROTECTIVE SHIELDING OR NETTING DURING DEMOLITION OF BRIDGE AND AS NEEDED DURING CONSTRUCTION OF NEW BRIDGE TO PREVENT CONSTRUCTION DEBRIS FROM FALLING INTO THE WATER BODIES BELOW. SEE PROJECT SPECIFICATIONS AND PERMITTING DOCUMENTS FOR ADDITIONAL REQUIREMENTS AND INFORMATION.



WEST ABUTMENT ELEVATION

SCALE: $\frac{1}{4}$"=1'-0"



EAST ABUTMENT ELEVATION

SCALE: $\frac{1}{4}$"=1'-0"

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NO.	DESCRIPTION	BY	DATE	APPR.

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EVERSOURCE

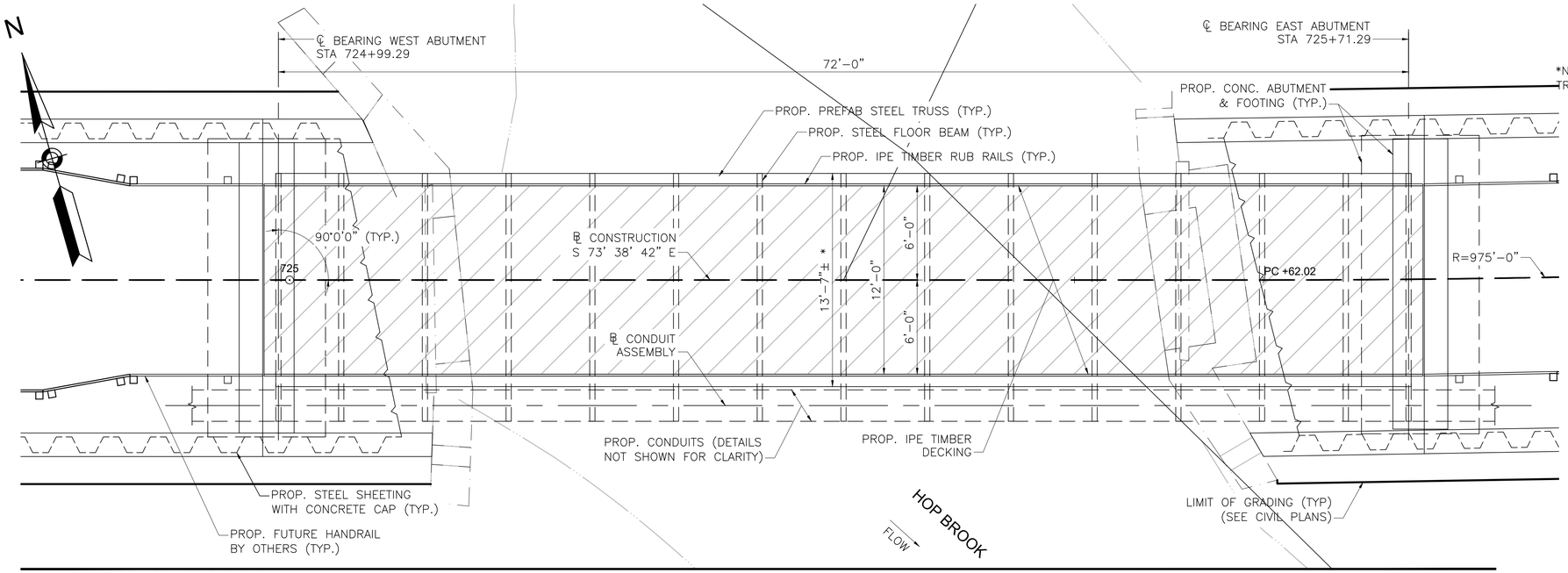
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE S–31–016 (BRIDGE 127) – DEMOLITION PLAN

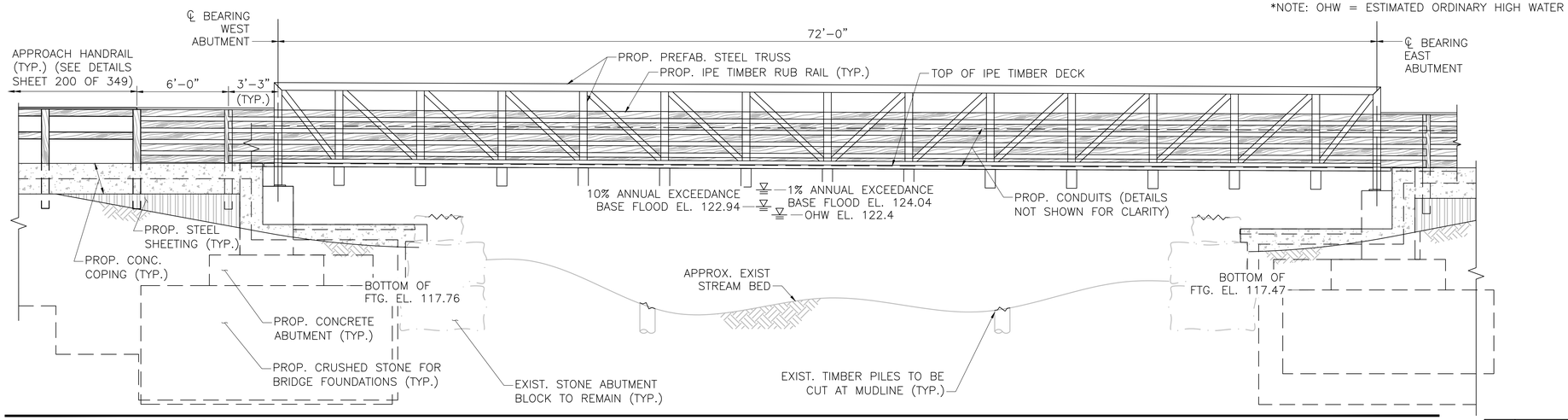
PLAN 197 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
VARIES	DEC 2021	AMS	SBK	KGK	.	.



BRIDGE 127 (HOP BROOK) PLAN

SCALE: $\frac{1}{4}$"=1'-0"



BRIDGE 127 (HOP BROOK) ELEVATION

SCALE: $\frac{1}{4}$"=1'-0"

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE S–31–016 (BRIDGE 127, HOP BROOK) – PLAN & EL.

PLAN198 OF 349

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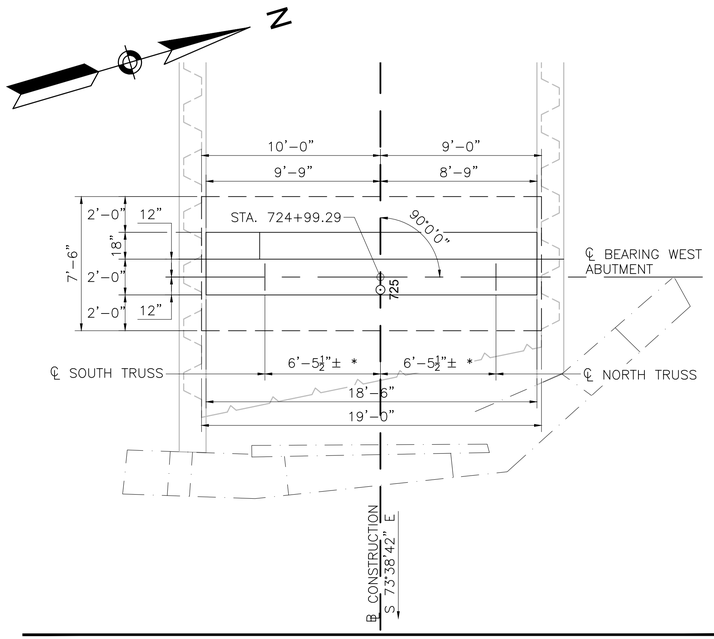
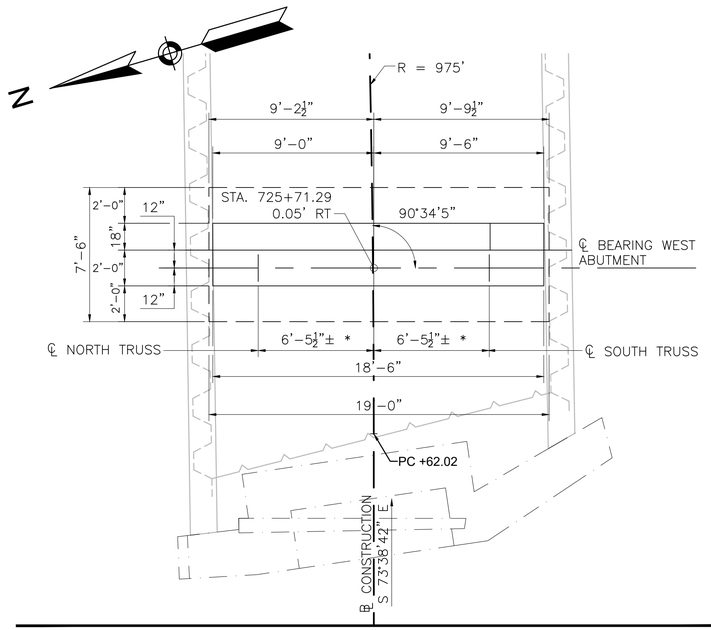
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=4'	DEC 2021	AMS	SBK	KGK	.	.



WEST ABUTMENT PLAN

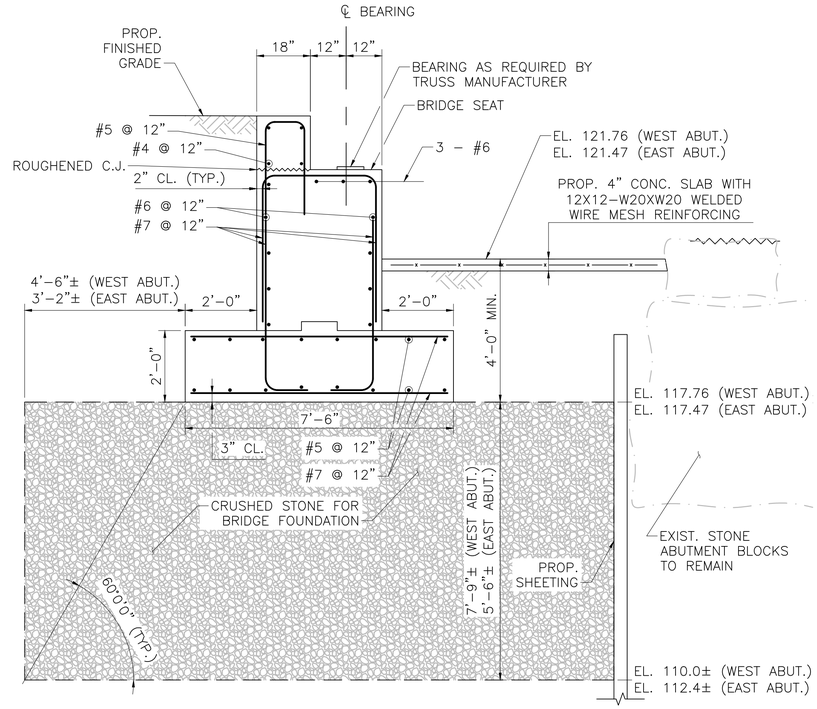
SCALE: ¼"=1'-0"



EAST ABUTMENT PLAN

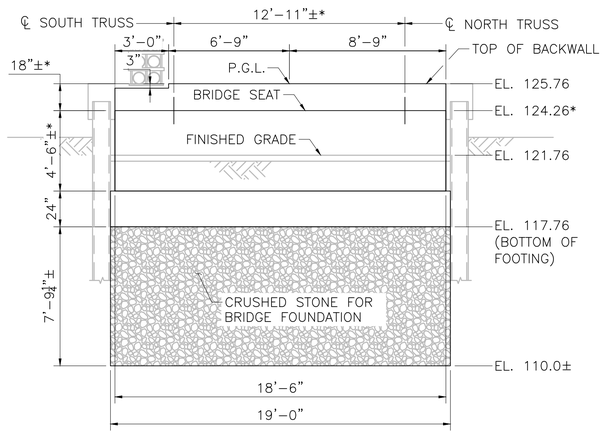
SCALE: ¼"=1'-0"

*NOTE: ACTUAL DIMENSIONS PER TRUSS MANUFACTURER'S DESIGN



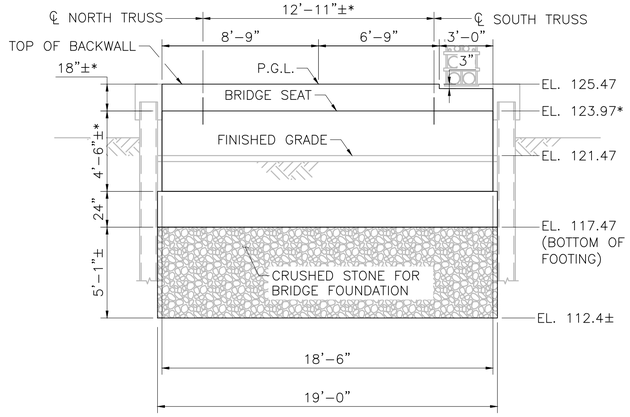
TYPICAL ABUTMENT SECTION

SCALE: ½"=1'-0"



WEST ABUTMENT ELEVATION

SCALE: ¼"=1'-0"



EAST ABUTMENT ELEVATION

SCALE: ¼"=1'-0"

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE S–31–016 (BRIDGE 127) – SUBSTRUCTURE DETAILS

PLAN 99 OF 349

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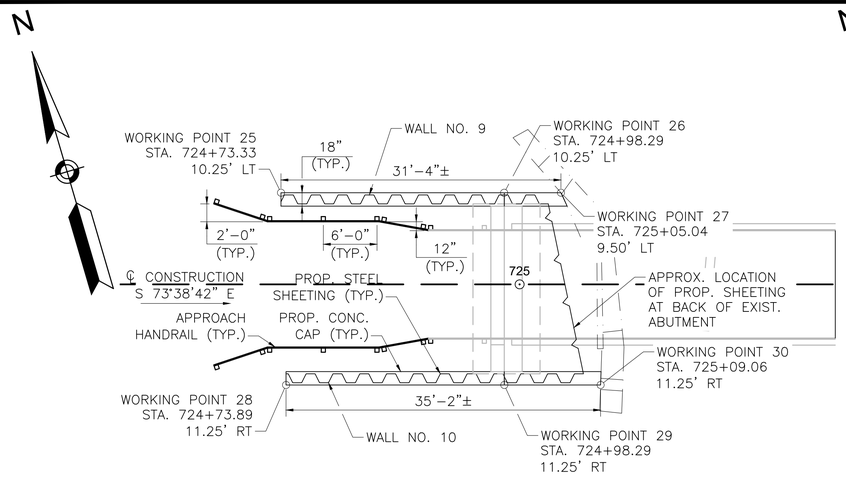
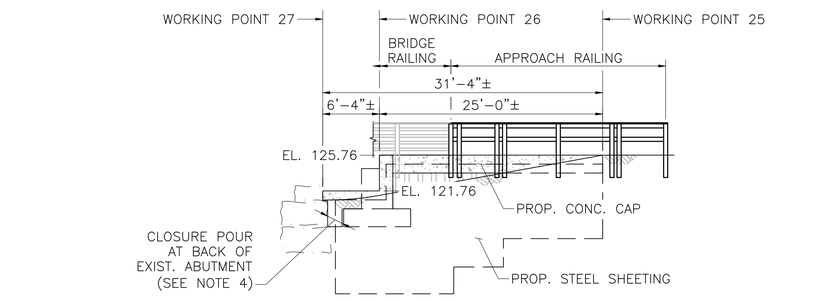
1"=4'	DEC 2021	AMS	SBK	KGK	.	



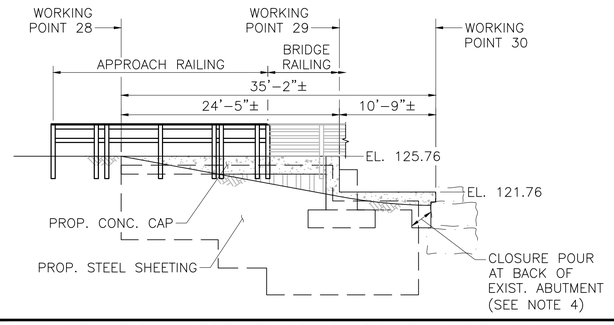
WALL 9 & 10 SHEETING PLAN (WEST APPROACH)

SCALE: $\frac{1}{4}$"=1'-0"



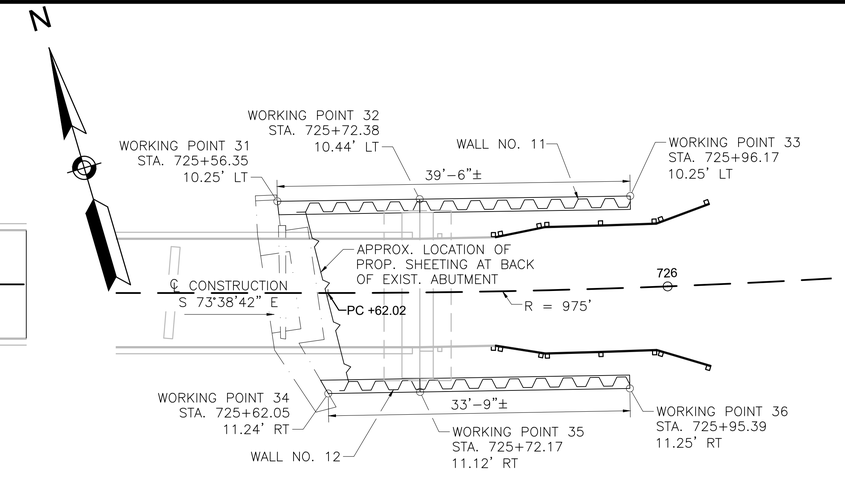
WALL 9 ELEVATION (WEST APPROACH NORTH SHEETING WALL)

SCALE: $\frac{1}{4}$"=1'-0"



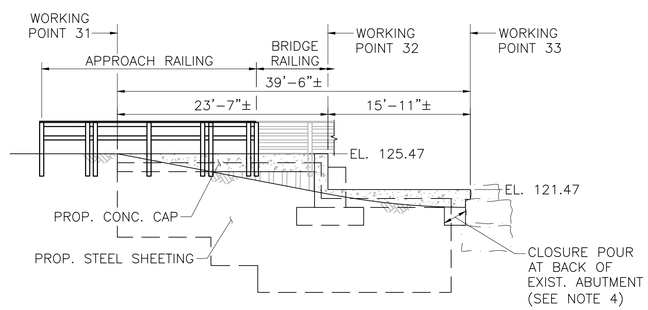
WALL 10 ELEVATION (WEST APPROACH SOUTH SHEETING WALL)

SCALE: $\frac{1}{4}$"=1'-0"



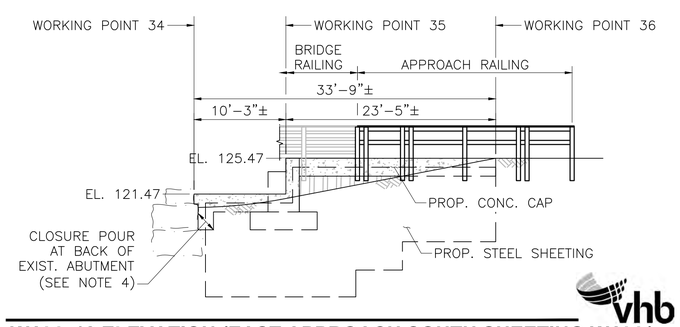
WALL 11 & 12 SHEETING PLAN (EAST APPROACH)

SCALE: $\frac{1}{4}$"=1'-0"



WALL 11 ELEVATION (EAST APPROACH NORTH SHEETING WALL)

SCALE: $\frac{1}{4}$"=1'-0"

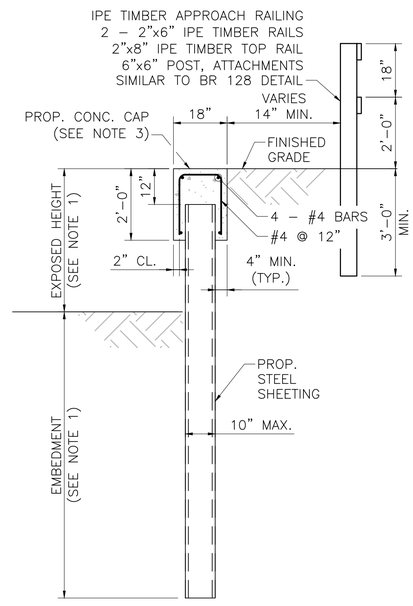


WALL 12 ELEVATION (EAST APPROACH SOUTH SHEETING WALL)

SCALE: $\frac{1}{4}$"=1'-0"

NOTES:

1. WALL EXPOSED HEIGHT TO BE VERIFIED IN FIELD. SHEETING EMBEDMENT DEPTH VARIES WITH WALL EXPOSED HEIGHT. SEE SHEETING EMBEDMENT TABLE BELOW.
2. SHEETING SECTION SHALL BE SELECTED BY CONTRACTOR. STEEL SHEETING SHALL BE GRADE 50 STEEL IN ACCORDANCE WITH ASTM A328 WITH A SECTION MODULUS (S_x) OF 7.08 IN^3 PER FOOT.
3. CONC. CAP SHALL BE 4000 PSI, $\frac{3}{4}$", 610 CEMENT CONCRETE. REINFORCING STEEL SHALL BE GRADE 60 EPOXY COATED STEEL IN ACCORDANCE WITH AASHTO M31. CONSTRUCTION JOINTS IN CAP SHALL BE SPACED AT 24'-0" MAX. CONTRACTOR SHALL SUBMIT JOINT LAYOUT PLAN TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. REINFORCEMENT SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINT.
4. CONTRACTOR SHALL DETERMINE LIMITS OF EXISTING STONE BLOCK ABUTMENTS PRIOR TO DRIVING SHEETING. SHEETING SHALL BE DRIVEN AS CLOSE TO THE BACK OF THE EXISTING ABUTMENTS AS PRACTICAL. WORKING POINT STATION/OFFSET AT THESE LOCATIONS (3, 6, 7, AND 10) IS SUBJECT TO CHANGE BASED ON CONDITIONS ENCOUNTERED IN THE FIELD. CONCRETE CAP SHALL BE EXTENDED AS NEEDED TO FORM A CLOSURE POUR BETWEEN END OF SHEETING AND BACK OF EXISTING ABUTMENT. HEIGHT OF CAP SHALL BE INCREASED AT CLOSURE POUR TO A DEPTH 2'-0" BELOW FINISHED GRADE TO MAINTAIN REQUIRED GRADE SEPARATION.



TYPICAL SHEETING SECTION

SCALE: $\frac{1}{2}$"=1'-0"

SHEETING EMBEDMENT TABLE

EXPOSED HEIGHT	EMBEDMENT
2'–0" (MAX.)	7'–4" (MIN.)
3'–0" (MAX.)	9'–5" (MIN.)
4'–0" (MAX.)	11'–6" (MIN.)
5'–0" (MAX.)	13'–7" (MIN.)
6'–0" (MAX.)	15'–7" (MIN.)
7'–0" (MAX.)	17'–7" (MIN.)

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE S–31–016 (BRIDGE 127) – SHEETING PLAN

PLAN 200 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=4'	DEC 2021	AMS	SBK	KGK	.	.

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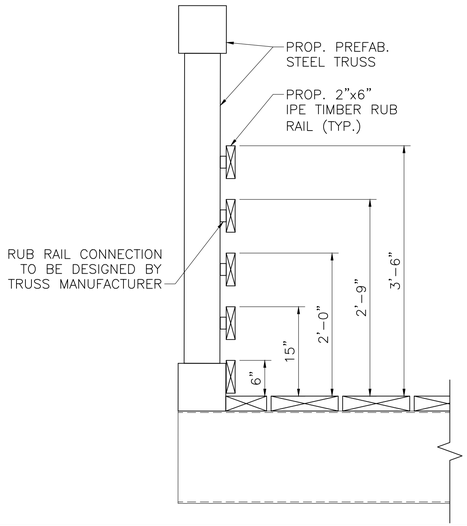
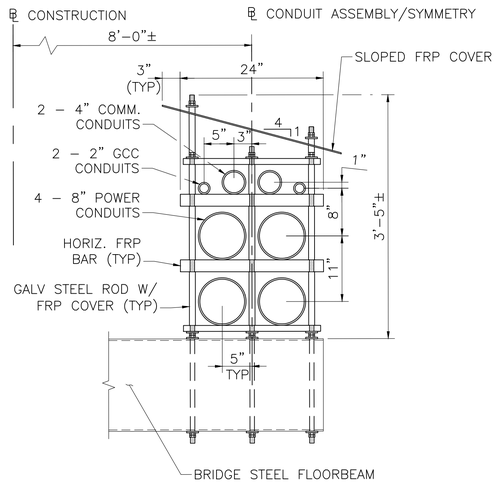


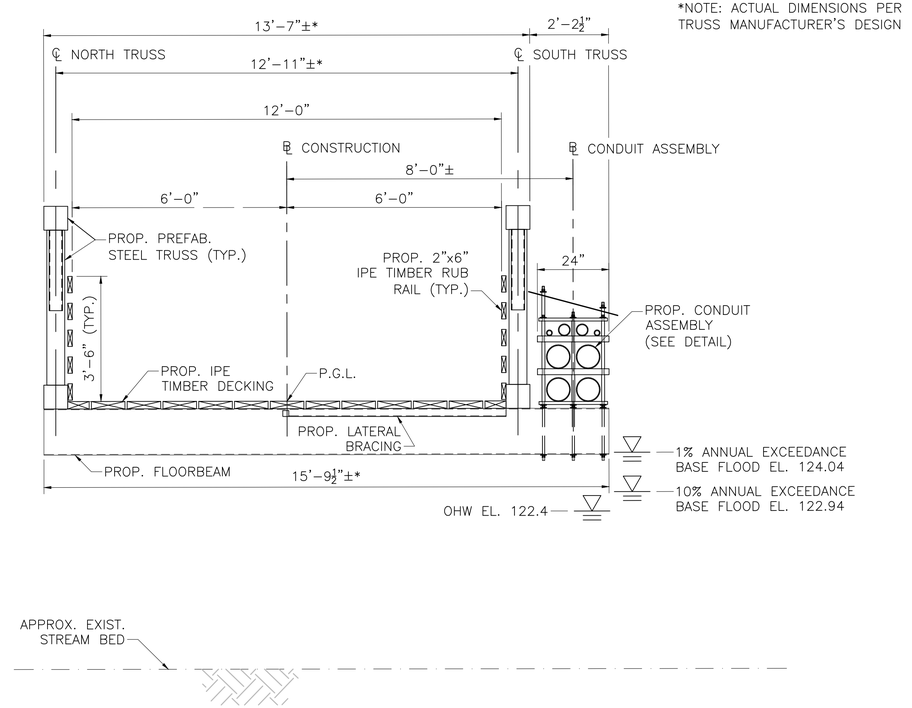
RAILING CONNECTION DETAIL

SCALE: 1"=1'-0"



CONDUIT ASSEMBLY DETAIL

SCALE: 1"=1'-0"



BRIDGE TRANSVERSE SECTION

SCALE: ½"=1'-0"

NOTES:

1. TRUSS SHALL BE DESIGNED FOR TEMPORARY H20 LOADING DURING CONSTRUCTION. TIMBER DECKING IS DESIGNED FOR H10 LOADING WITHOUT IMPACT AND 90 PSF PEDESTRIAN LOADING, WHICHEVER CONTROLS. CONTRACTOR SHALL DESIGN TEMPORARY DECKING IF BRIDGE IS INTENDED TO BE USED FOR CONSTRUCTION VEHICLES.

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

BRIDGE S–31–016 (BRIDGE 127) – SECTION OF DETAILS

PLAN 201OF 349

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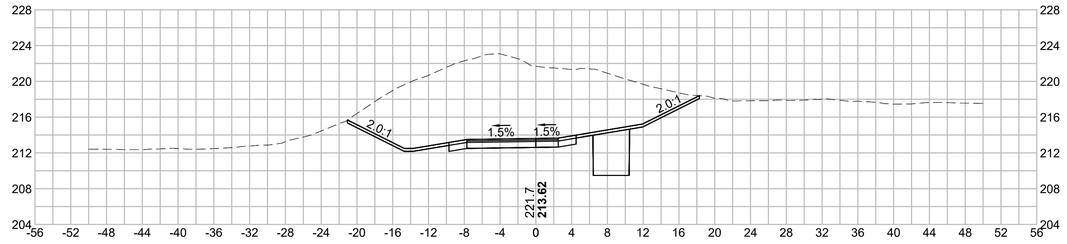
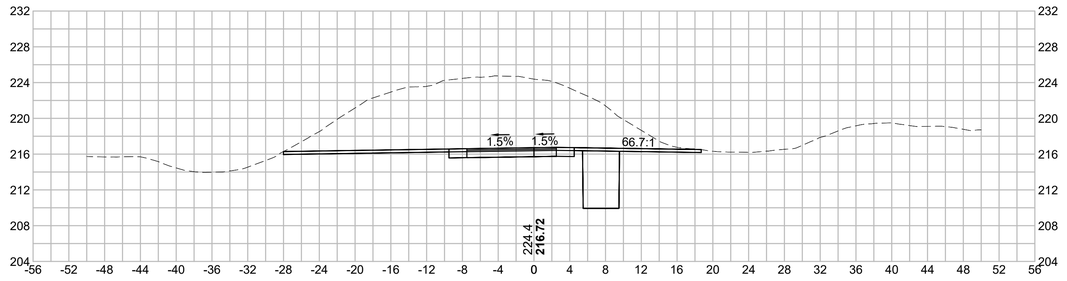
SCALE: unless noted	DATE	DRAWN	CH'KD.	APPR.	DRAWING NO.	REV.
VARIES	JAN 2020	AMS	SBK	KGK	.	#

101+00



102+50



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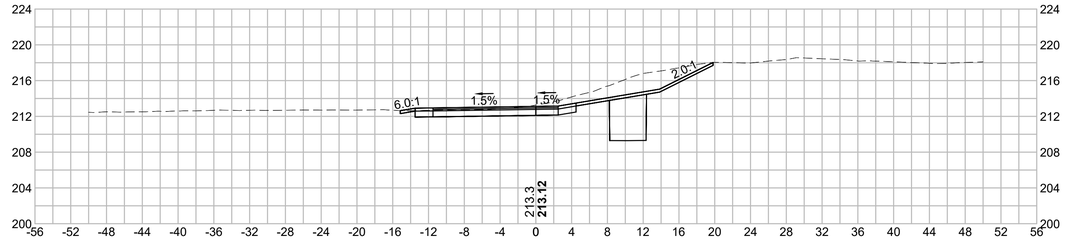
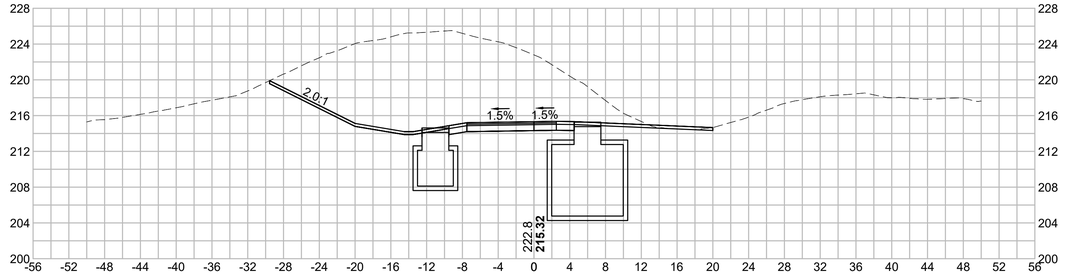


102+00



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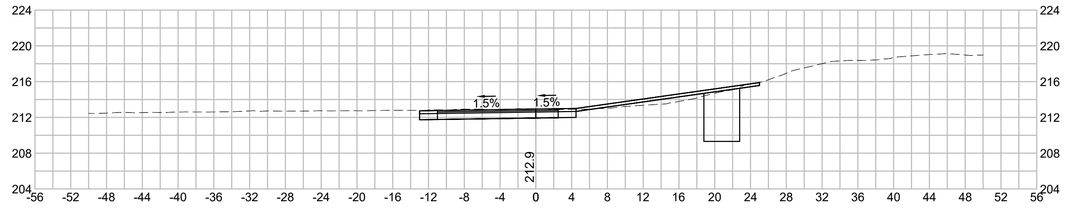

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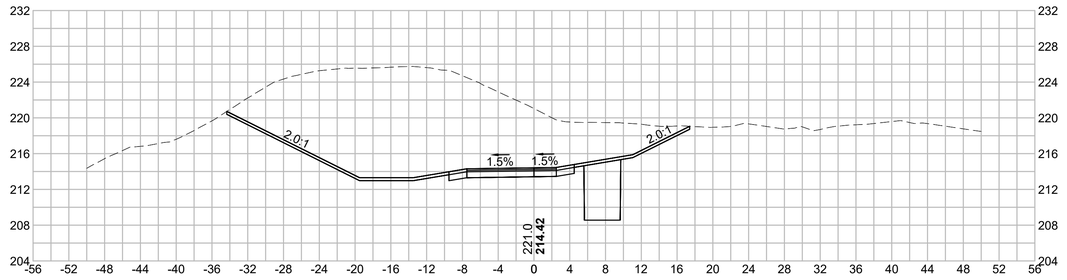

8 0 8 16
SCALE IN FEET

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

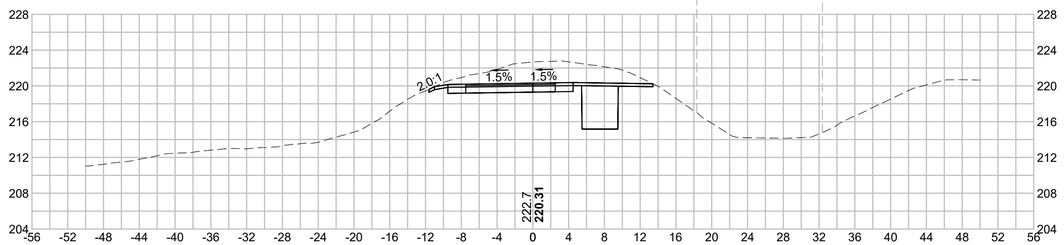
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

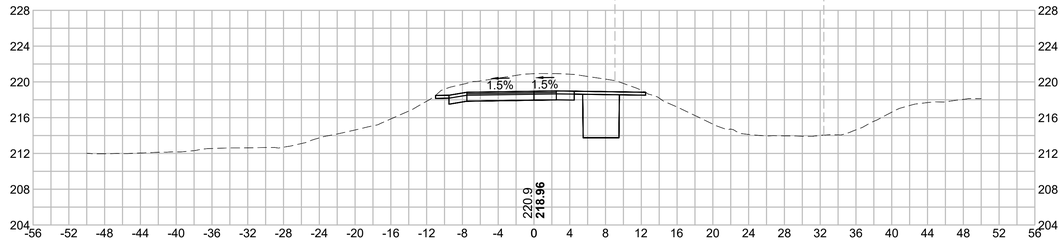
PLAN 202 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

104+00



105+50



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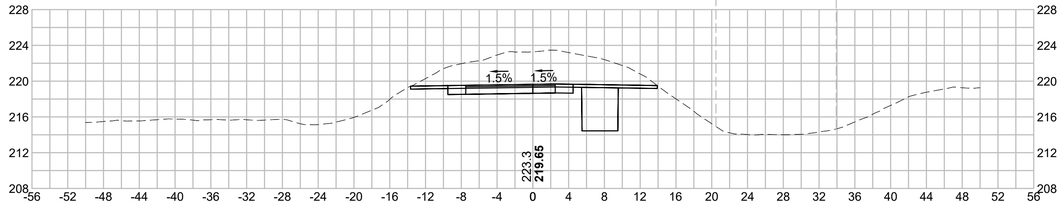

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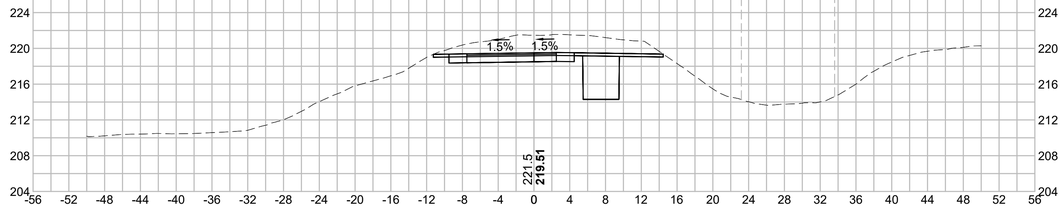

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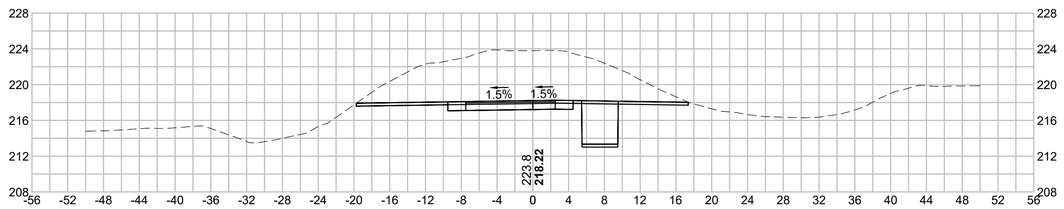

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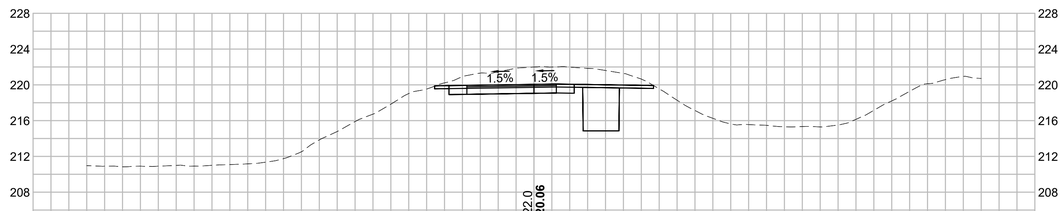

8 0 8 16
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

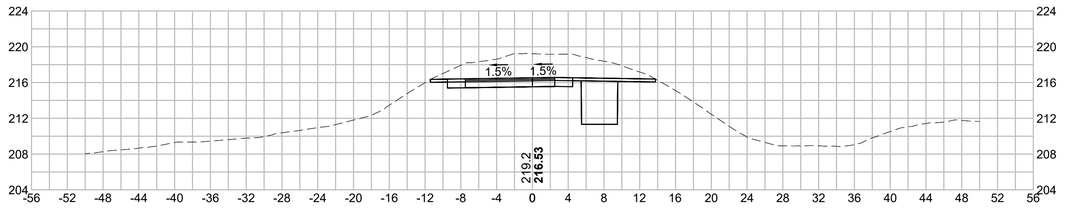
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

PLAN 203OF 349

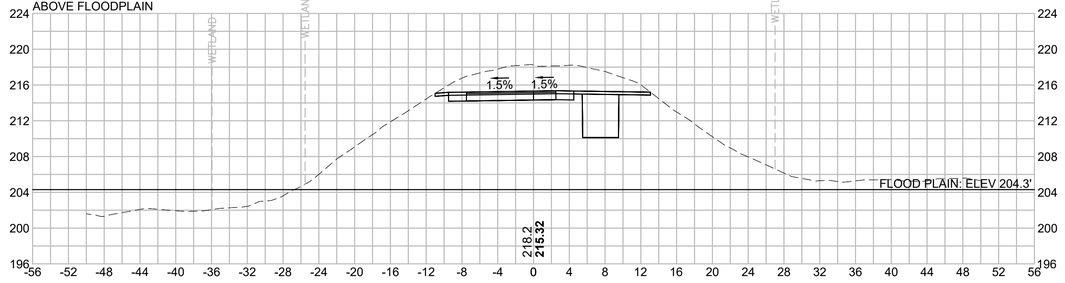
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

107+00

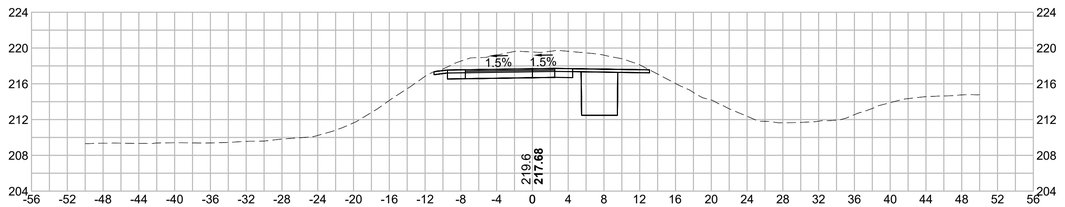


108+00

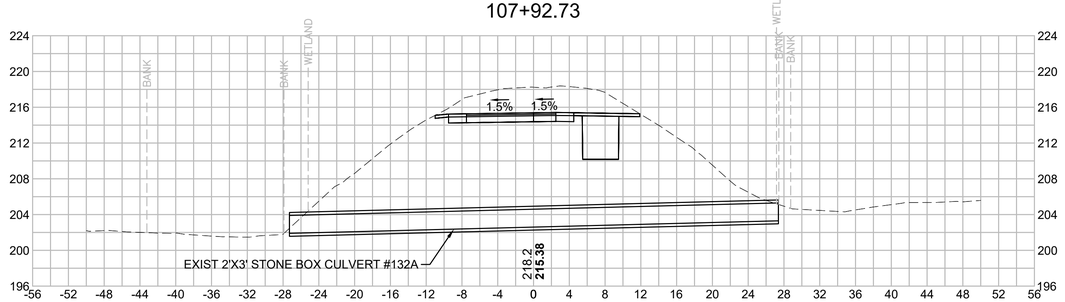
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN



106+50



107+92.73



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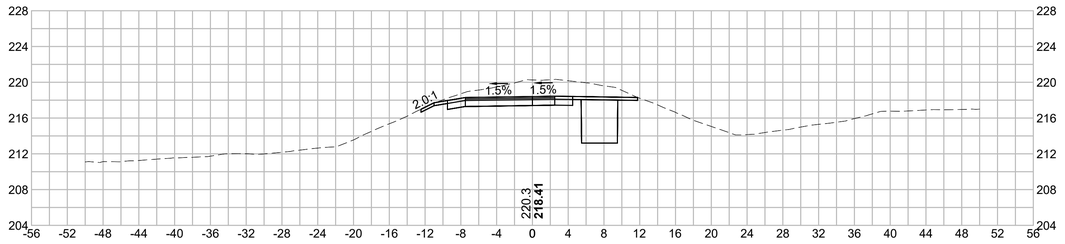
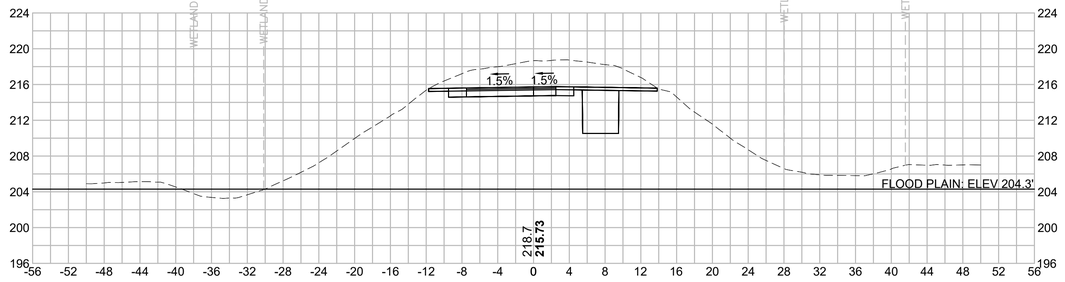


FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

107+50



BLSF CROSSING STA 108 - FEMA ZONE AE - ASSABET BRANCH NO. 4
FEMA ELEV 205.8 @ CROSSING BUT VARIES AS STREAM RUNS PARALLEL TO ALIGNMENT
NO IMPACTS

8 0 8 16
SCALE IN FEET

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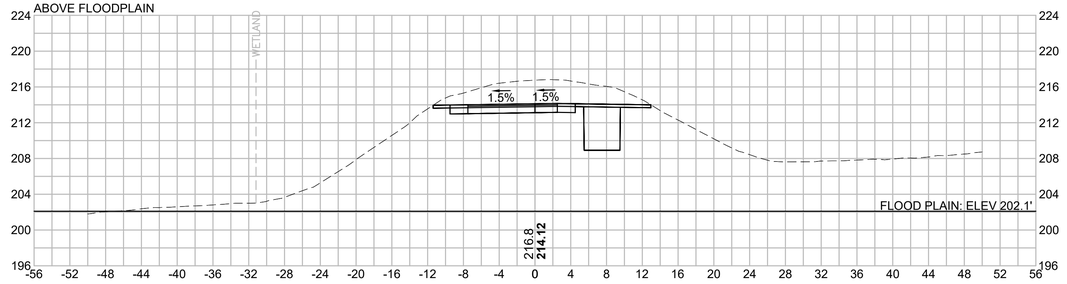
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 204 OF 349

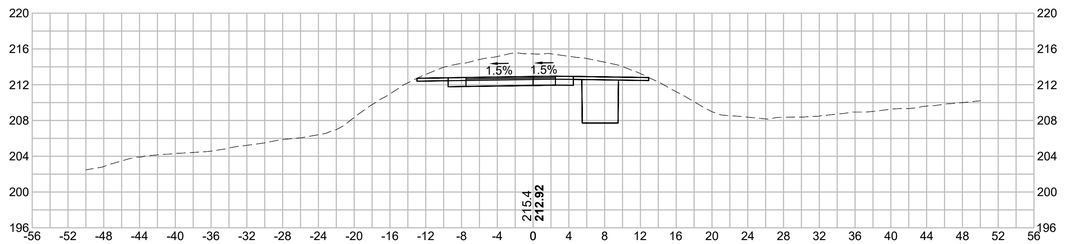
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

109+50

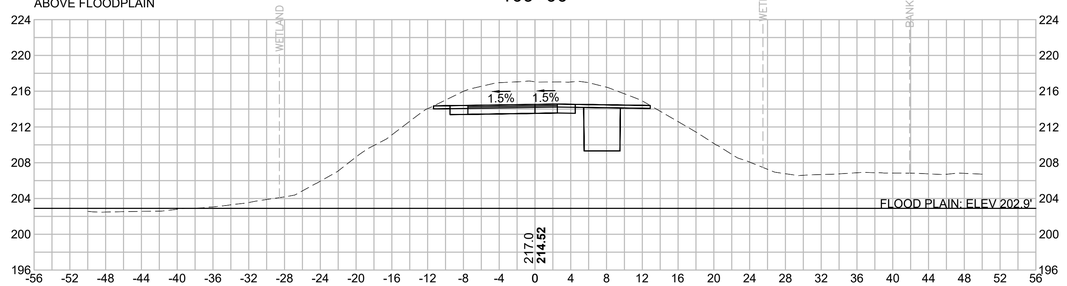


111+00

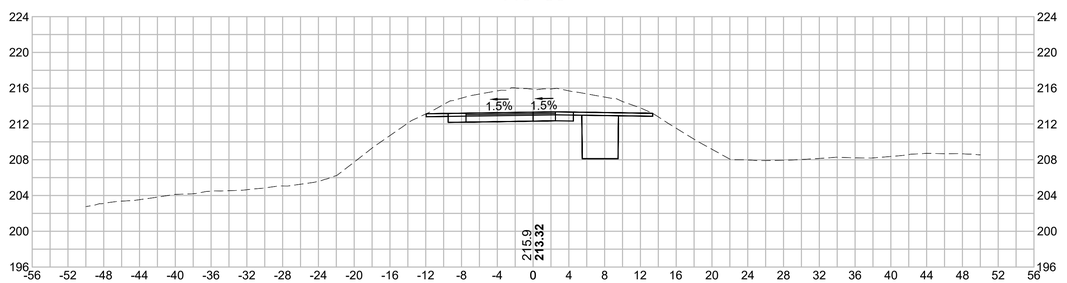


FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

109+00

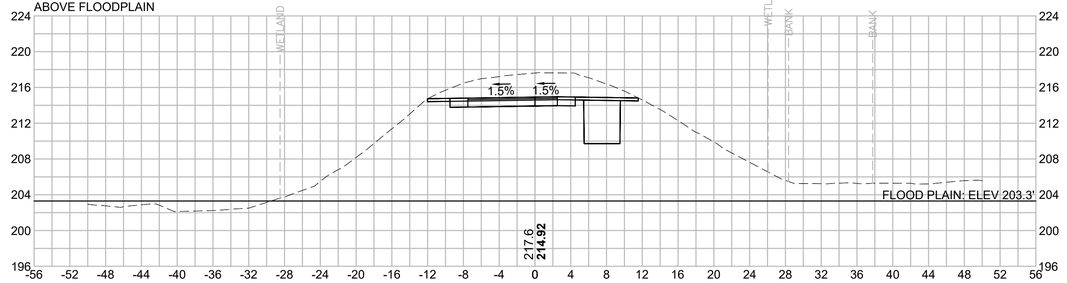


110+50

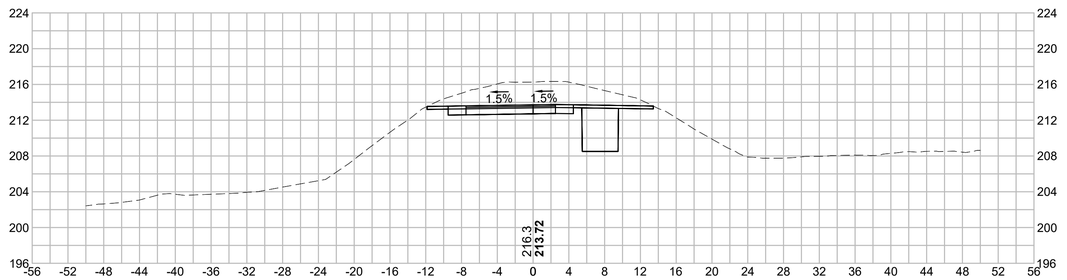


FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

108+50



110+00



8 0 8 16
SCALE IN FEET

NO.	DESCRIPTION	BY	DATE	APPR.

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vhb
Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
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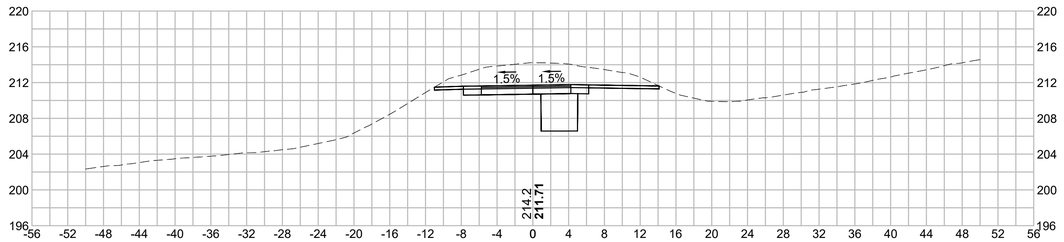
EVERSOURCE

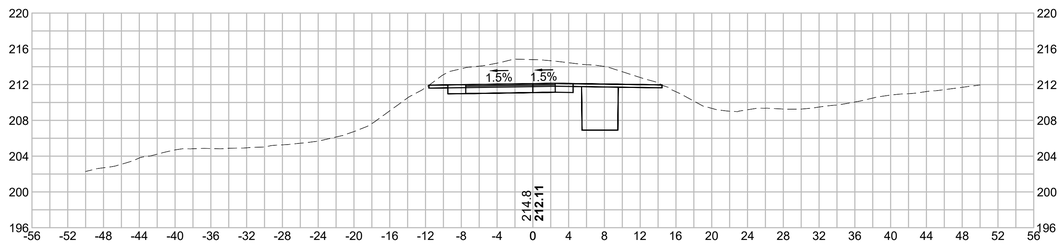
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 205 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

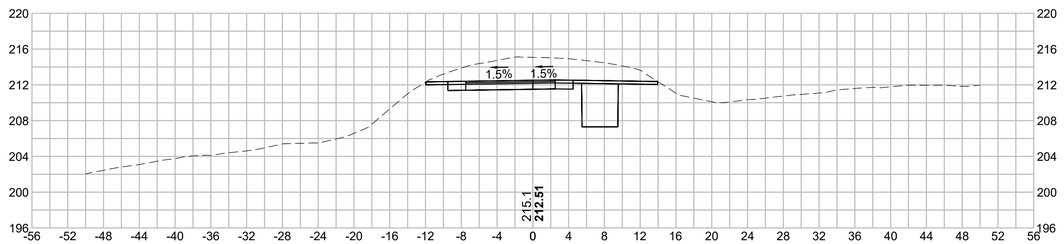
112+50



112+00

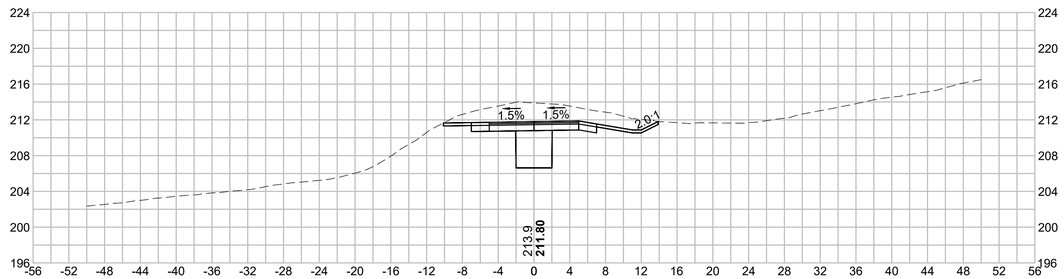


111+50



113+50

113+00



8 0 8 16
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NO.	DESCRIPTION	BY	DATE	APPR.
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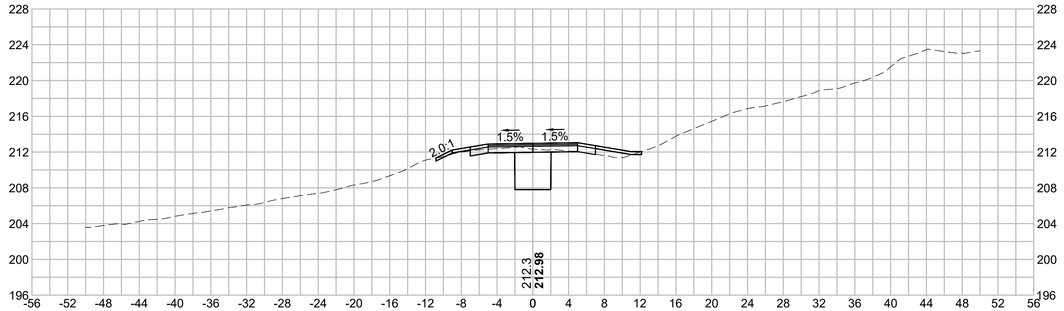
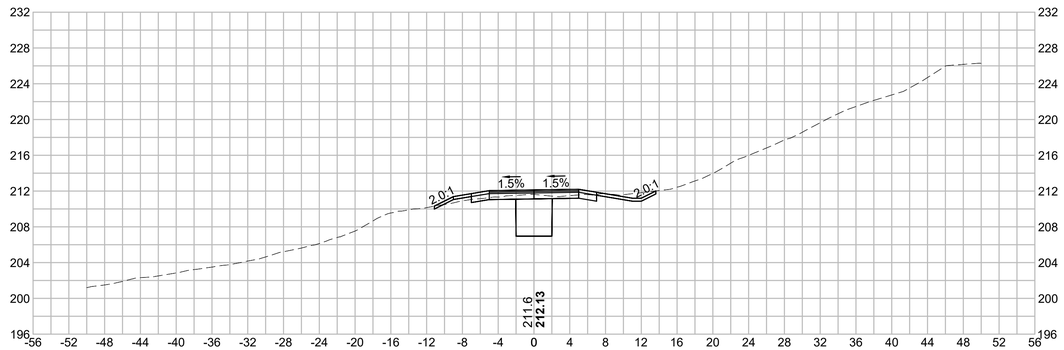
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 206 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

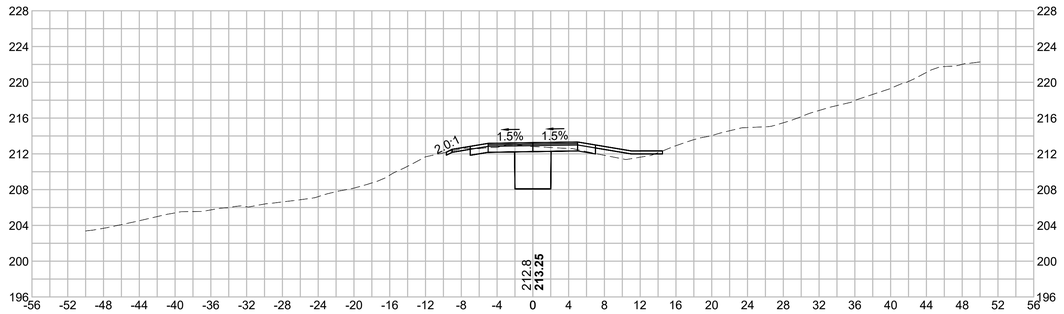
114+50



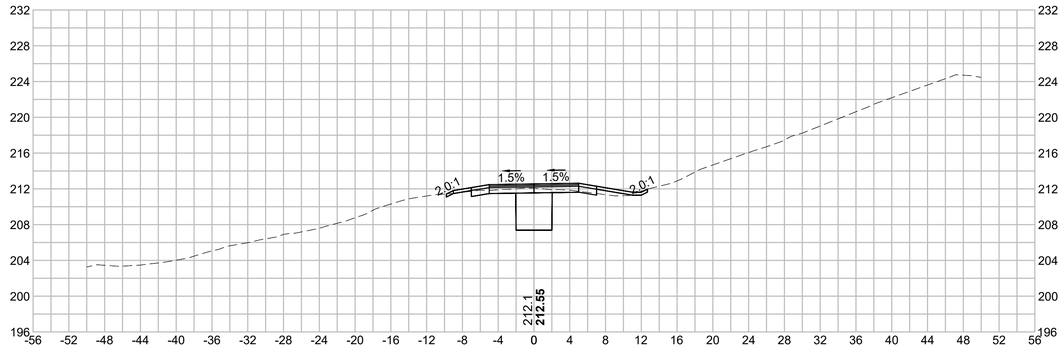
115+50



114+00



115+00



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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

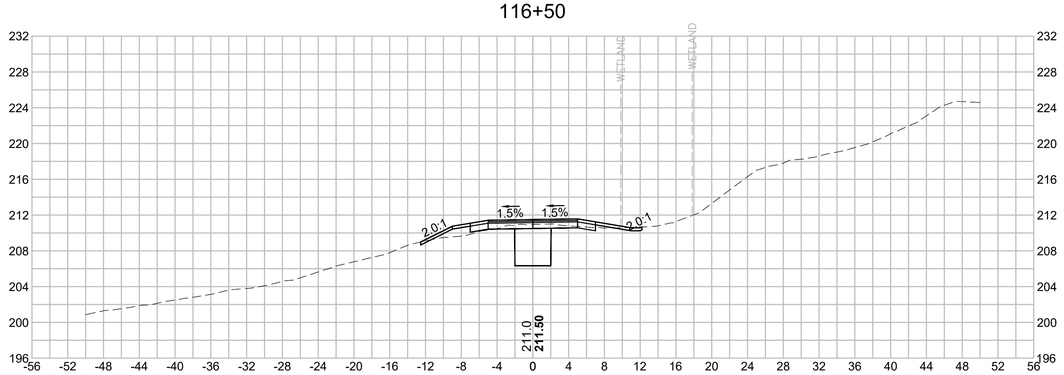
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

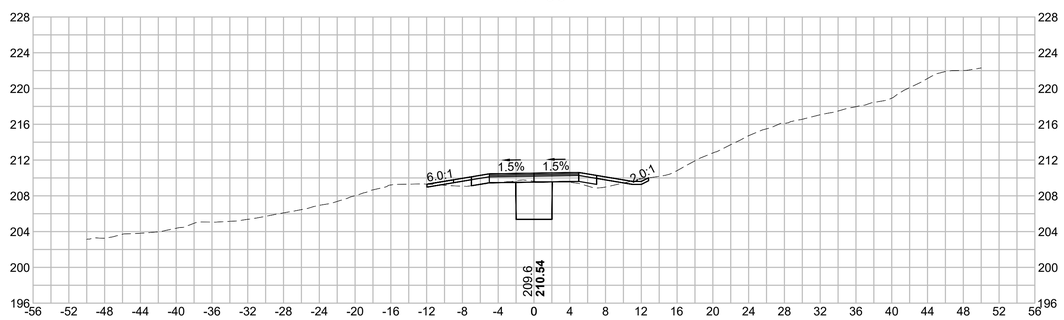
PLAN 207 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

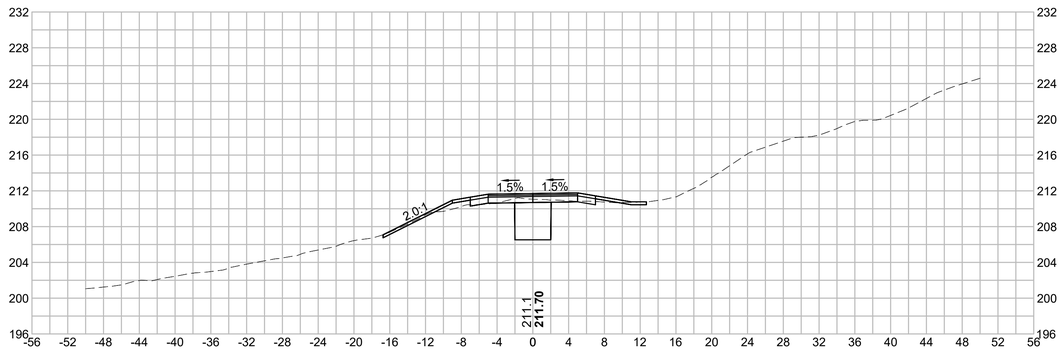
116+50



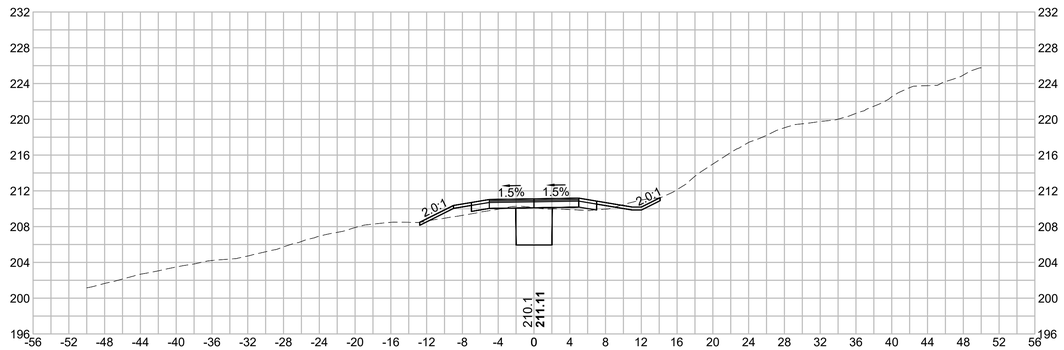
117+50



116+00



117+00



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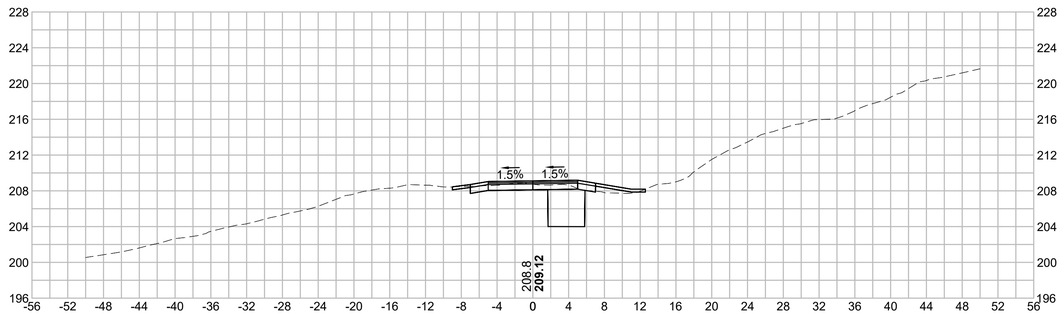
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 208 OF 349

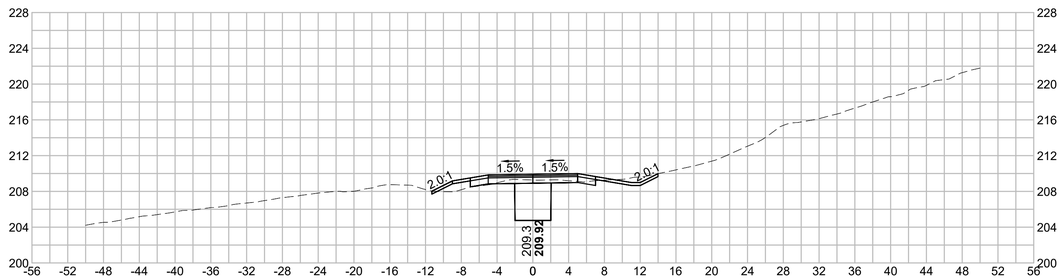
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

118+50

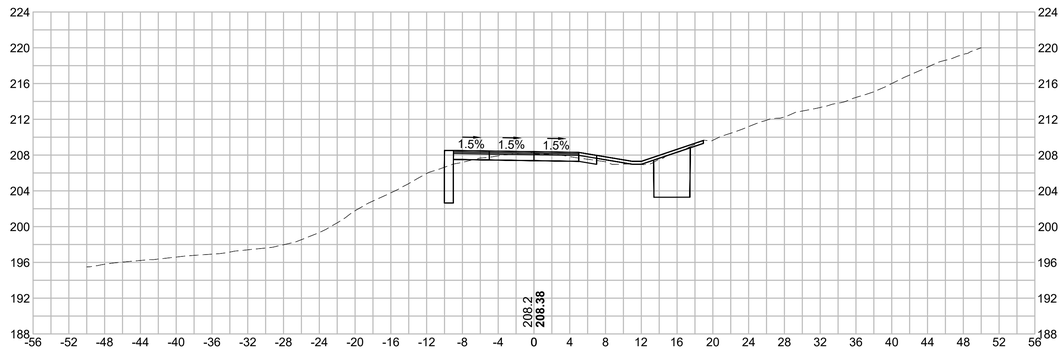


119+25

118+00



119+00



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NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

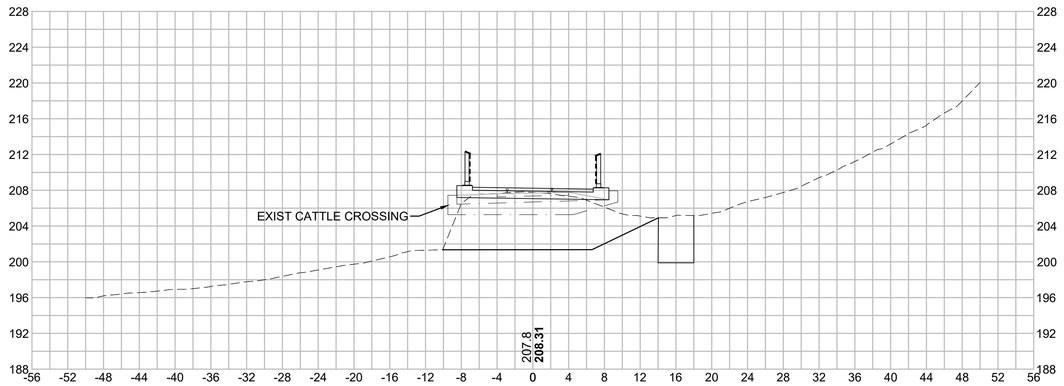
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

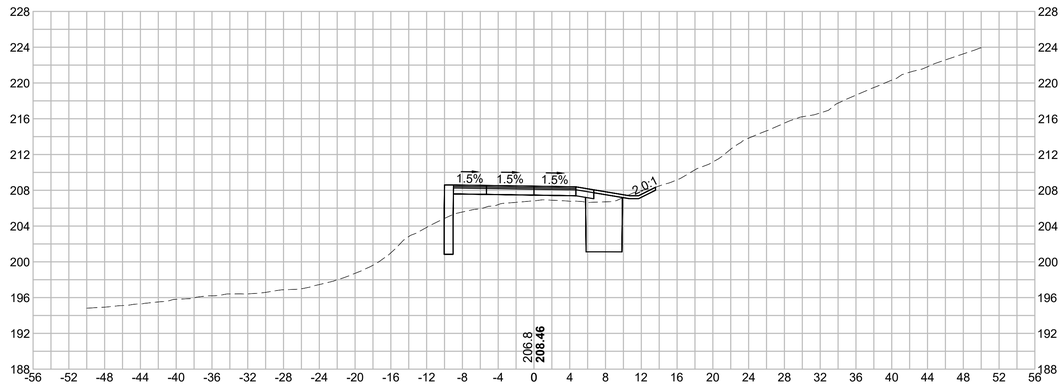
PLAN 209 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

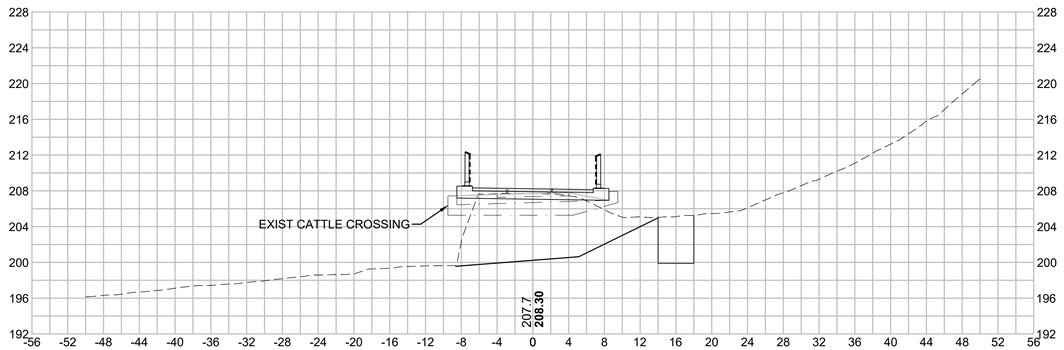
119+50



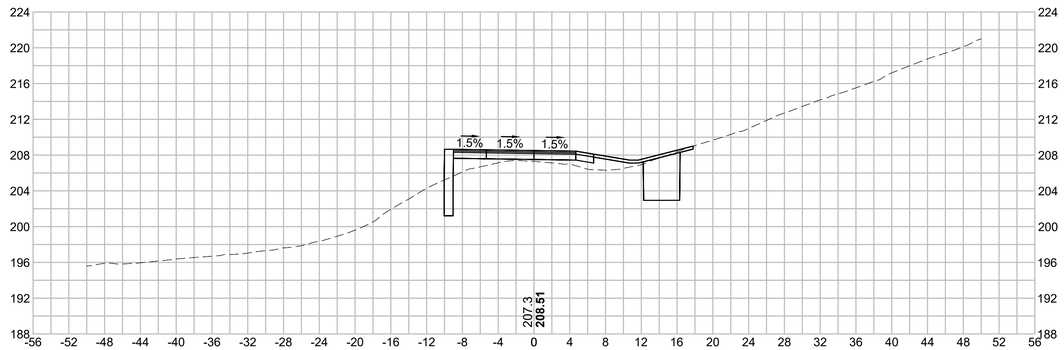
120+50



119+45.63



120+00



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NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

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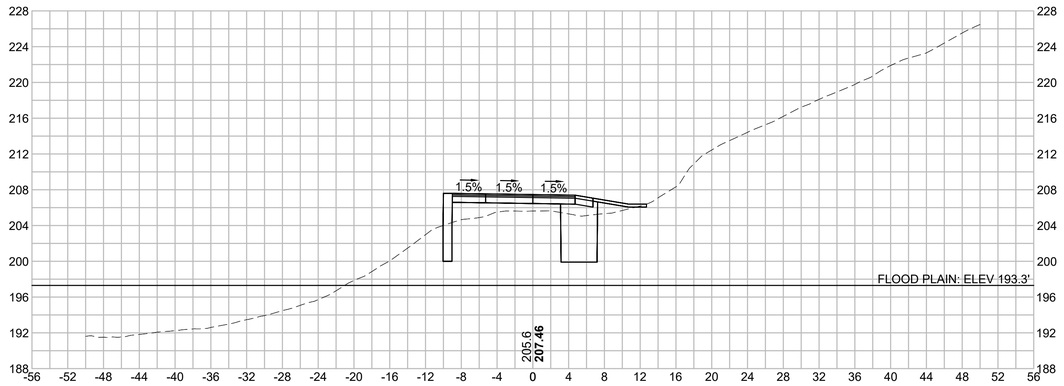
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 2100F349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

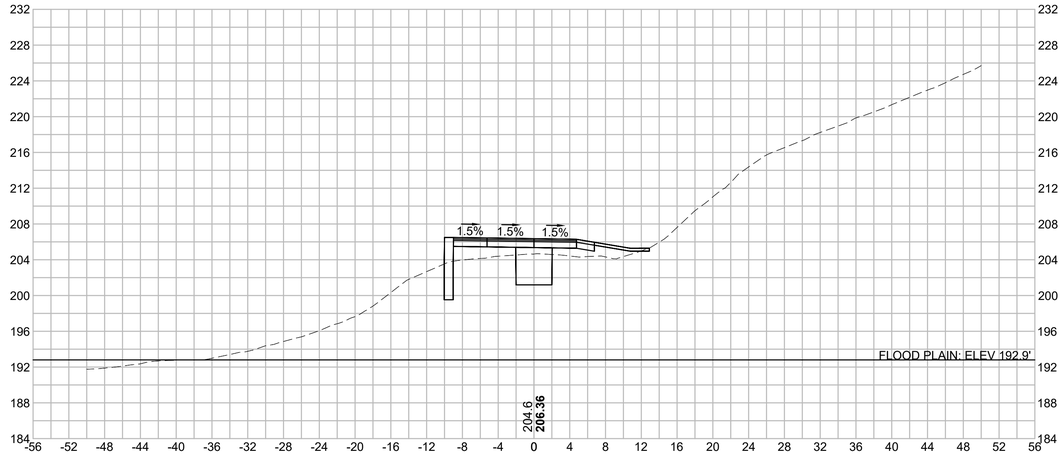
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

121+50



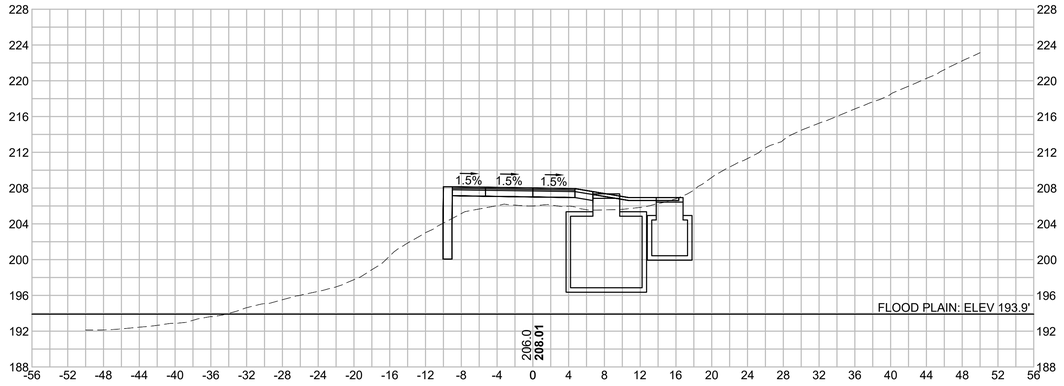
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

122+50



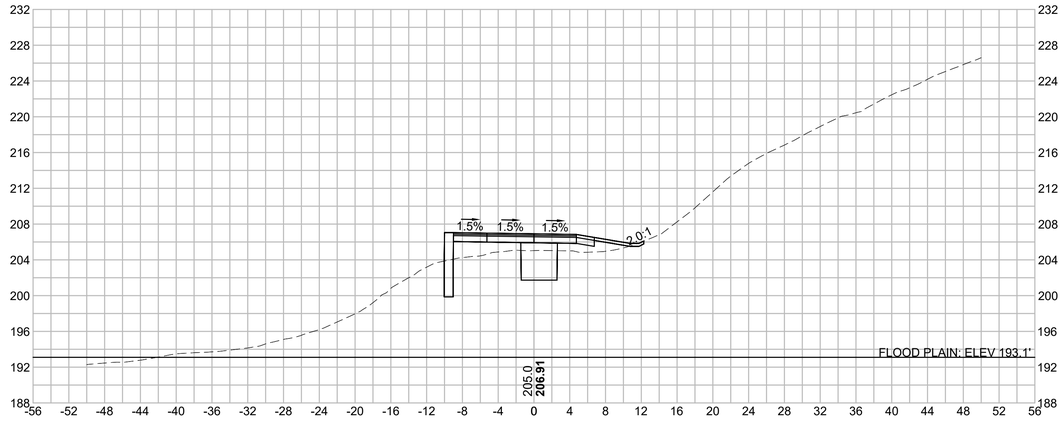
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

121+00



FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

122+00



8 0 8 16
SCALE IN FEET

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Watertown, MA 02472
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NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

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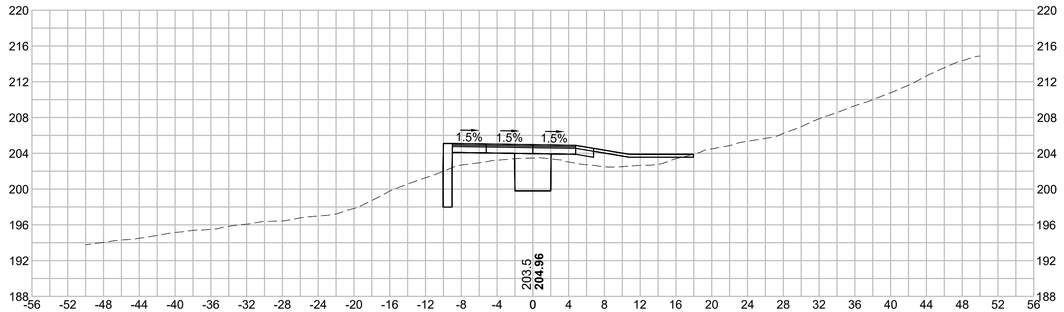
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 2110F 349

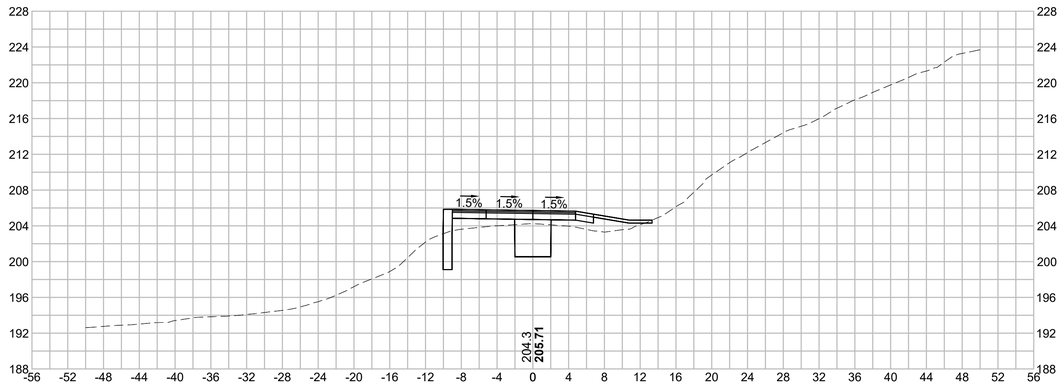
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

TOWN OF STOW
TOWN OF HUDSON

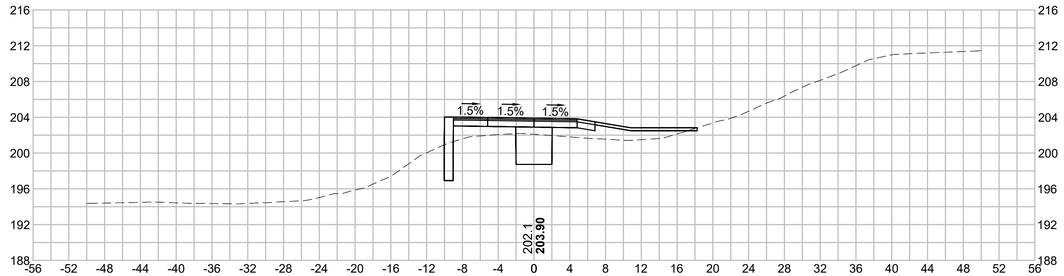
123+50



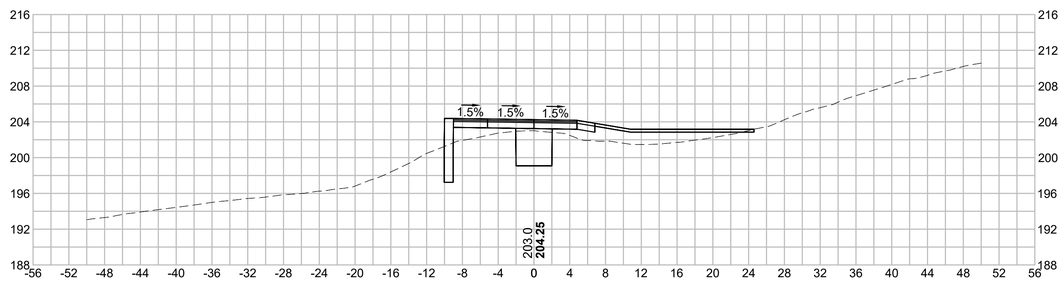
123+00



124+50



124+00



8 0 8 16
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NO.	DESCRIPTION	BY	DATE	APPR.
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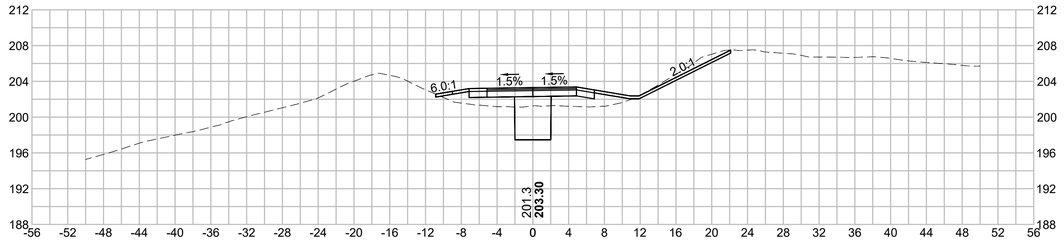
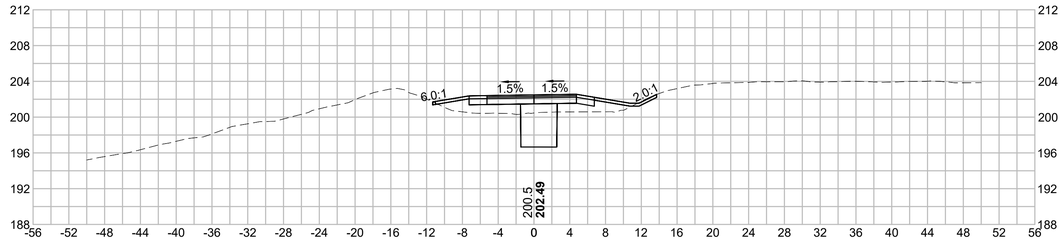
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 212 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

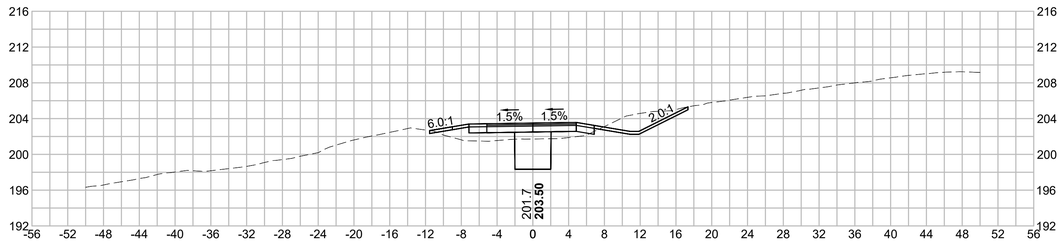
126+00



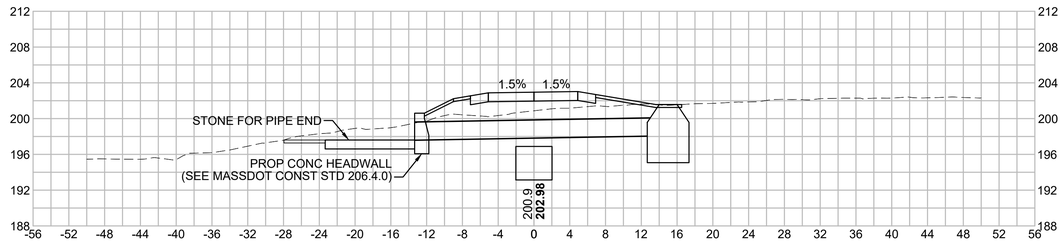
127+00



125+50

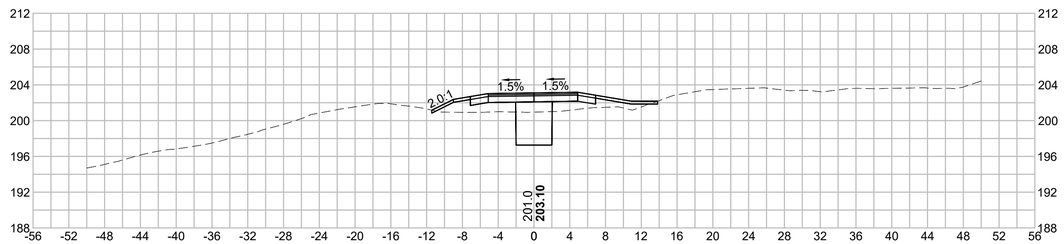


126+70



125+00

126+50



8 0 8 16
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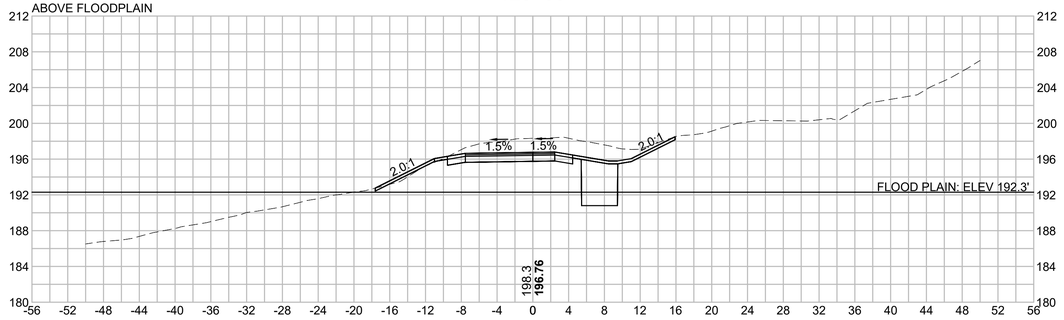
EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 2130F349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

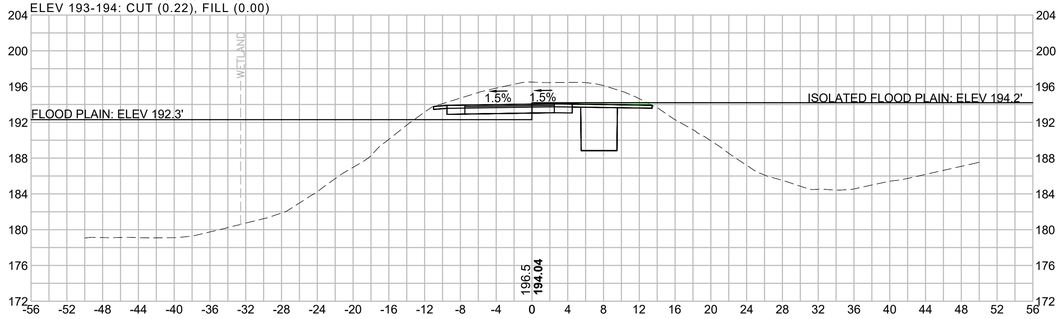
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

128+50



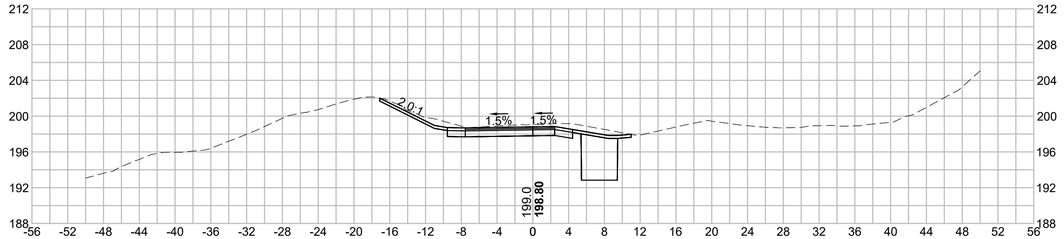
FLOOD PLAIN
ELEV 194-194.2: CUT (2.25), FILL (0.00)
ELEV 193-194: CUT (0.22), FILL (0.00)

130+00



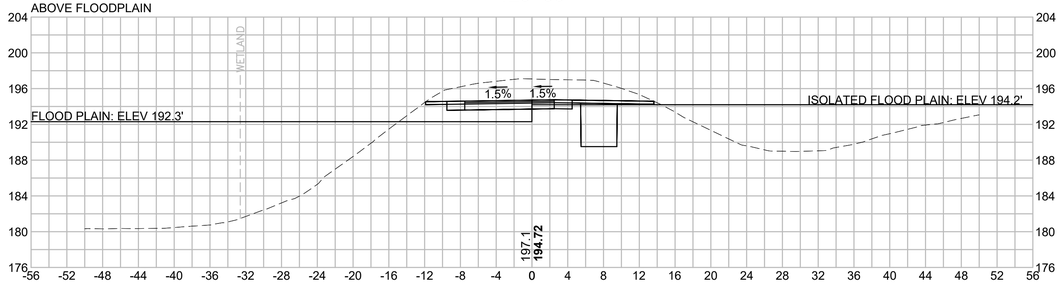
TOWN OF HUDSON
TOWN OF STOW

128+00

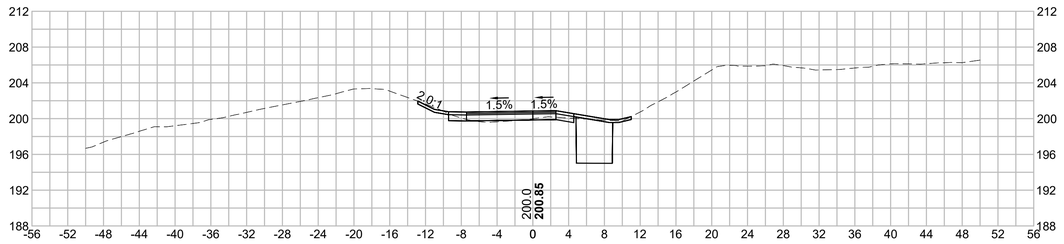


FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

129+50



127+50



FLOOD PLAIN
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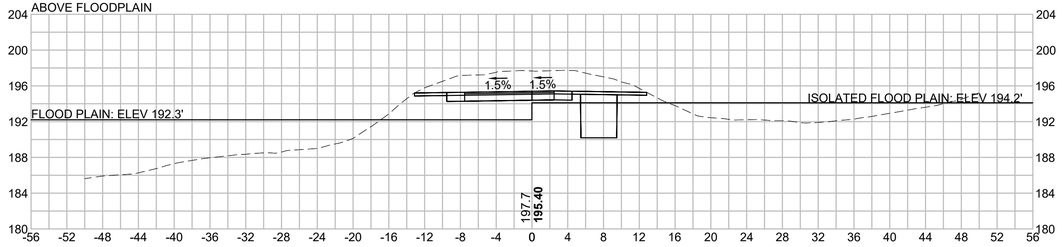
ABOVE FLOODPLAIN

129+00



BLSF CROSSING STA 130 TO STA 132 - FEMA ZONE A - ASSABET BRANCH NO. 4
FEMA ELEV - UPSTREAM PORTION (192.3) AND DOWNSTREAM PORTION (LOWER)
NO FILL
CUT:
192'-193': 1.52 CY
191'-192': 0.07 CY

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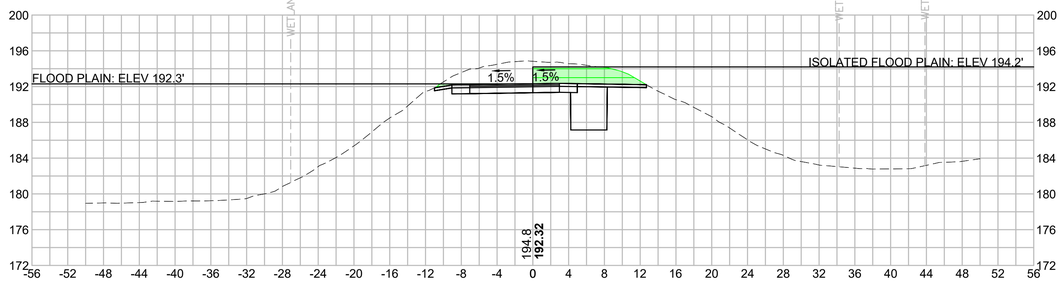
NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 214 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

131+50

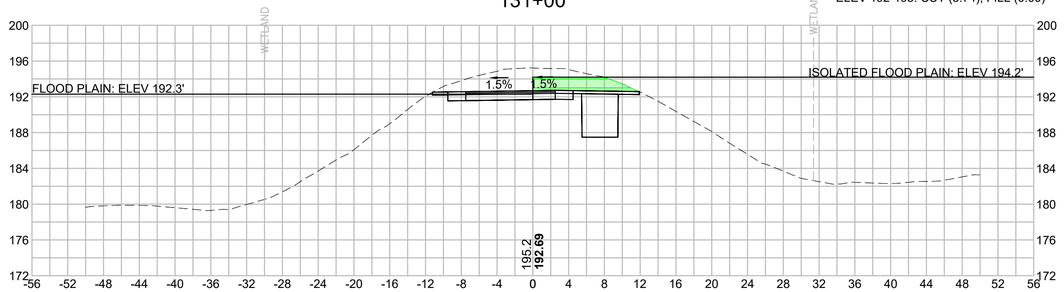


ISOLATED FLOOD PLAIN
ELEV 194-194.2: CUT (1.66), FILL (0.00)
ELEV 193-194: CUT (10.30), FILL (0.00)
ELEV 192-193: CUT (8.36), FILL (0.00)

FLOODPLAIN
ELEV 192-192.3: CUT (0.82), FILL (0.00)
ELEV 191-192: CUT (0.04), FILL (0.00)

FLOOD PLAIN
ELEV 192-192.3: CUT (0.00), FILL (0.00)

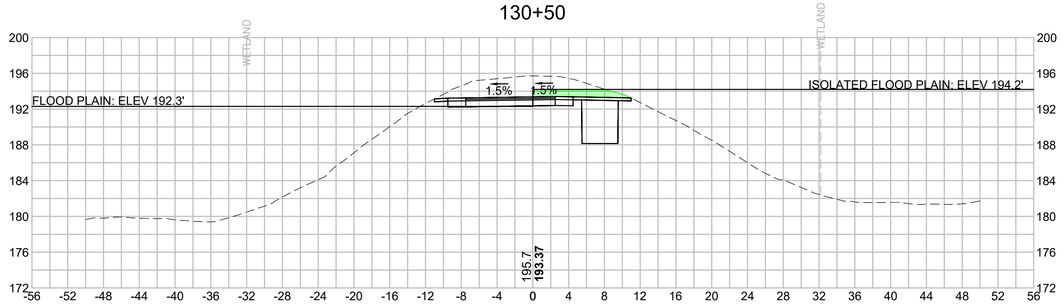
131+00



ISOLATED FLOOD PLAIN
ELEV 194-194.2: CUT (1.64), FILL (0.00)
ELEV 193-194: CUT (9.83), FILL (0.00)
ELEV 192-193: CUT (3.74), FILL (0.00)

FLOOD PLAIN
ELEV 194-194.2: CUT (1.68), FILL (0.00)
ELEV 193-194: CUT (6.54), FILL (0.00)

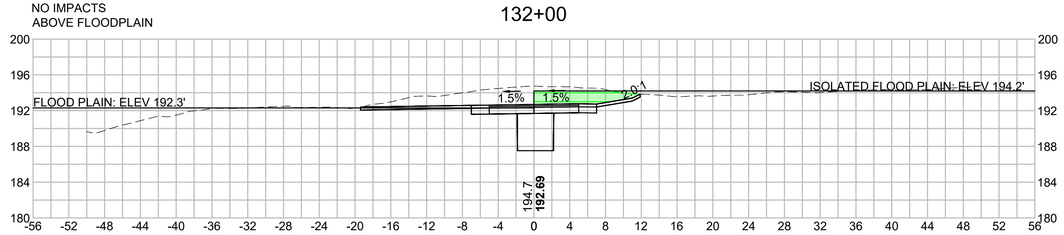
130+50



ISOLATED FLOOD PLAIN
ELEV 194-194.2: CUT (1.85), FILL (0.00)
ELEV 193-194: CUT (10.65), FILL (0.00)
ELEV 192-193: CUT (2.06), FILL (0.00)

FLOODPLAIN
NO IMPACTS
ABOVE FLOODPLAIN

132+00



SCALE IN FEET
8 0 8 16

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

Vanasse Hangen Brustlin, Inc.
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Watertown, MA 02472
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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

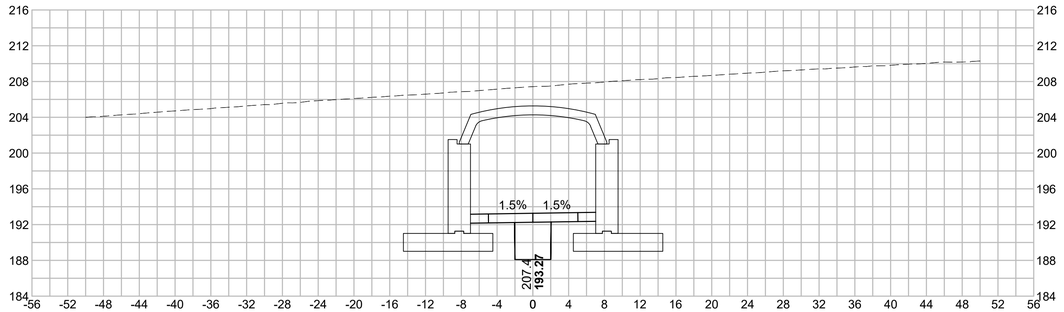
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

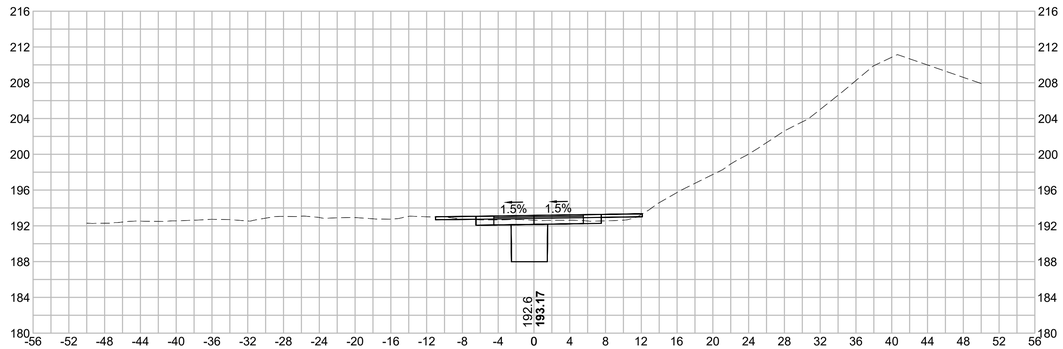
PLAN 215 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

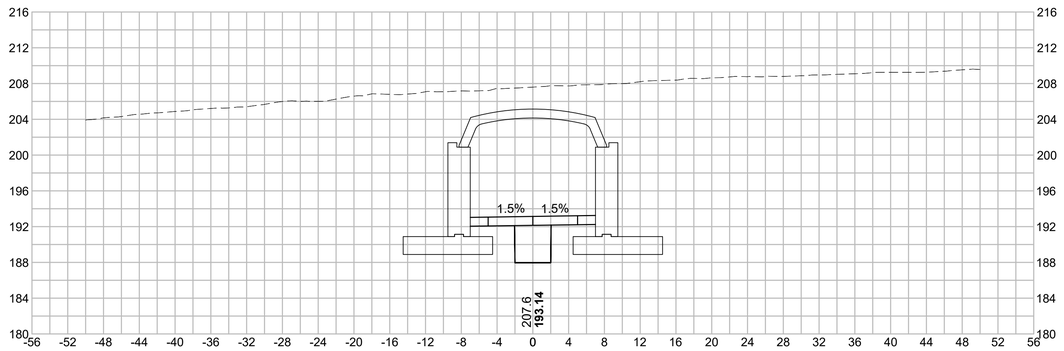
132+64.32



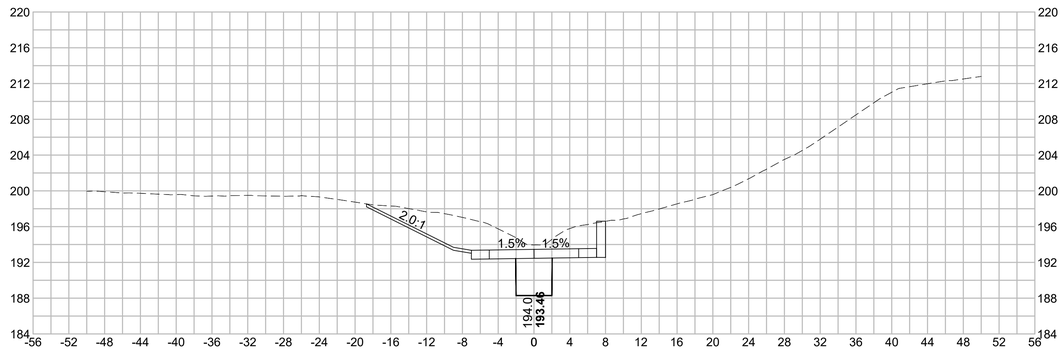
133+50



132+50



133+00



8 0 8 16
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

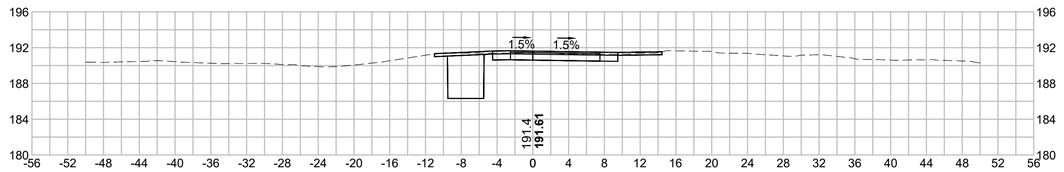
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

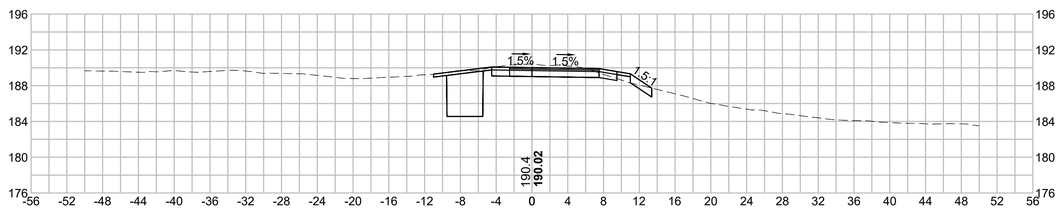
PLAN 216 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

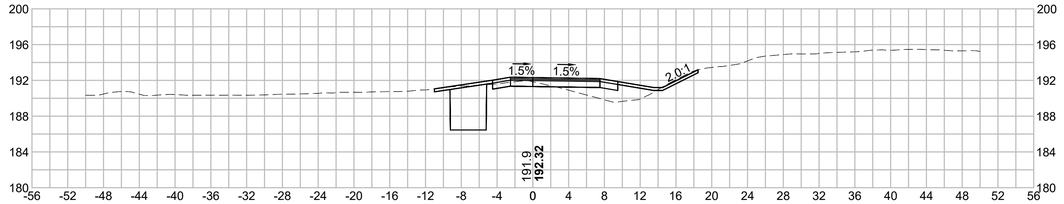
135+00



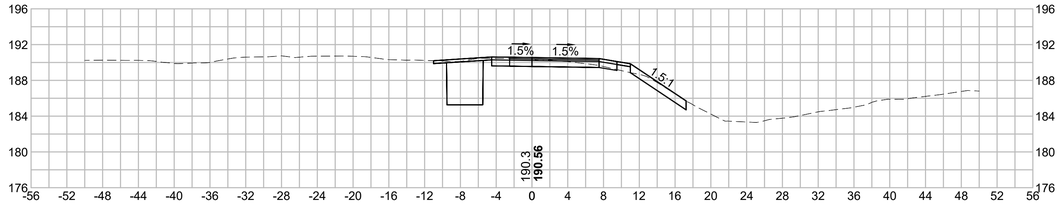
136+00



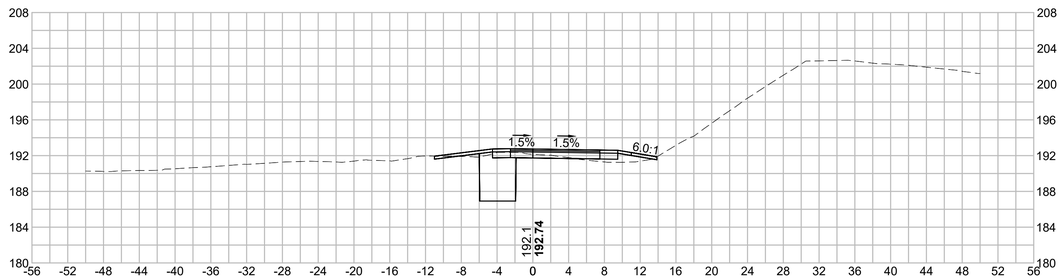
134+50



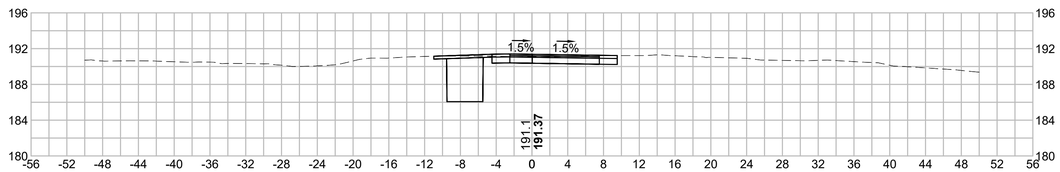
135+50



134+00



135+10.44



8 0 8 16
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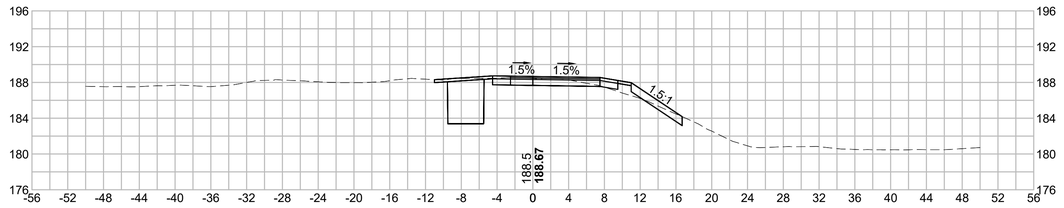
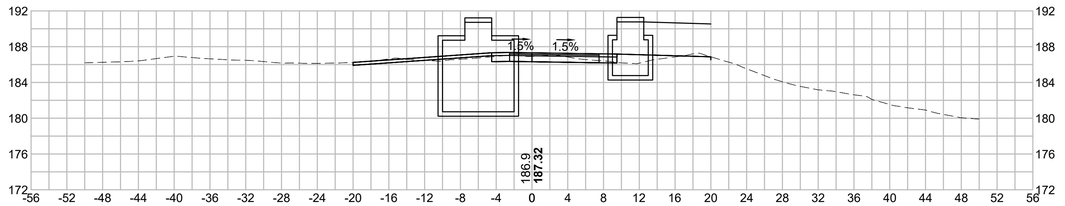
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 217 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

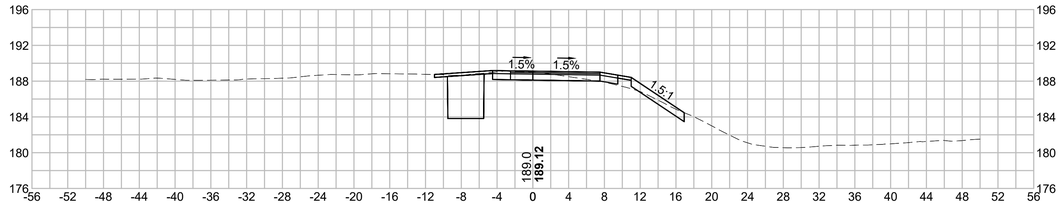
137+50



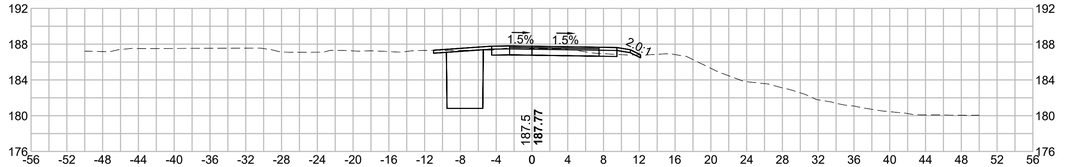
139+00



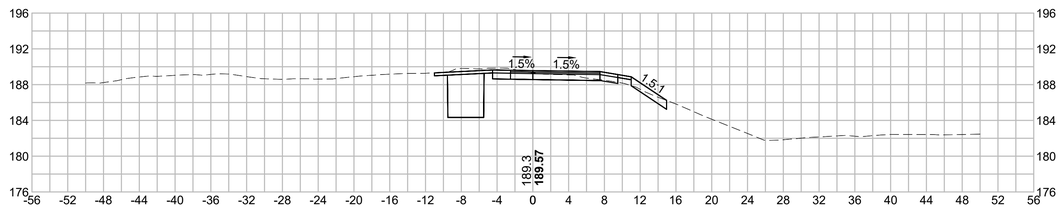
137+00



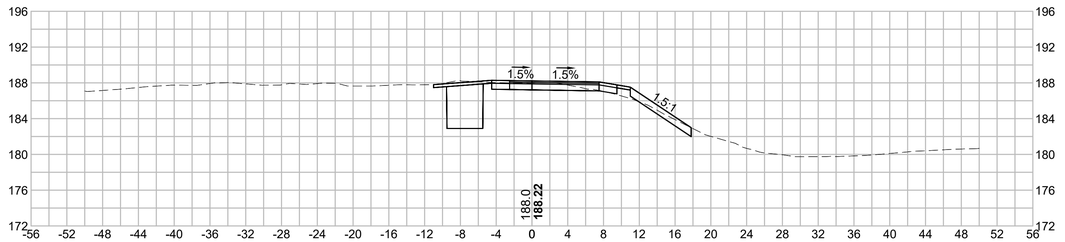
138+50



136+50



138+00



8 0 8 16
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

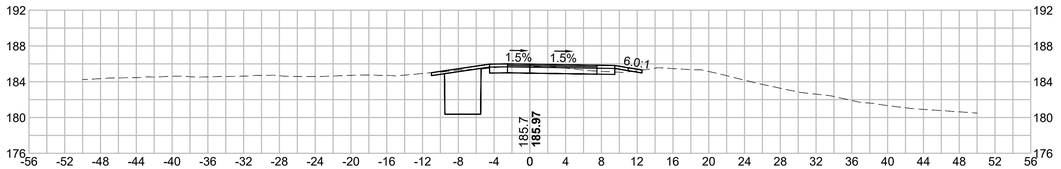
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

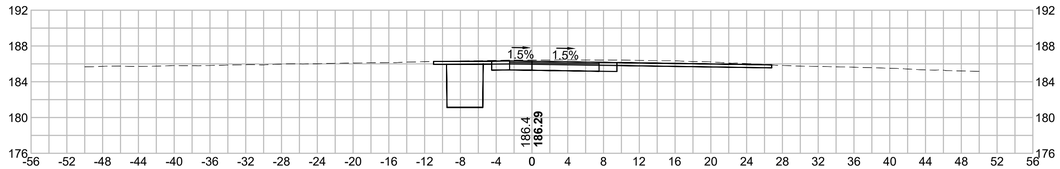
PLAN 218 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

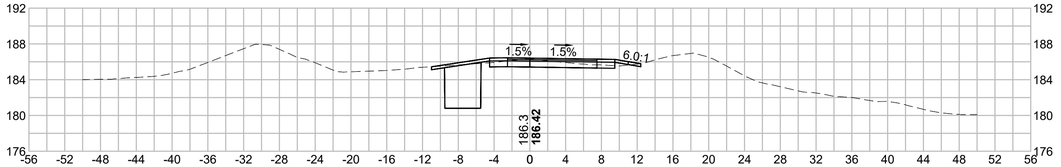
140+50



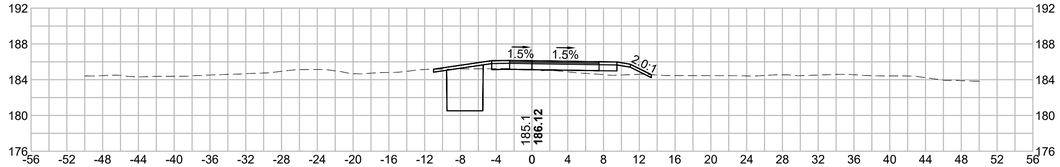
142+00



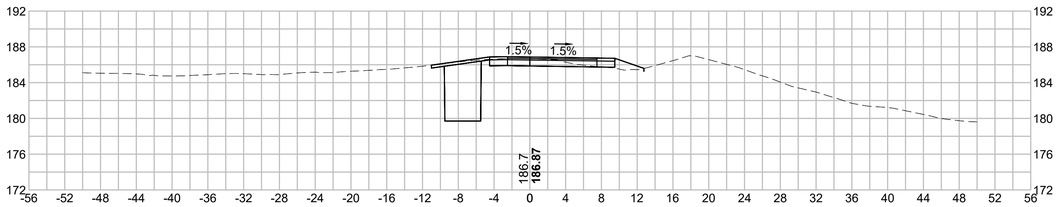
140+00



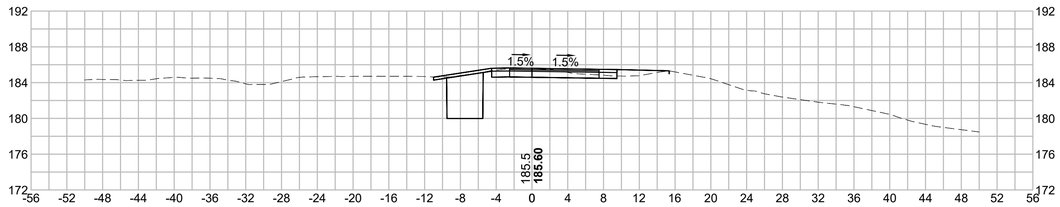
141+50



139+50



141+00



BLSF CROSSING STA 143 TO STA 153 - FEMA ZONE AE - FORT MEADOW BROOK
FEMA ELEV : 182.0'

FILL:	CUT:
181'-182': 22.54 CY	181'-182': 329.43 CY
180'-181': 8.46 CY	180'-181': 242.89 CY
179'-180': 0.27 CY	179'-180': 13.84 CY
178'-179': 0.00 CY	178'-179': 4.21 CY

8 0 8 16
SCALE IN FEET

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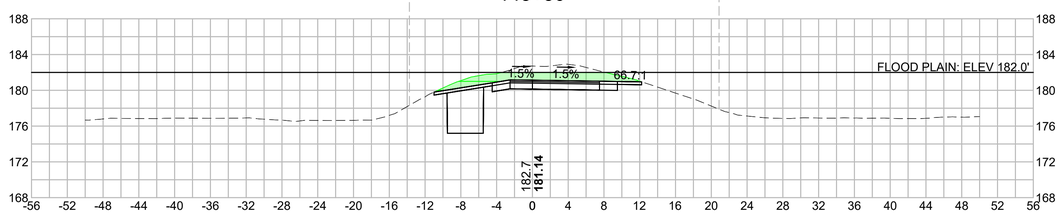
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 219 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

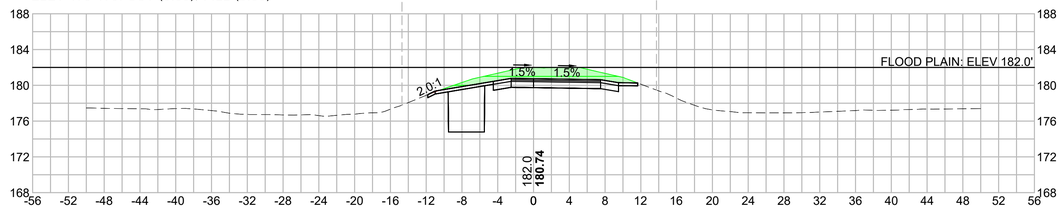
FLOOD PLAIN
ELEV 181-182: CUT (15.47), FILL (0.00)
ELEV 180-181: CUT (2.89), FILL (0.00)
ELEV 179-180: CUT (0.08), FILL (0.00)

143+50



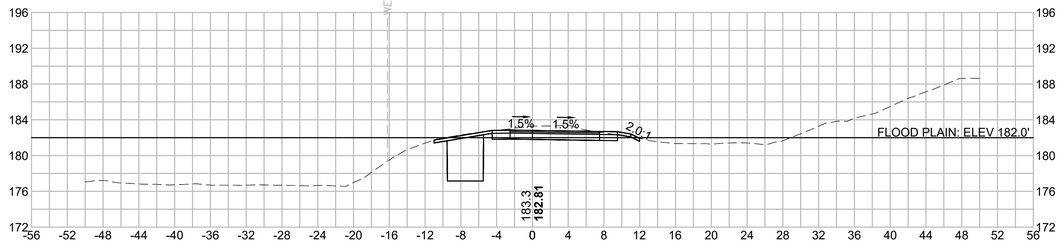
FLOOD PLAIN
ELEV 181-182: CUT (10.63), FILL (0.00)
ELEV 180-181: CUT (7.93), FILL (0.00)
ELEV 179-180: CUT (0.50), FILL (0.05)
ELEV 178-179: CUT (0.00), FILL (0.00)

145+00



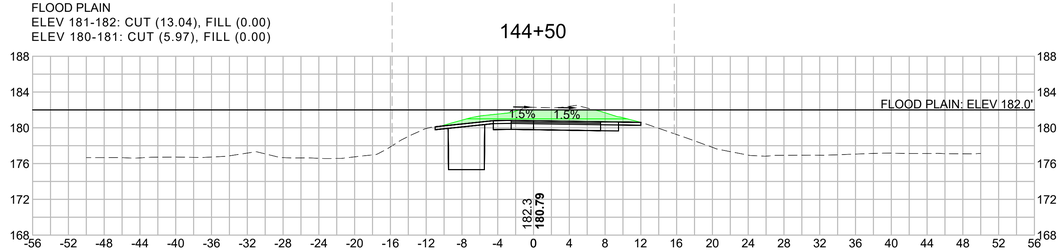
FLOOD PLAIN
ELEV 181-182: CUT (0.08), FILL (0.00)

143+00



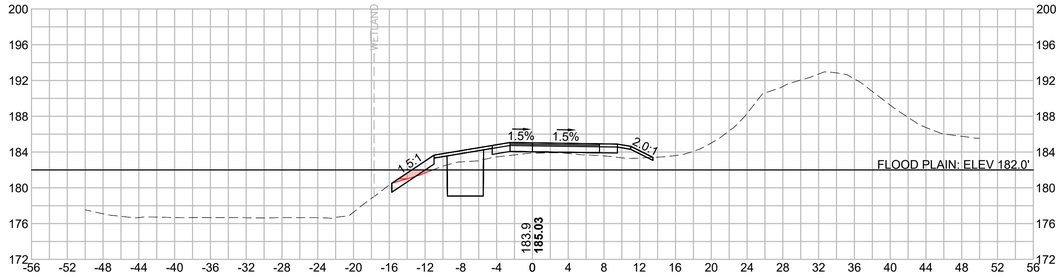
FLOOD PLAIN
ELEV 181-182: CUT (13.04), FILL (0.00)
ELEV 180-181: CUT (5.97), FILL (0.00)

144+50



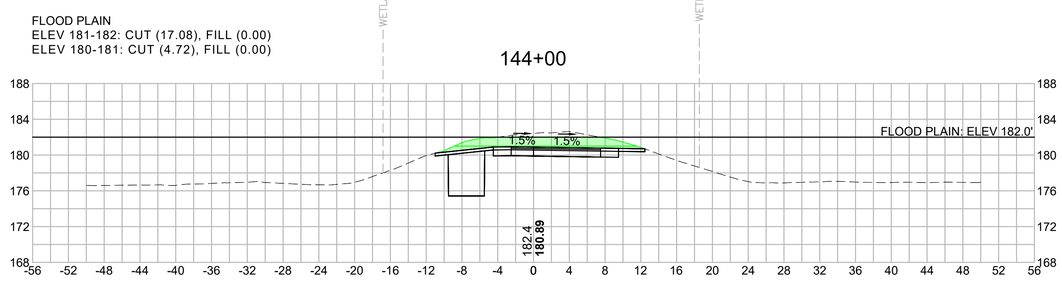
FLOOD PLAIN
ELEV 181-182: CUT (0.00), FILL (1.76)
ELEV 180-181: CUT (0.00), FILL (0.24)

142+50



FLOOD PLAIN
ELEV 181-182: CUT (17.08), FILL (0.00)
ELEV 180-181: CUT (4.72), FILL (0.00)

144+00



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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 220 OF 349

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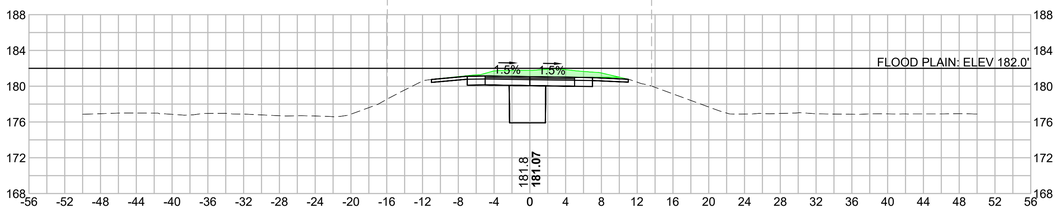
617.924.1770 FAX 617.924.2286

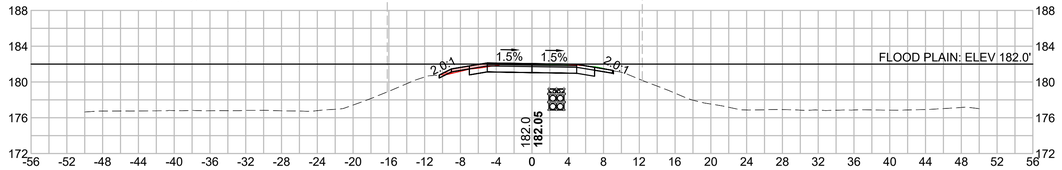
FLOOD PLAIN
ELEV 181-182: CUT (10.00), FILL (0.00)
ELEV 180-181: CUT (0.50), FILL (0.00)

146+50



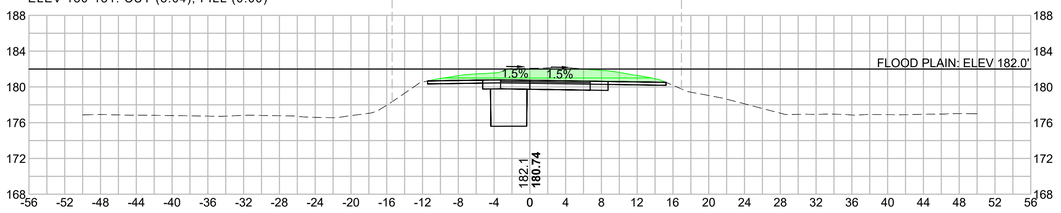
FLOOD PLAIN
ELEV 181-182: CUT (0.16), FILL (2.33)
ELEV 180-181: CUT (0.00), FILL (0.18)

148+00



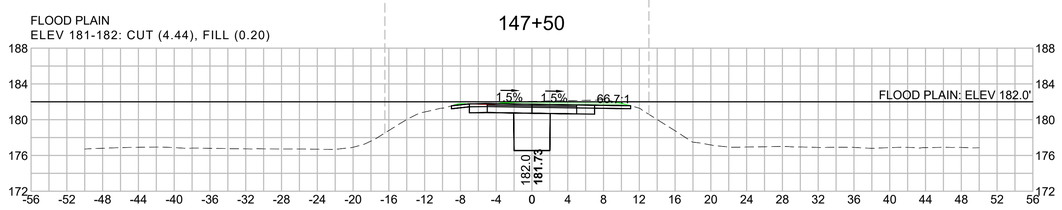
FLOOD PLAIN
ELEV 181-182: CUT (16.08), FILL (0.00)
ELEV 180-181: CUT (8.04), FILL (0.00)

146+00



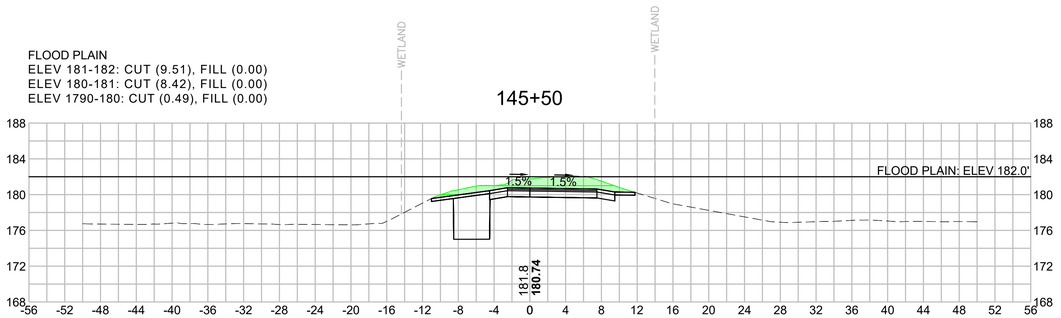
FLOOD PLAIN
ELEV 181-182: CUT (4.44), FILL (0.20)

147+50



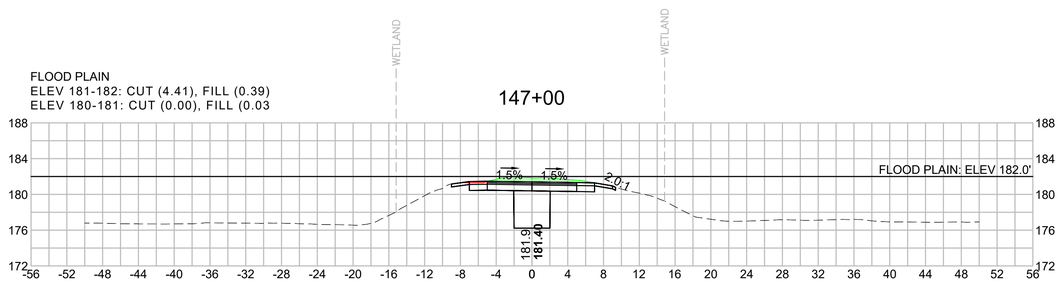
FLOOD PLAIN
ELEV 181-182: CUT (9.51), FILL (0.00)
ELEV 180-181: CUT (8.42), FILL (0.00)
ELEV 1790-180: CUT (0.49), FILL (0.00)

145+50



FLOOD PLAIN
ELEV 181-182: CUT (4.41), FILL (0.39)
ELEV 180-181: CUT (0.00), FILL (0.03

147+00



8 0 8 16
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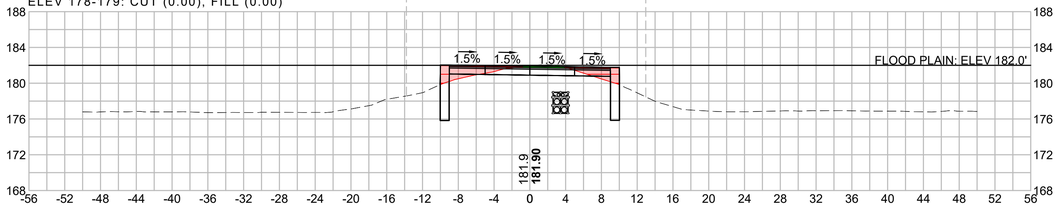
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 221OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

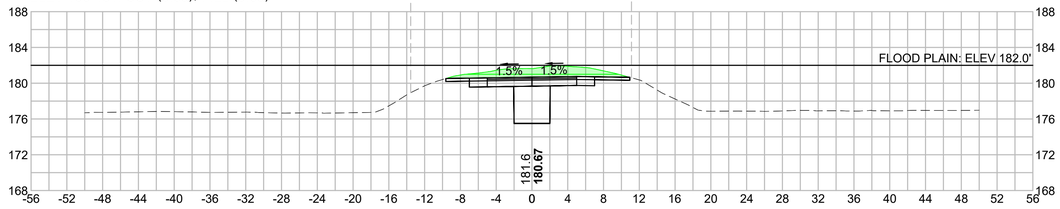
FLOOD PLAIN
ELEV 181-182: CUT (0.69), FILL (9.52)
ELEV 180-181: CUT (0.00), FILL (4.20)
ELEV 179-180: CUT (0.00), FILL (0.07)
ELEV 178-179: CUT (0.00), FILL (0.00)

149+50



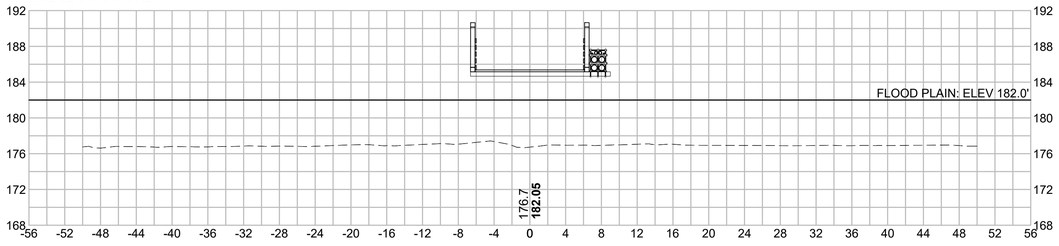
FLOOD PLAIN
ELEV 181-182: CUT (9.69), FILL (0.00)
ELEV 180-181: CUT (6.39), FILL (0.00)

151+00



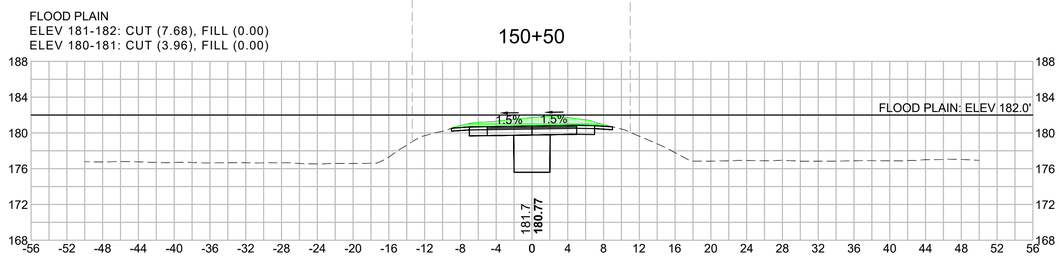
NO FLOOD PLAIN ANALYSIS
BRIDGE STRUCTURE

149+00



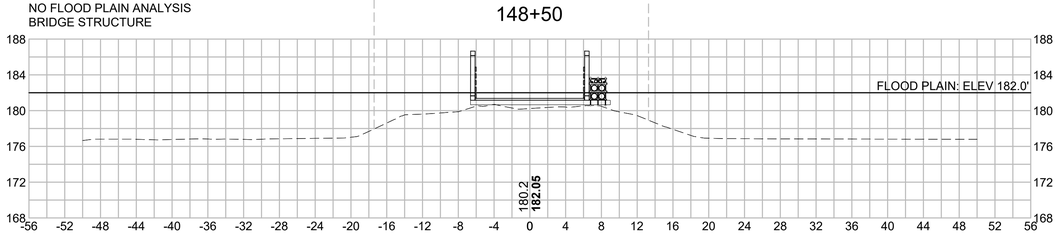
FLOOD PLAIN
ELEV 181-182: CUT (7.68), FILL (0.00)
ELEV 180-181: CUT (3.96), FILL (0.00)

150+50



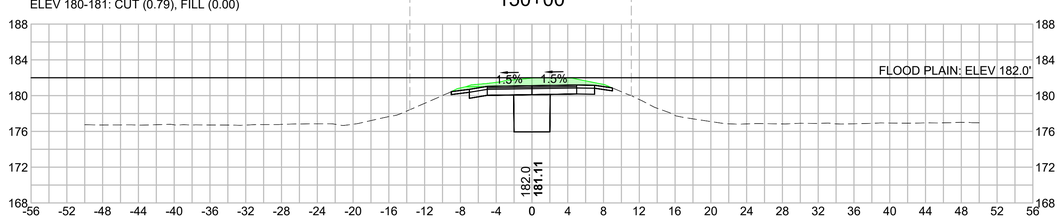
NO FLOOD PLAIN ANALYSIS
BRIDGE STRUCTURE

148+50



FLOOD PLAIN
ELEV 181-182: CUT (9.16), FILL (0.00)
ELEV 180-181: CUT (0.79), FILL (0.00)

150+00



8 0 8 16
SCALE IN FEET

Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
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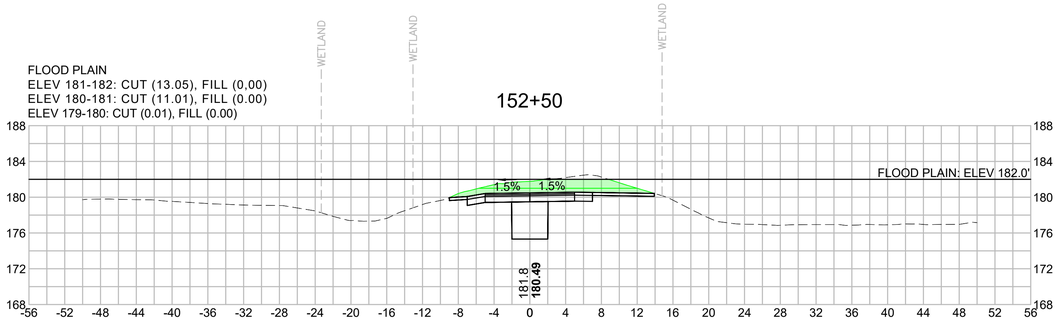
NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

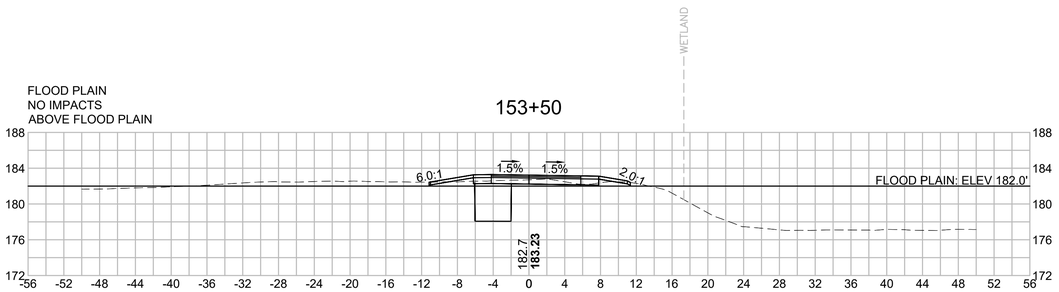
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 222OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

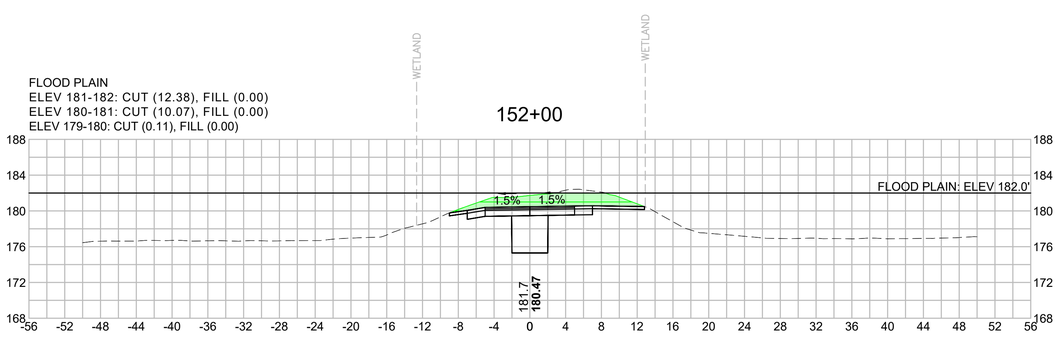
FLOOD PLAIN
ELEV 181-182: CUT (13.05), FILL (0,00)
ELEV 180-181: CUT (11.01), FILL (0.00)
ELEV 179-180: CUT (0.01), FILL (0.00)



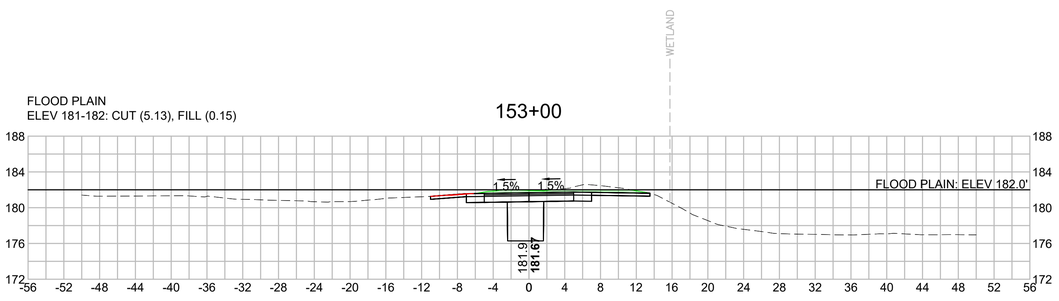
FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN



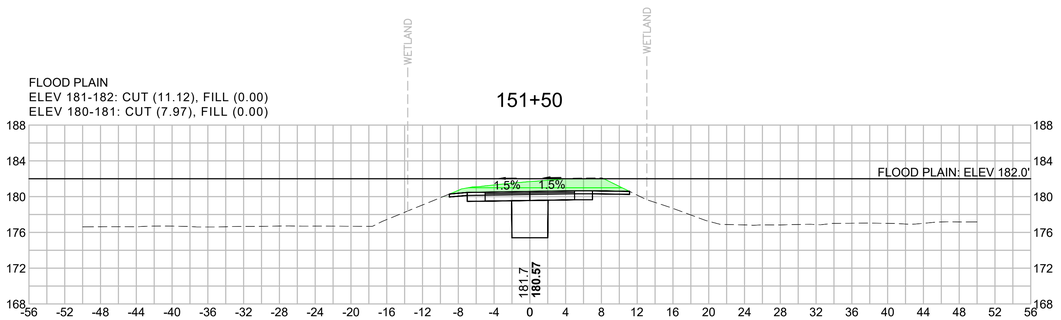
FLOOD PLAIN
ELEV 181-182: CUT (12.38), FILL (0.00)
ELEV 180-181: CUT (10.07), FILL (0.00)
ELEV 179-180: CUT (0.11), FILL (0.00)



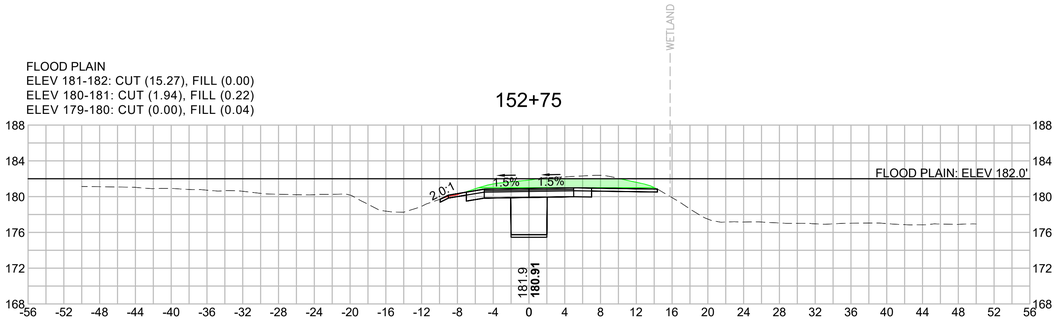
FLOOD PLAIN
ELEV 181-182: CUT (5.13), FILL (0.15)



FLOOD PLAIN
ELEV 181-182: CUT (11.12), FILL (0.00)
ELEV 180-181: CUT (7.97), FILL (0.00)



FLOOD PLAIN
ELEV 181-182: CUT (15.27), FILL (0.00)
ELEV 180-181: CUT (1.94), FILL (0.22)
ELEV 179-180: CUT (0.00), FILL (0.04)



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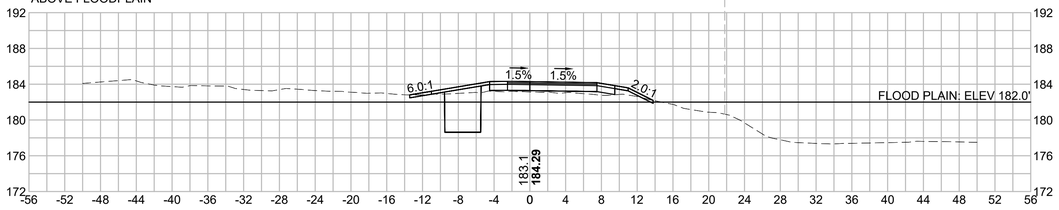
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 223 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

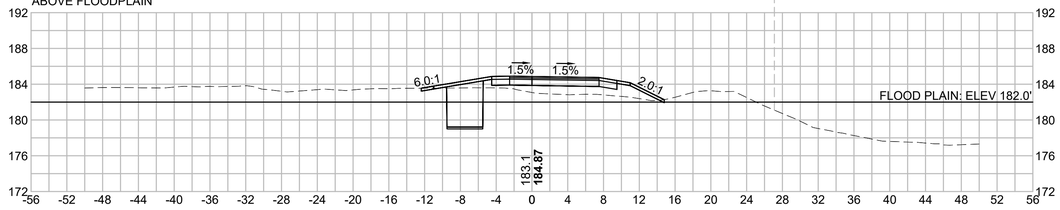
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

155+00



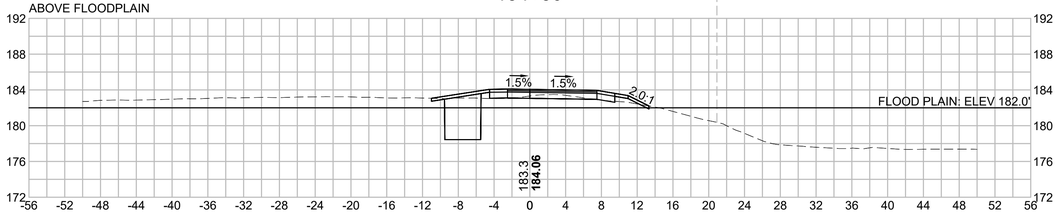
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

156+50



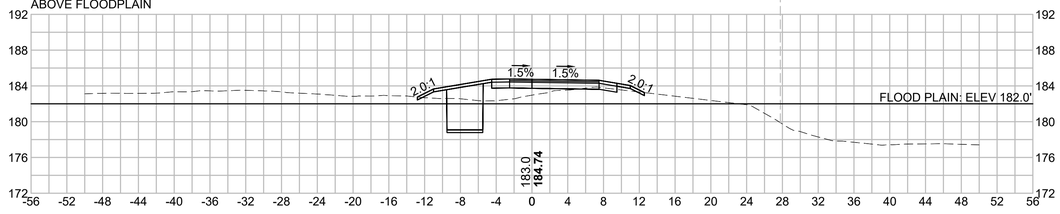
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

154+50



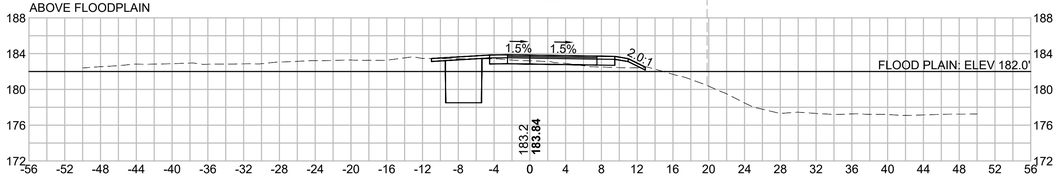
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

156+00



FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

154+00



FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

155+50

8 0 8 16
SCALE IN FEET

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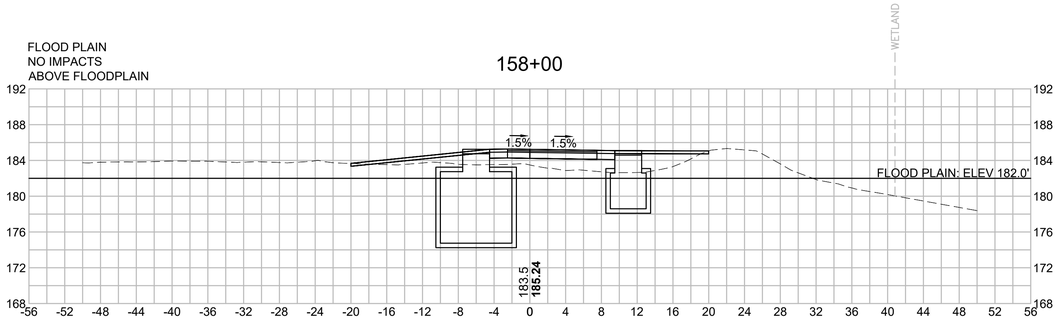
EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 224 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

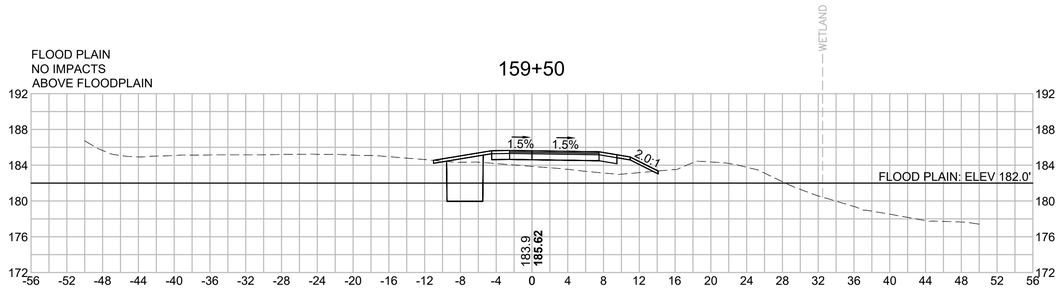
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

158+00



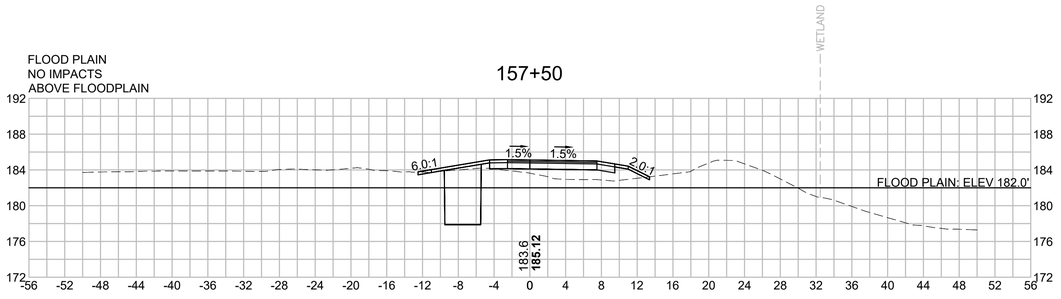
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

159+50



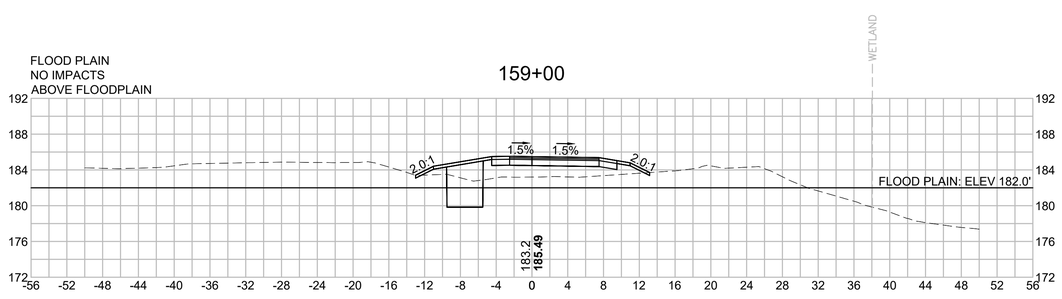
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

157+50



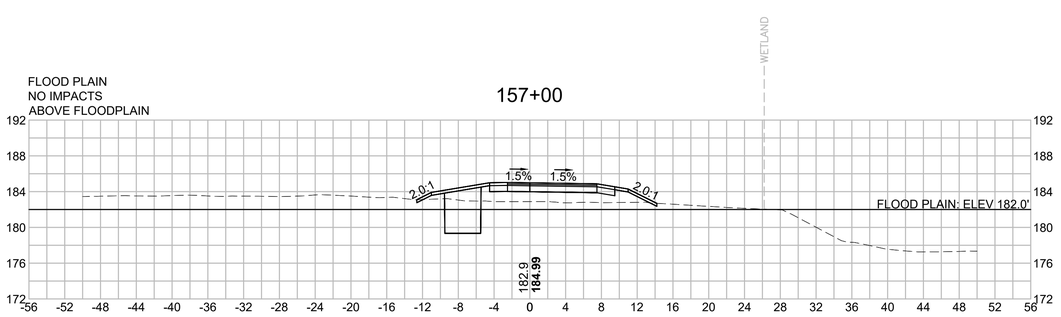
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

159+00



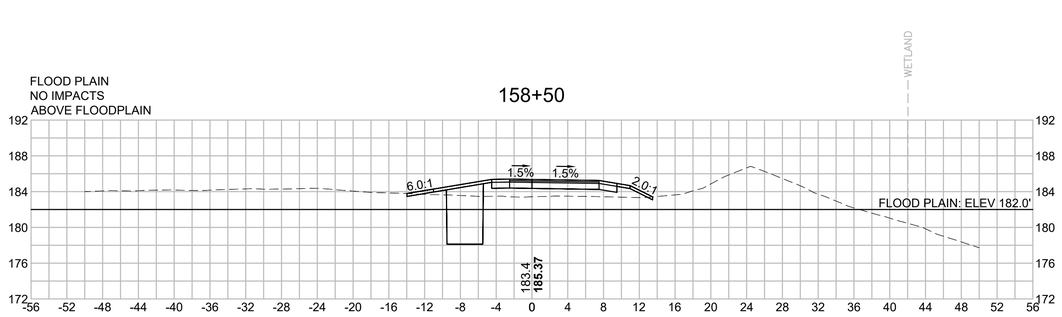
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

157+00



FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

158+50



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NO.	DESCRIPTION	BY	DATE	APPR.
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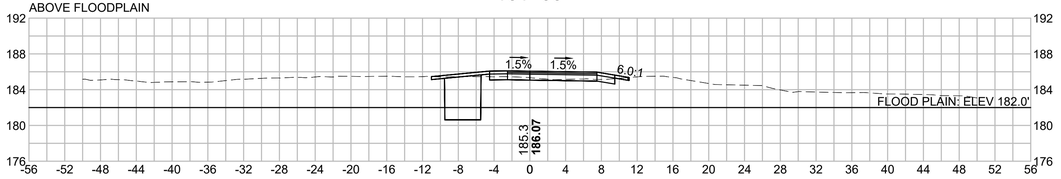
EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 225 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

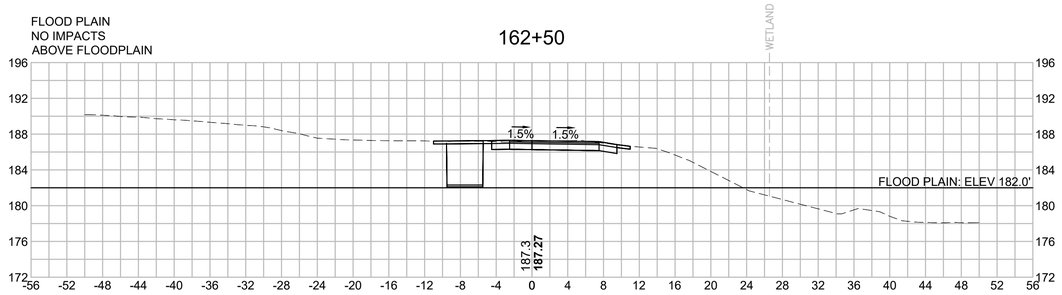
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

161+00



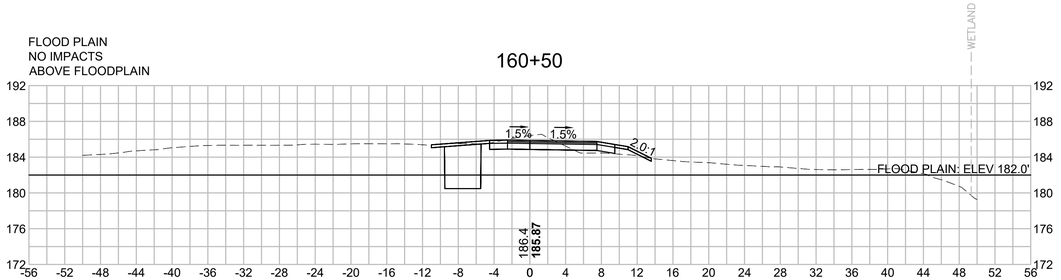
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

162+50



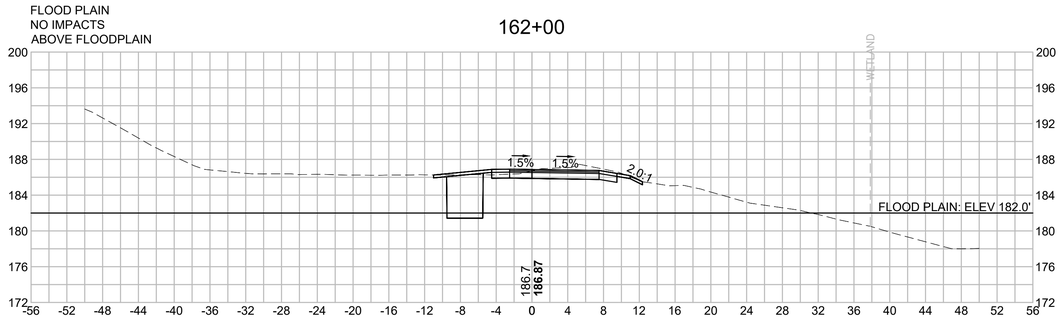
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

160+50



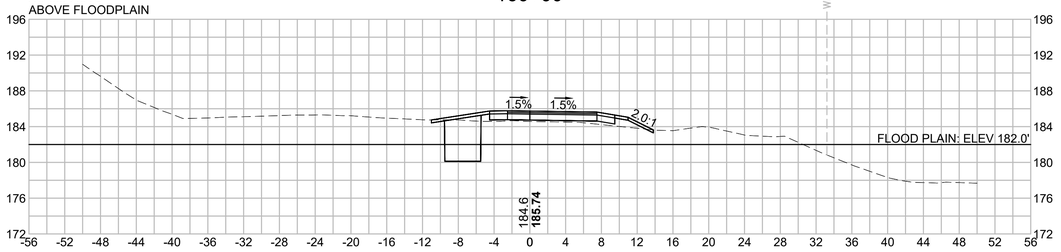
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

162+00



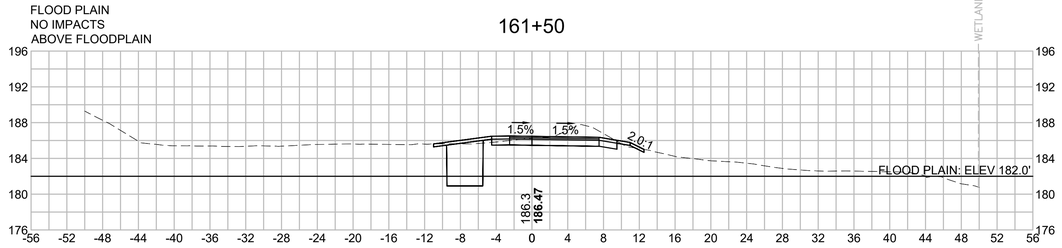
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

160+00



FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

161+50



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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

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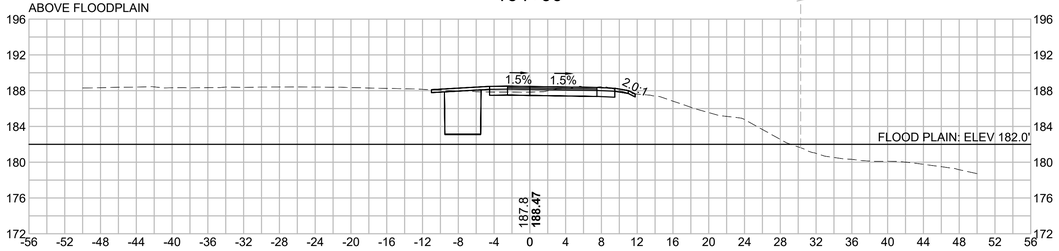
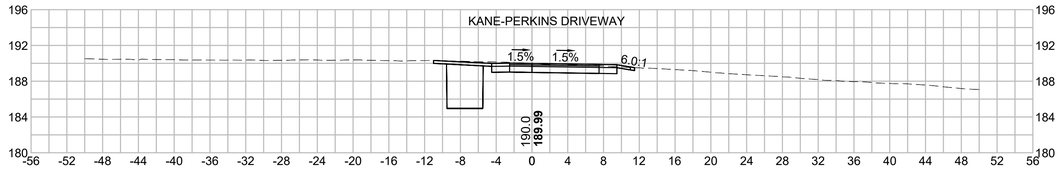
1"=8'	DEC 2021	MS	SK	MES	.	.

FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

164+00

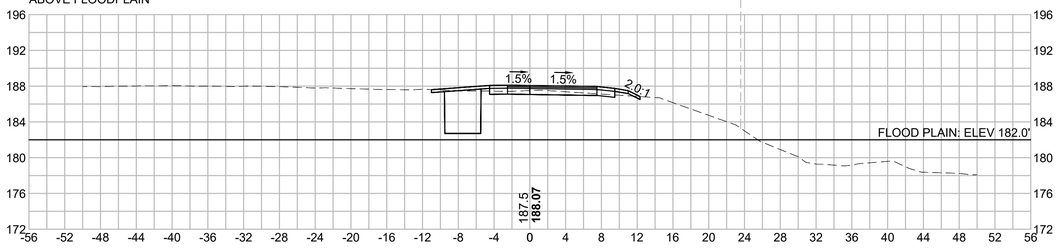


165+50

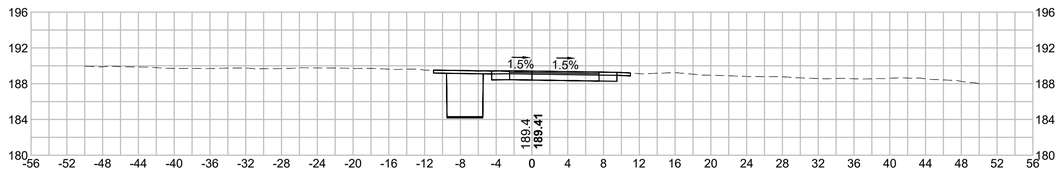


FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

163+50

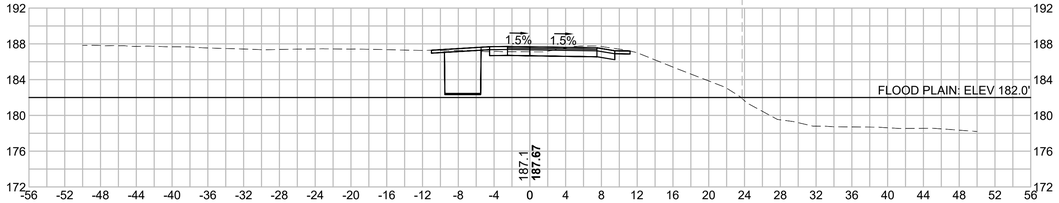


165+00

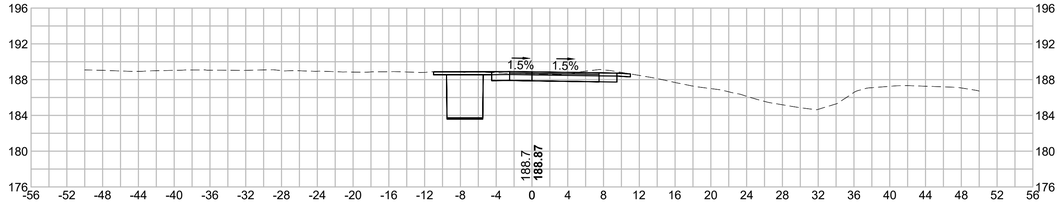


FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

163+00



164+50



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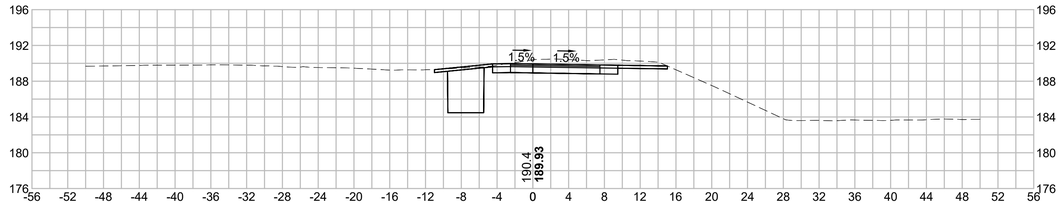
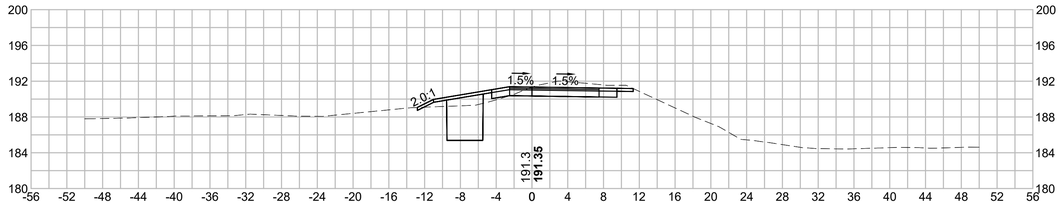
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 227OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

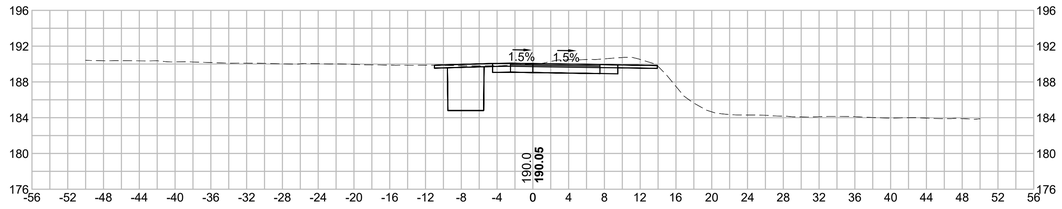
167+00



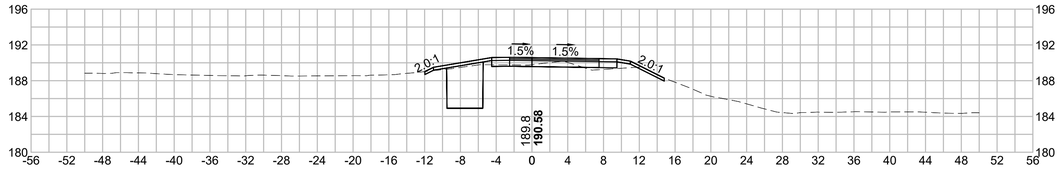
168+50



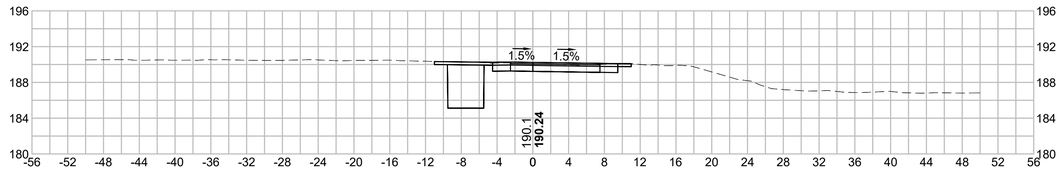
166+50



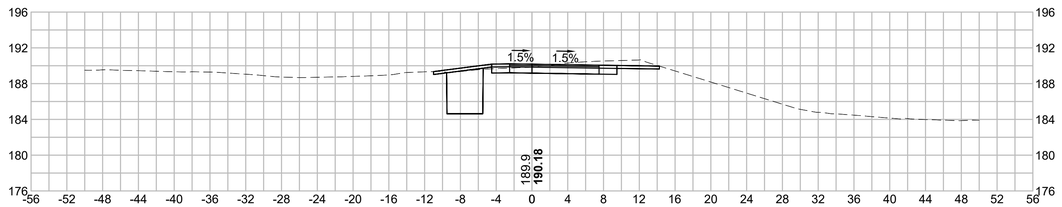
168+00



166+00



167+50



8 0 8 16
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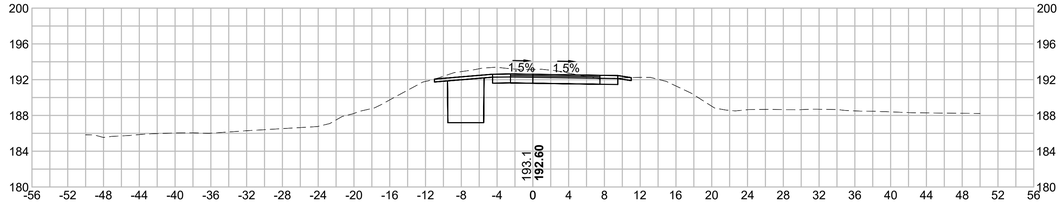
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 228 OF 349

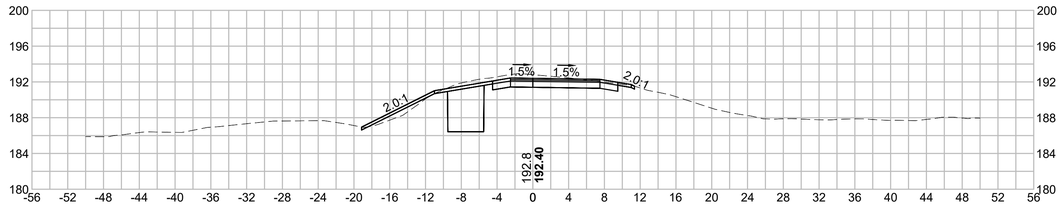
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

170+00

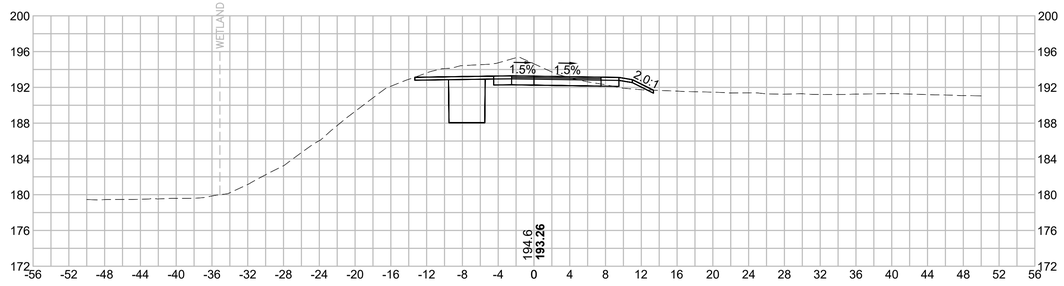


171+50

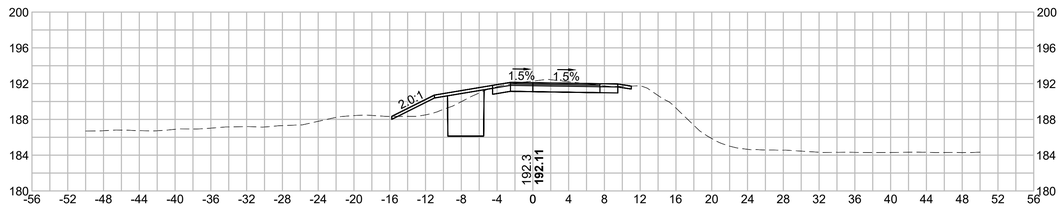
169+50



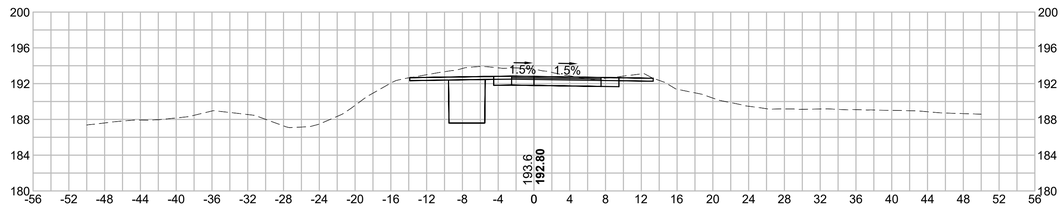
171+00



169+00



170+50



8 0 8 16
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NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

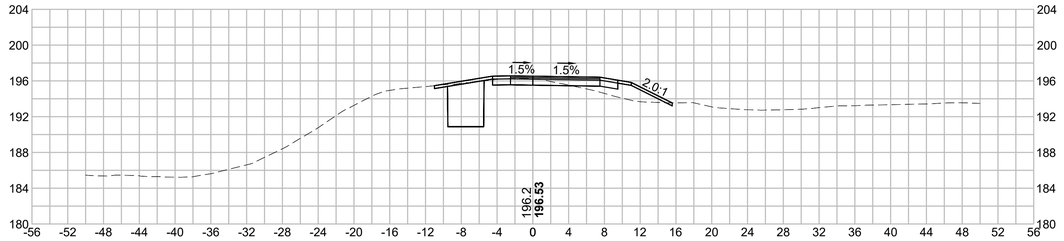
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

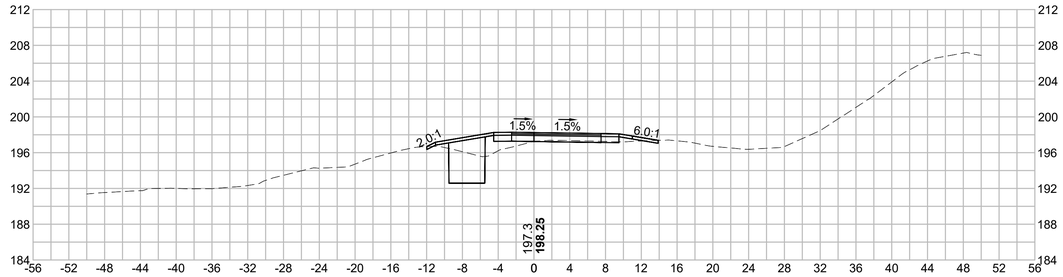
PLAN 229 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

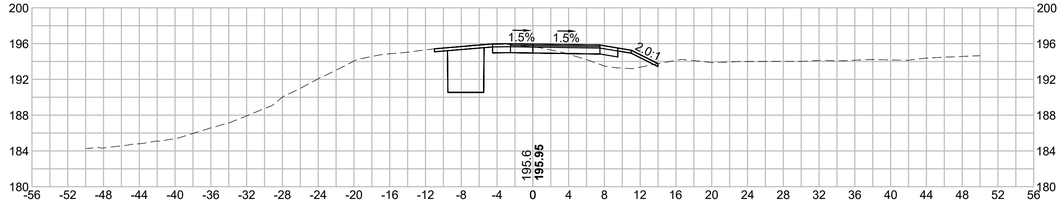
173+00



174+50



172+50



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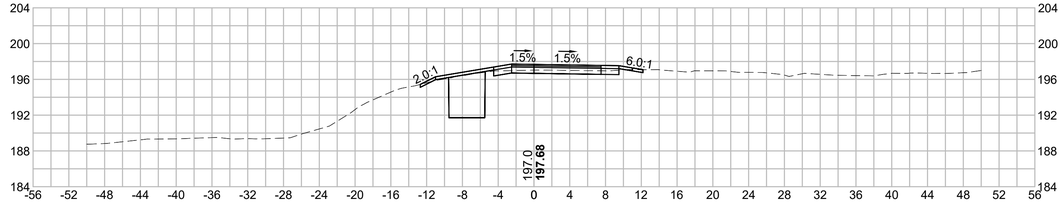

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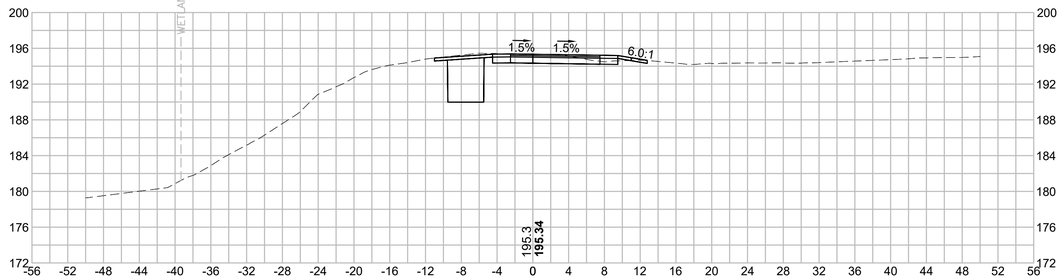

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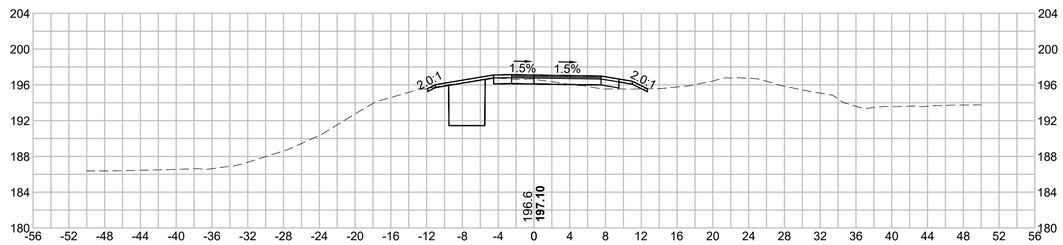

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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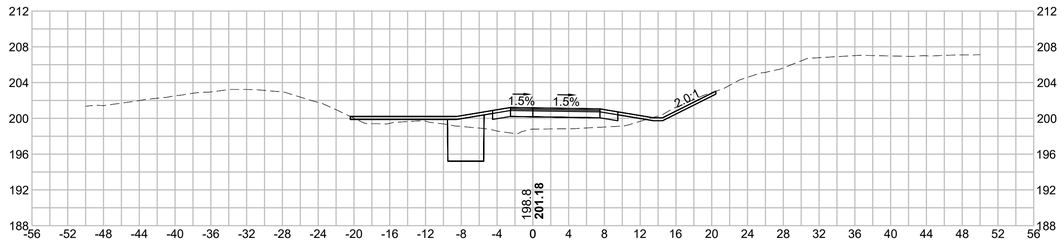
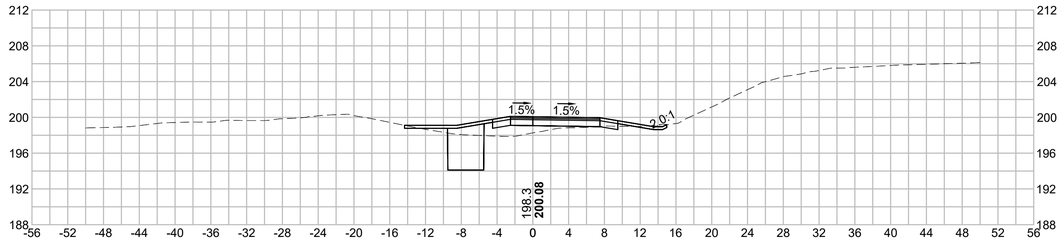
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

176+00



175+50



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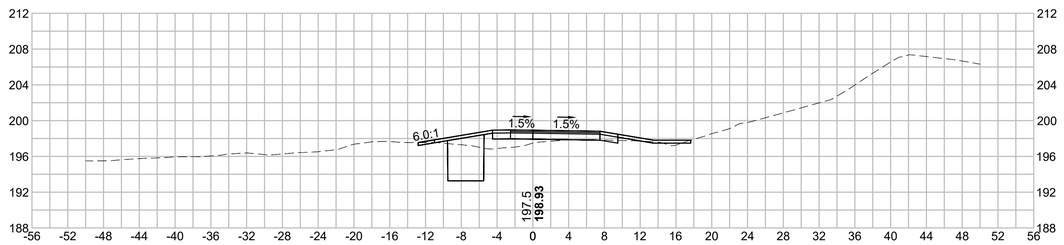

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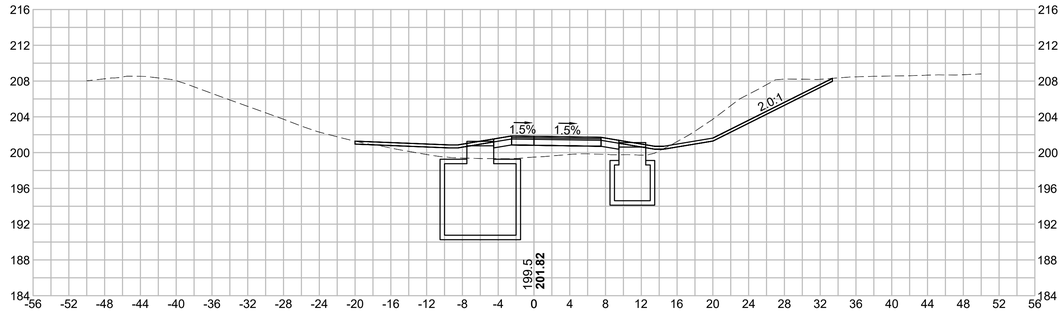

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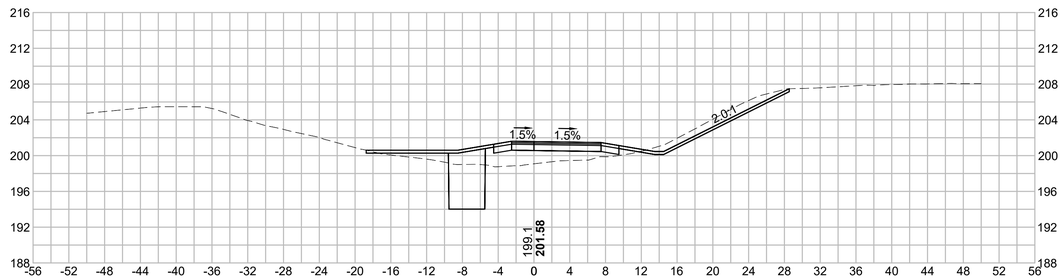

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

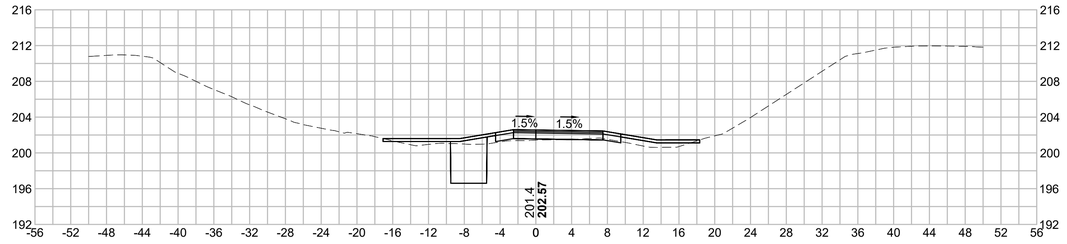
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

PLAN 2310F349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

178+50



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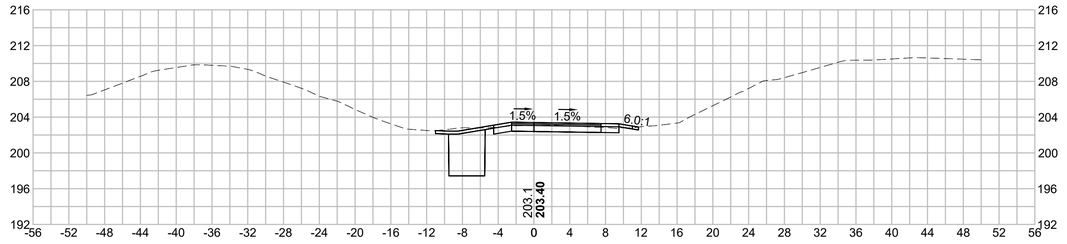

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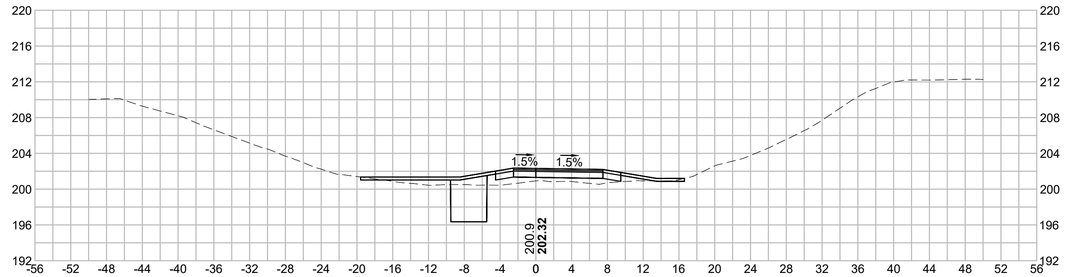

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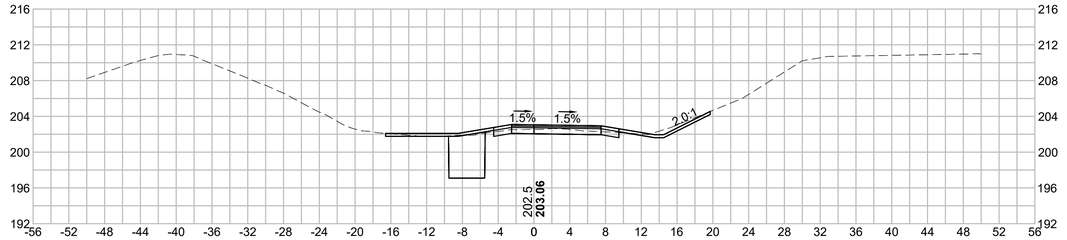

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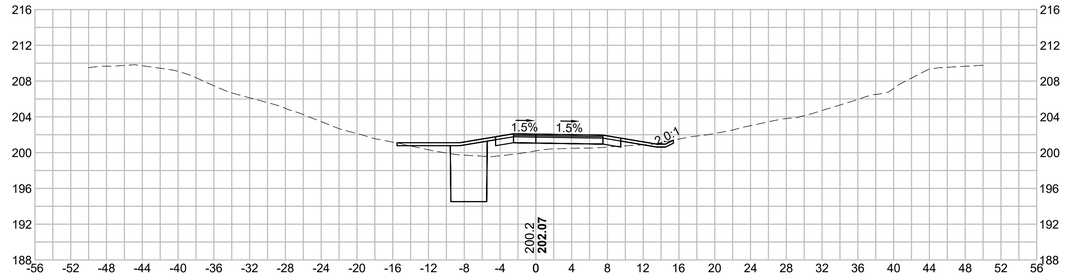

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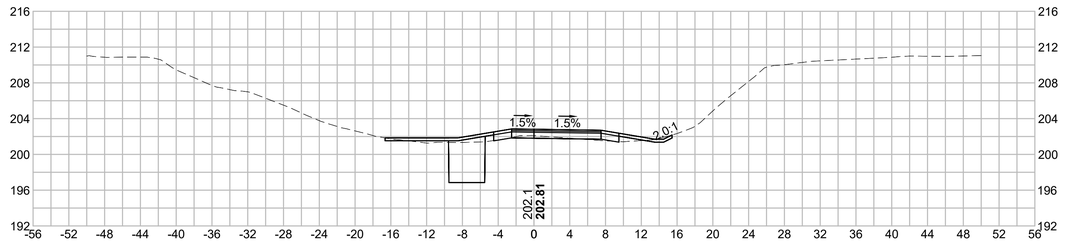

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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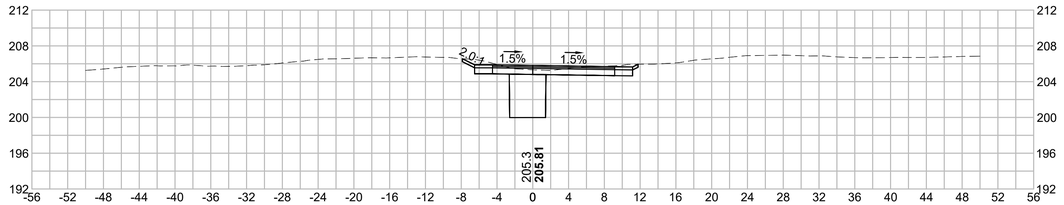
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

181+50



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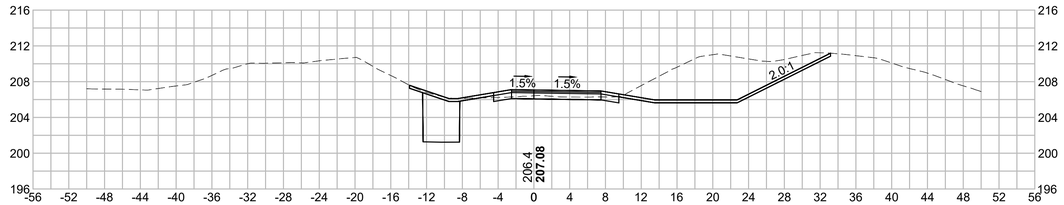

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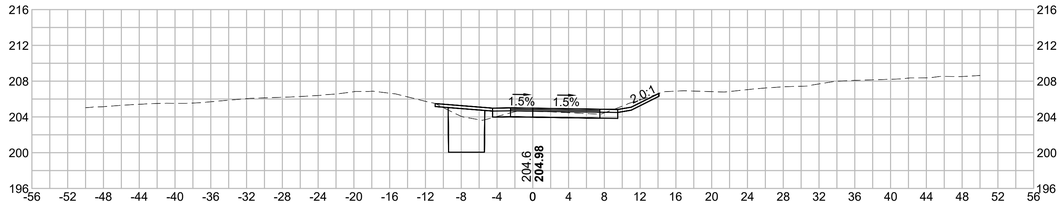

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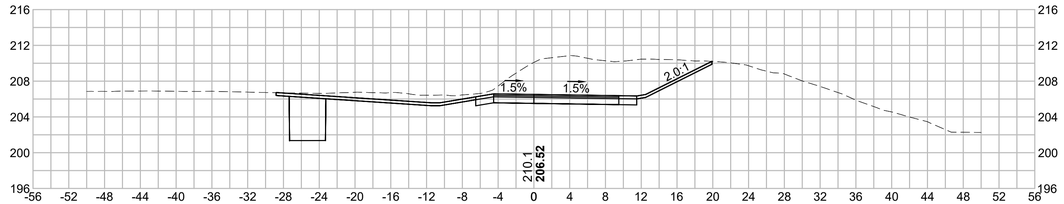

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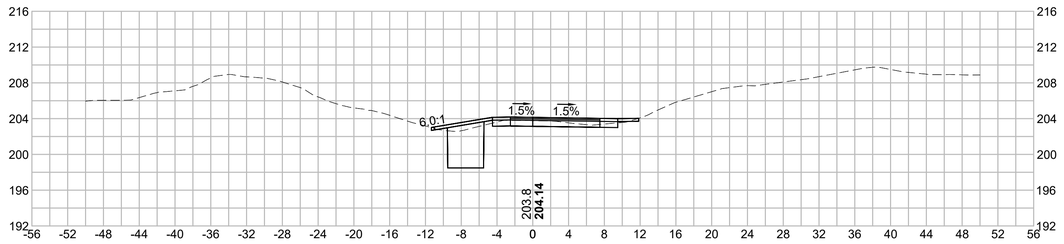

182+00

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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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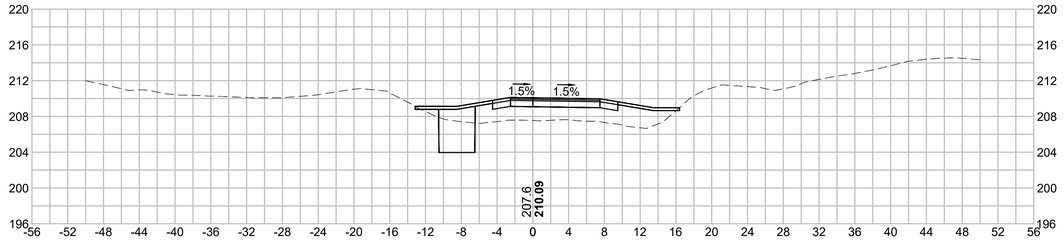
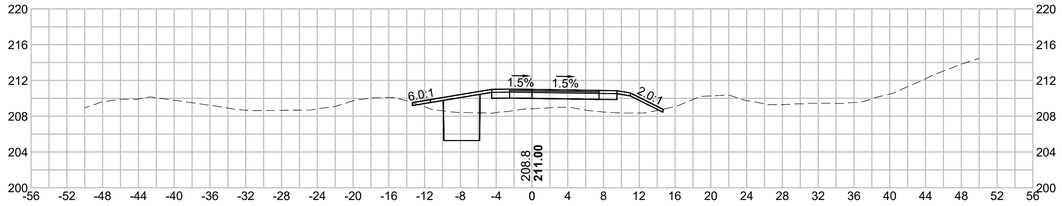
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

184+50



186+00



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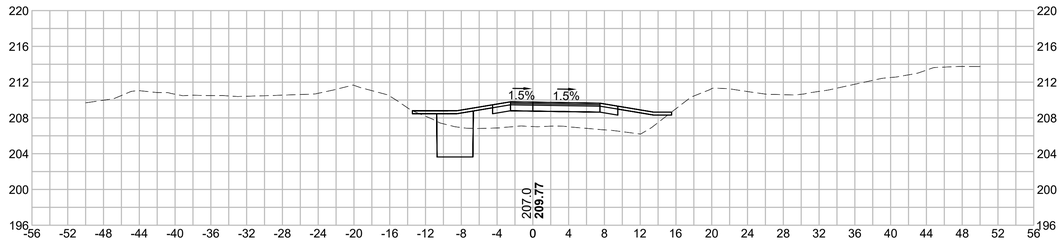

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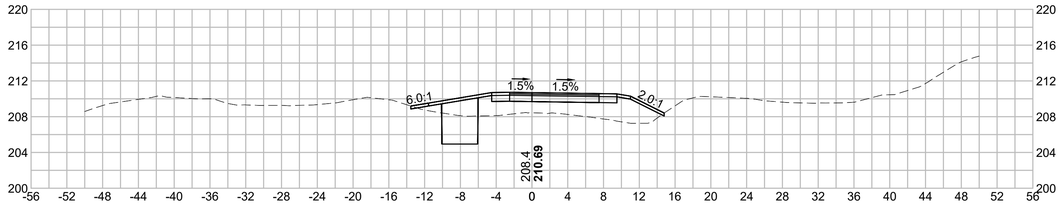

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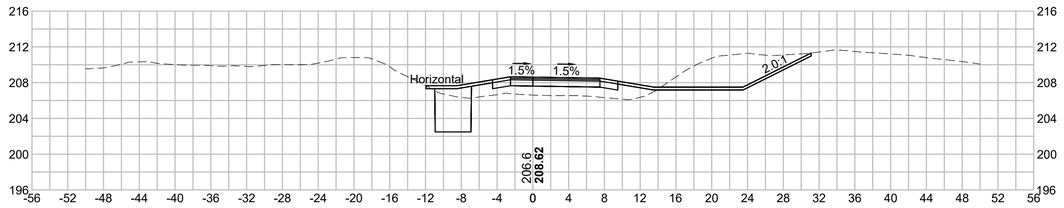

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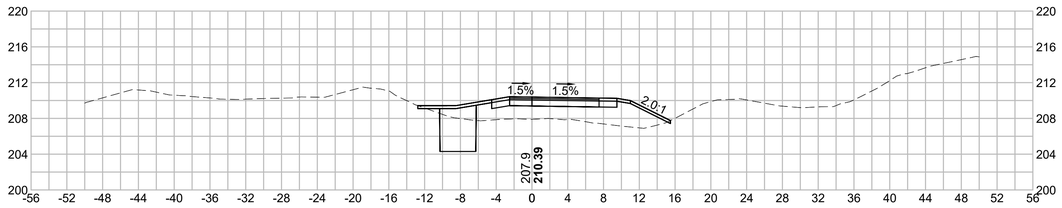

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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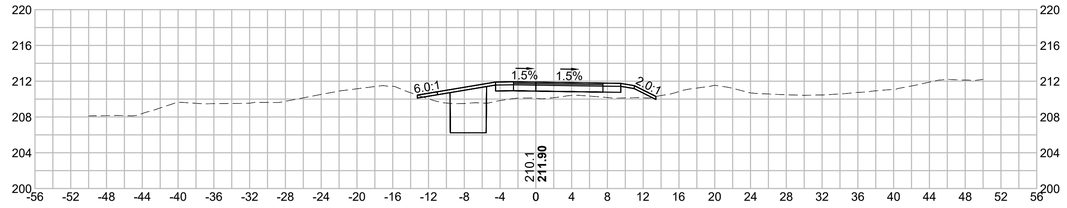
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

187+50



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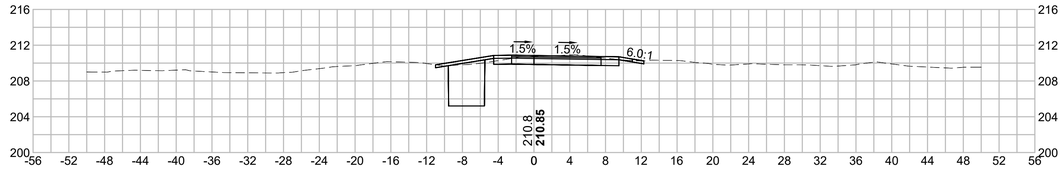

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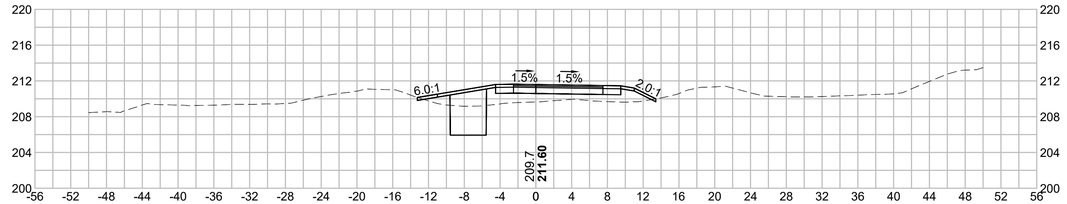

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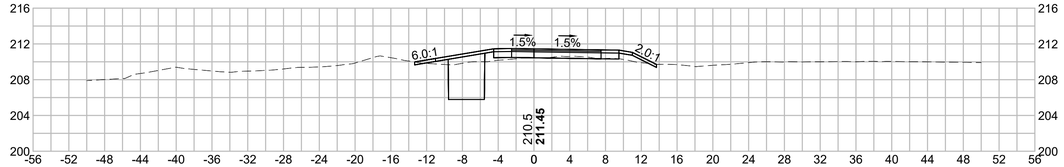

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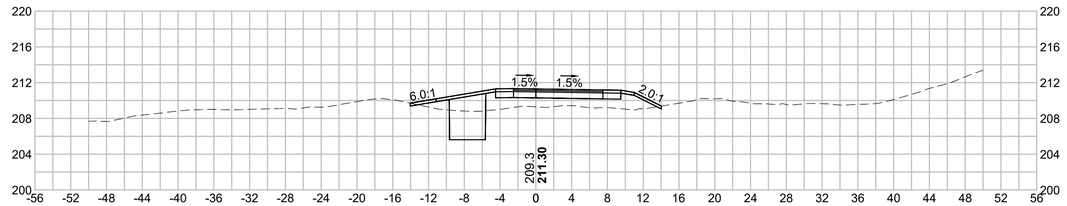

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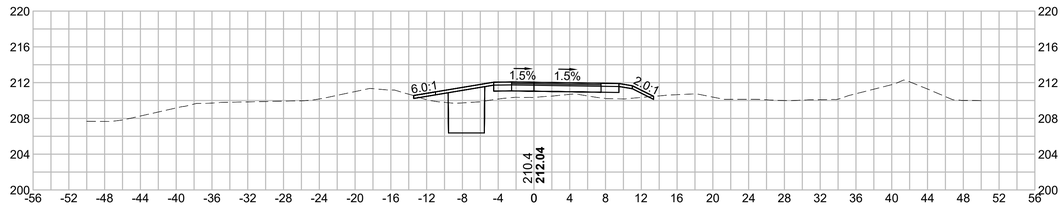

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
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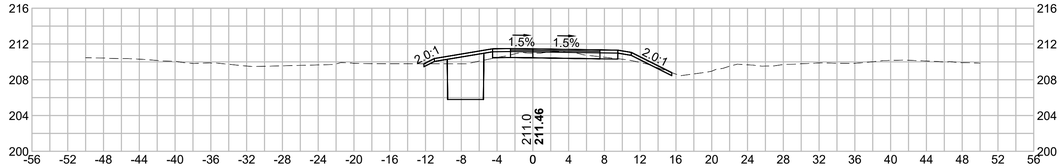
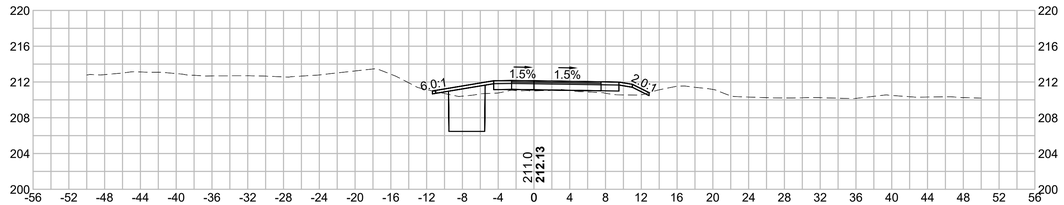
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

190+50



192+00



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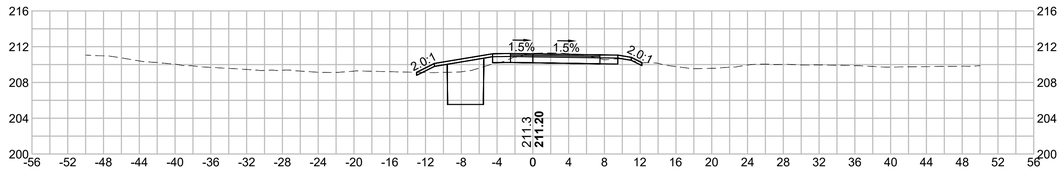

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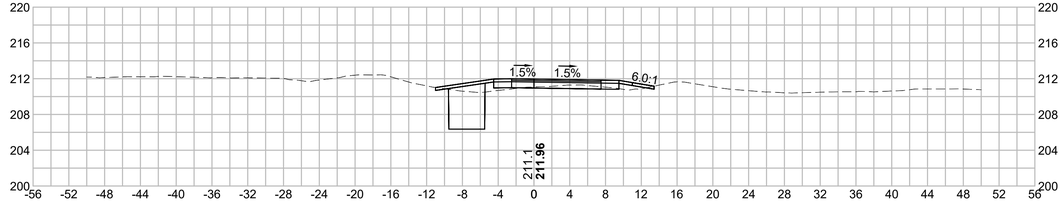

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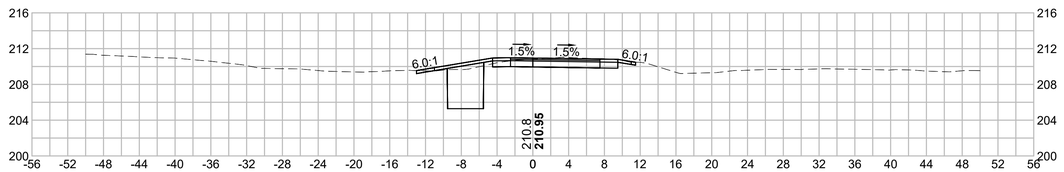

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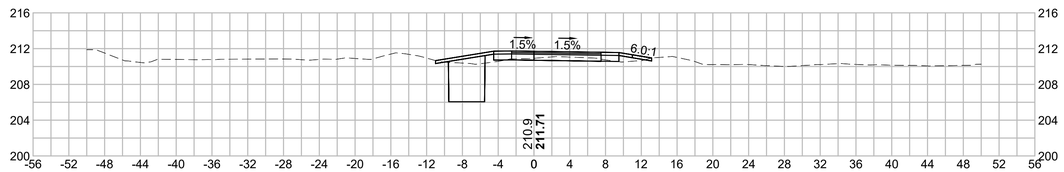

8 0 8 16
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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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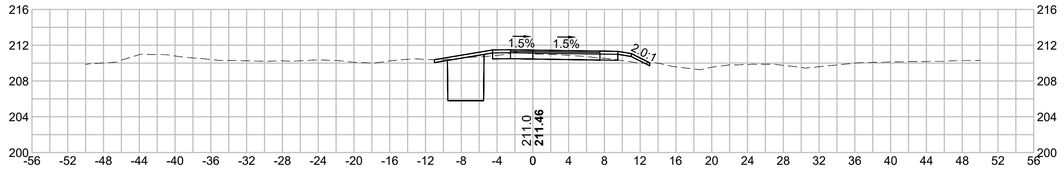
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

193+50



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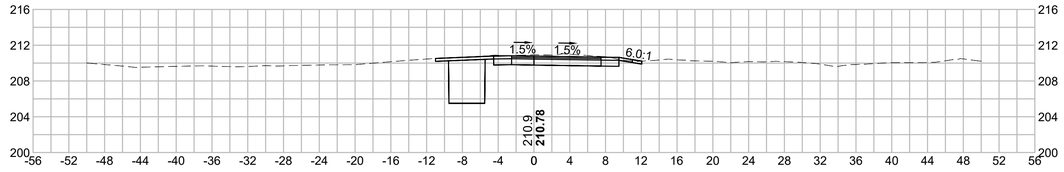

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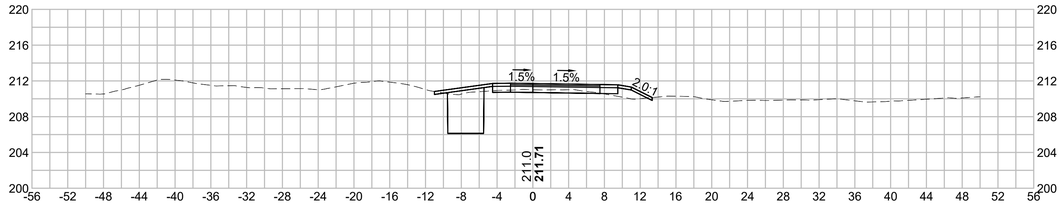

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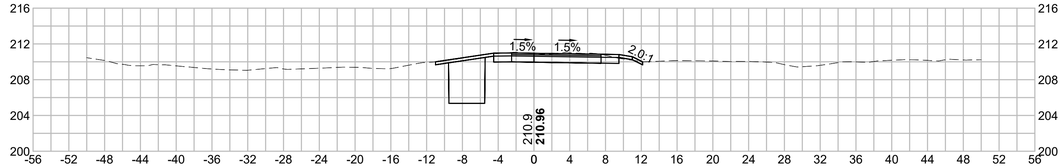

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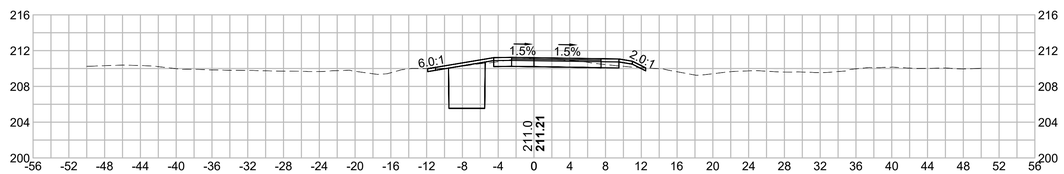

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NO.	DESCRIPTION	BY	DATE	APPR.
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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

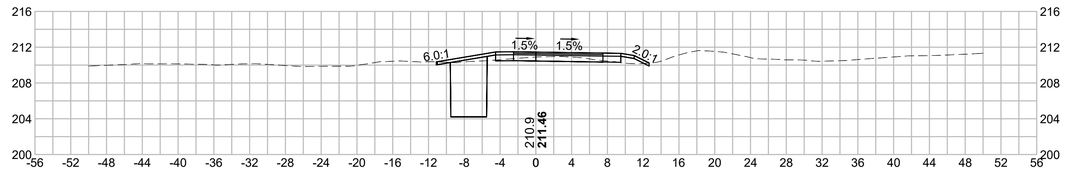
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

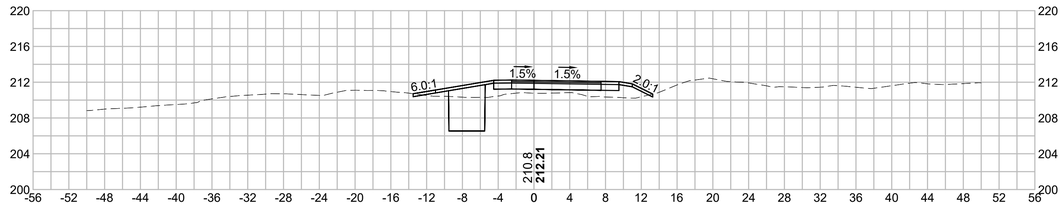
PLAN 237 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

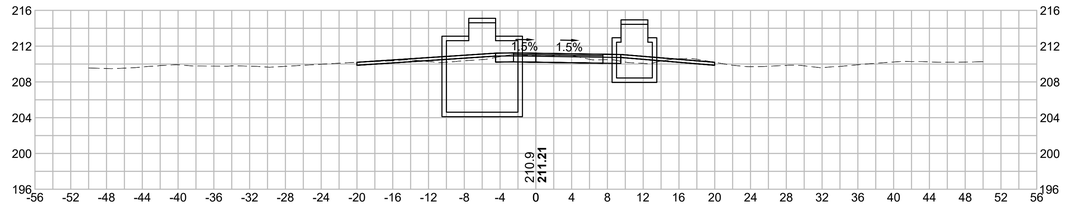
196+50



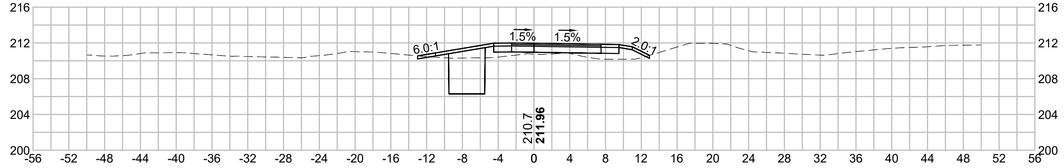
198+00



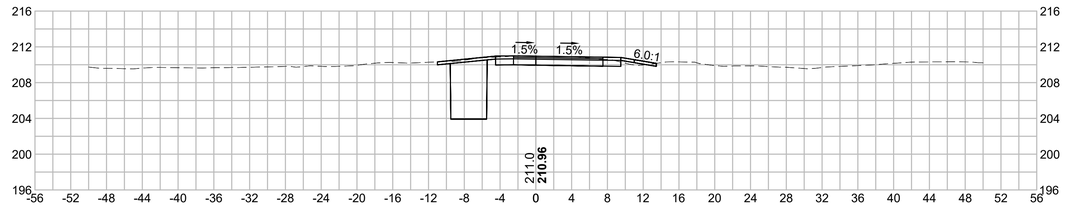
196+00



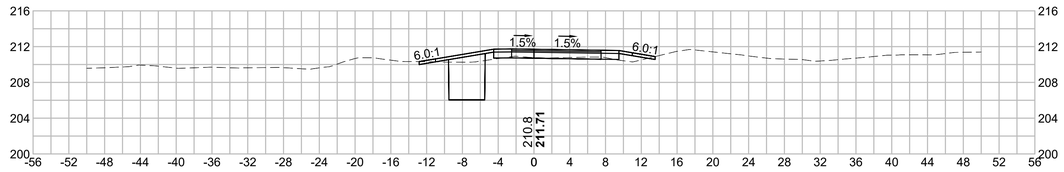
197+50



195+50



197+00



8 0 8 16
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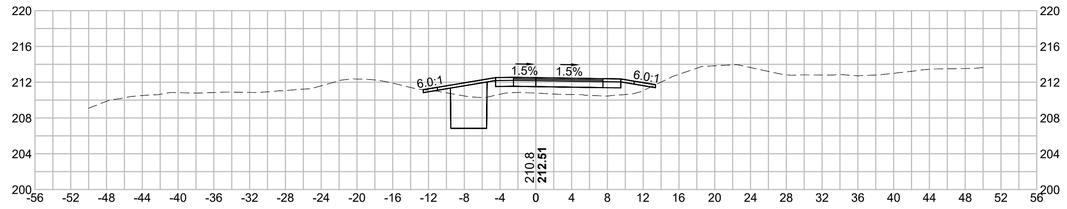
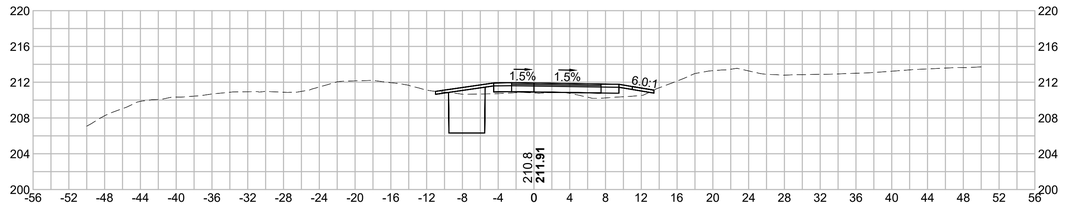
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 238 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MS	.	.

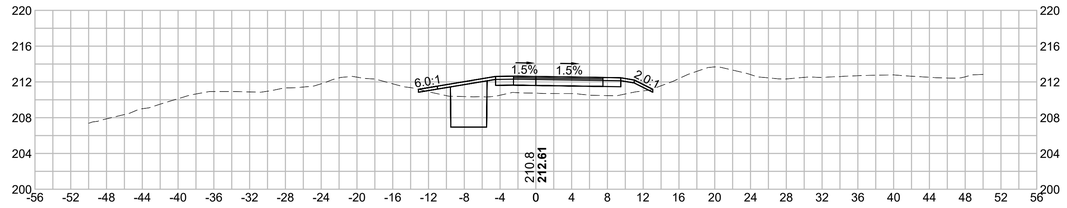
199+50



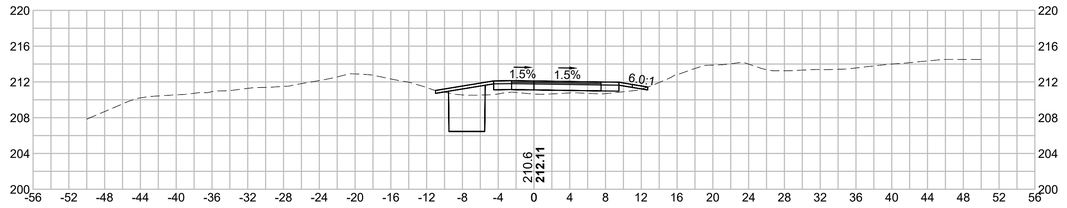
201+00



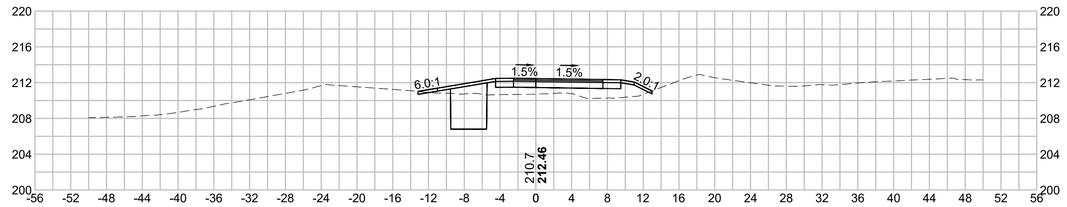
199+00



200+50



198+50



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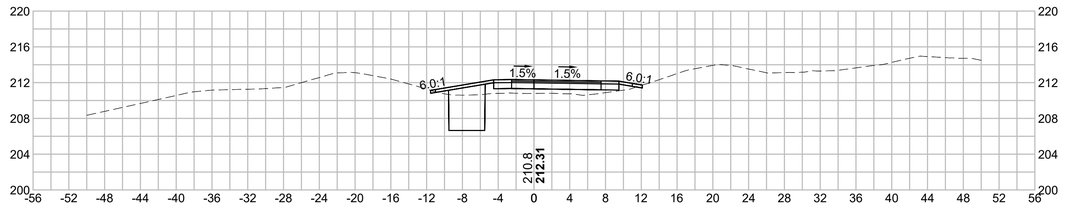

8 0 8 16
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

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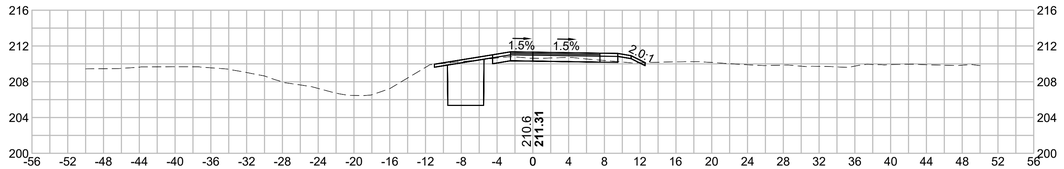
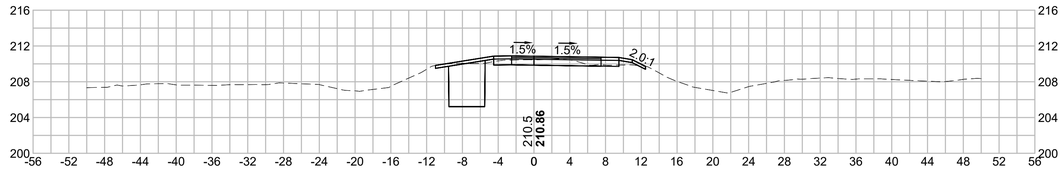
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

202+50



204+00



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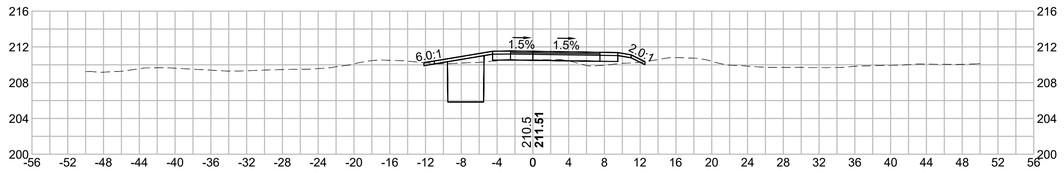
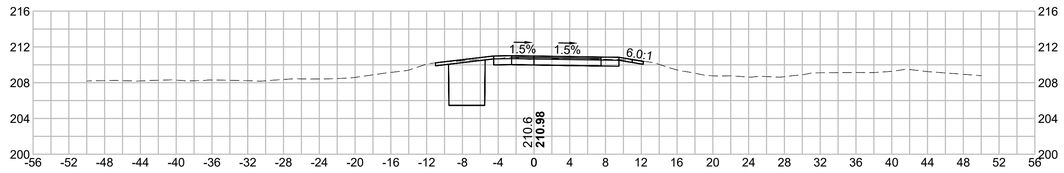


203+50



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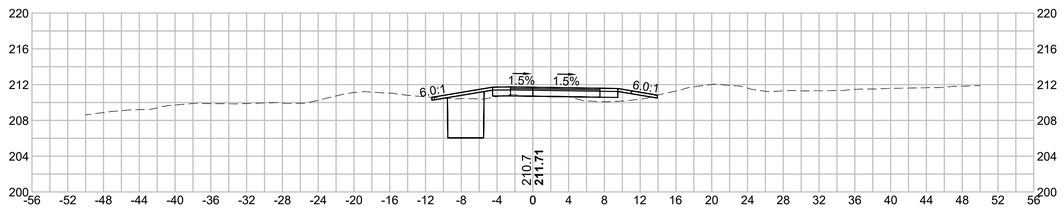

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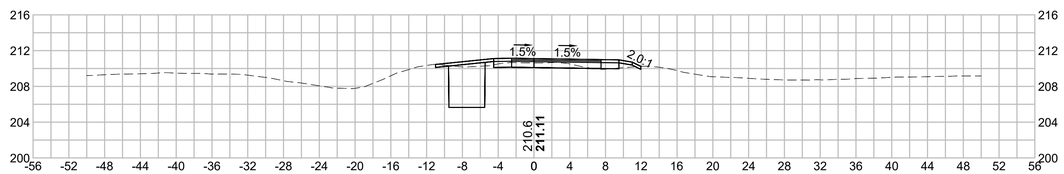

8 0 8 16
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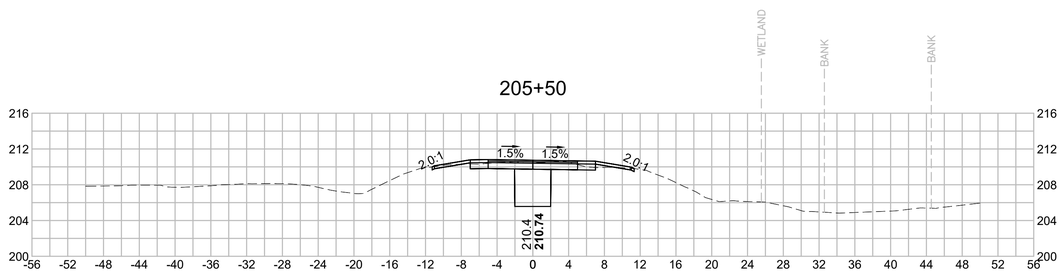
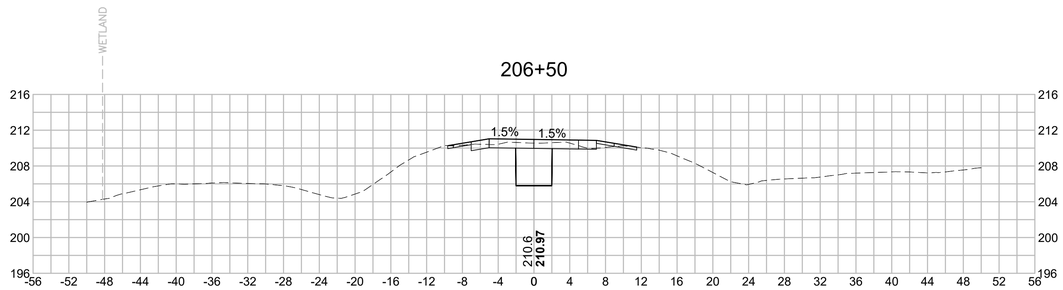
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 2400F349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

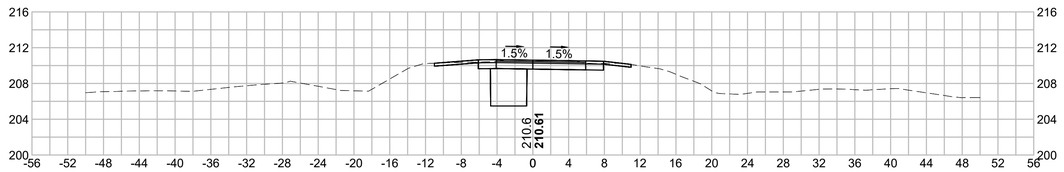
205+50



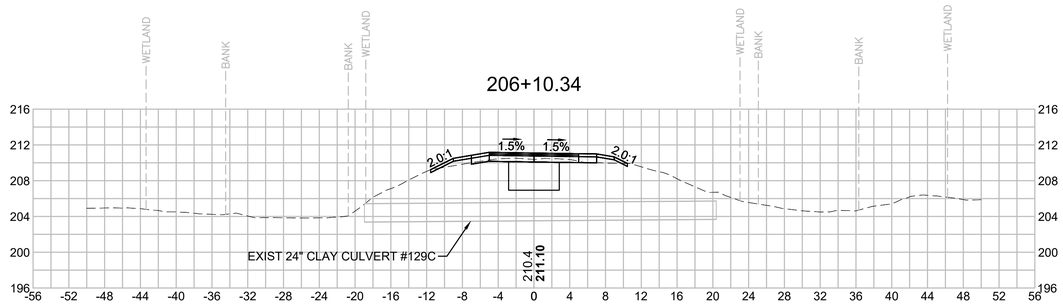
206+50



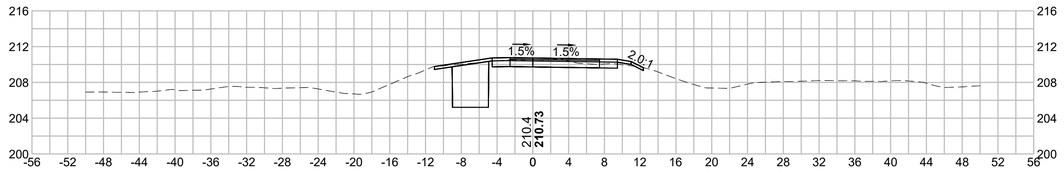
205+00



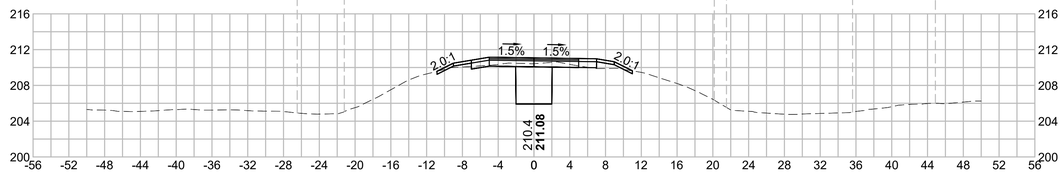
206+10.34



204+50



206+00



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101 Walnut St, PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

NO.	DESCRIPTION	BY	DATE	APPR.

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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

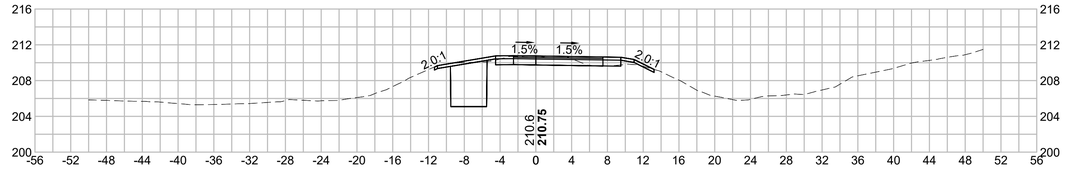
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

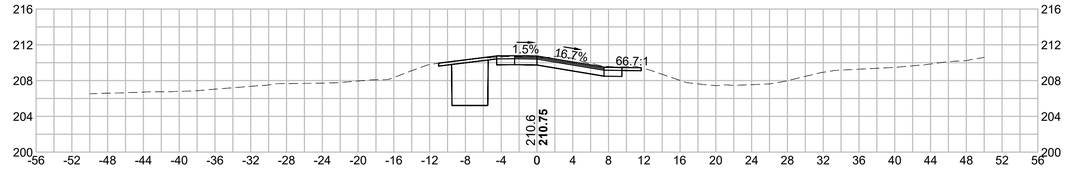
PLAN 241OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

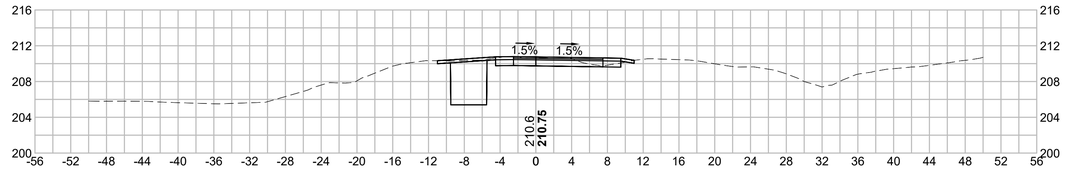
208+50



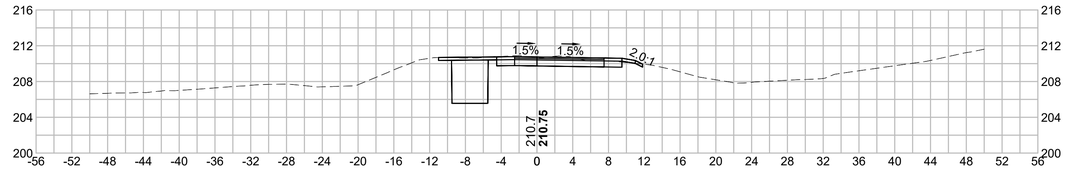
210+50



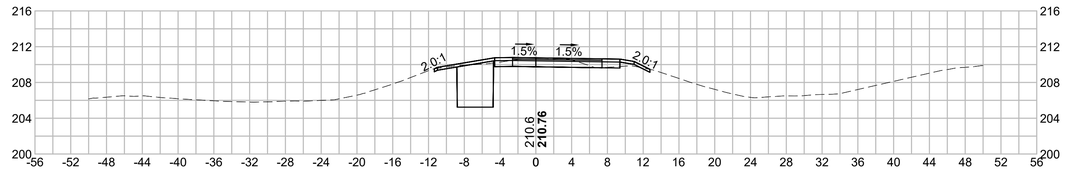
208+00



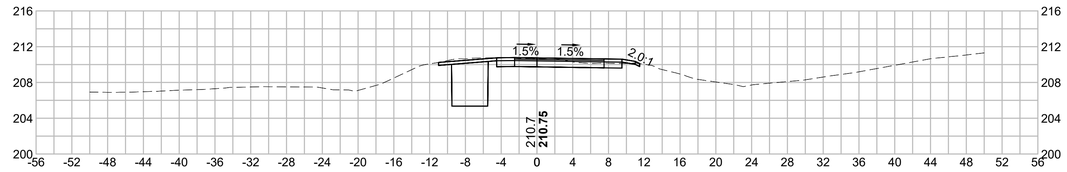
210+00



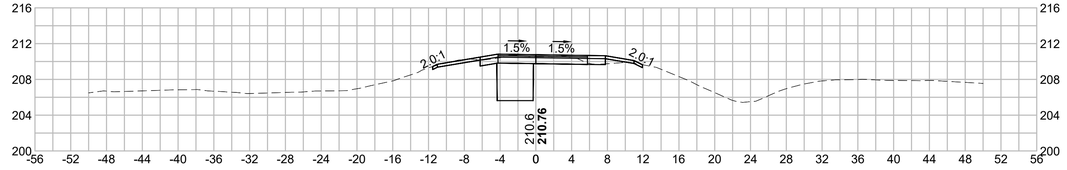
207+50



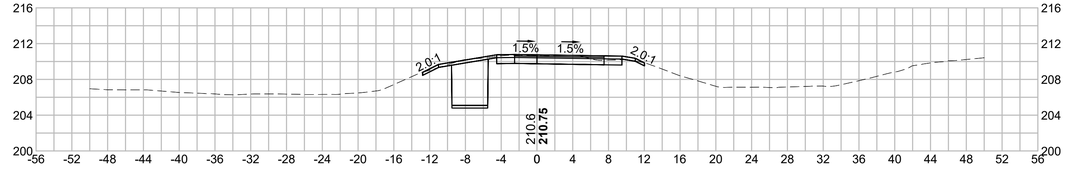
209+50



207+00



209+00



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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

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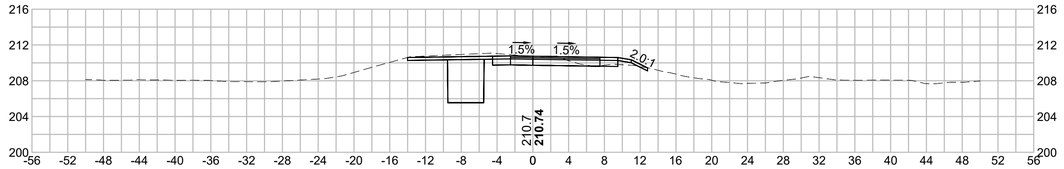
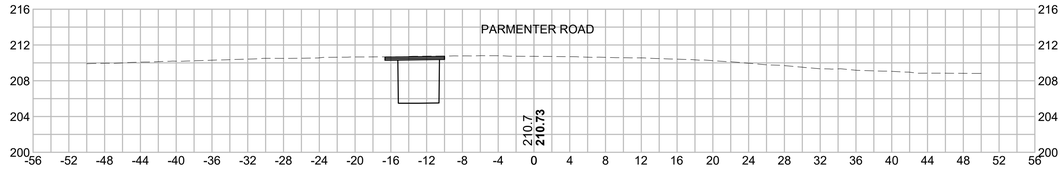
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

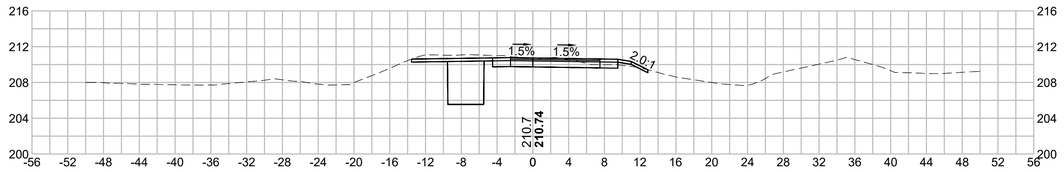
212+00



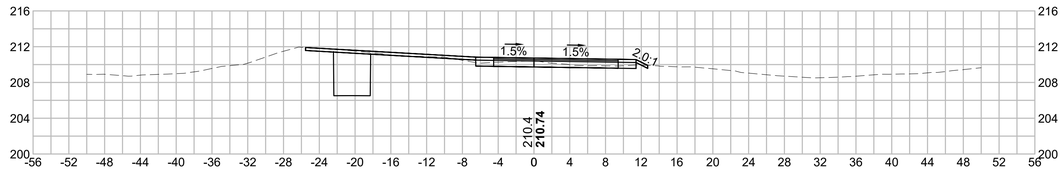
213+50



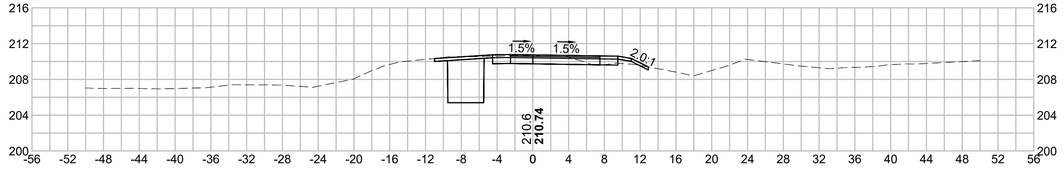
211+50



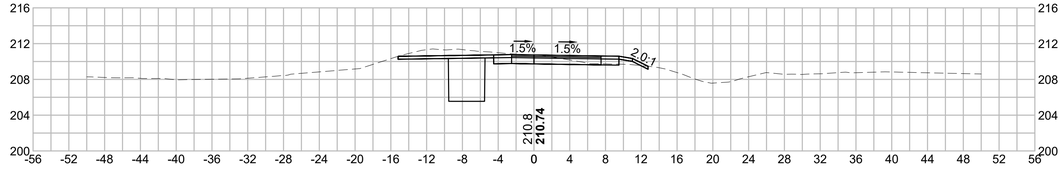
213+00



211+00



212+50



8 0 8 16
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

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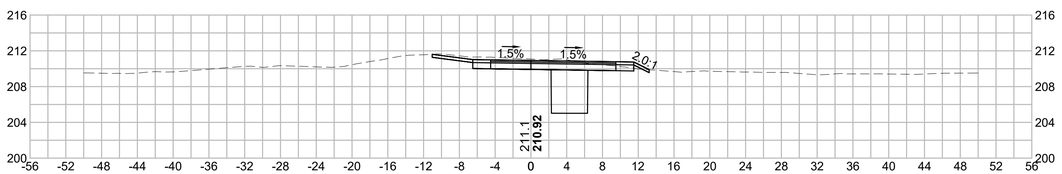
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

214+00



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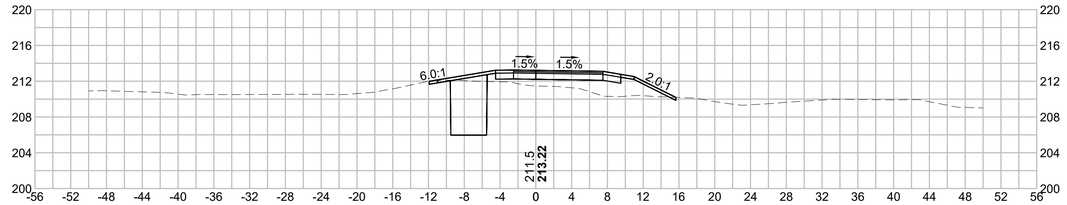
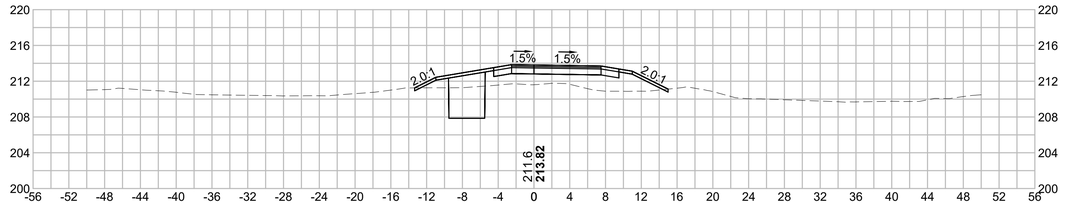
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

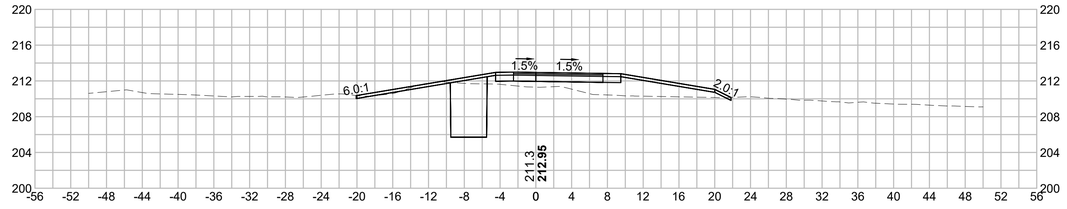
301+00



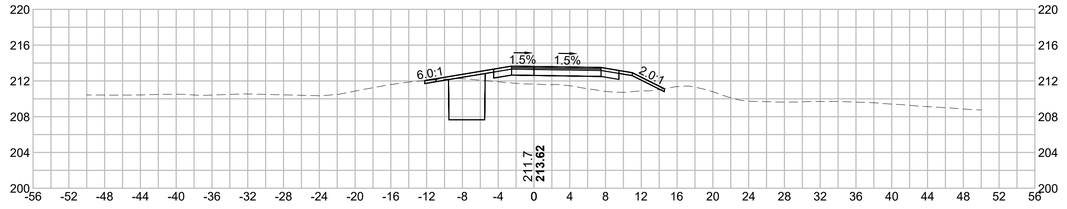
302+50



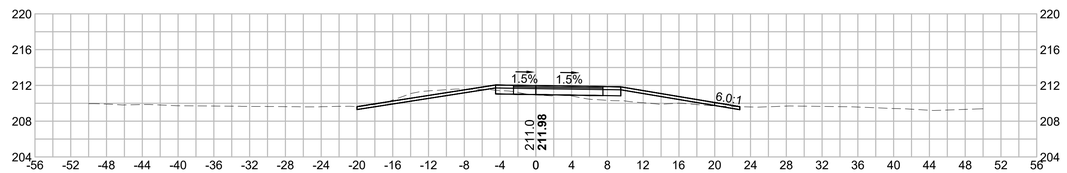
300+50



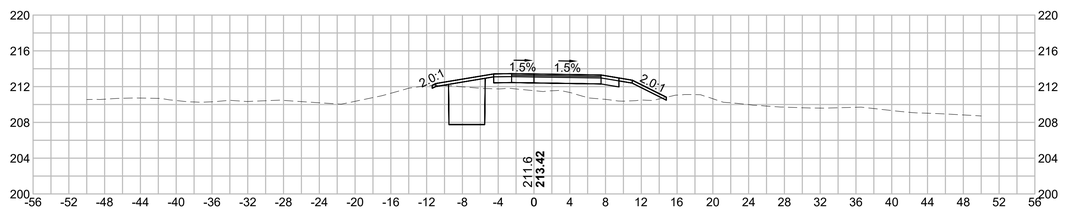
302+00



300+00



301+50



8 0 8 16
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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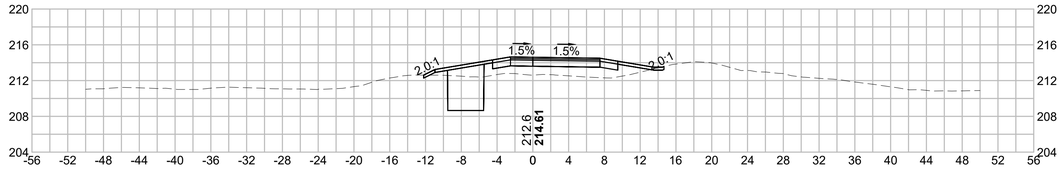
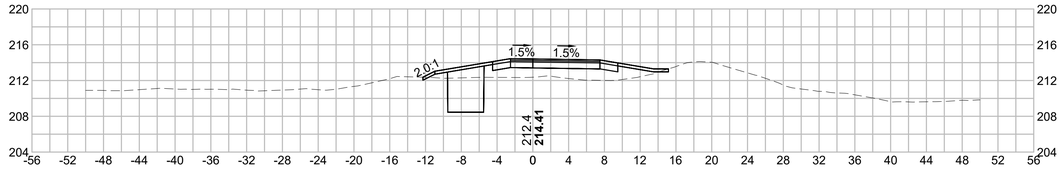
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

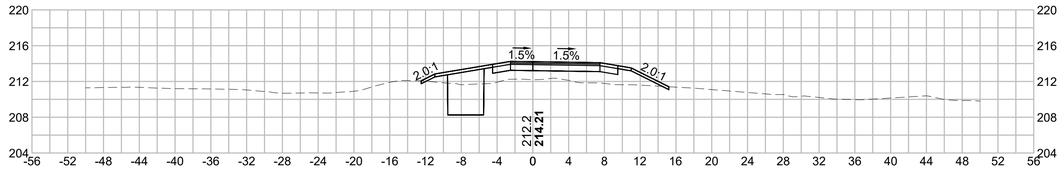
304+50



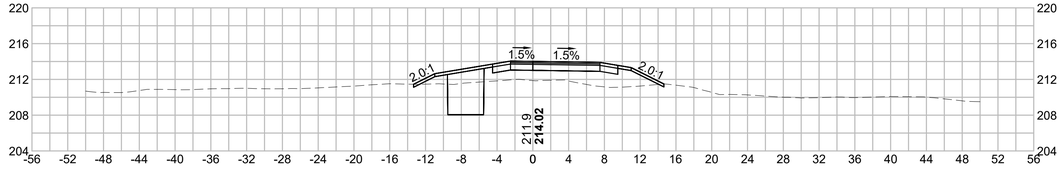
304+00



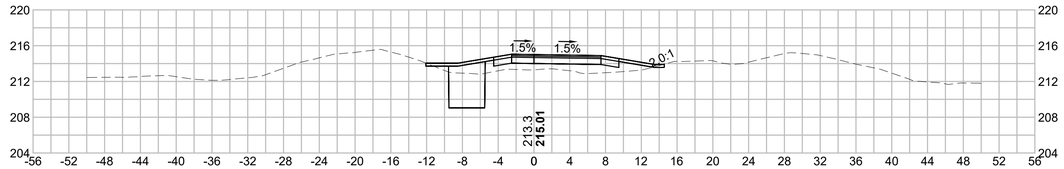
303+50



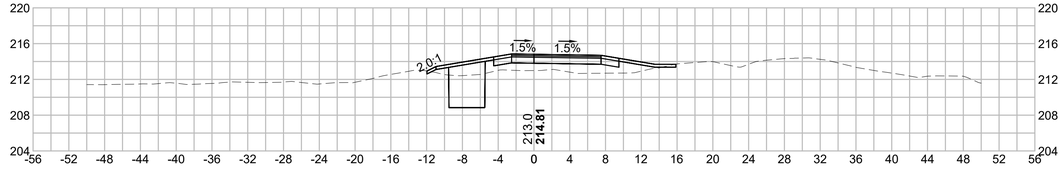
303+00



305+50



305+00



8 0 8 16

SCALE IN FEET

vhb
Vanasse Hangen Brustlin, Inc.
101 Walnut St, PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

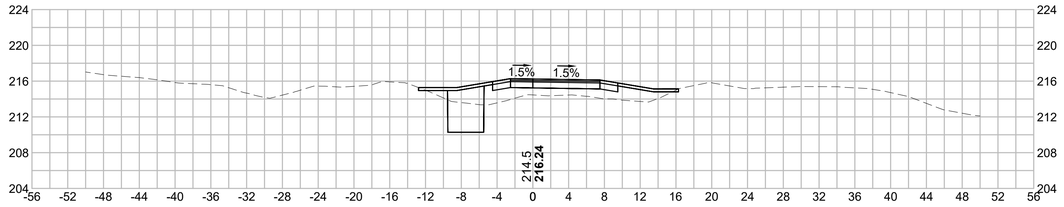
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

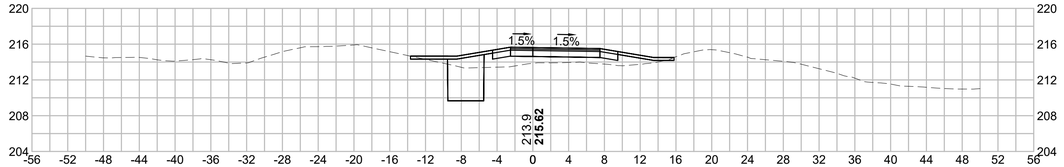
PLAN 246 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

307+00

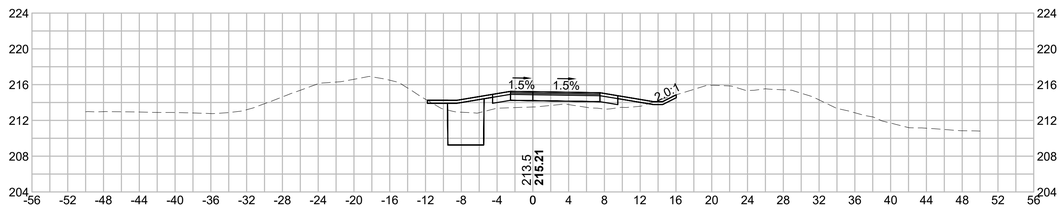


306+50

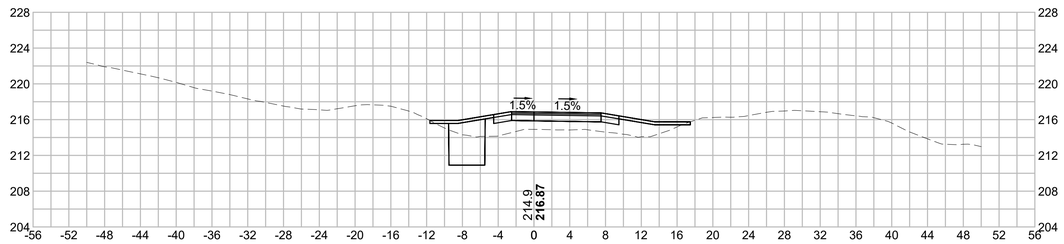


308+00

306+00



307+50



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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

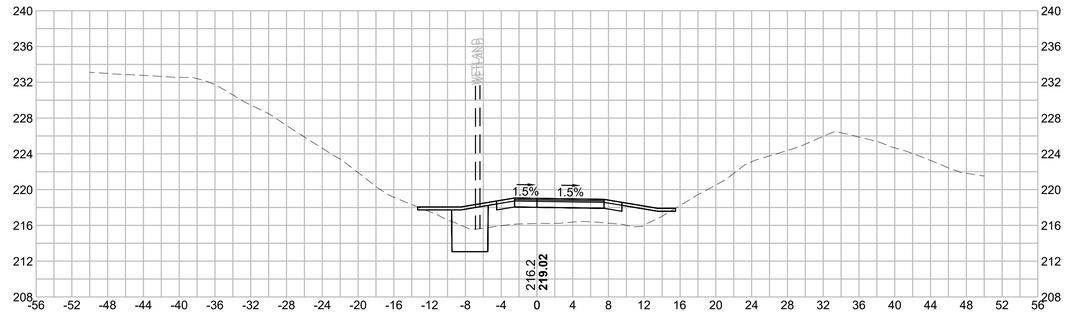
CROSS SECTIONS

PLAN 247 OF 349

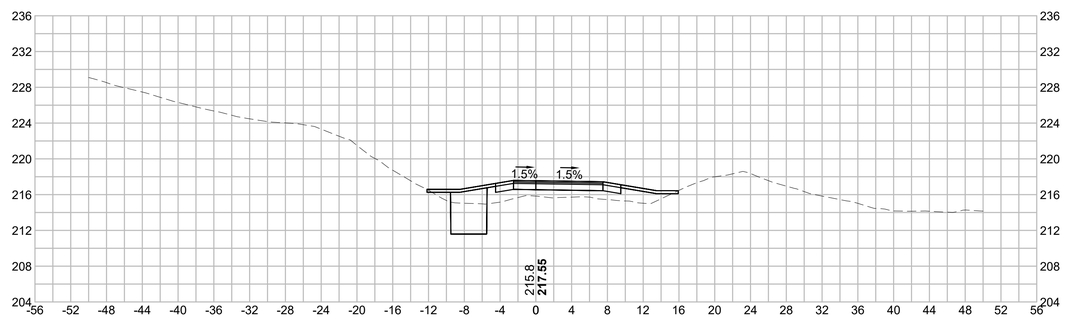
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

309+00

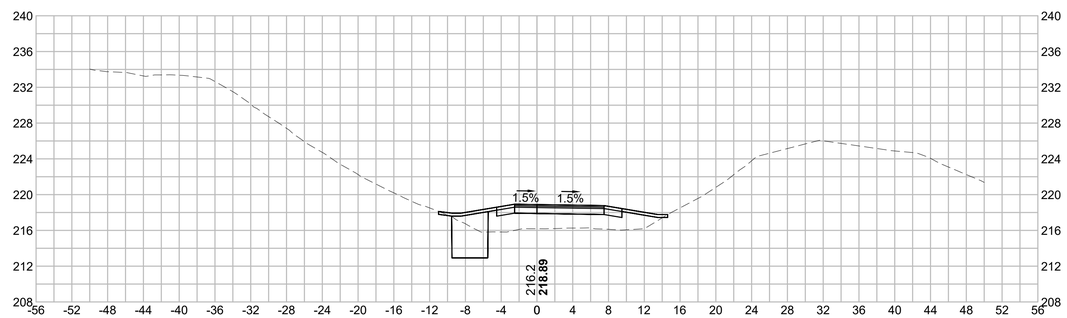
310+00



308+50



309+50



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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

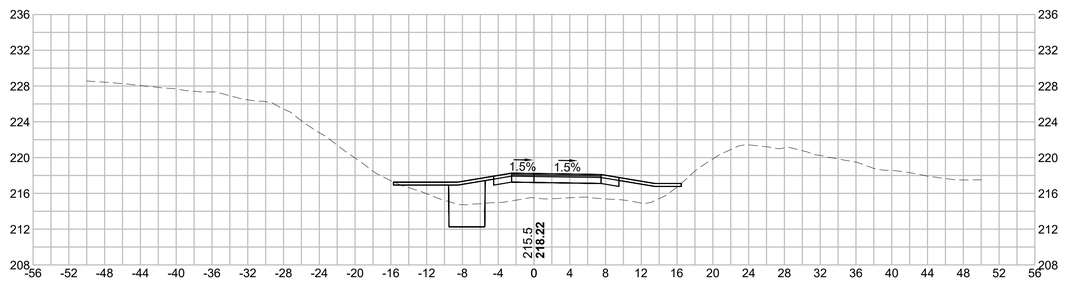
CROSS SECTIONS

PLAN 248 OF 349

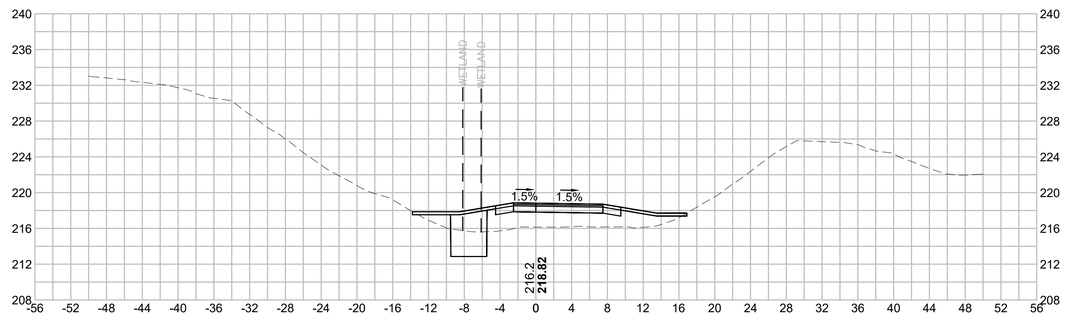
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

311+00

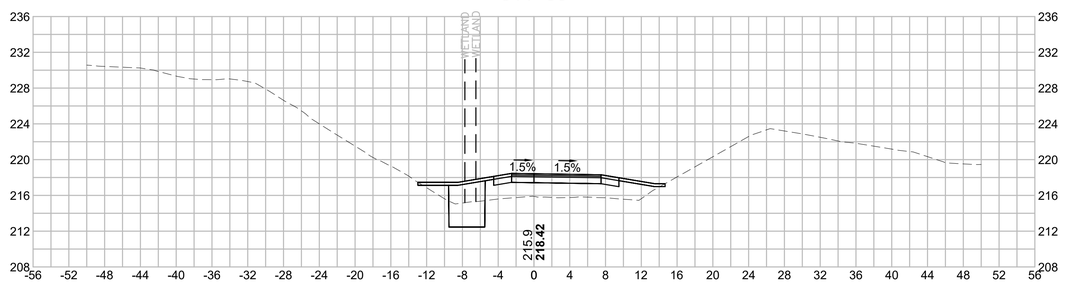
312+00



310+50



311+50



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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
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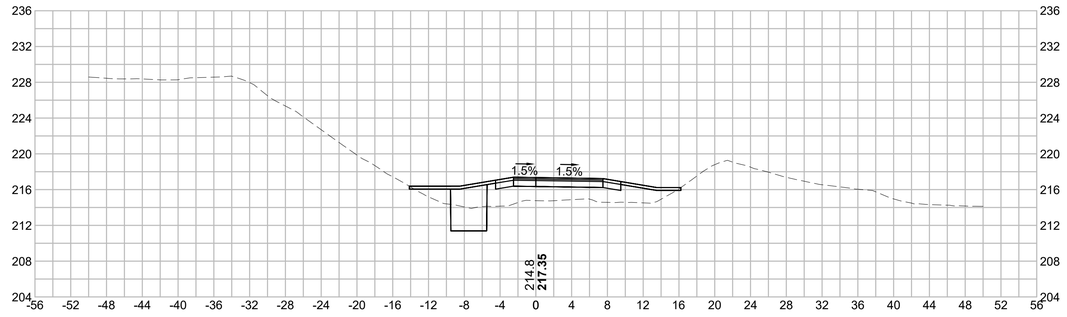
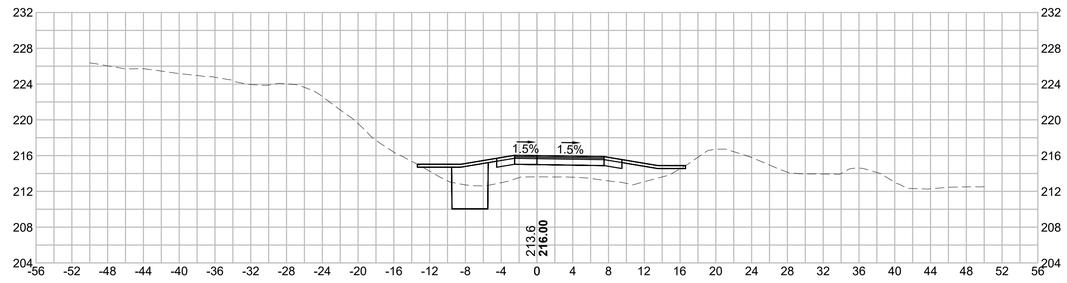
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

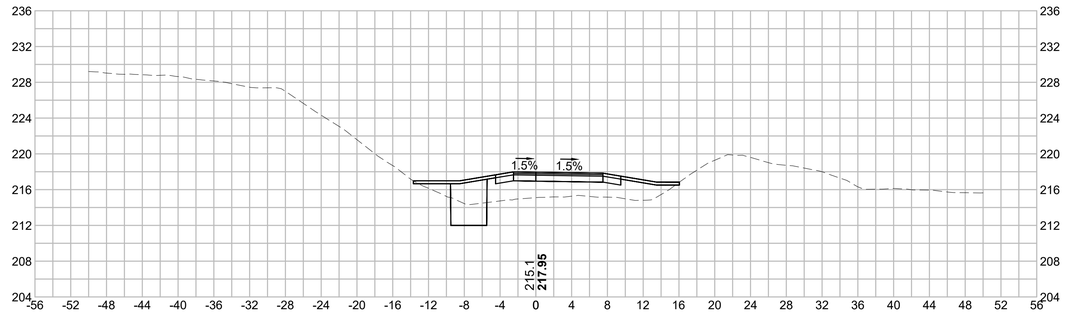
313+00



314+00



312+50



313+50

8 0 8 16
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

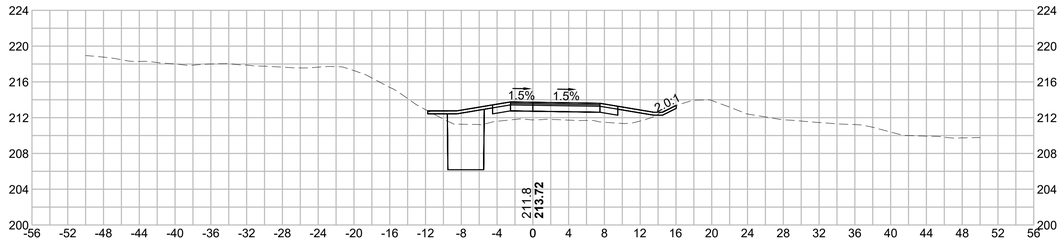
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

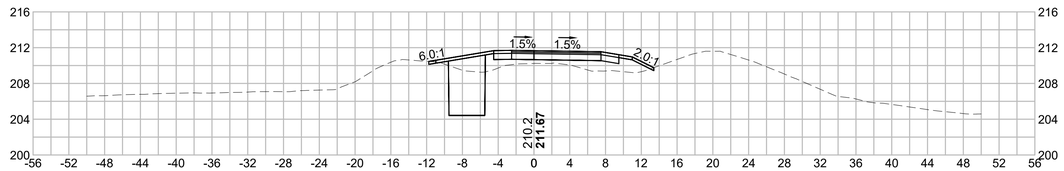
PLAN 250 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

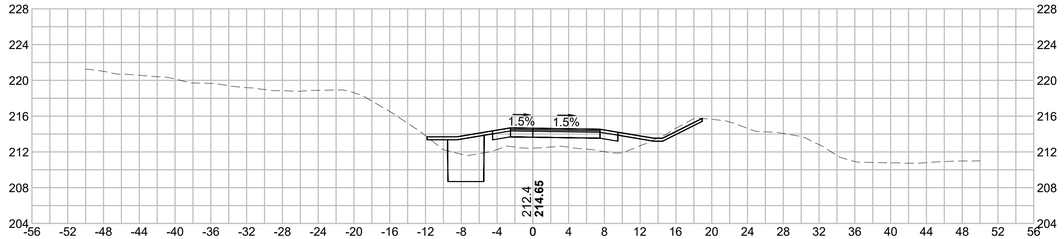
315+50



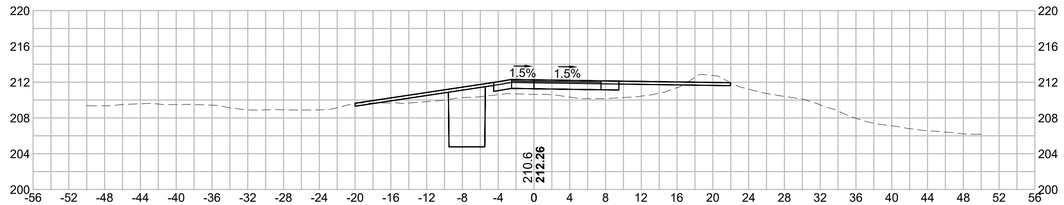
317+00



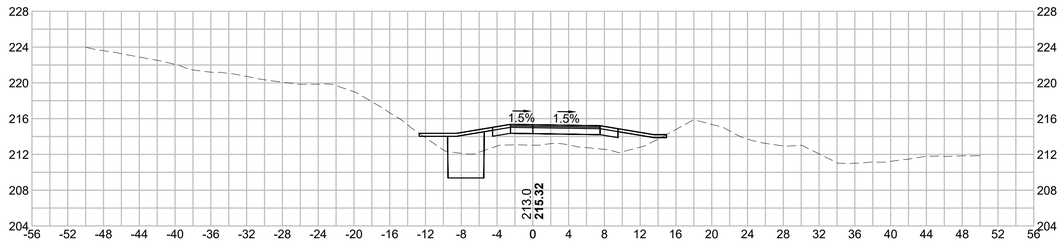
315+00



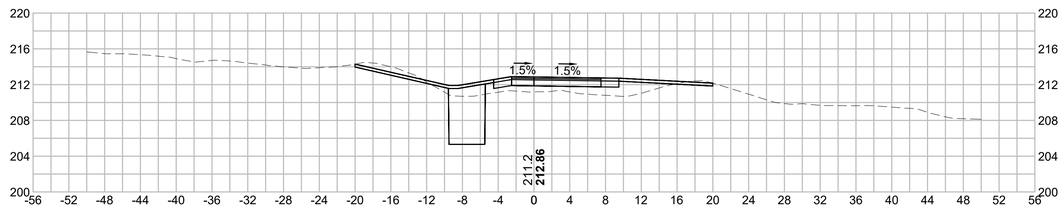
316+50



314+50



316+00



8 0 8 16
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Watertown, MA 02472
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

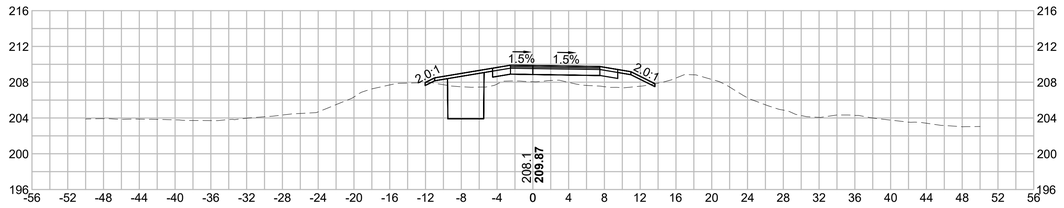
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

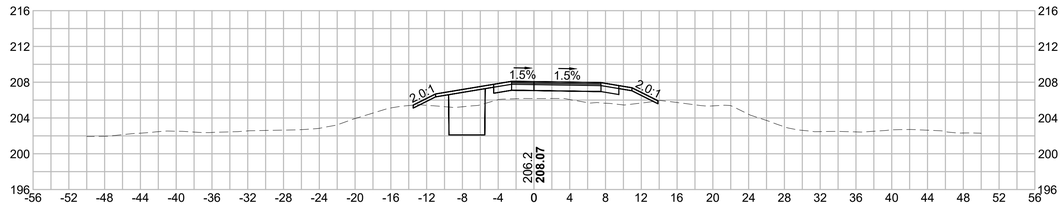
PLAN 2510F 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

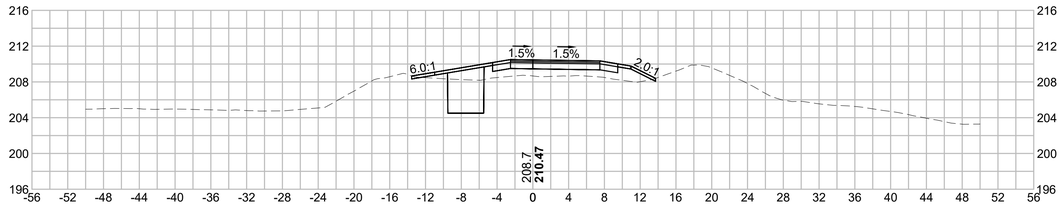
318+50



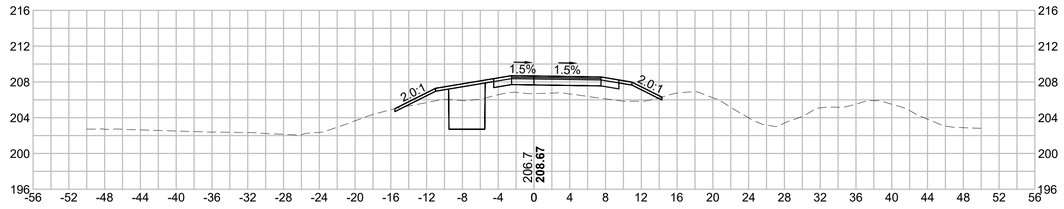
320+00



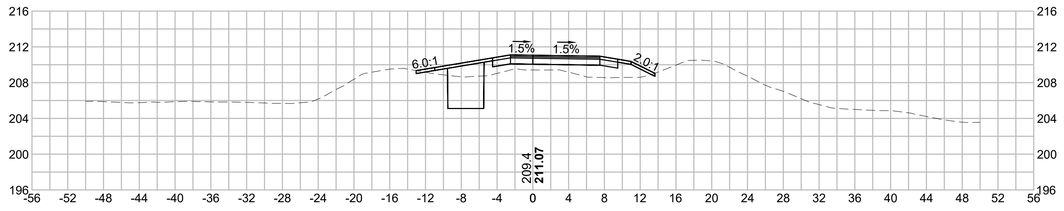
318+00



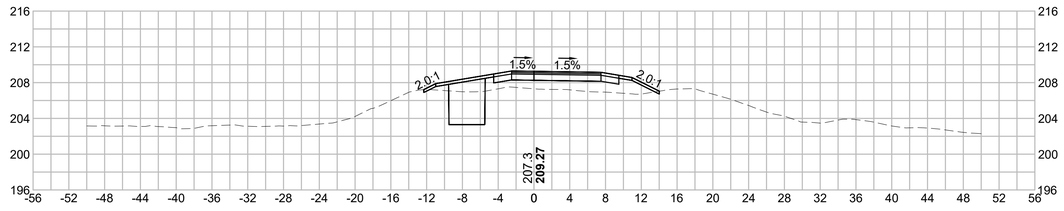
319+50



317+50



319+00



8 0 8 16
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Watertown, MA 02472
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

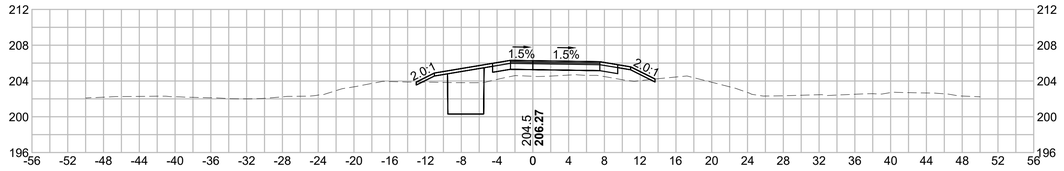
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

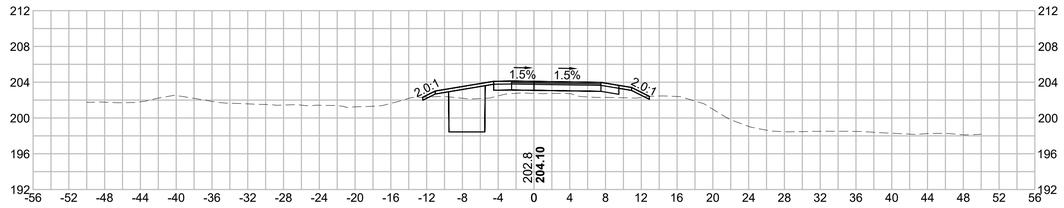
PLAN 252 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

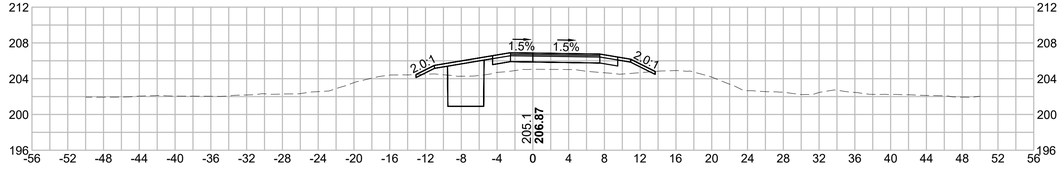
321+50



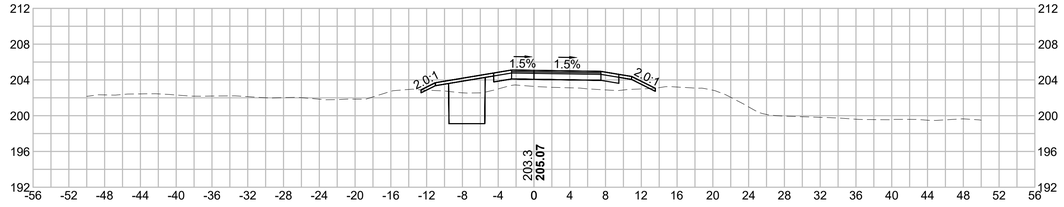
323+00



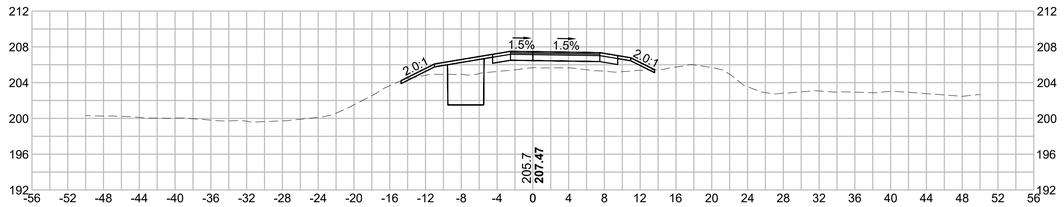
321+00



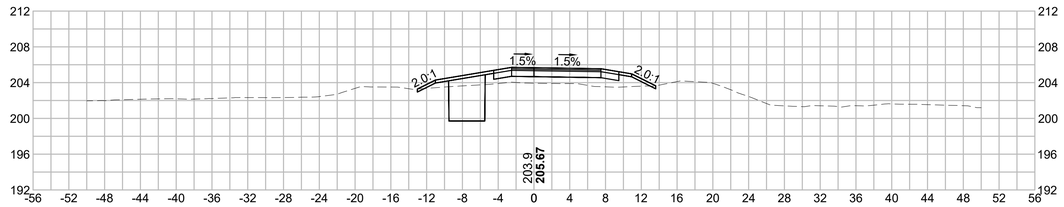
322+50



320+50



322+00



8 0 8 16
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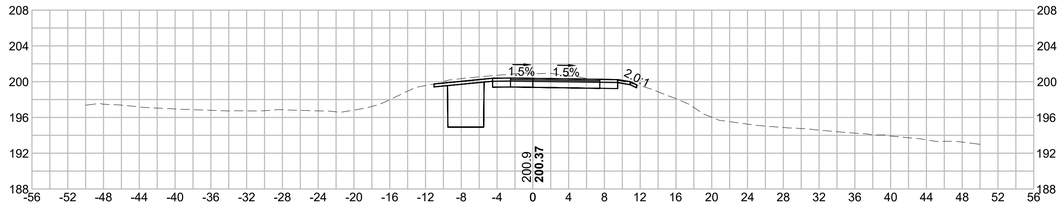
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

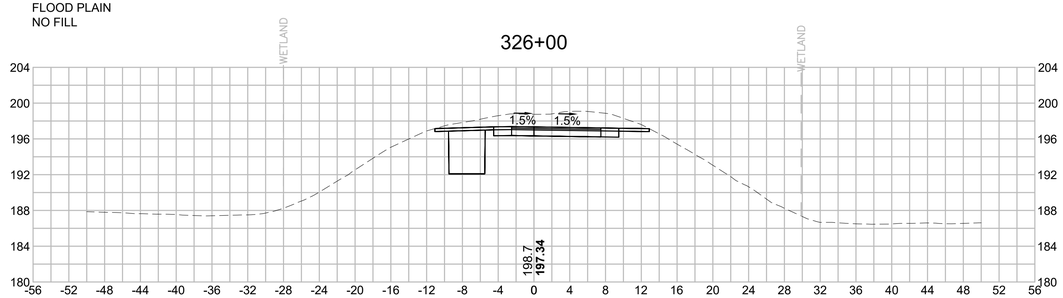
CROSS SECTIONS

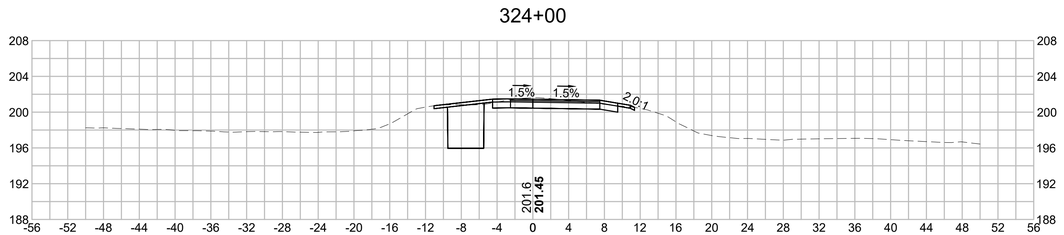
PLAN 253 OF 349

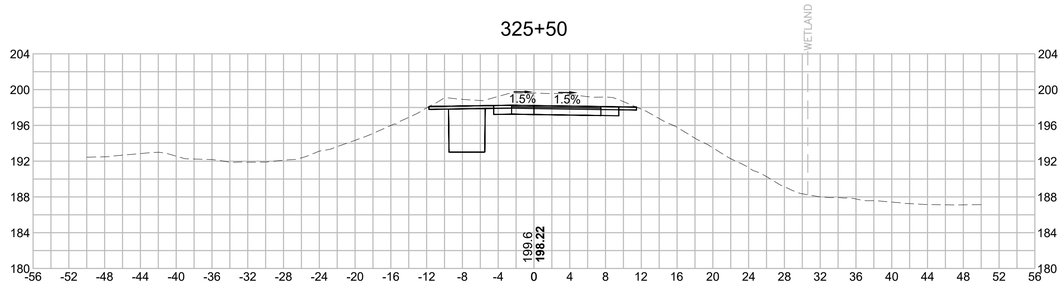
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

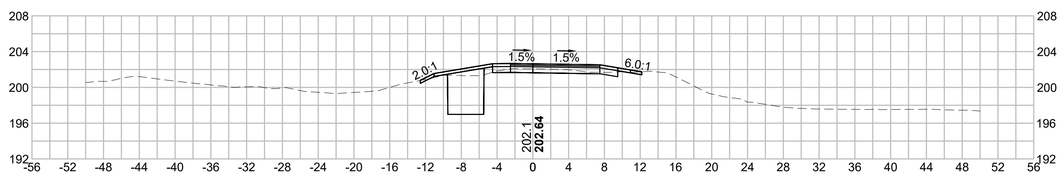


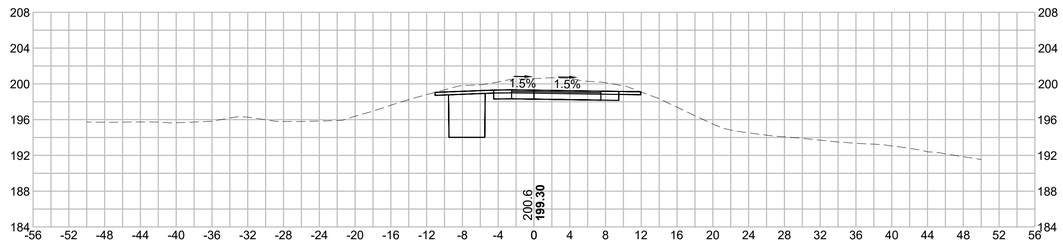
FLOOD PLAIN
NO FILL











BLSF CROSSING STA 326 TO STA 332 - FEMA ZONE A - UNNAMED PERENNIAL STREAM
NO ELEVATION FROM FEMA - UNSTUDIED AREA
NO IMPACTS - NO FILL

8 0 8 16
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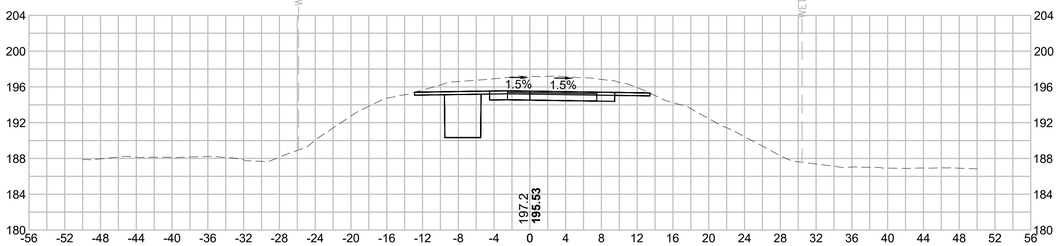
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 254 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

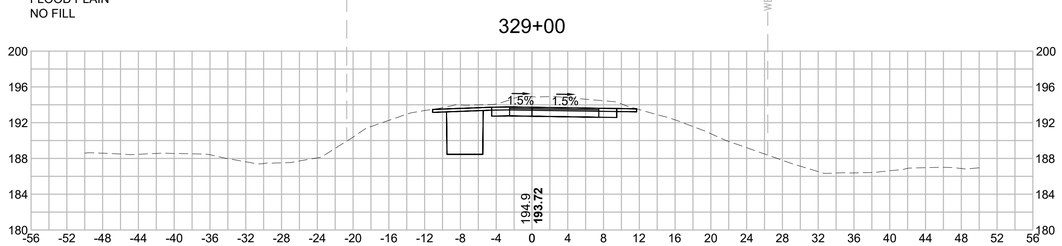
FLOOD PLAIN
NO FILL

327+50



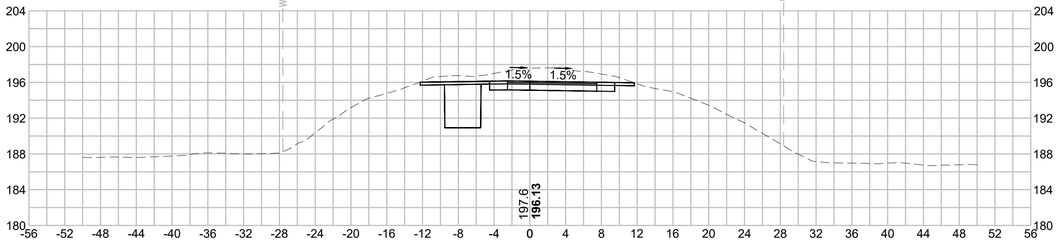
FLOOD PLAIN
NO FILL

329+00



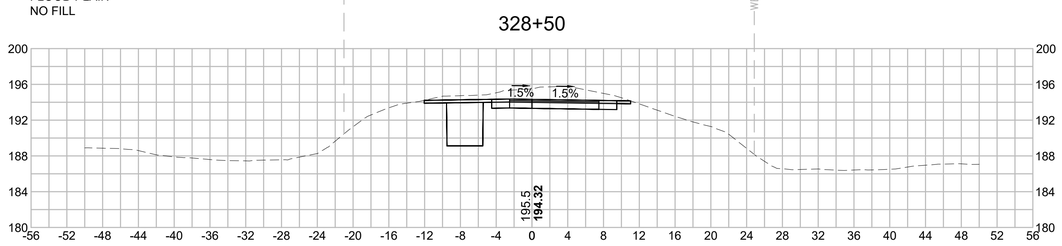
FLOOD PLAIN
NO FILL

327+00



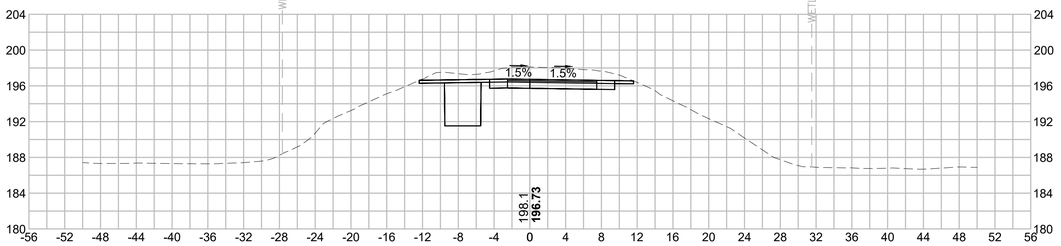
FLOOD PLAIN
NO FILL

328+50



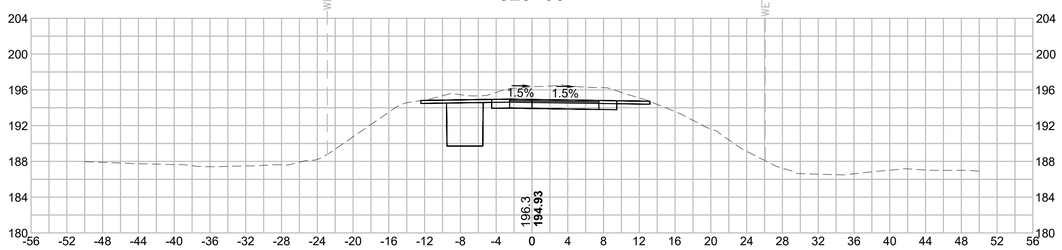
FLOOD PLAIN
NO FILL

326+50



FLOOD PLAIN
NO FILL

328+00



8 0 8 16
SCALE IN FEET

vhb
Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

NO.	DESCRIPTION	BY	DATE	APPR.

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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

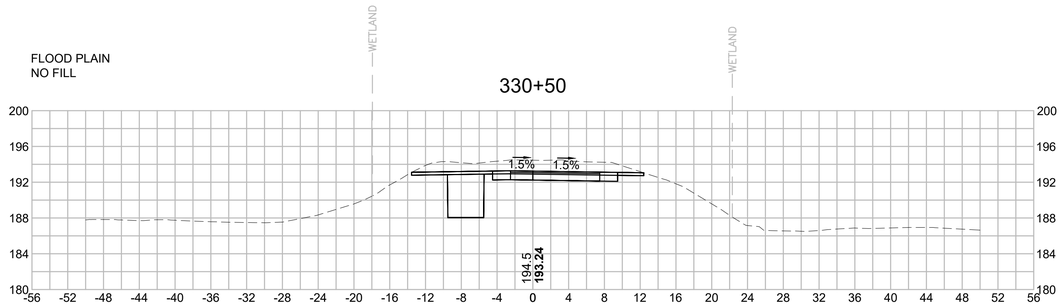
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

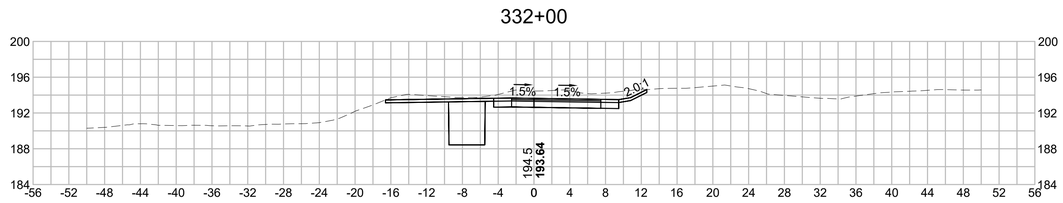
CROSS SECTIONS

PLAN 255 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

FLOOD PLAIN
NO FILL





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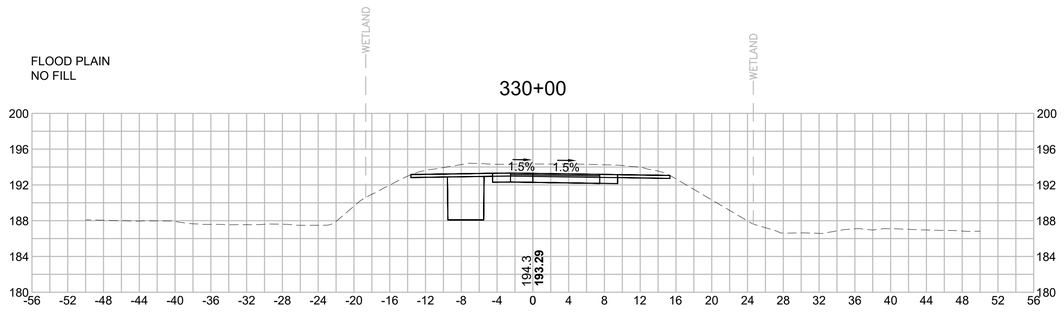

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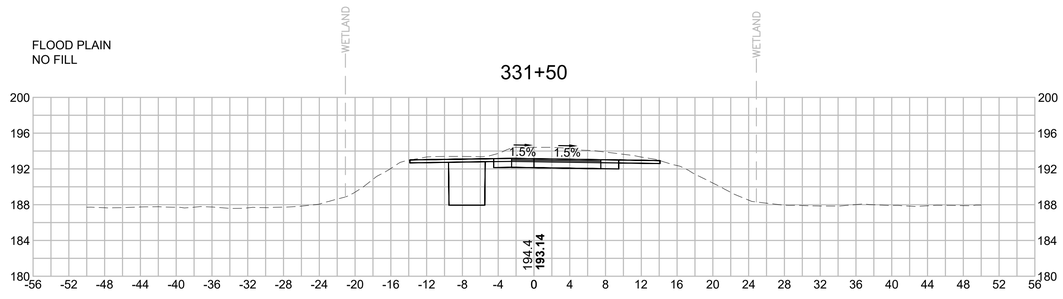
NO FILL



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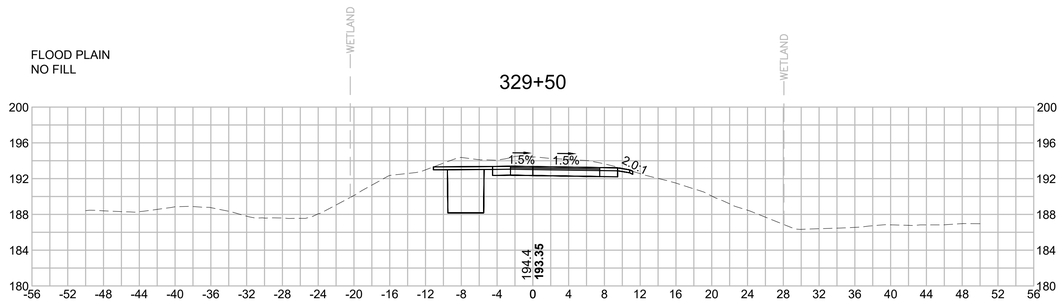

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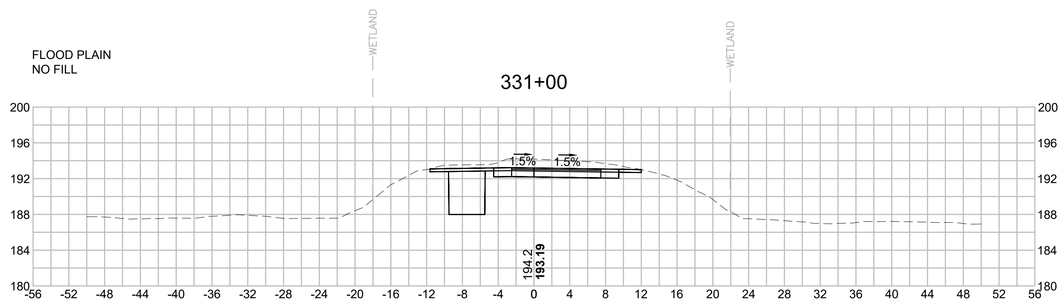

8 0 8 16
SCALE IN FEET

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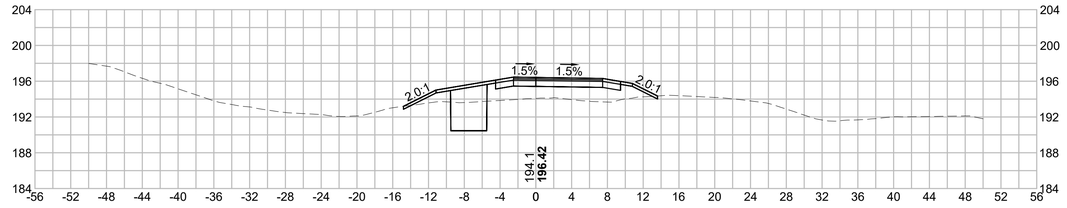
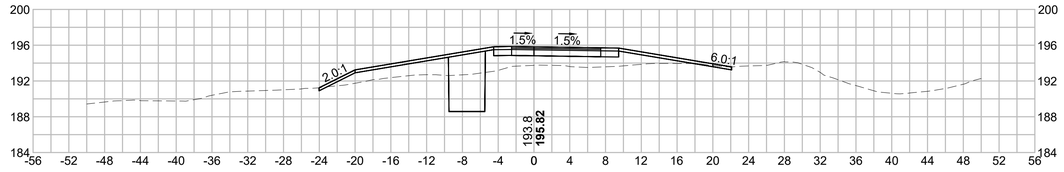
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 256 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

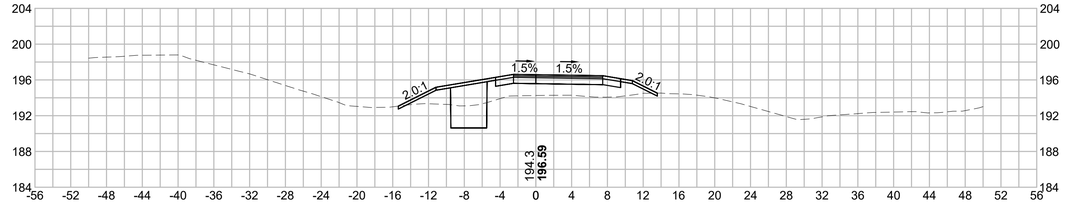
333+50



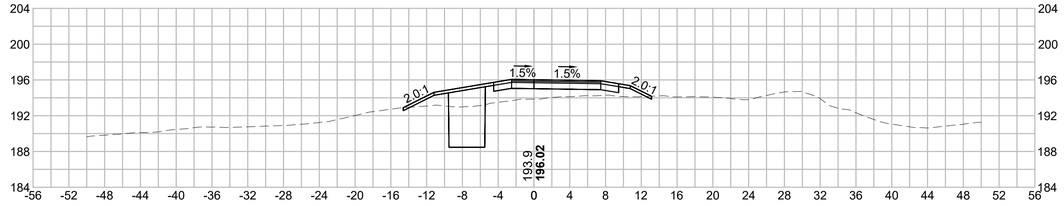
335+00



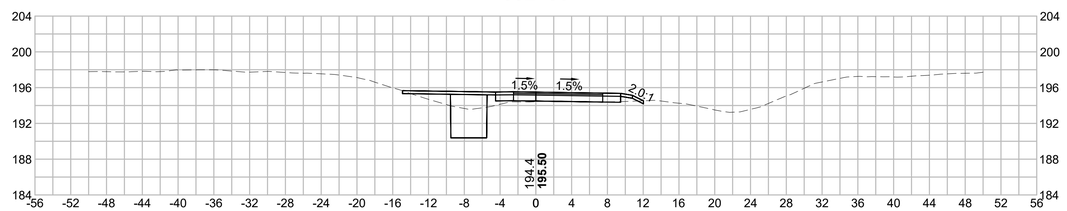
333+00



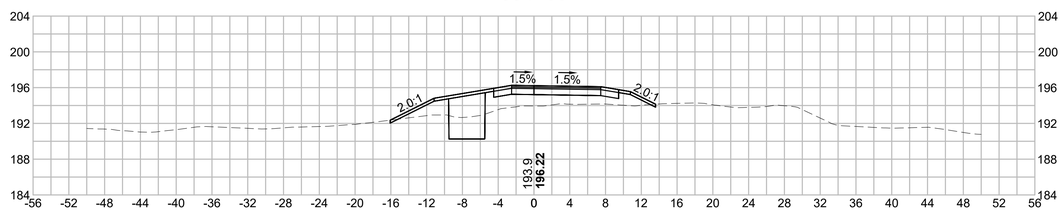
334+50



332+50



334+00



8 0 8 16
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

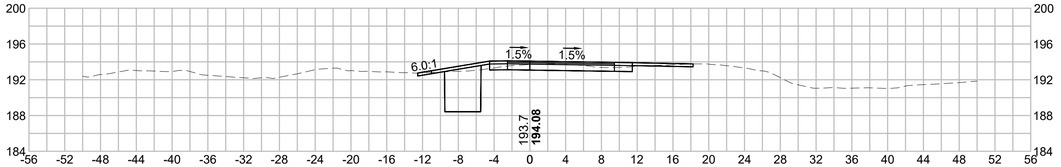
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

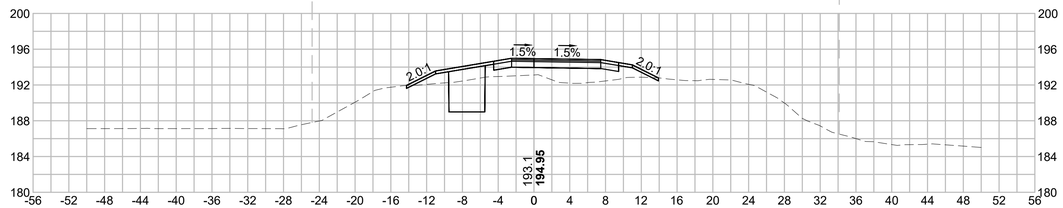
PLAN 257 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

336+50

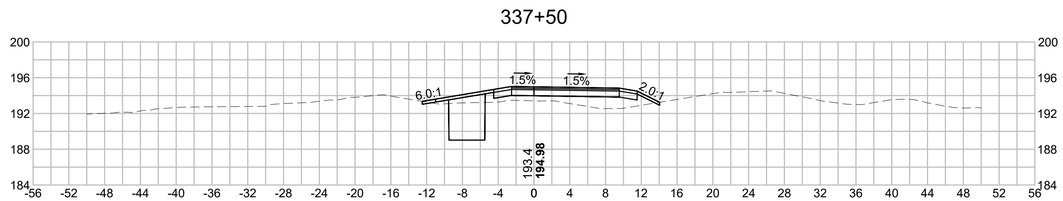


338+00

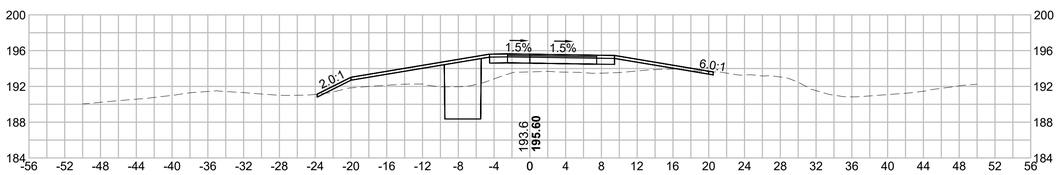


336+00

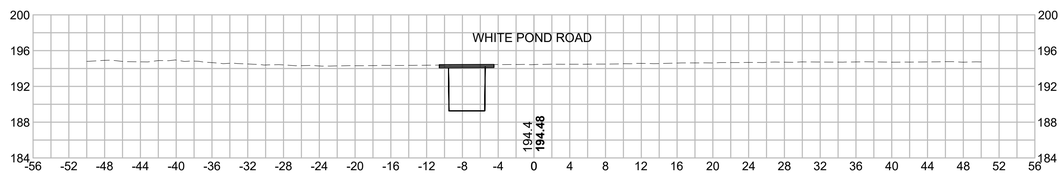
337+50



335+50



337+00



8 0 8 16
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

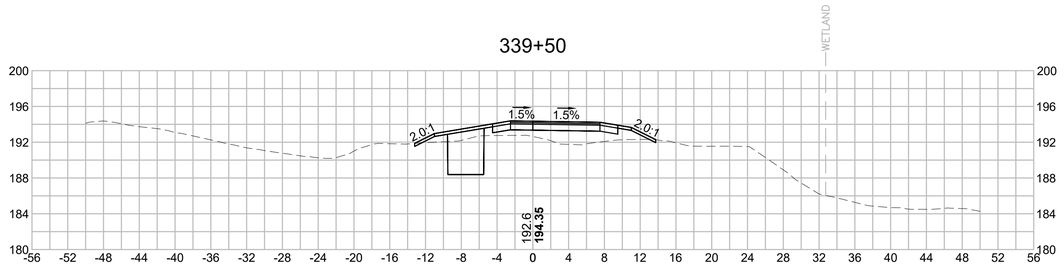
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

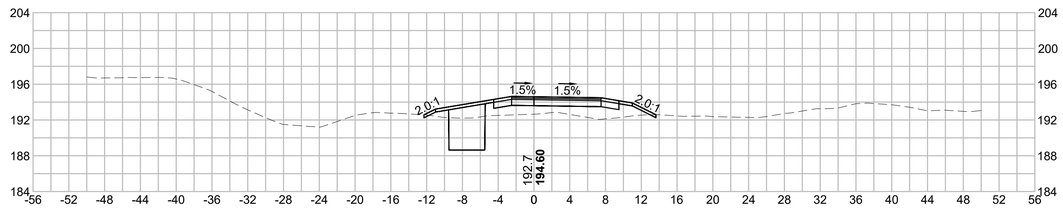
PLAN 258 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

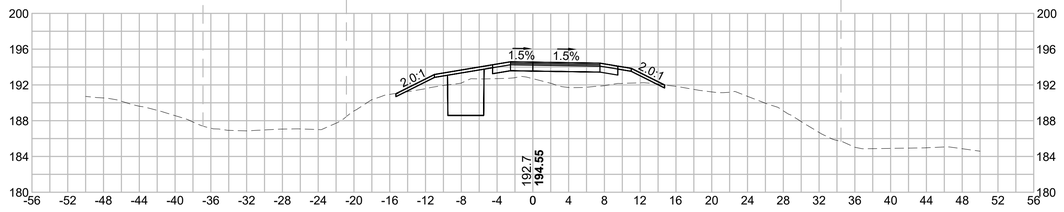
339+50



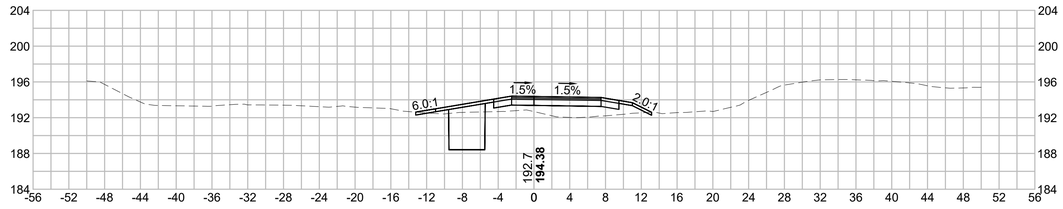
341+00



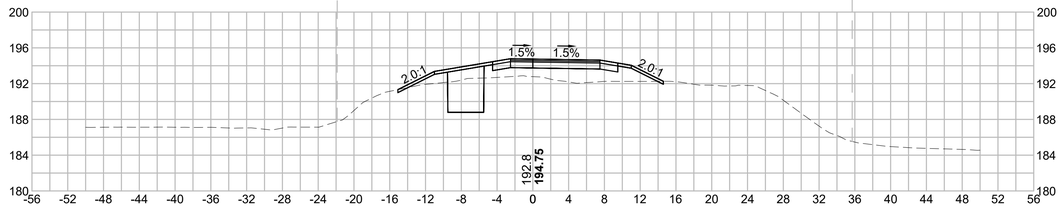
339+00



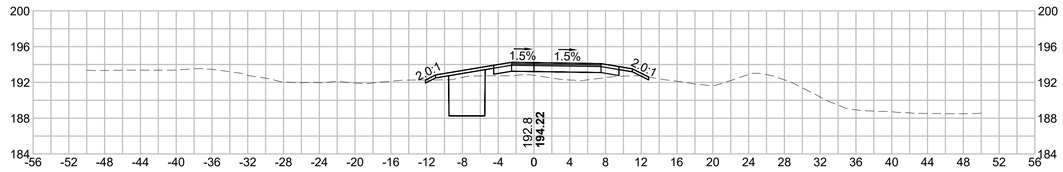
340+50



338+50



340+00



8 0 8 16
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

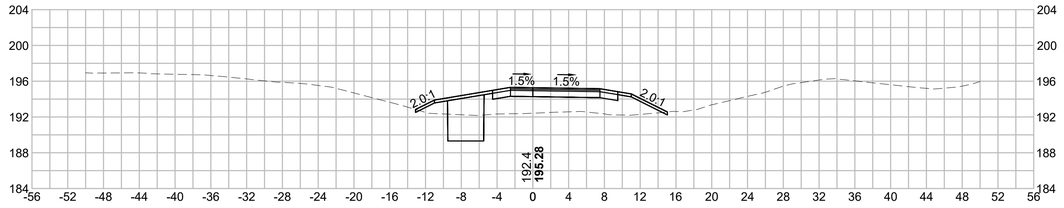
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

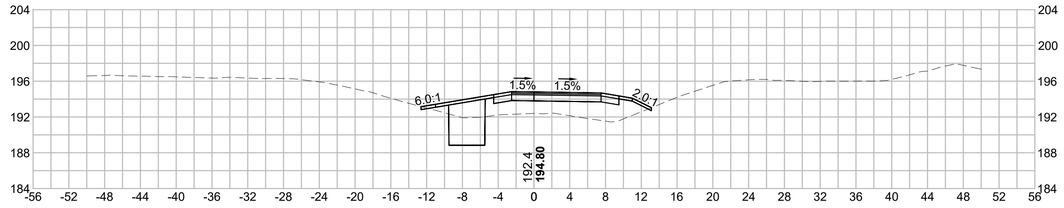
PLAN 259 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

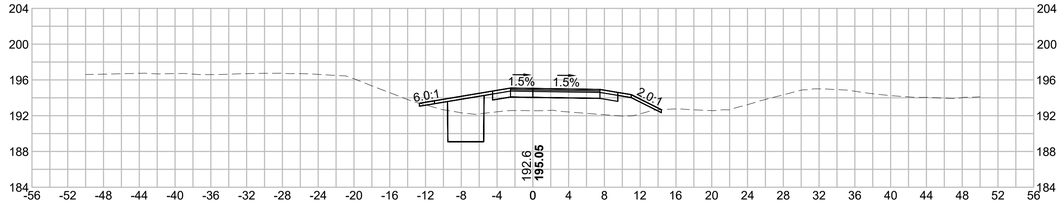
342+50



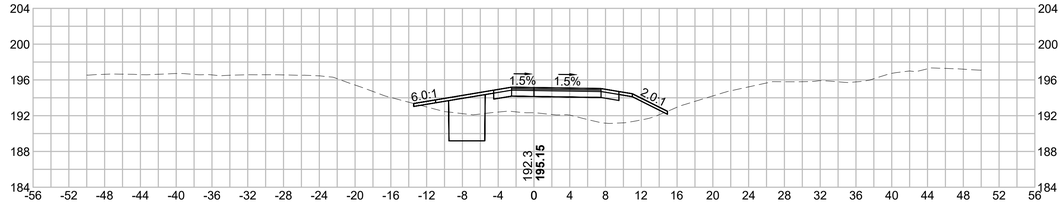
344+00



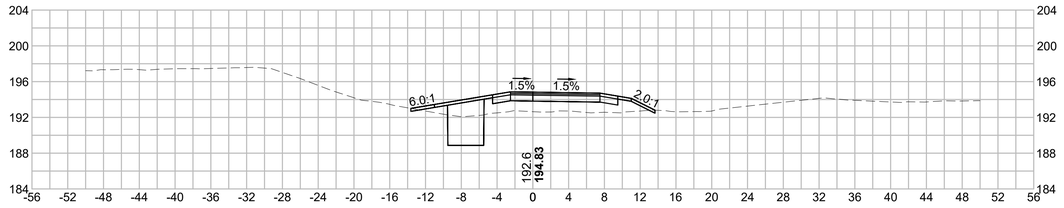
342+00



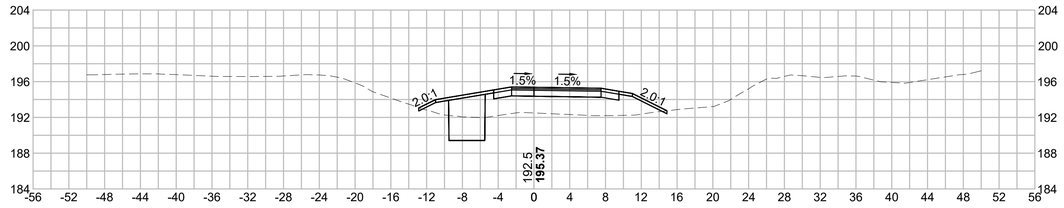
343+50



341+50



343+00



8 0 8 16
SCALE IN FEET

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Watertown, MA 02472
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

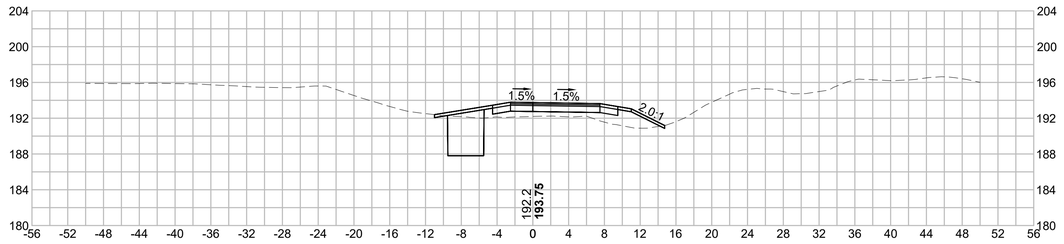
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

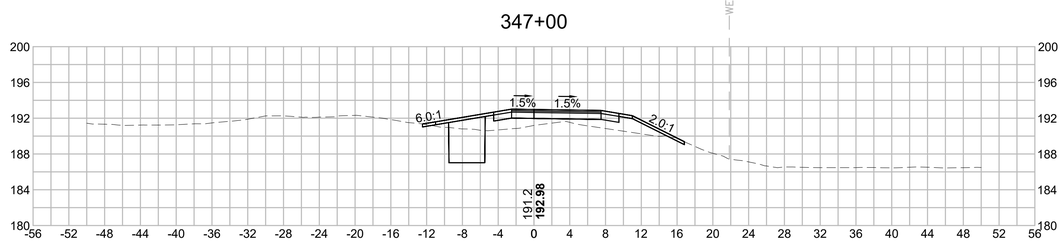
PLAN 260OF349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

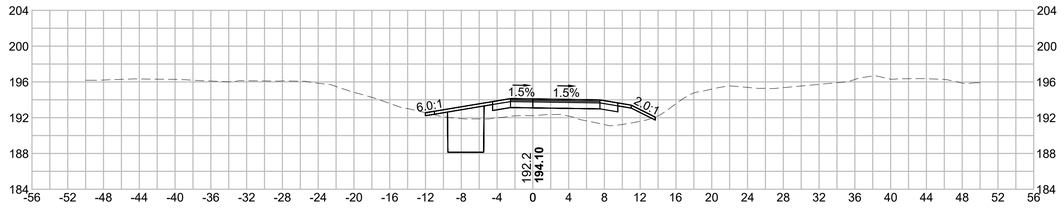
345+50



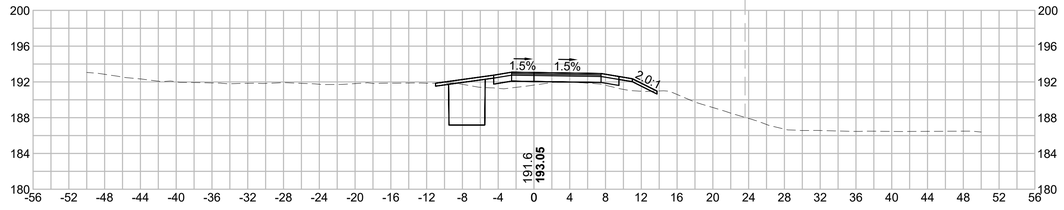
347+00



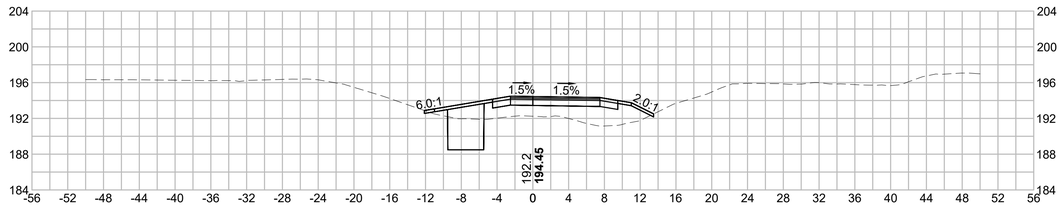
345+00



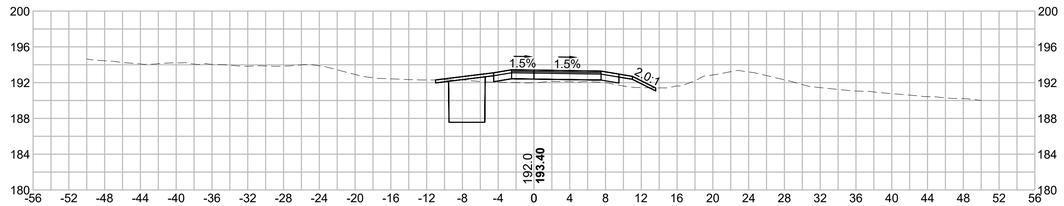
346+50



344+50



346+00



8 0 8 16
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NO.	DESCRIPTION	BY	DATE	APPR.
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

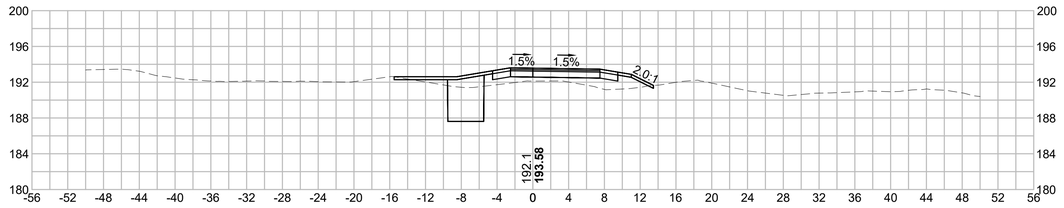
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

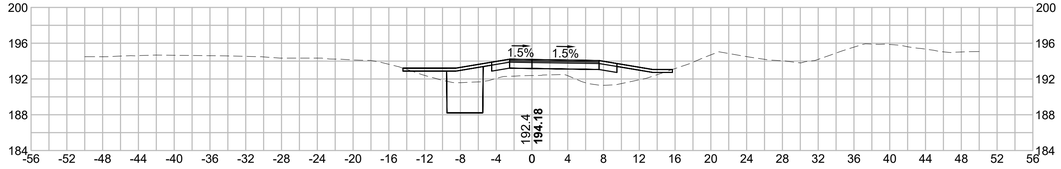
PLAN 2610F 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

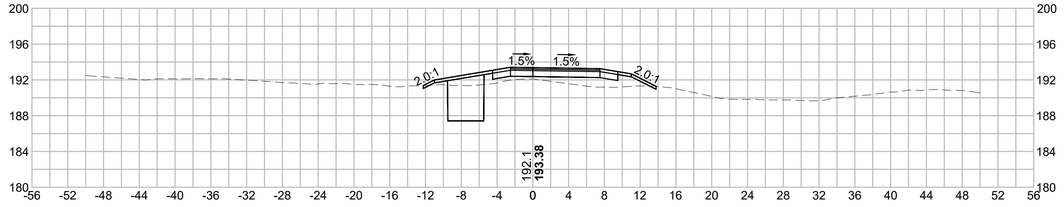
348+50



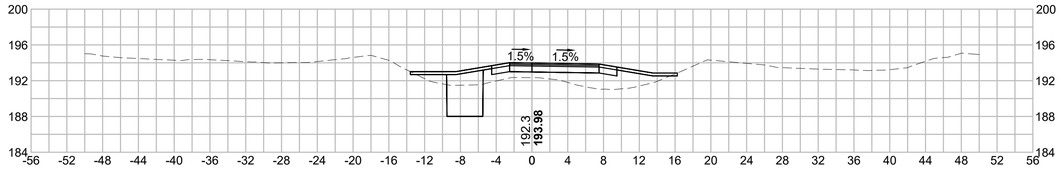
350+00



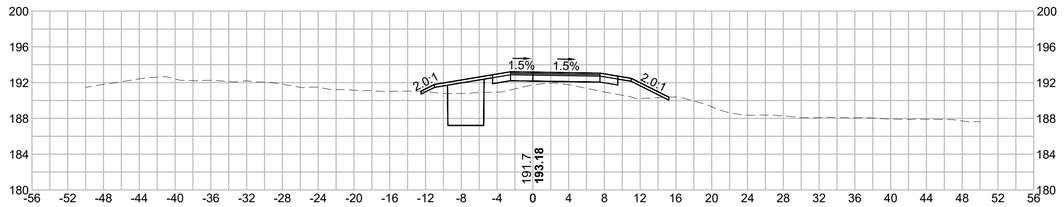
348+00



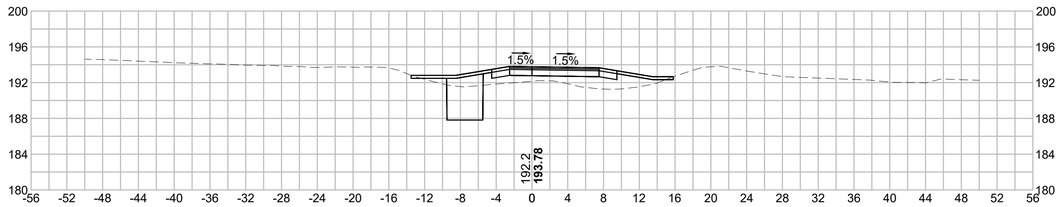
349+50



347+50



349+00



8 0 8 16
SCALE IN FEET

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NO.	DESCRIPTION	BY	DATE	APPR.
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

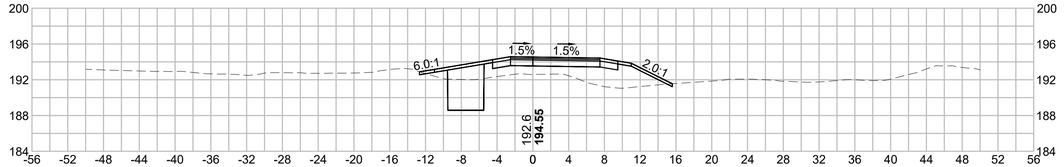
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

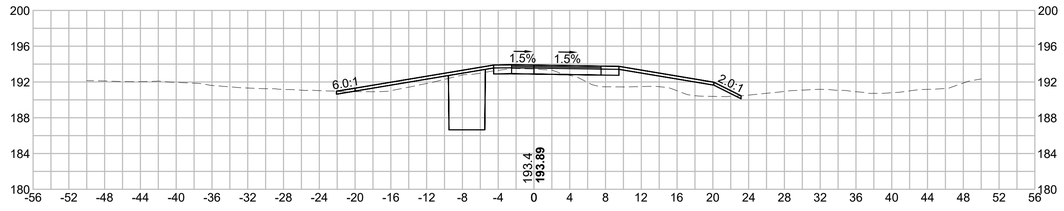
PLAN 262OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

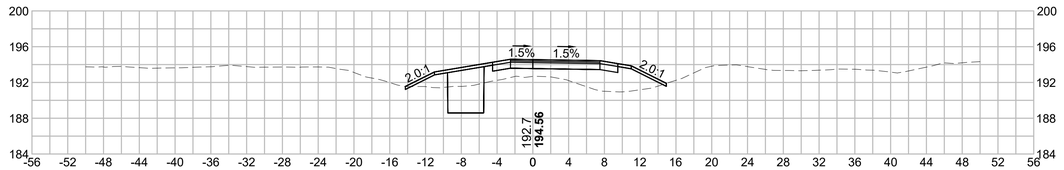
351+50



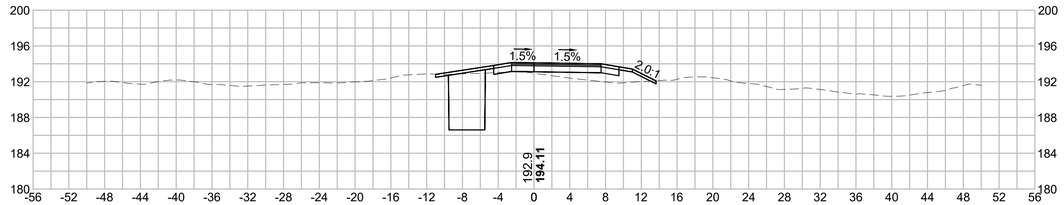
353+00



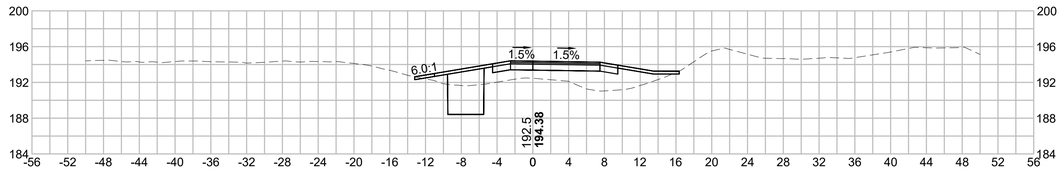
351+00



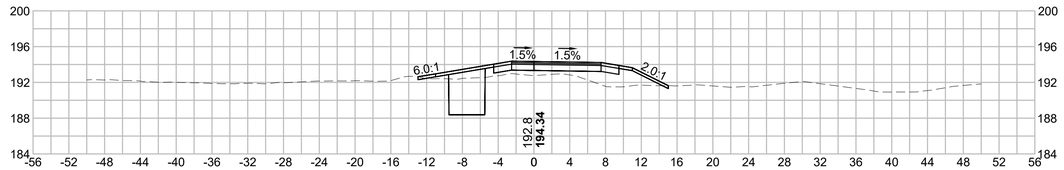
352+50



350+50



352+00



8 0 8 16
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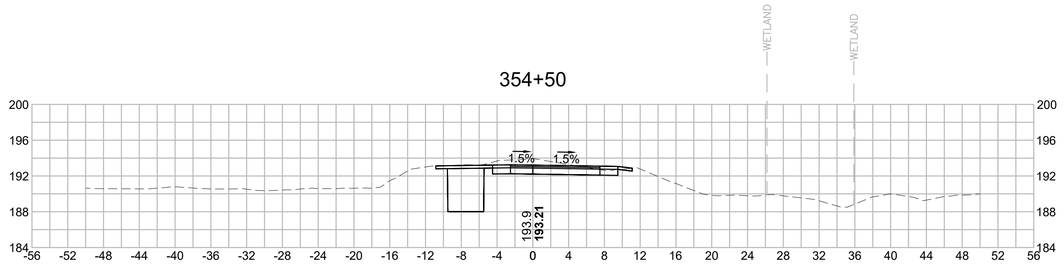
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

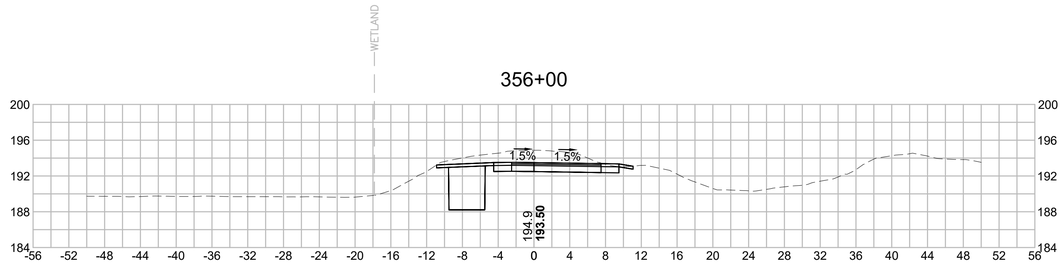
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

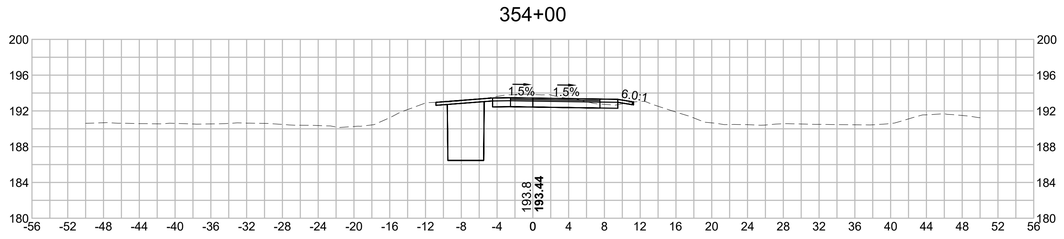
CROSS SECTIONS

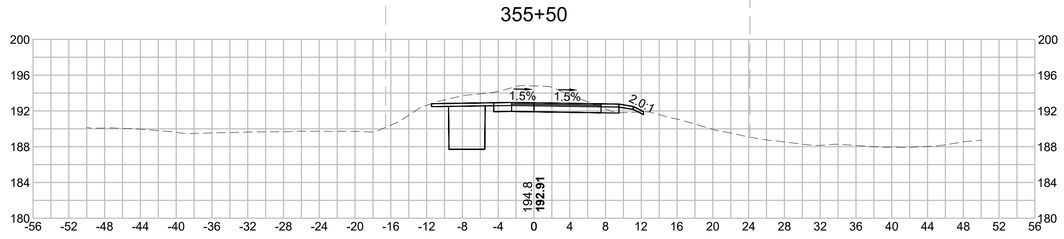
PLAN 263 OF 349

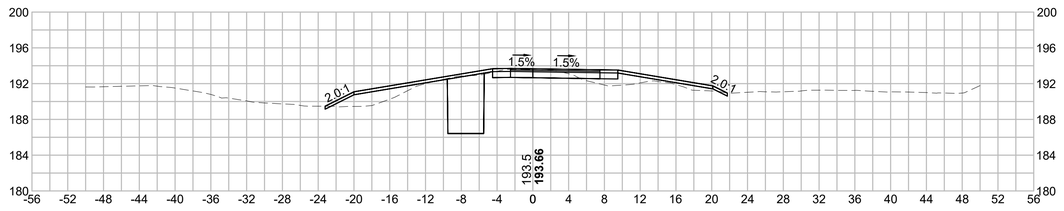
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

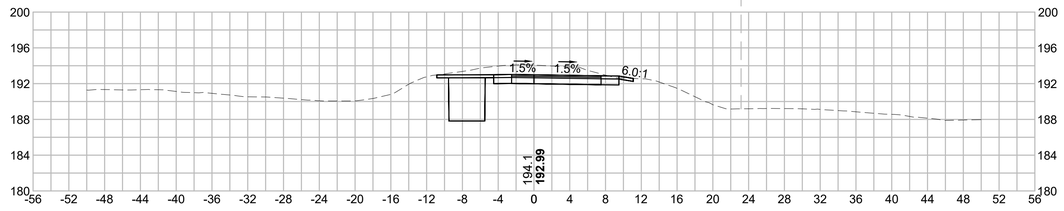












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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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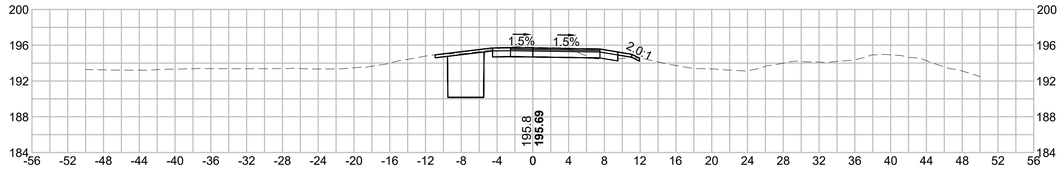
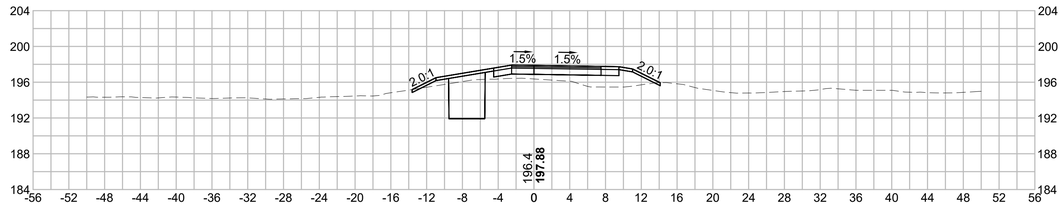
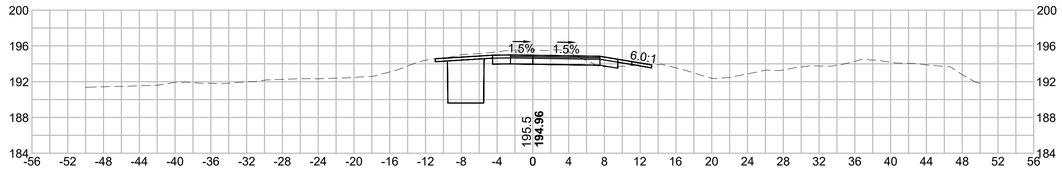
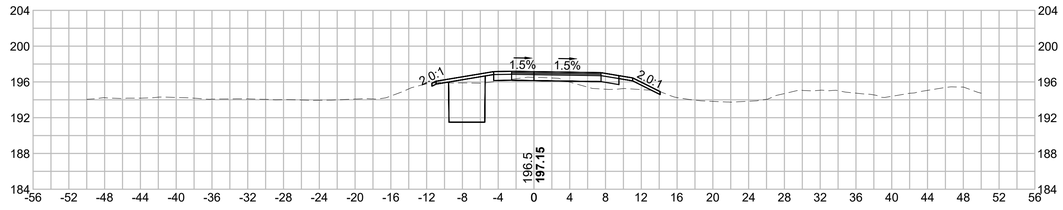
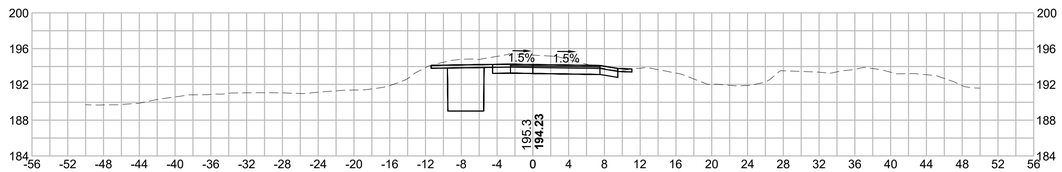
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

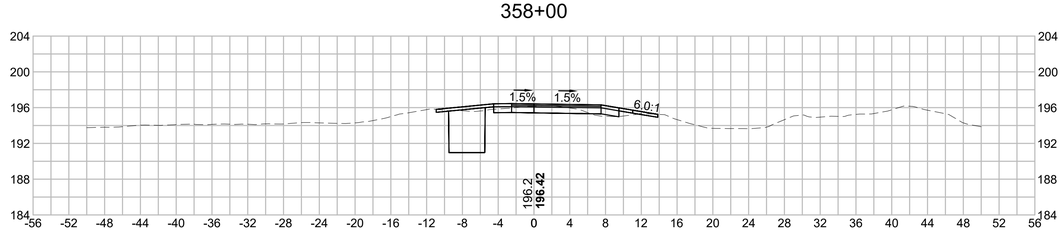












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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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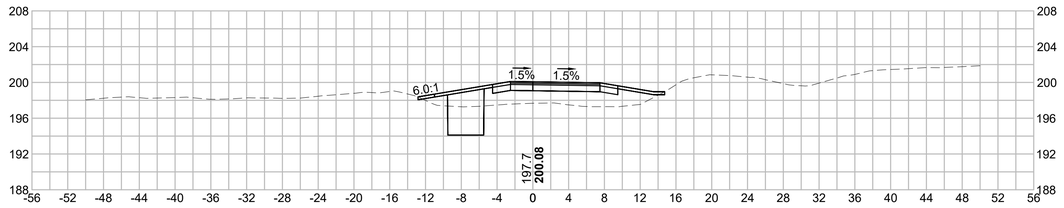
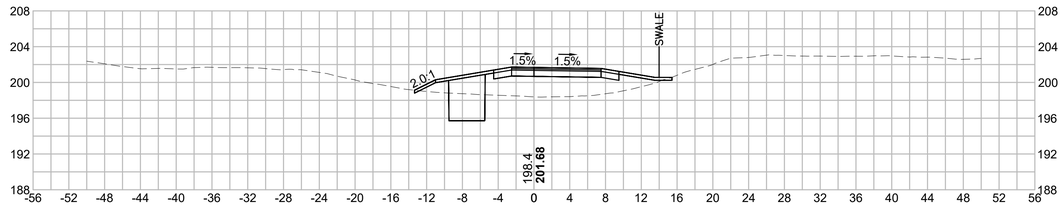
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

360+50

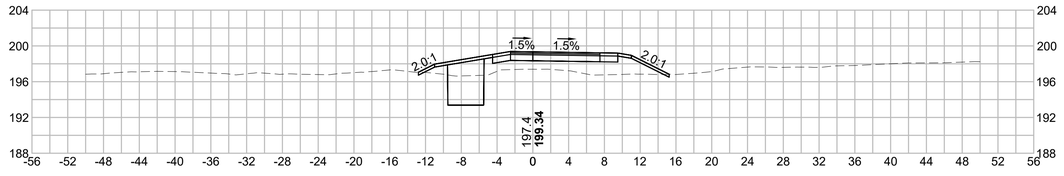


362+00

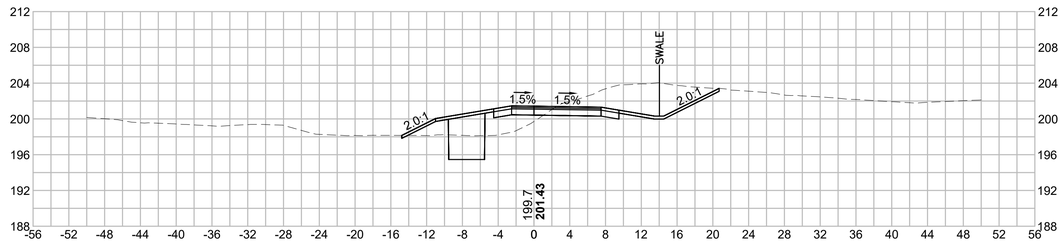


TOWN OF SUDBURY

360+00

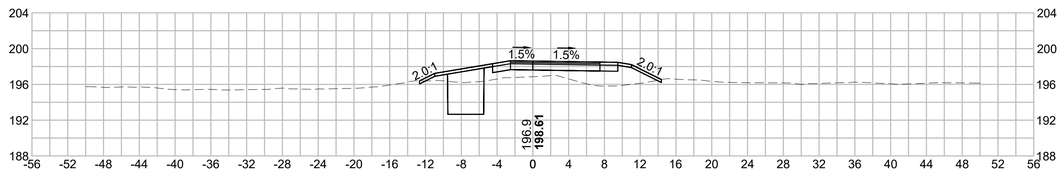


361+50

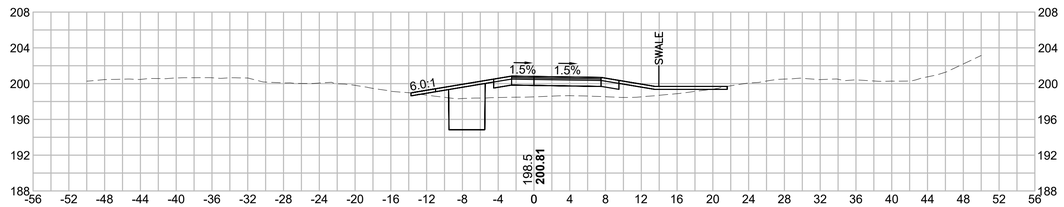


CITY OF MARLBOROUGH
TOWN OF HUDSON

359+50



361+00



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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

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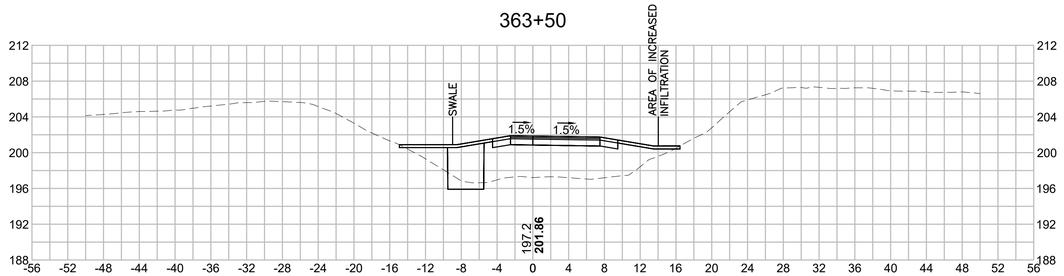
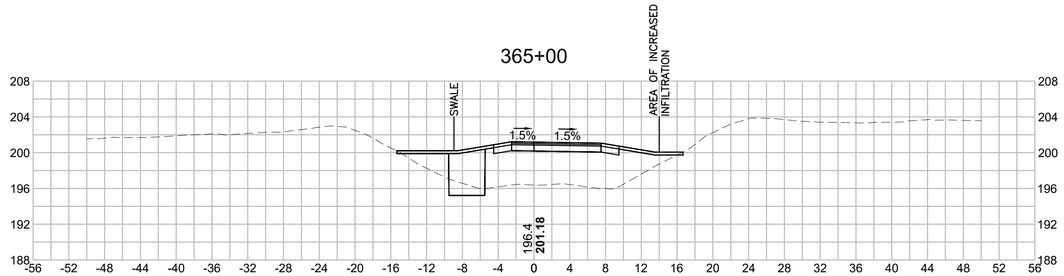
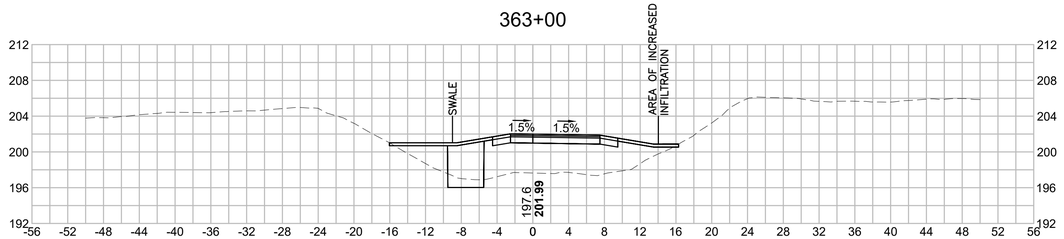
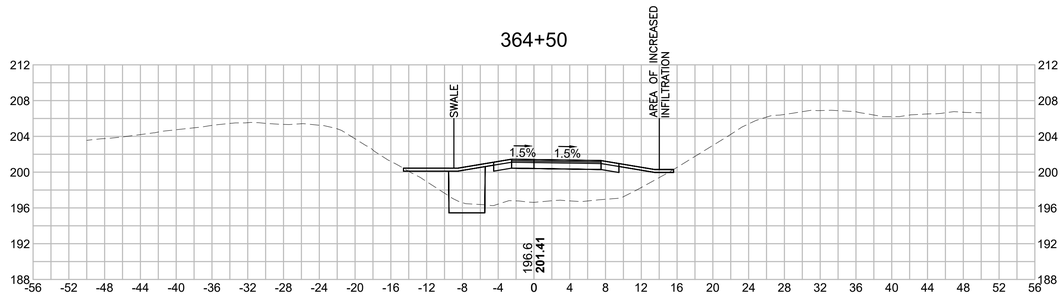
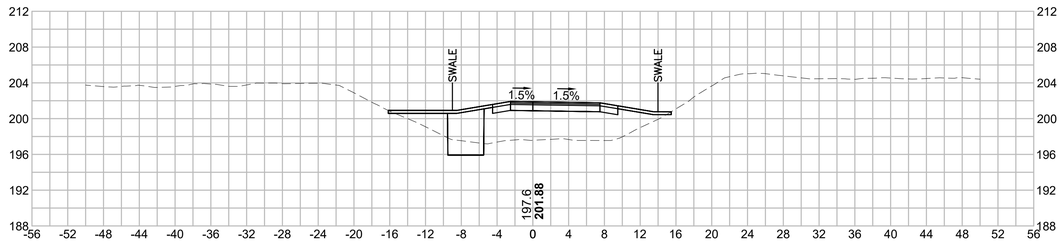
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

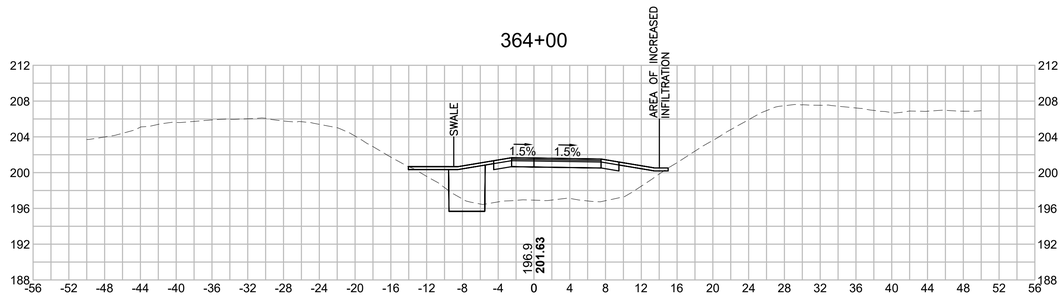












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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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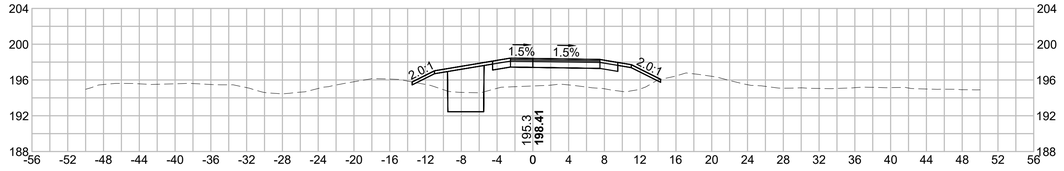
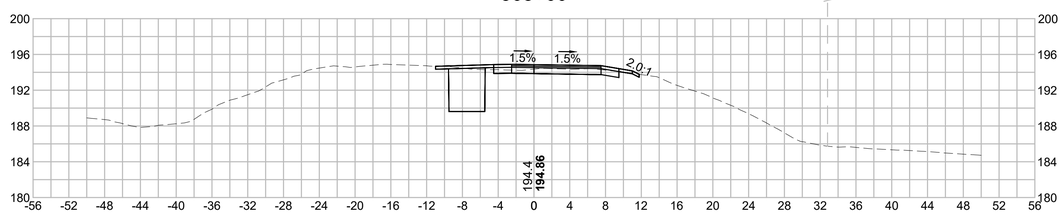
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MS	.	.

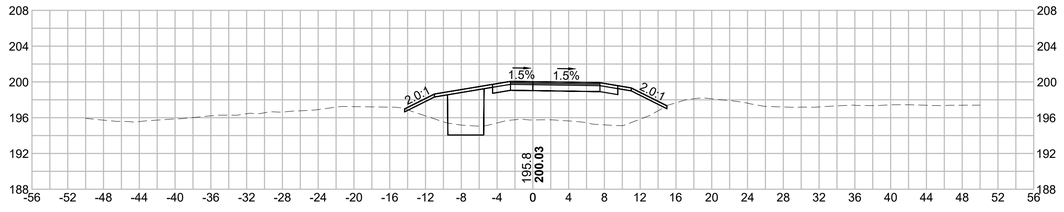
366+50



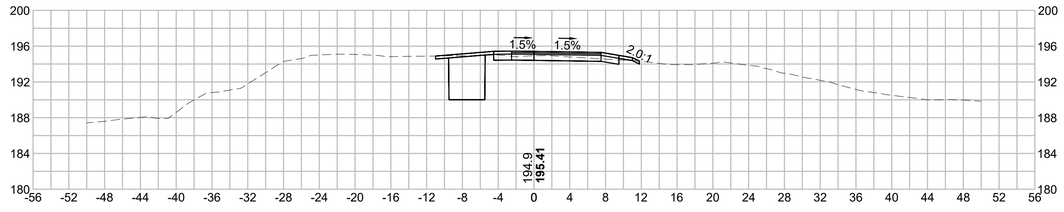
368+00



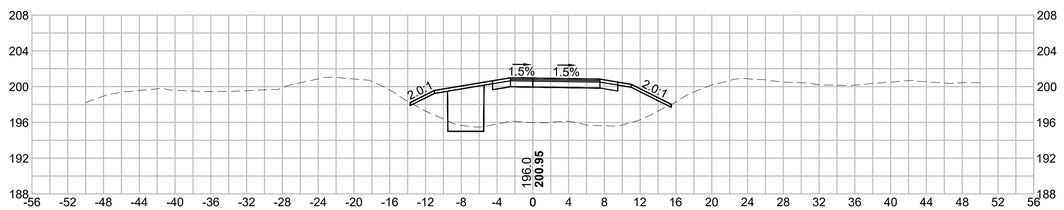
366+00



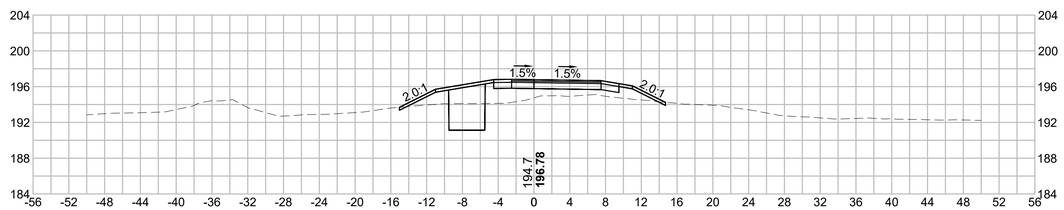
367+50



365+50



367+00



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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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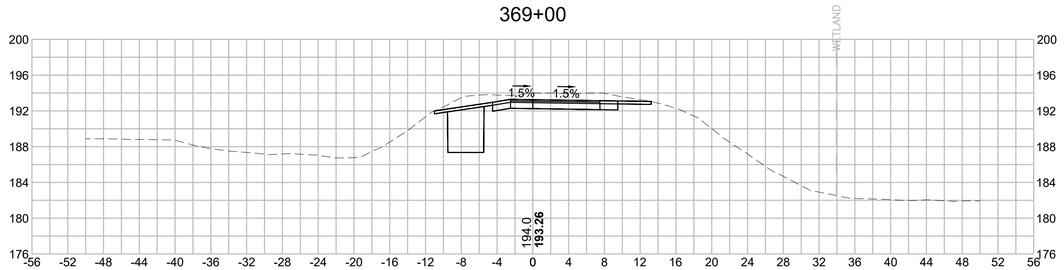
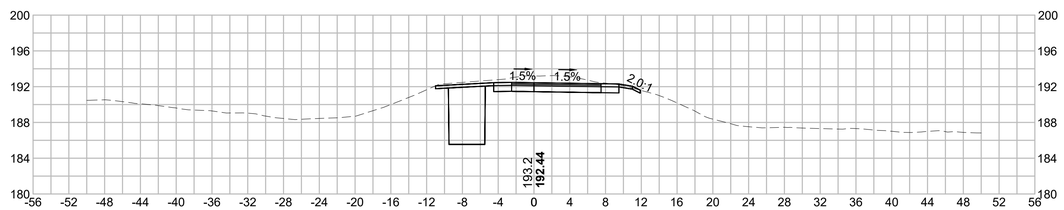
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

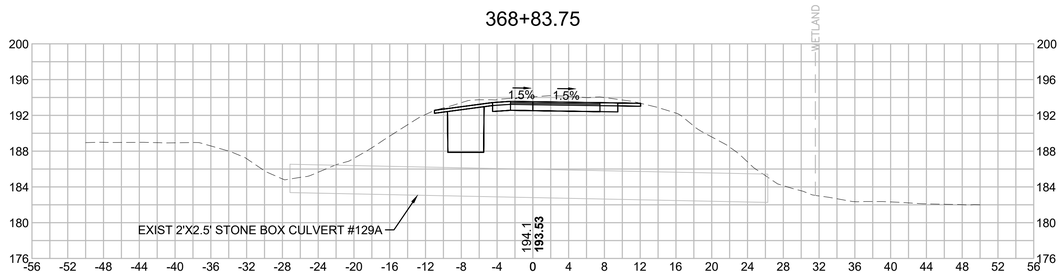
369+00



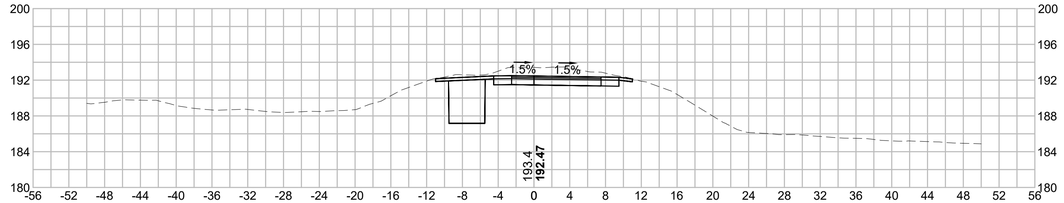
370+50



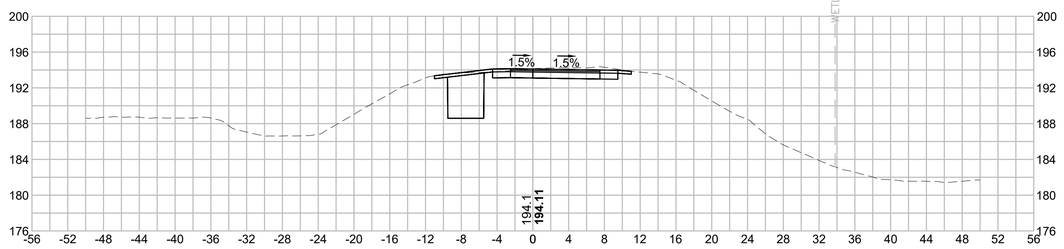
368+83.75



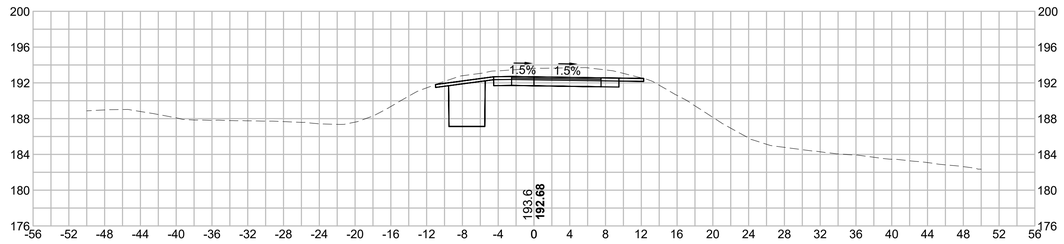
370+00



368+50



369+50



8 0 8 16
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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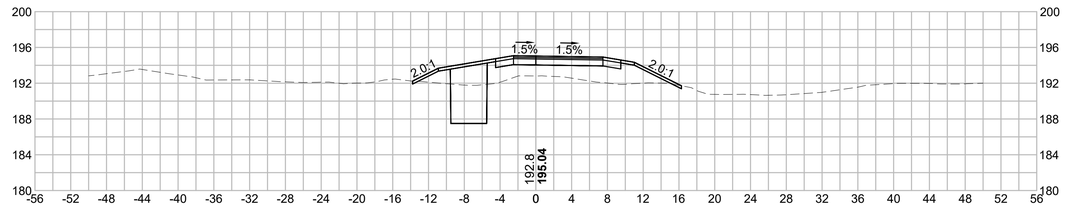
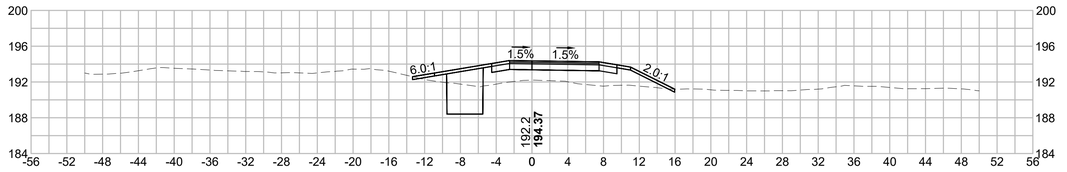
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

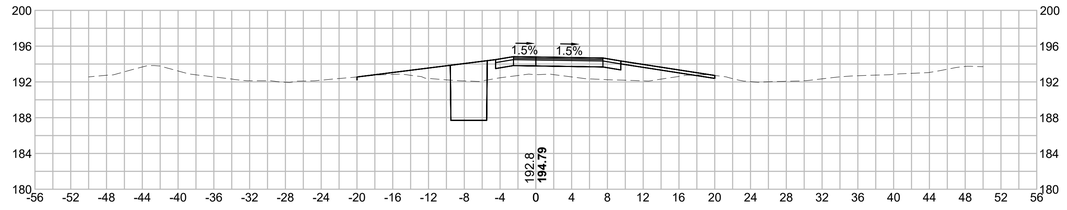
372+00



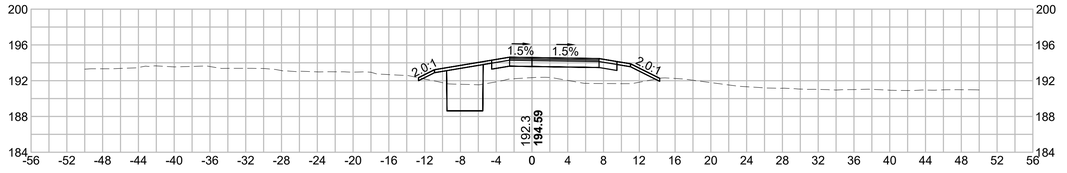
373+50



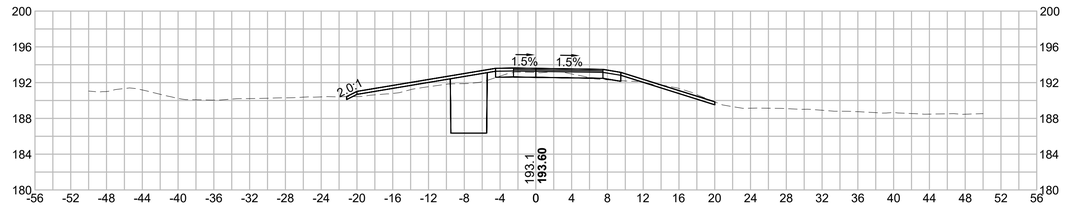
371+50



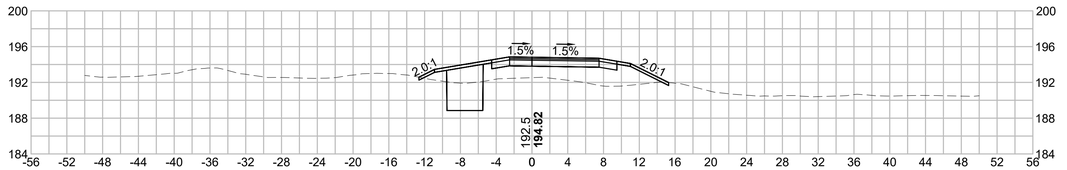
373+00



371+00



372+50



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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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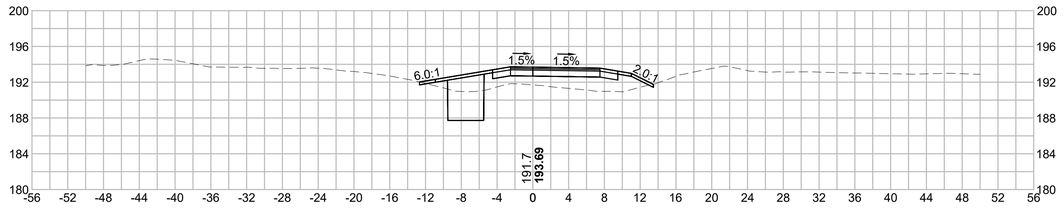
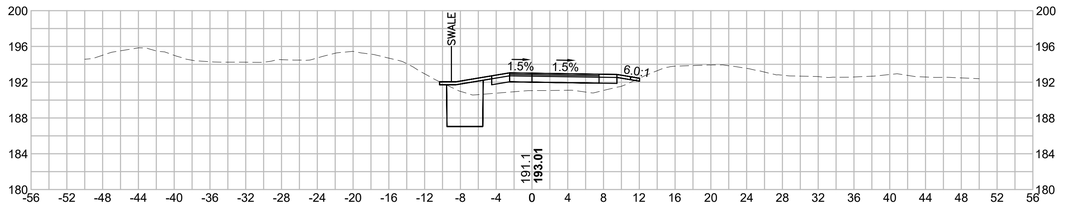
PLAN 2700F 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

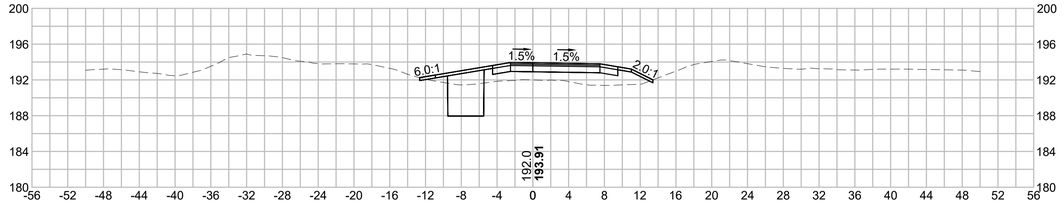
375+00



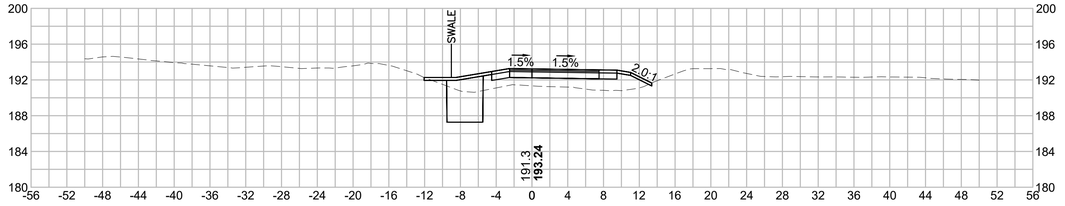
376+50



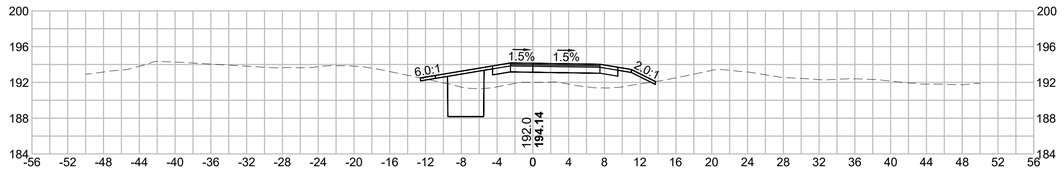
374+50



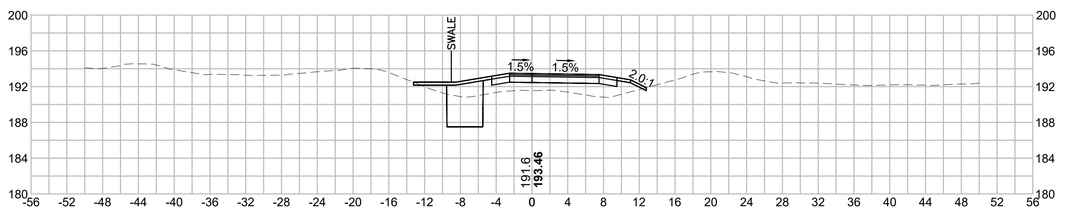
376+00



374+00



375+50



8 0 8 16
SCALE IN FEET

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NO.	DESCRIPTION	BY	DATE	APPR.
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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

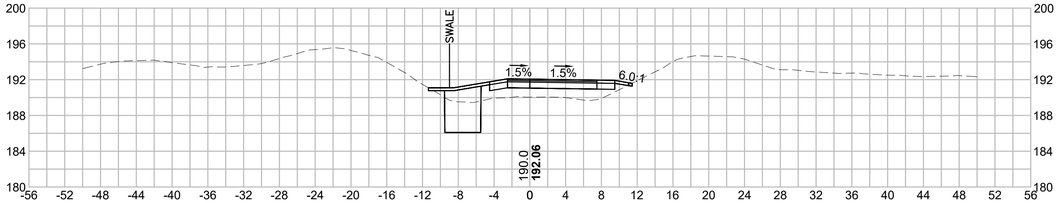
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

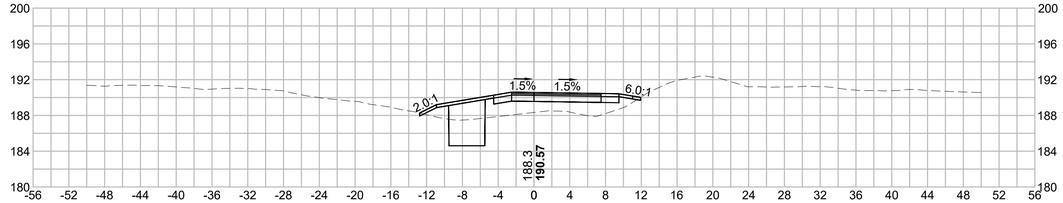
PLAN 2710F 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

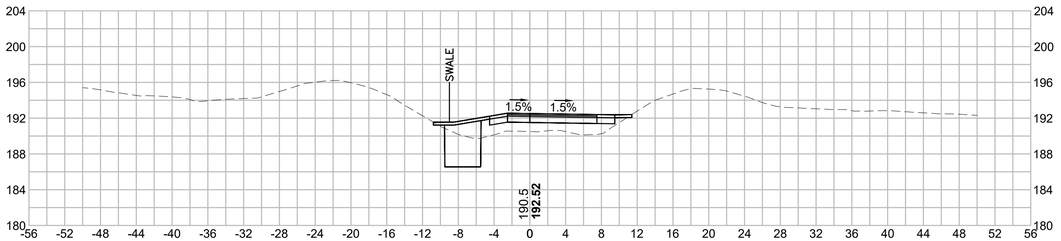
378+00



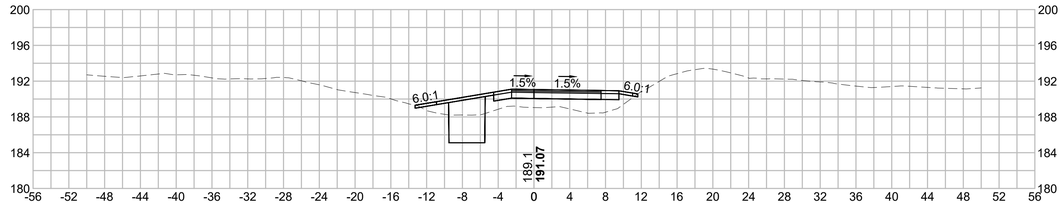
379+50



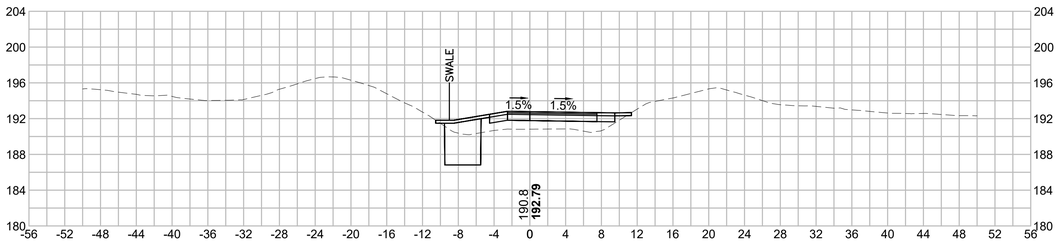
377+50



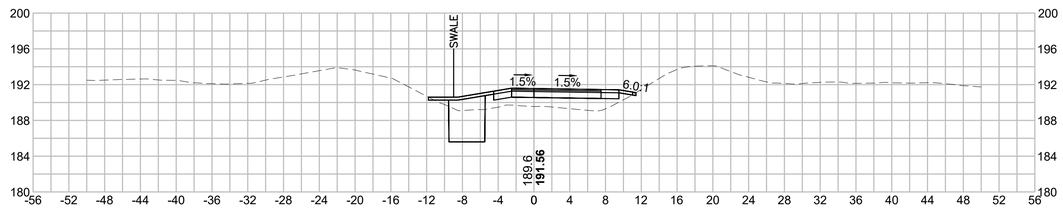
379+00



377+00



378+50



8 0 8 16
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NO.	DESCRIPTION	BY	DATE	APPR.

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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

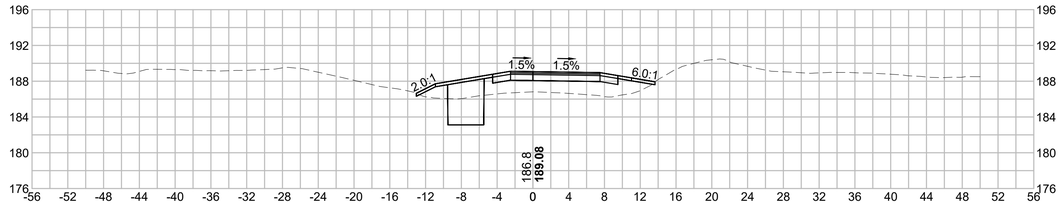
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

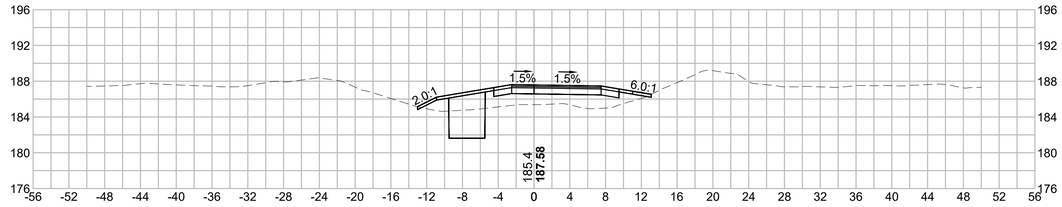
PLAN 272 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

381+00



382+50



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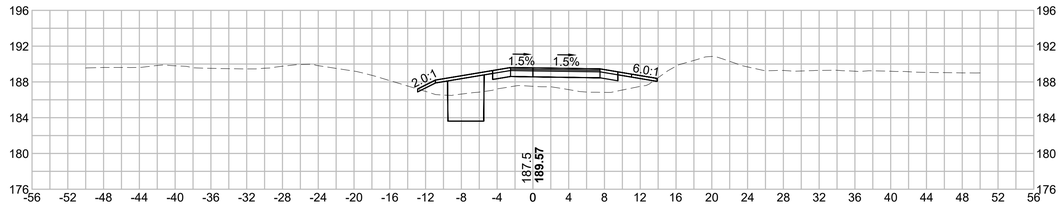

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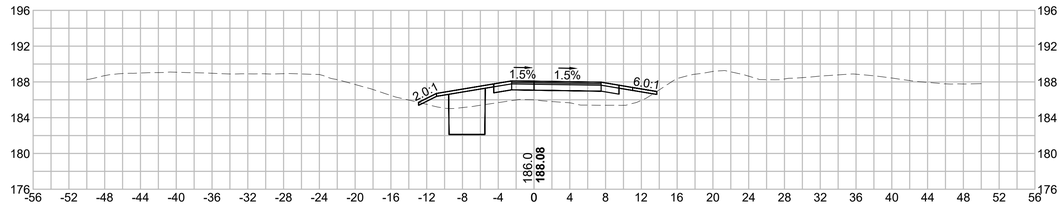

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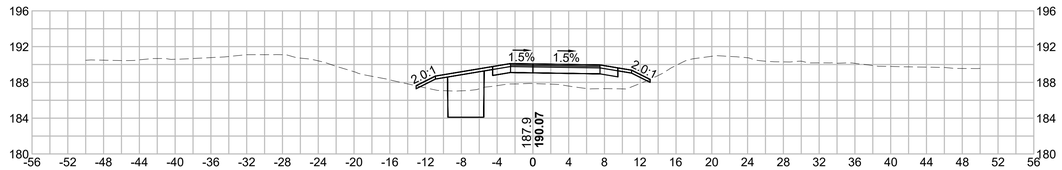

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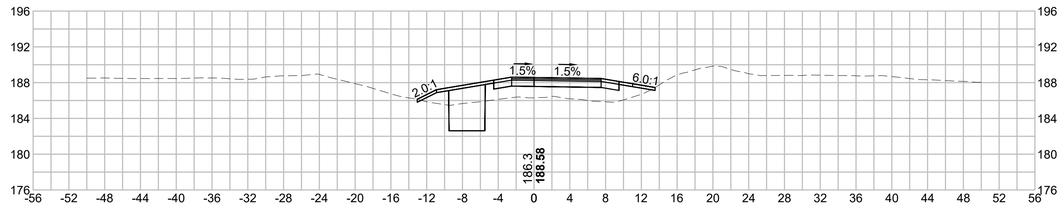

8 0 8 16
SCALE IN FEET

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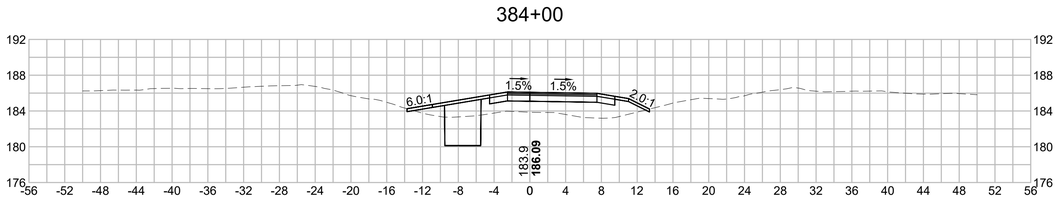
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

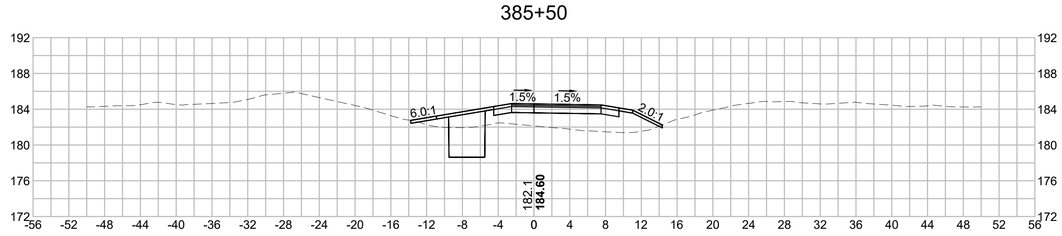
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

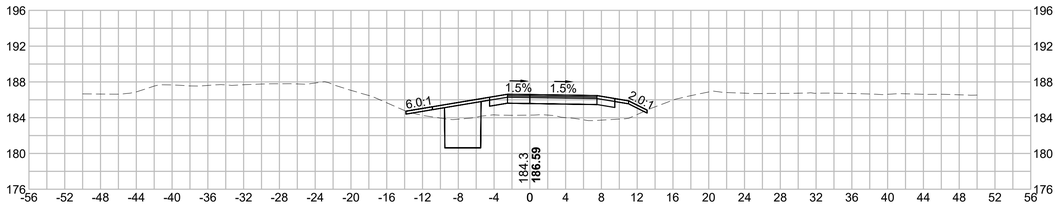
CROSS SECTIONS

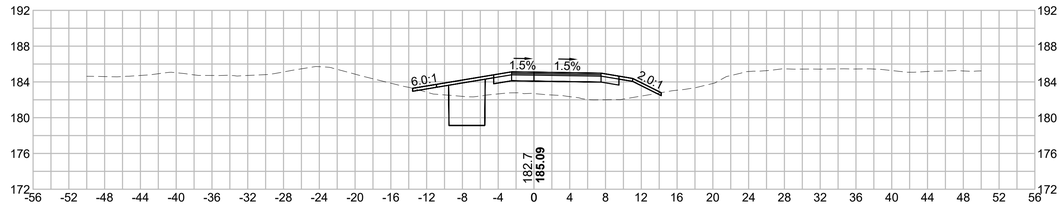
PLAN 273 OF 349

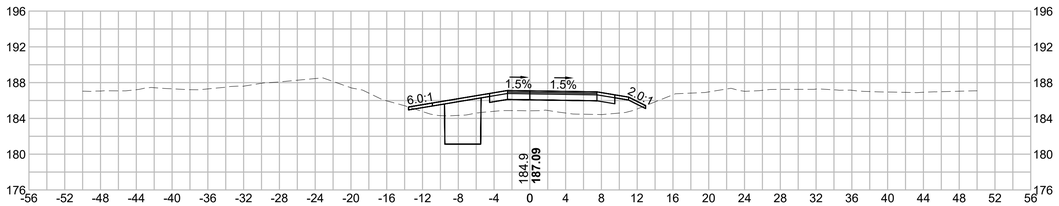
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

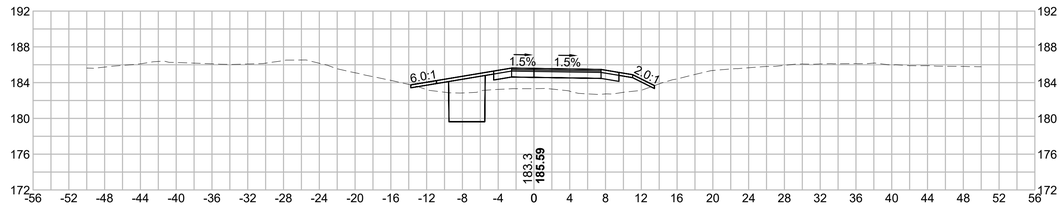












8 0 8 16
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NO.	DESCRIPTION	BY	DATE	APPR.
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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

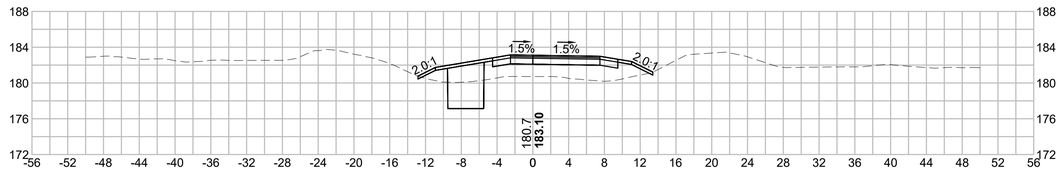
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

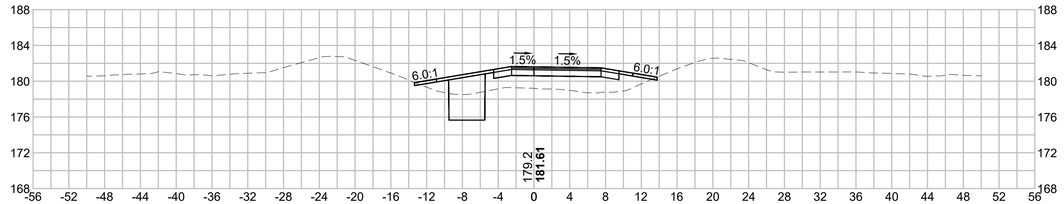
PLAN 274 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

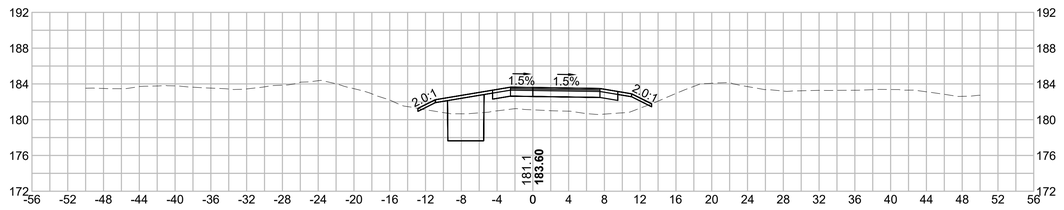
387+00



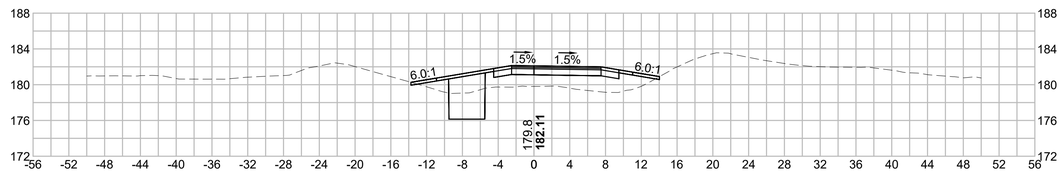
388+50



386+50



388+00



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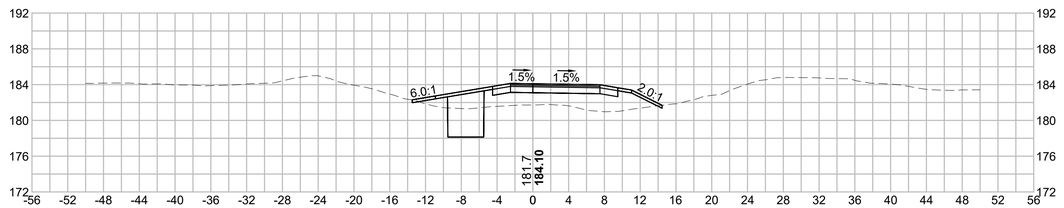

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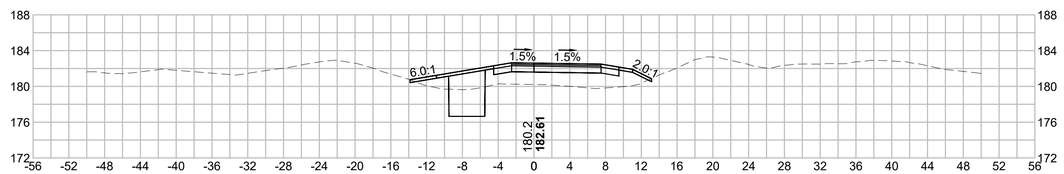

8 0 8 16
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Watertown, MA 02472
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NO.	DESCRIPTION	BY	DATE	APPR.
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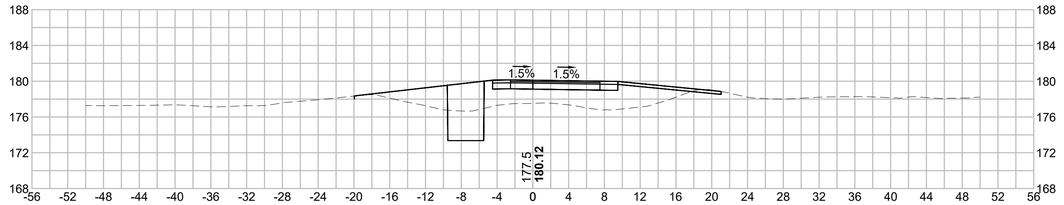
EVERSOURCE

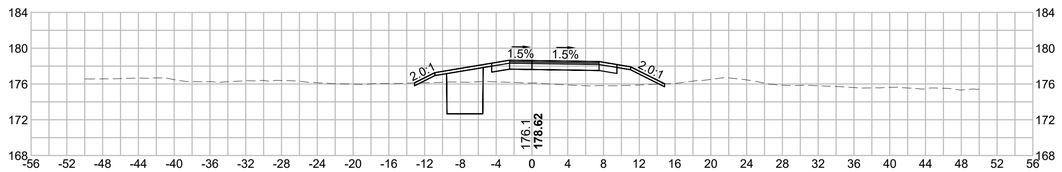
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 275 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

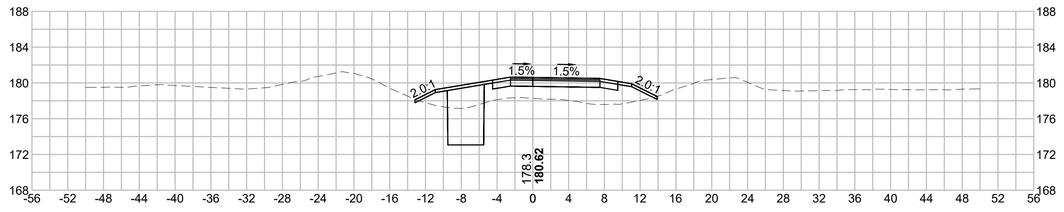
390+00



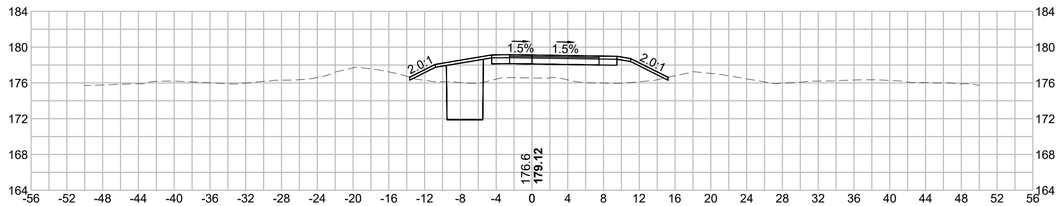
391+50



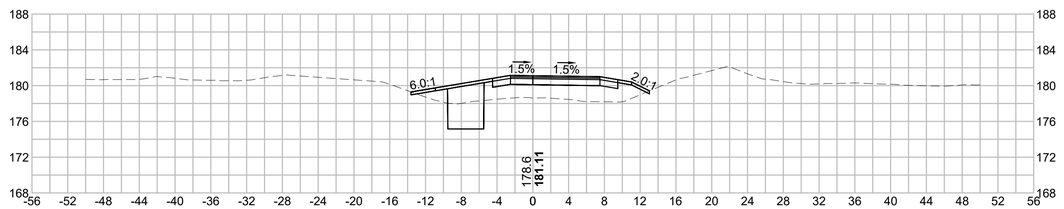
389+50



391+00



389+00



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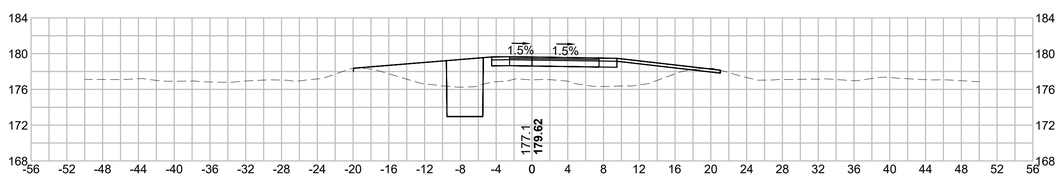

8 0 8 16
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Watertown, MA 02472
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NO.	DESCRIPTION	BY	DATE	APPR.
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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

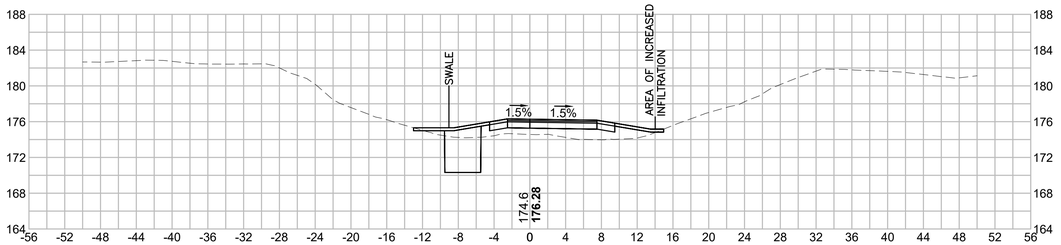
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

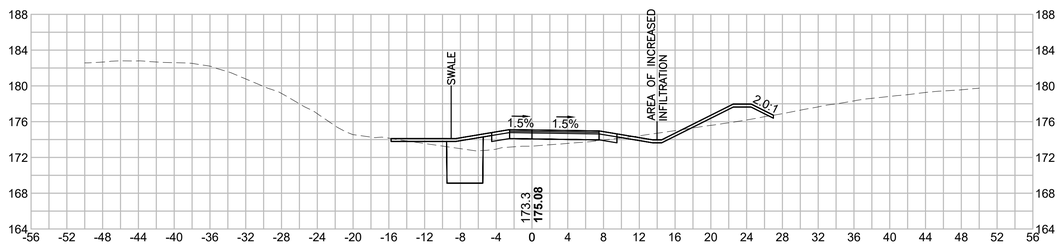
PLAN 276 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

393+00



394+50



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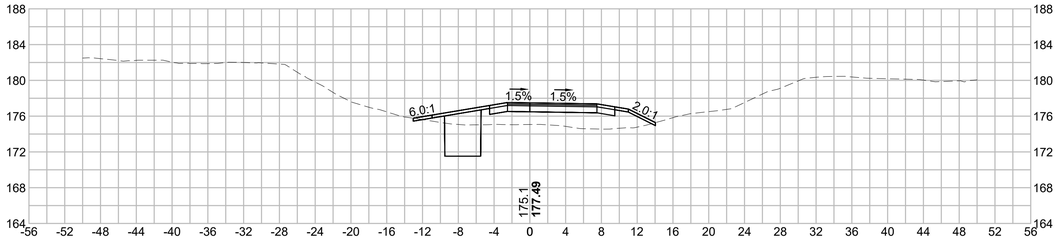

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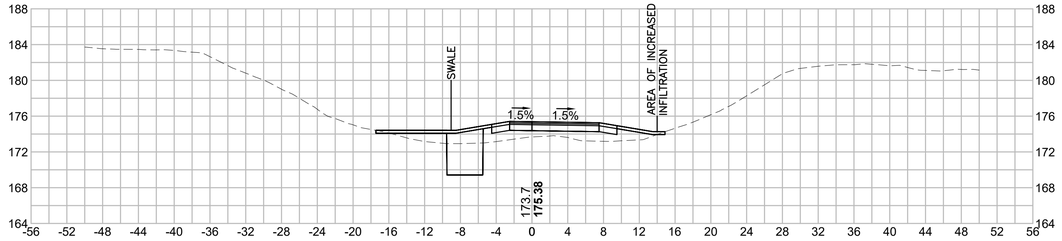

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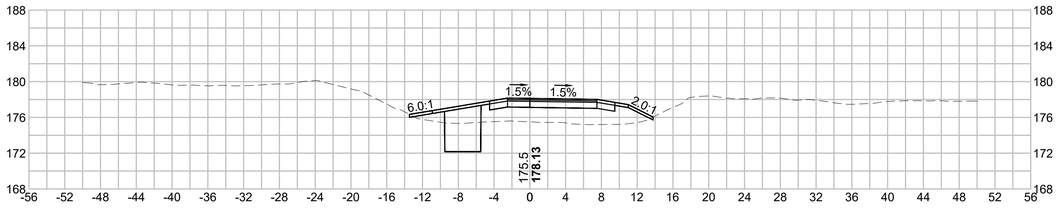

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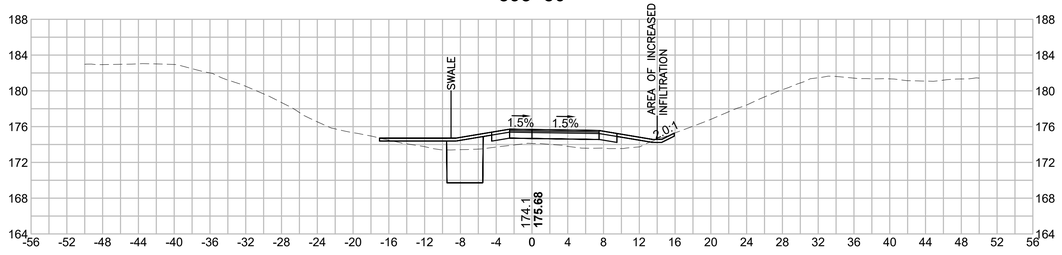

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Watertown, MA 02472
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NO.	DESCRIPTION	BY	DATE	APPR.
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

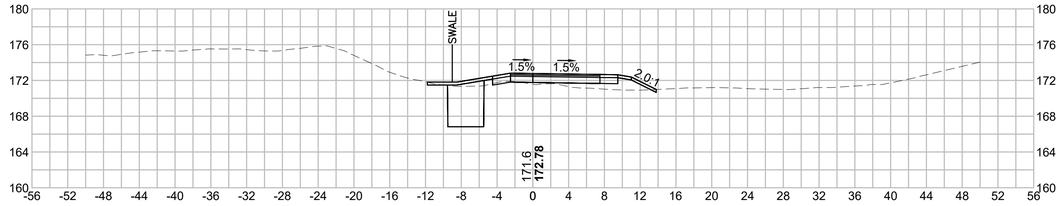
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

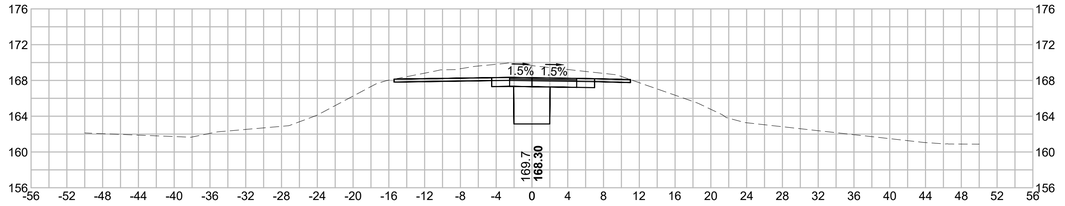
PLAN 277 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

396+00



397+50



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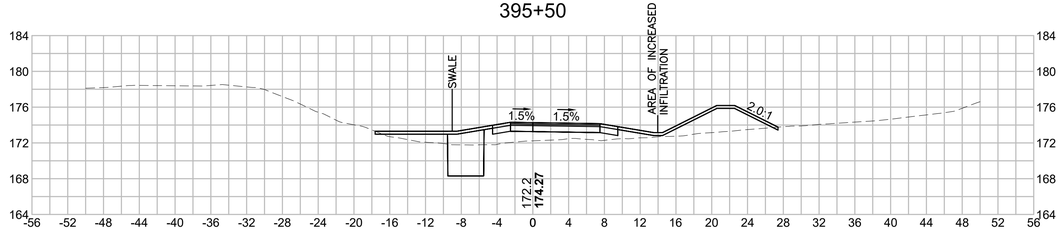

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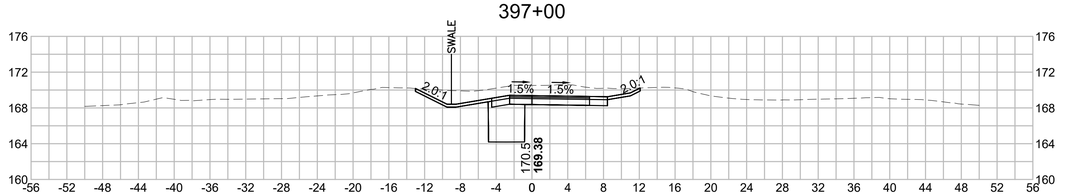

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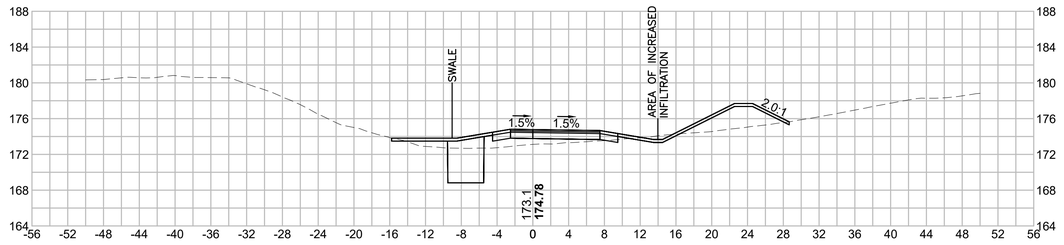

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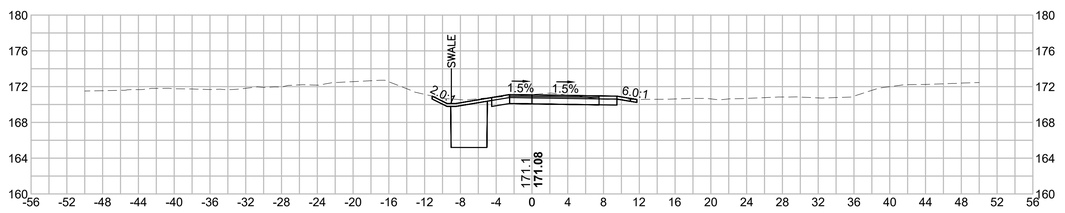

BLSF CROSSING STA 398 TO STA 403 - FEMA ZONE AE - HOP BROOK
FEMA ELEVATION: 161.0'
FILL:
160'-161': 0.95 CY
159'-160': 0.33 CY
CUT:
160'-161': 4.04 CY
159'-160': 1.17 CY

8 0 8 16
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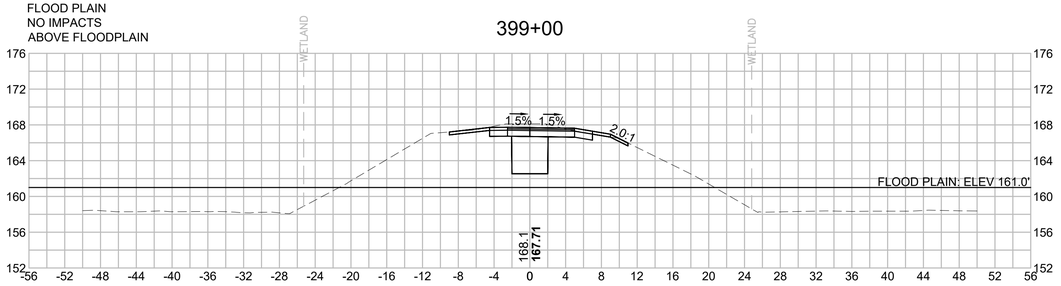
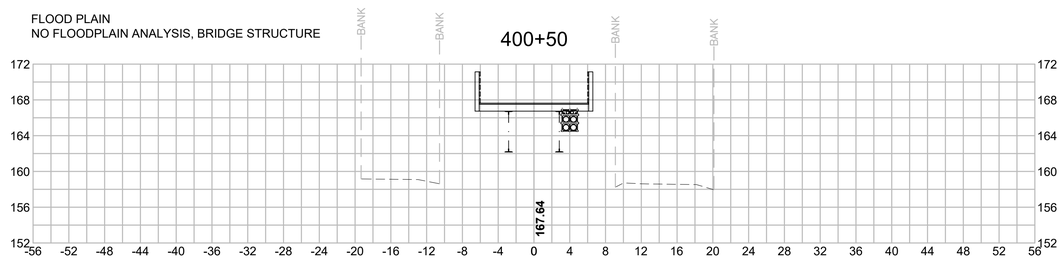
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 278 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

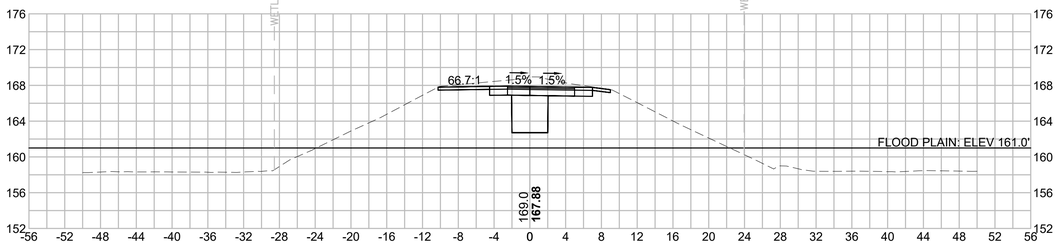
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN



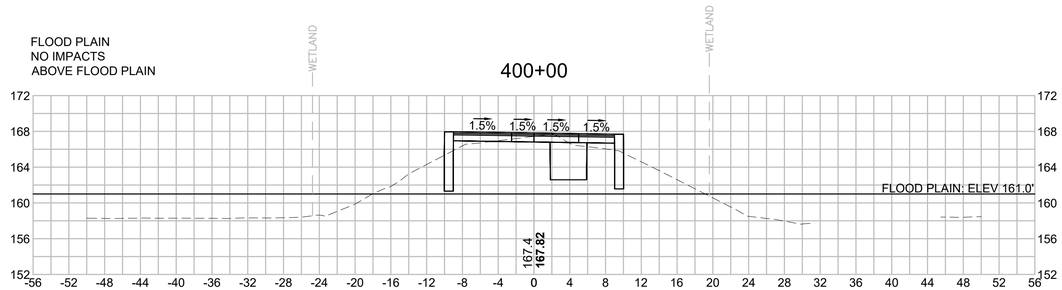
FLOOD PLAIN
NO FLOODPLAIN ANALYSIS, BRIDGE STRUCTURE



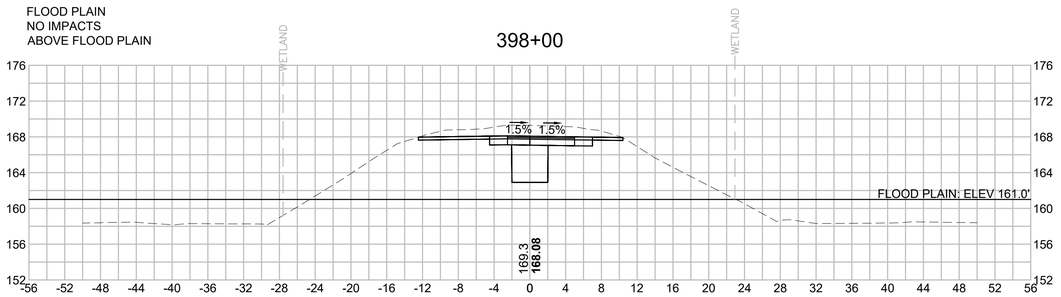
FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN



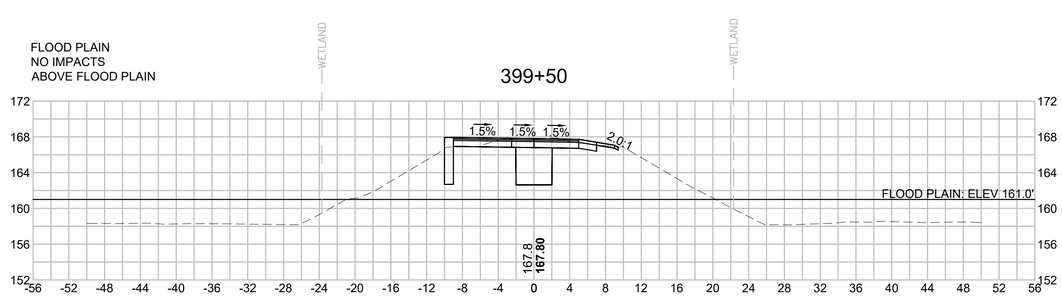
FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN



FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN



FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN



8 0 8 16
SCALE IN FEET

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NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

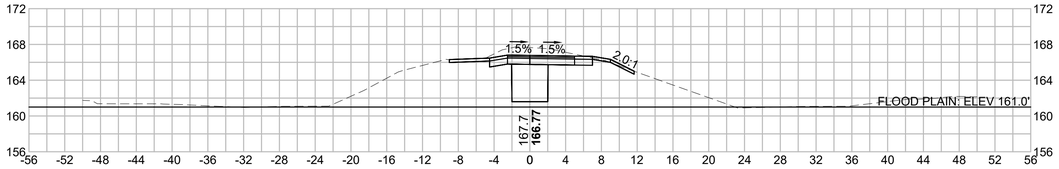
CROSS SECTIONS

PLAN 279 OF 349

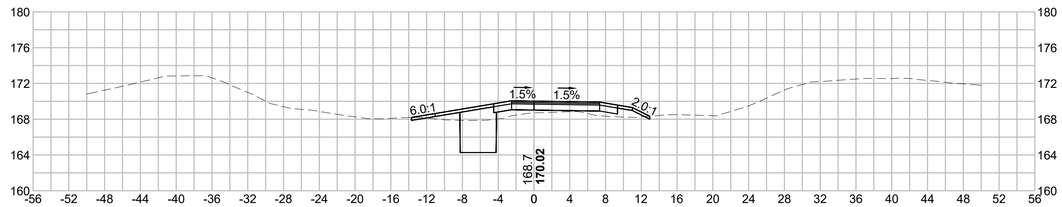
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

FLOOD PLAIN
ABOVE FLOODPLAIN
NO IMPACTS

402+00

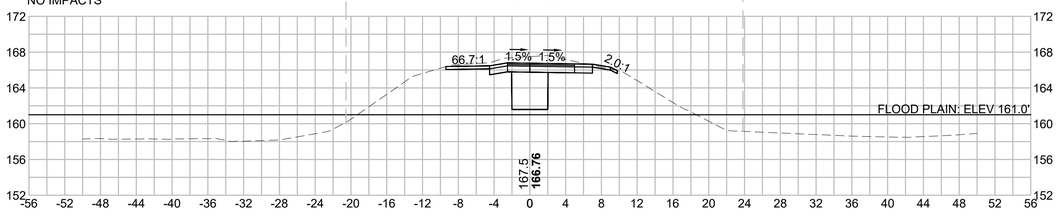


403+50

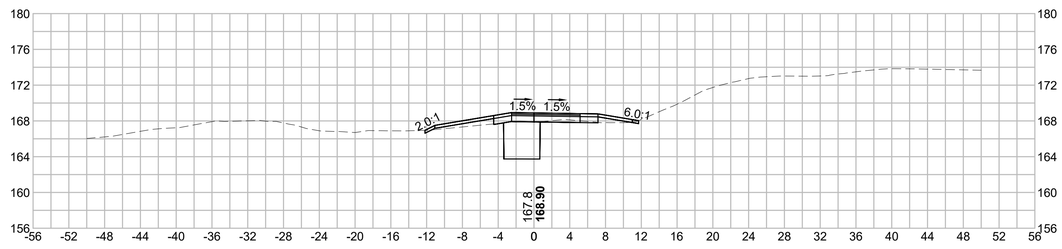


FLOOD PLAIN
ABOVE FLOODPLAIN
NO IMPACTS

401+50

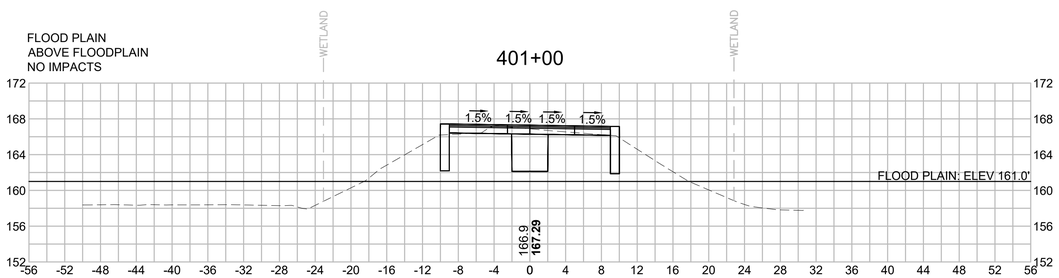


403+00

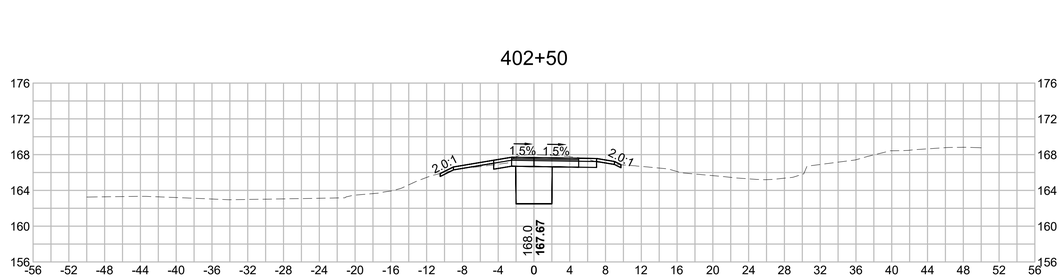


FLOOD PLAIN
ABOVE FLOODPLAIN
NO IMPACTS

401+00



402+50



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NO.	DESCRIPTION	BY	DATE	APPR.
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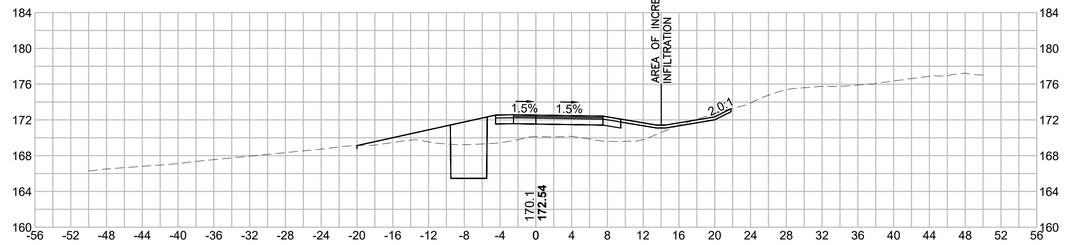
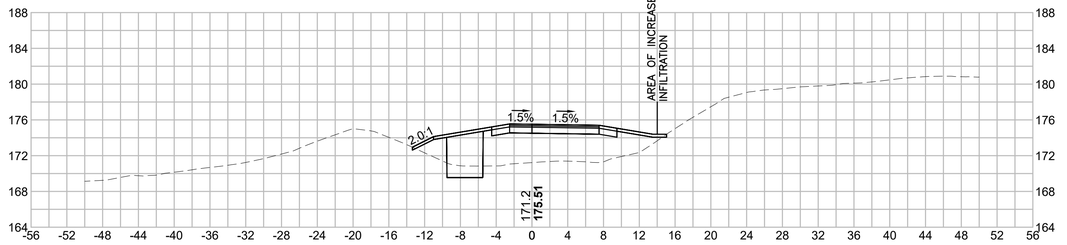
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 2800F 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

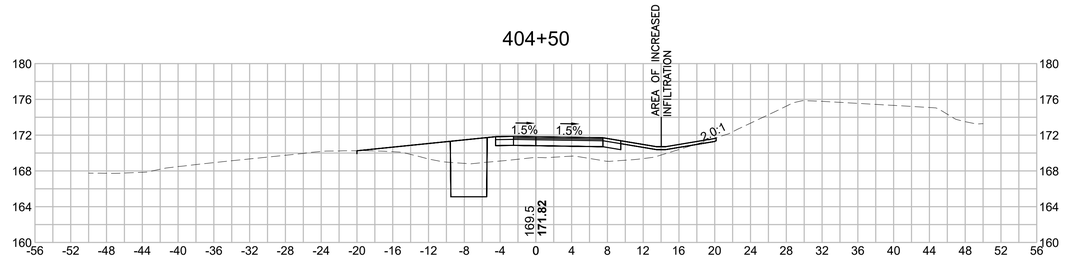
405+00



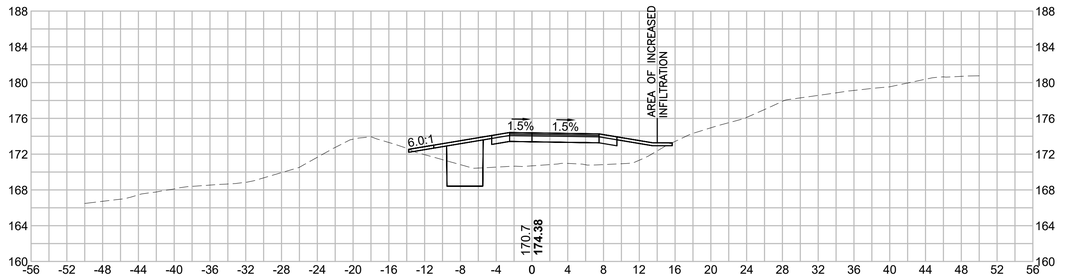
406+50



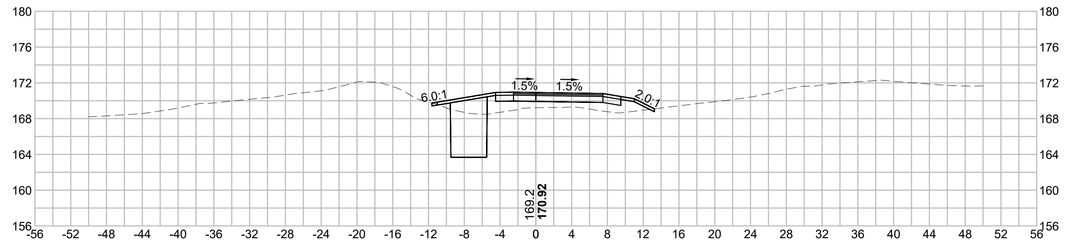
404+50



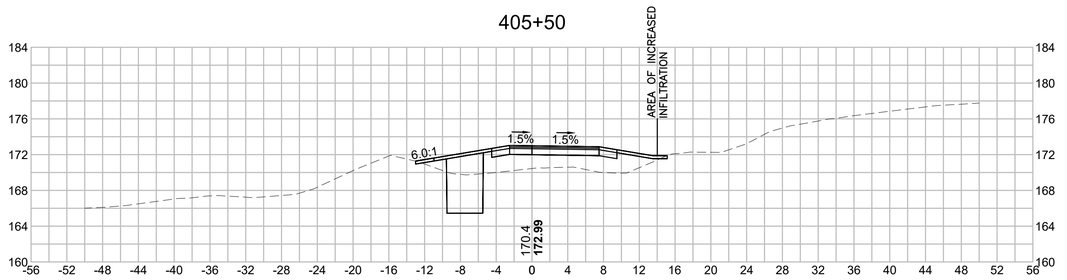
406+00



404+00



405+50



8 0 8 16
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NO.	DESCRIPTION	BY	DATE	APPR.

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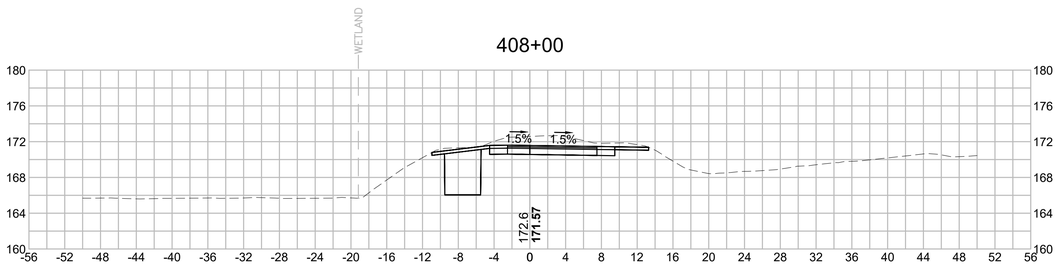
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

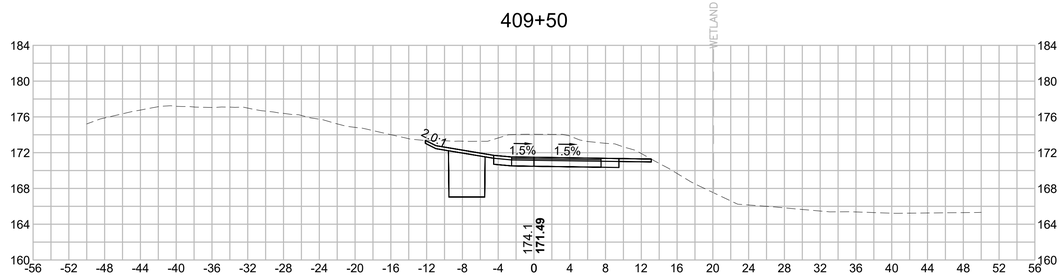
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

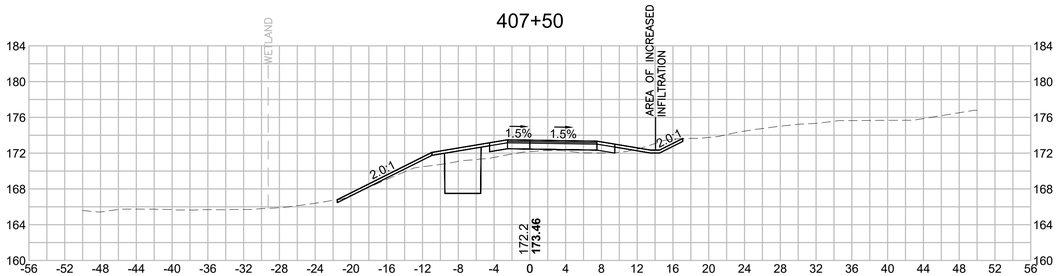
CROSS SECTIONS

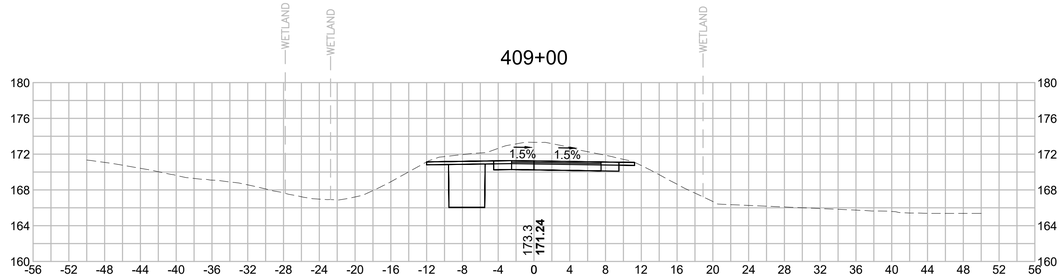
PLAN 2810F 349

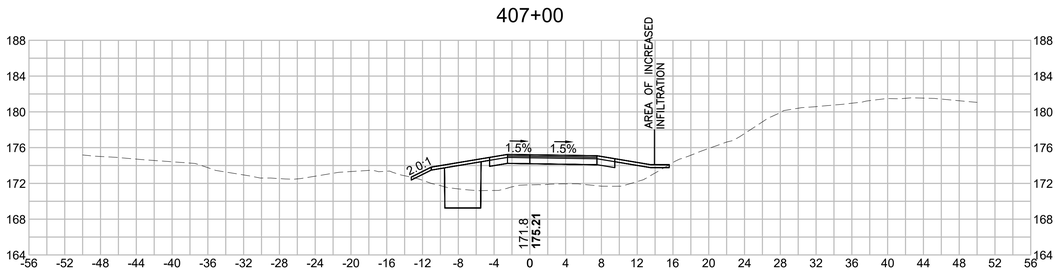
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

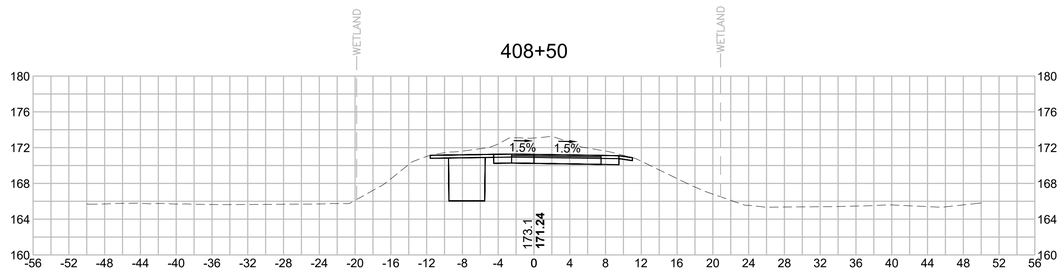












8 0 8 16
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

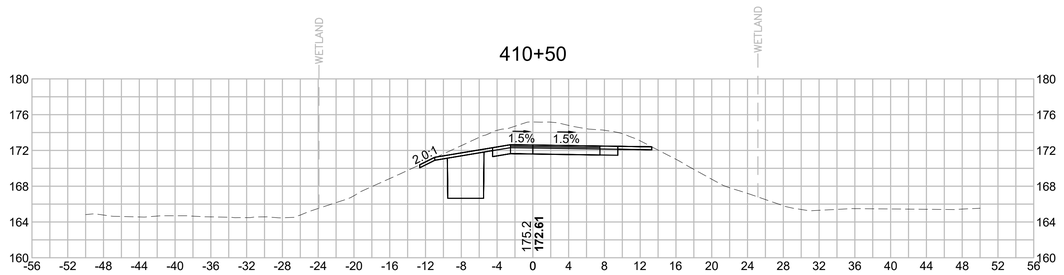
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

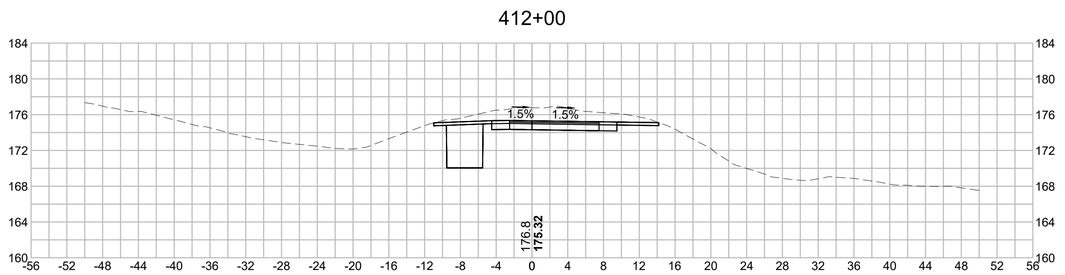
PLAN 282 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

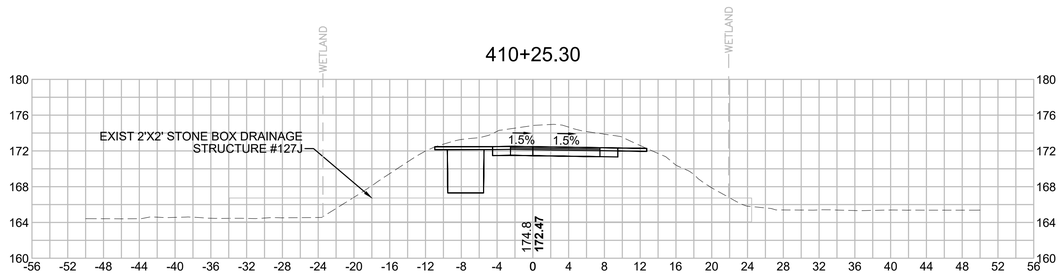
410+50



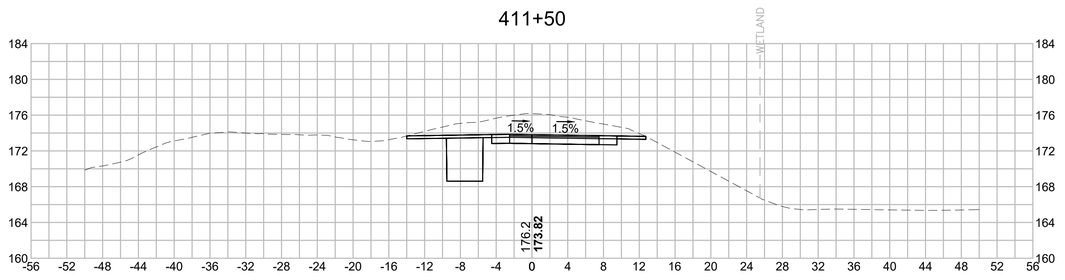
412+00



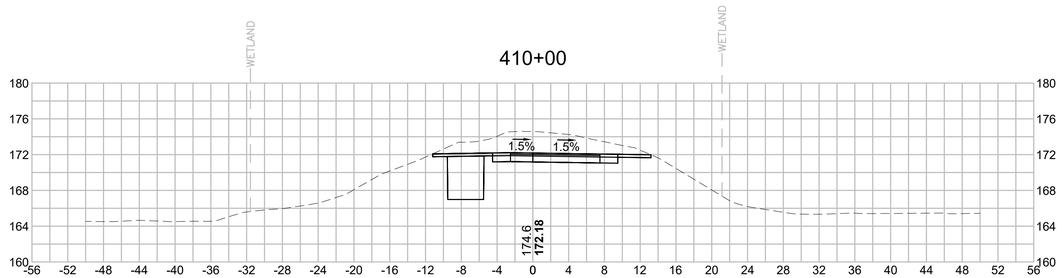
410+25.30



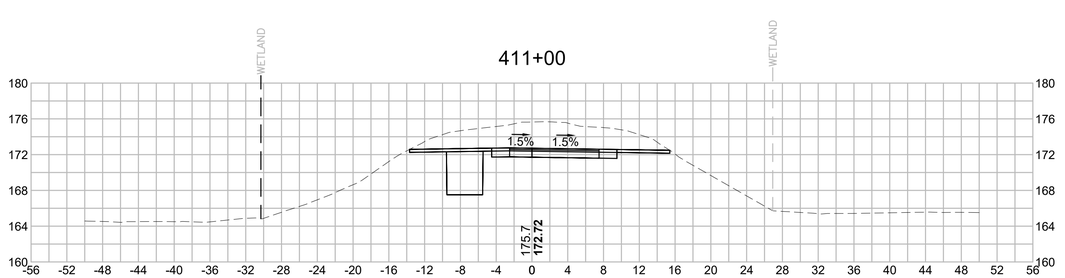
411+50



410+00



411+00



8 0 8 16
SCALE IN FEET

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

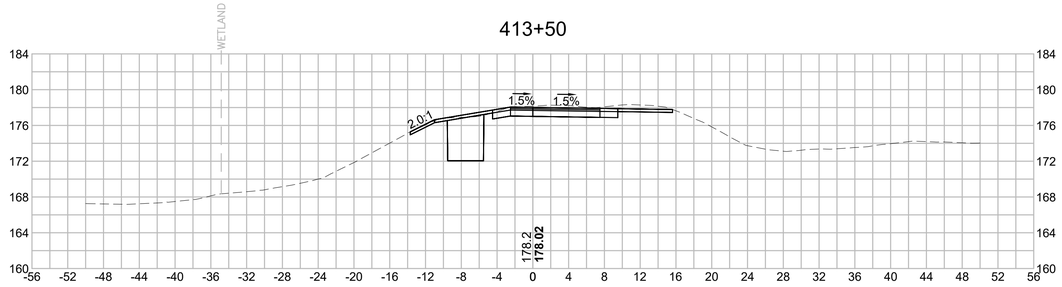
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

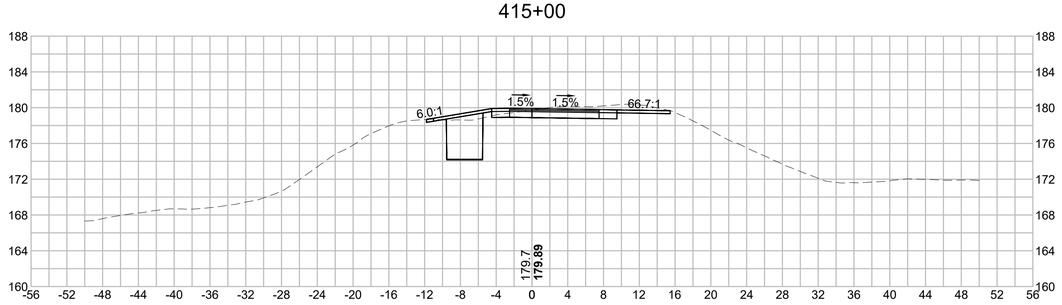
PLAN 283 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

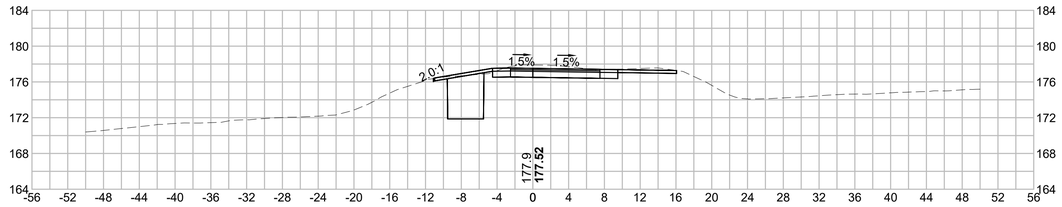
413+50



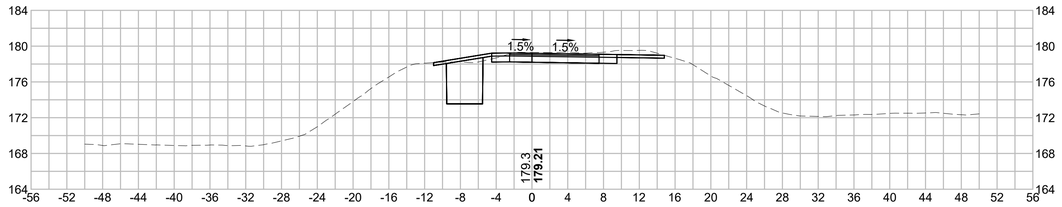
415+00



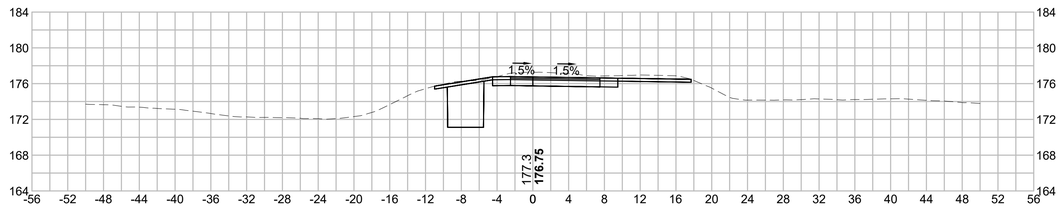
413+00



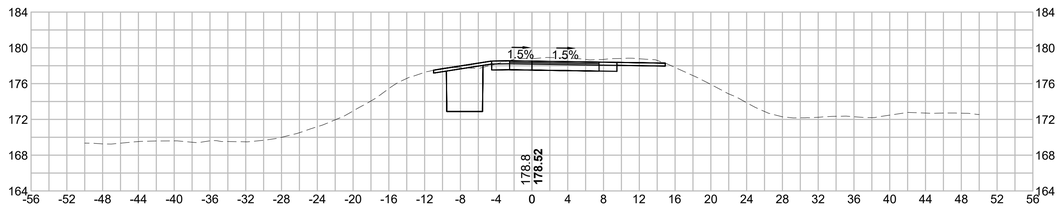
414+50



412+50



414+00



8 0 8 16
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101 Walnut St., PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

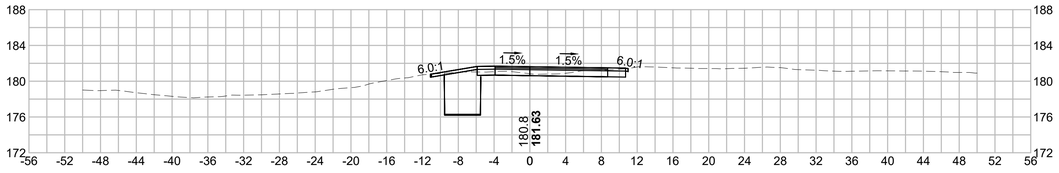
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

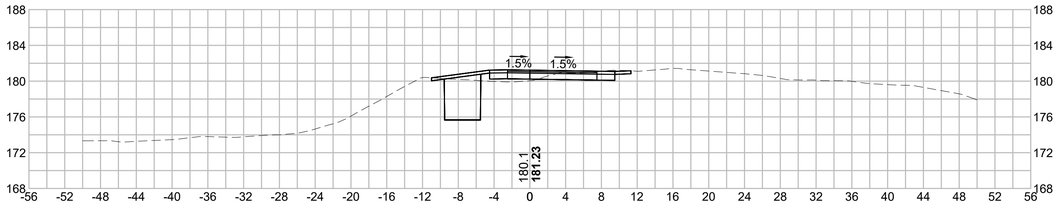
PLAN 284 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

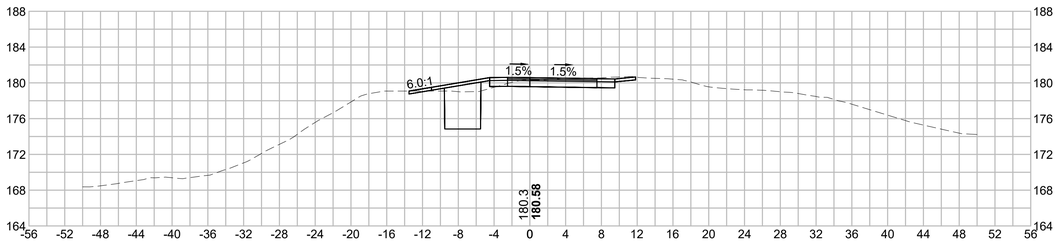
416+50



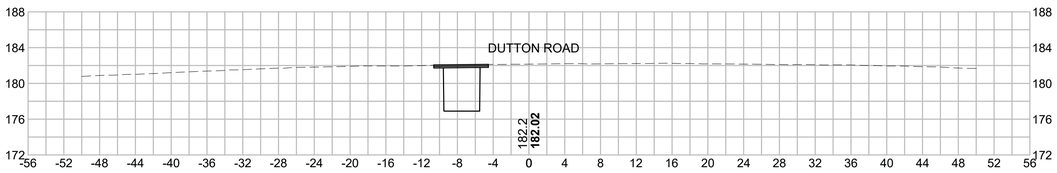
416+00



415+50



417+00



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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

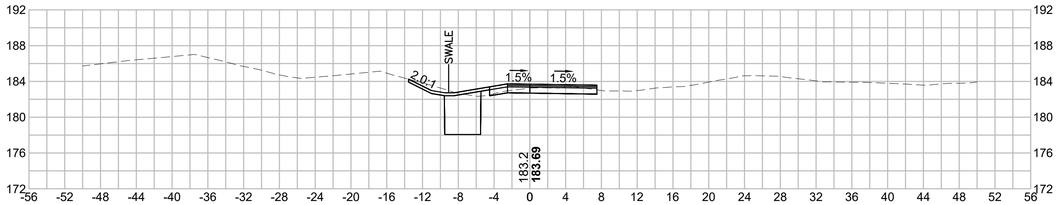
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

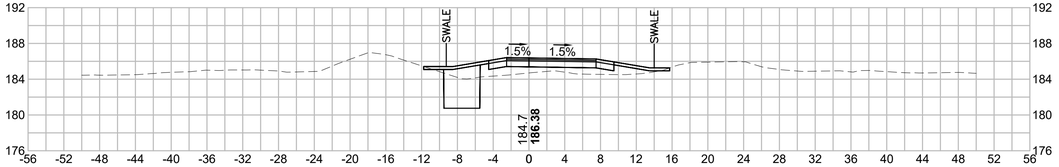
PLAN 285OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

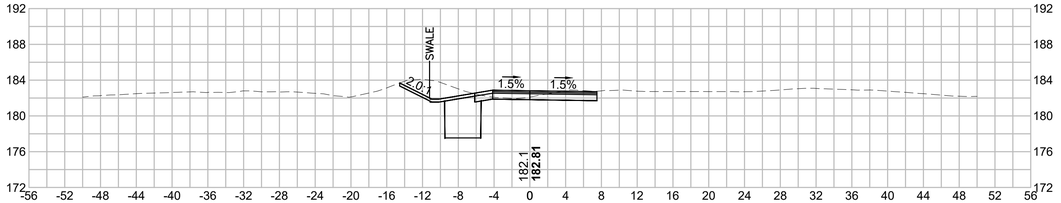
501+00



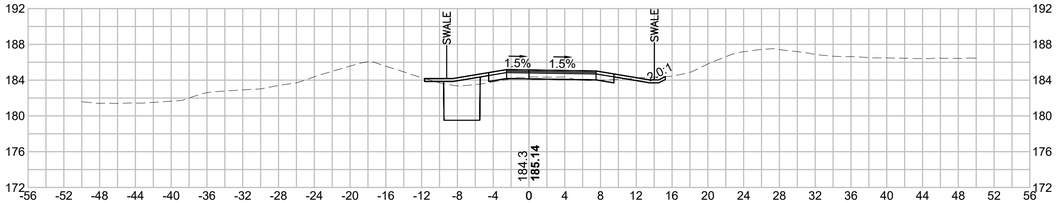
502+50



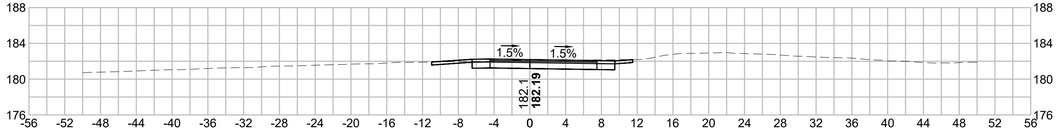
500+50



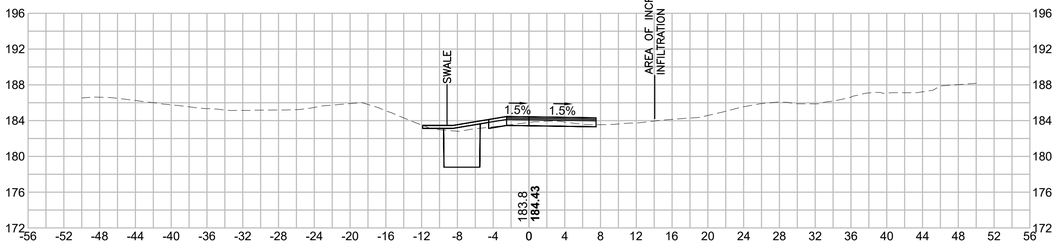
502+00



500+00



501+50



8 0 8 16
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

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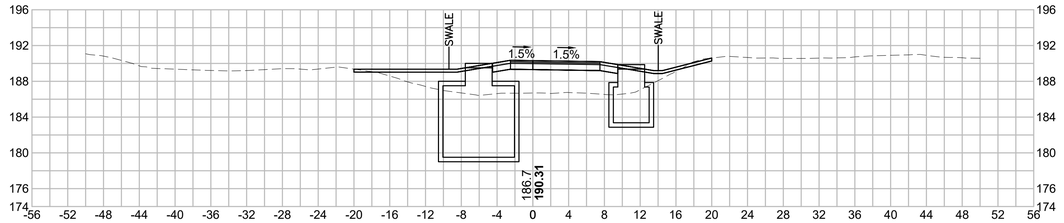
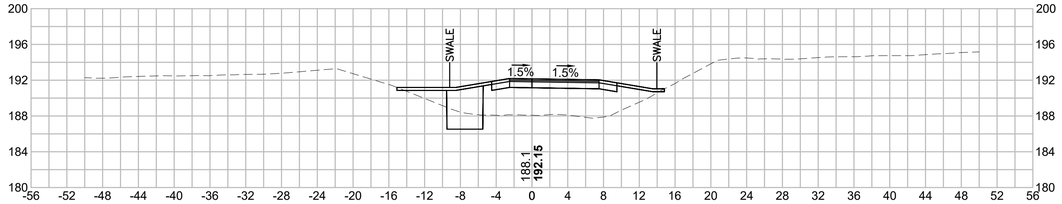
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

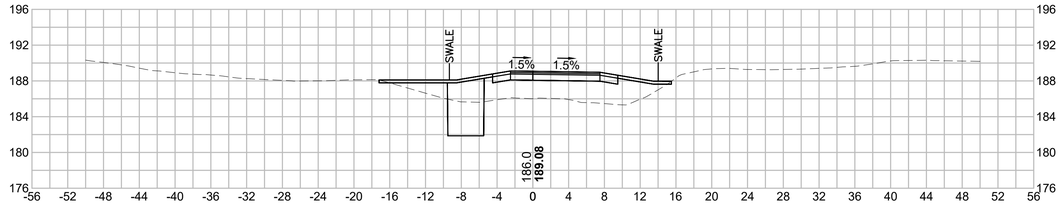
504+00



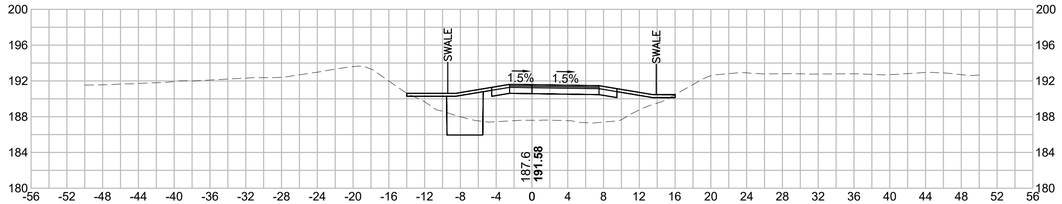
505+50



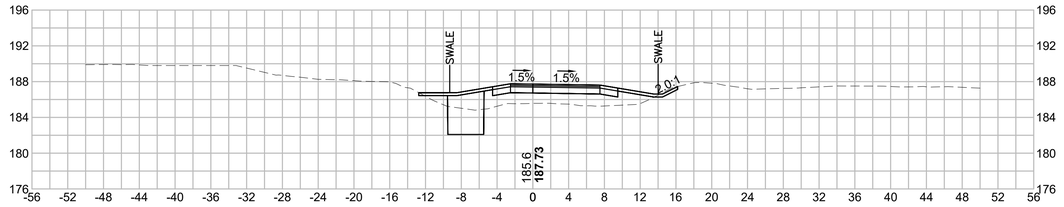
503+50



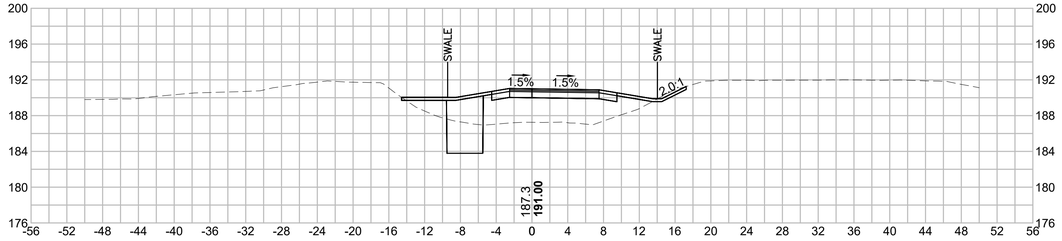
505+00



503+00



504+50



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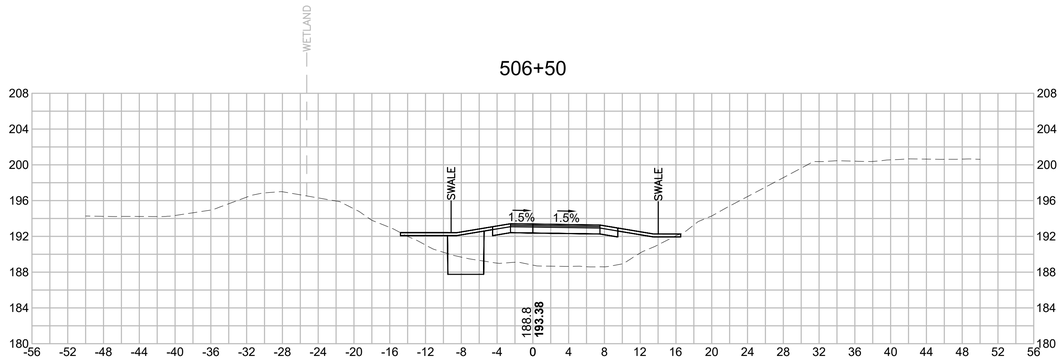
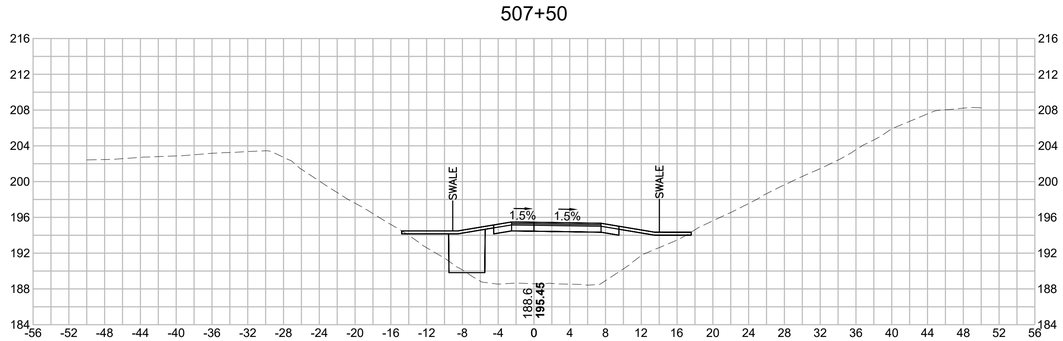
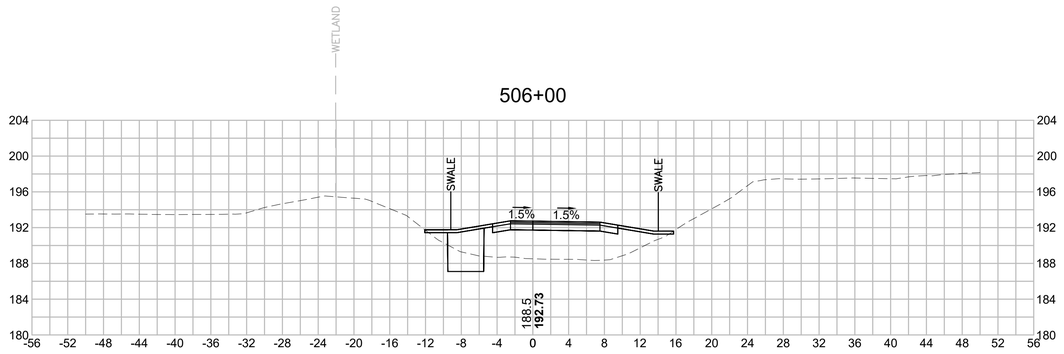
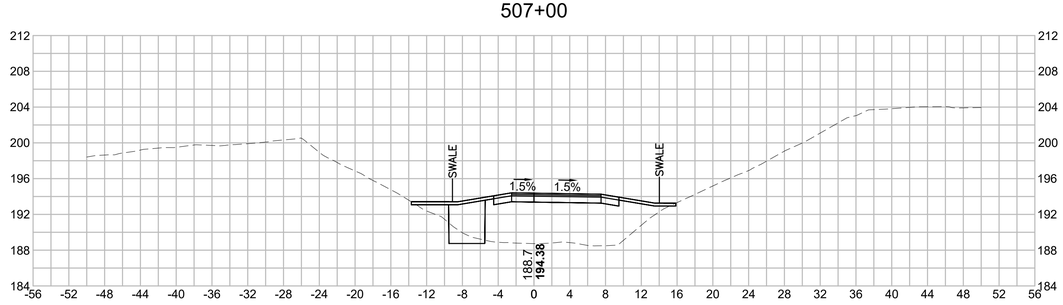
1"=8'	DEC 2021	MS	SK	MES	.	.









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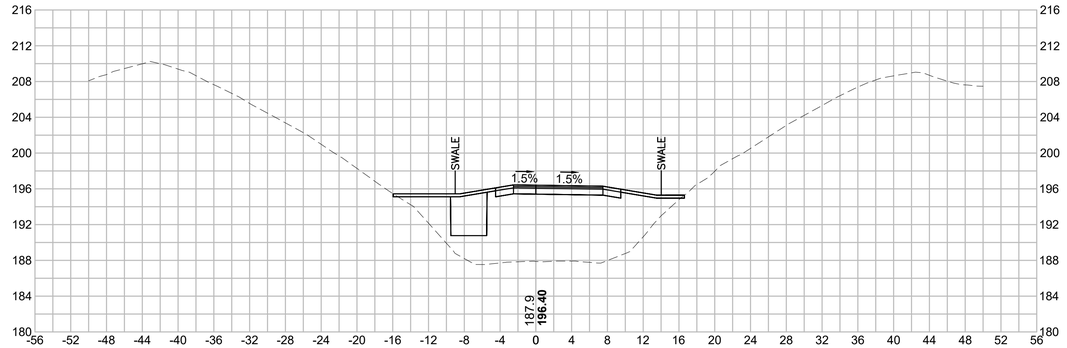
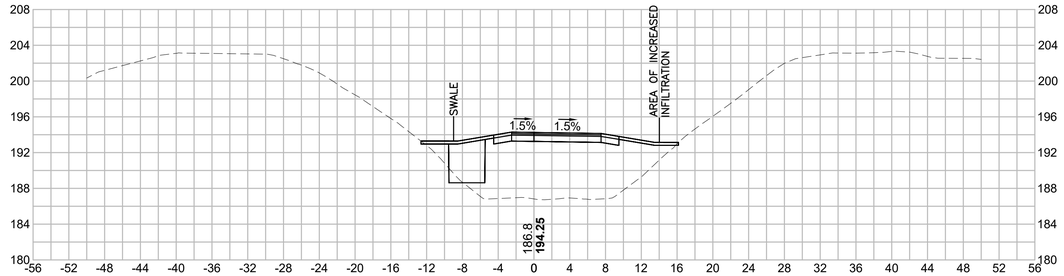
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

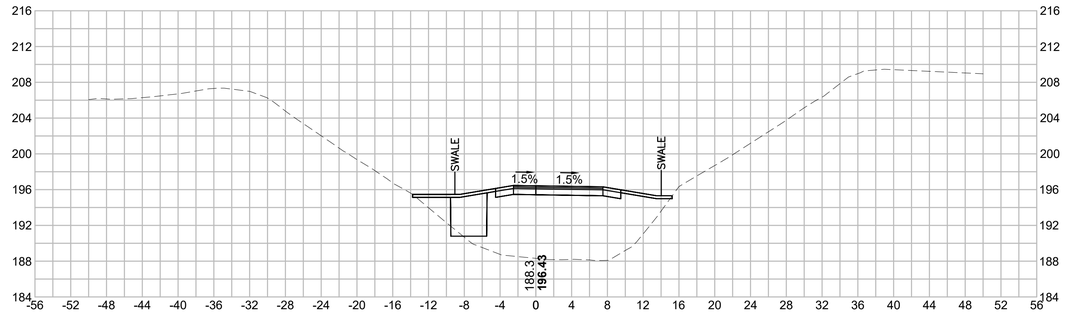
508+50



509+50



508+00



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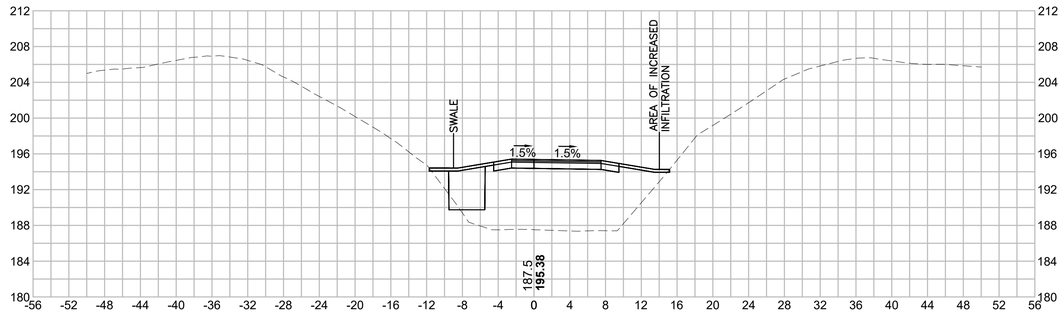

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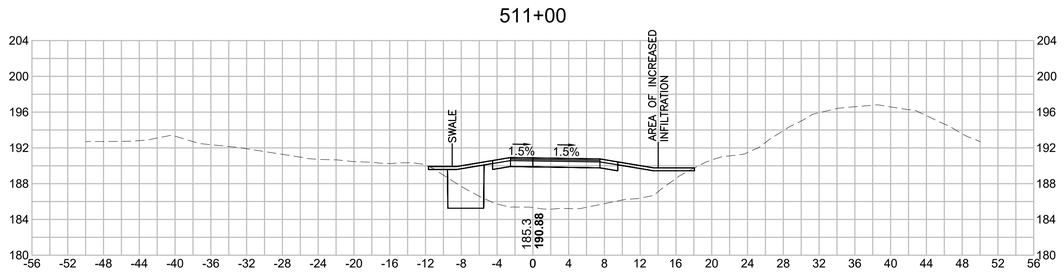
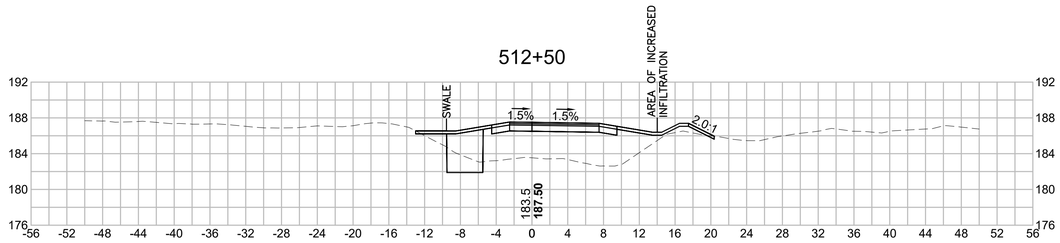
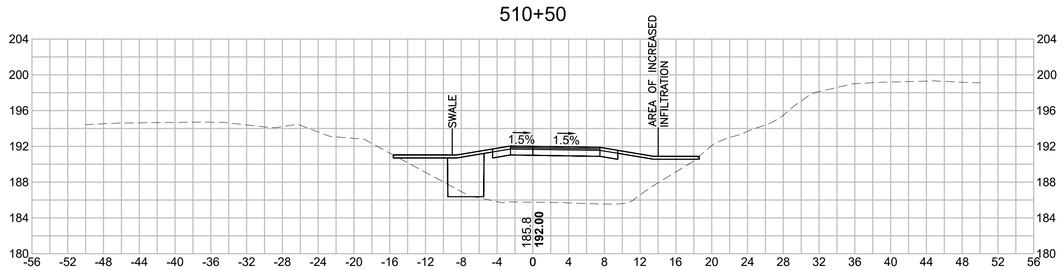
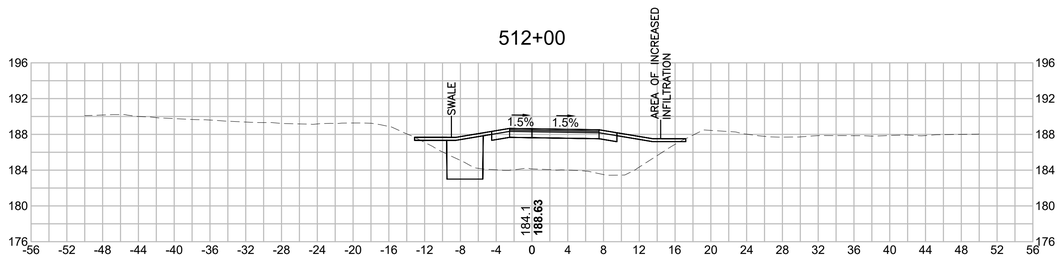
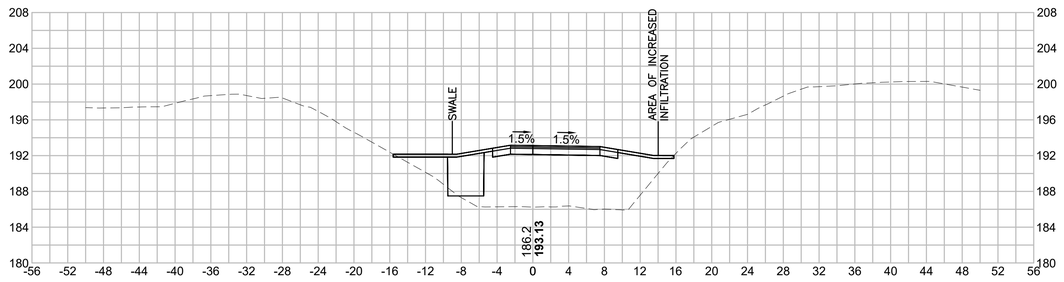
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

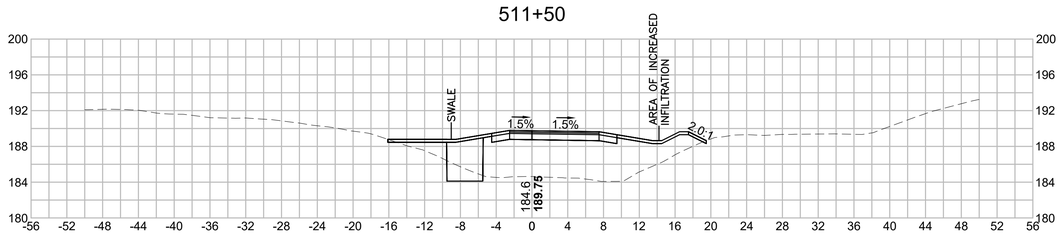












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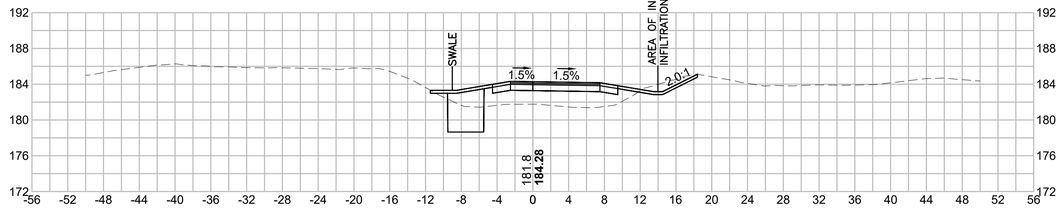
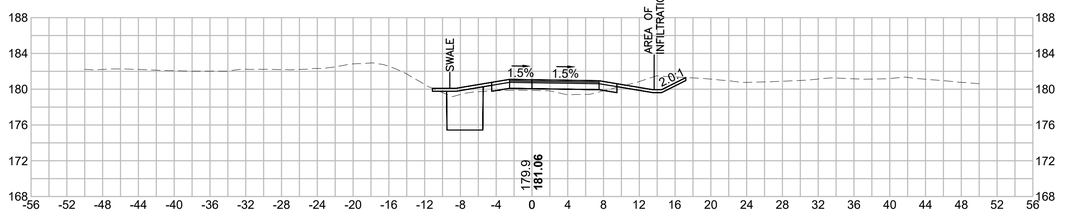
1"=8'	DEC 2021	MS	SK	MES	.	.

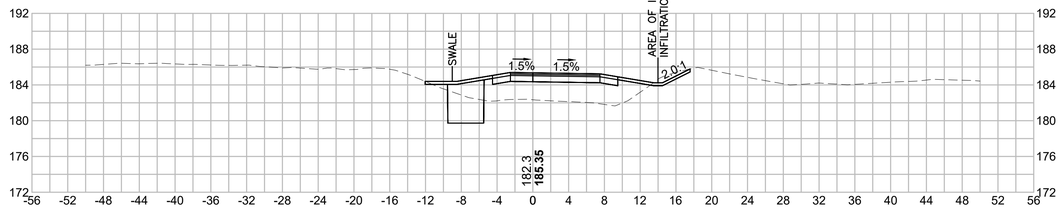
514+00



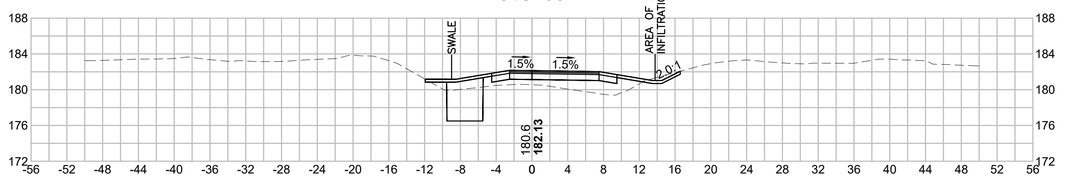
515+50



513+50



515+00



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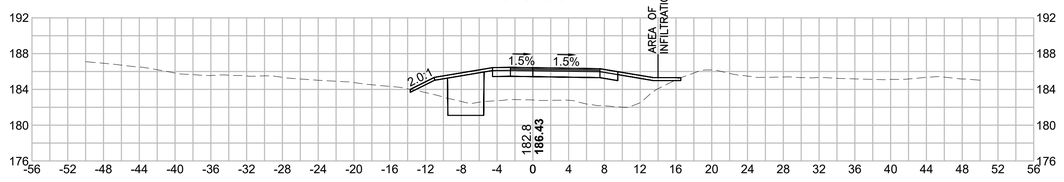

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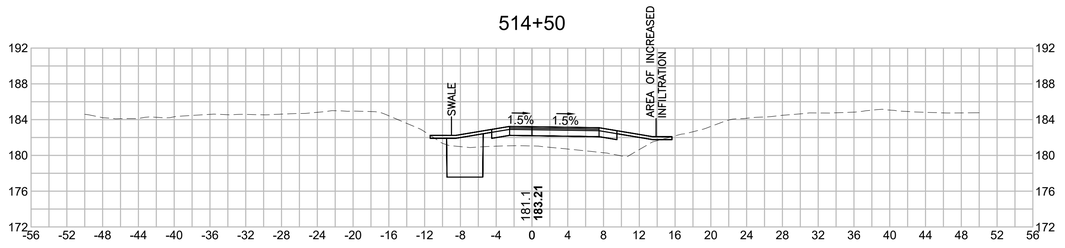

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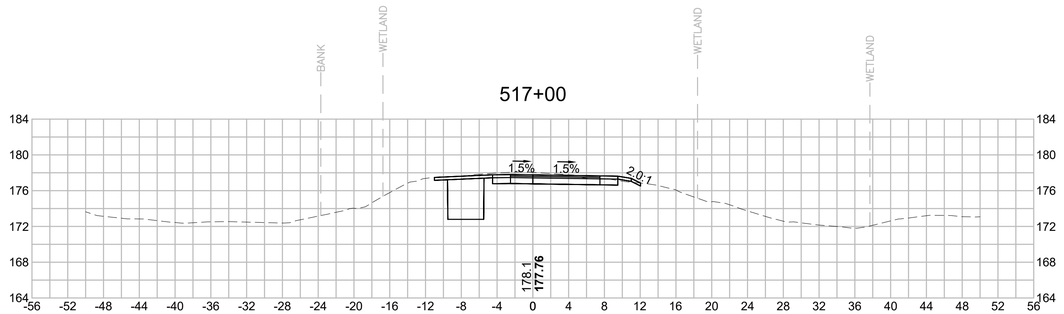
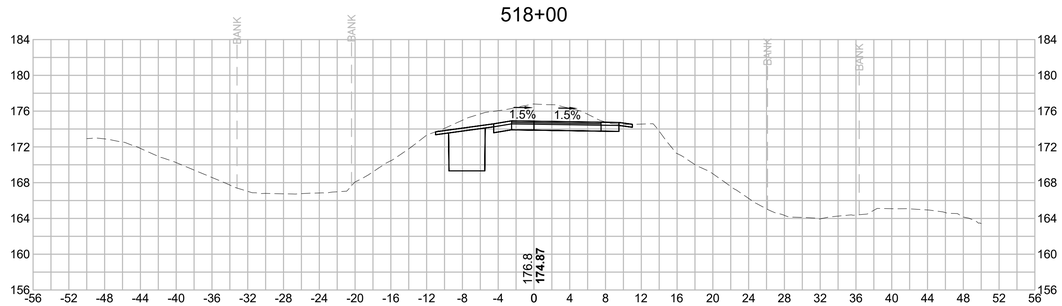
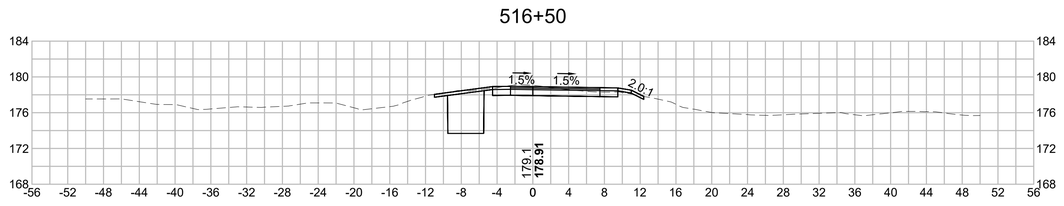
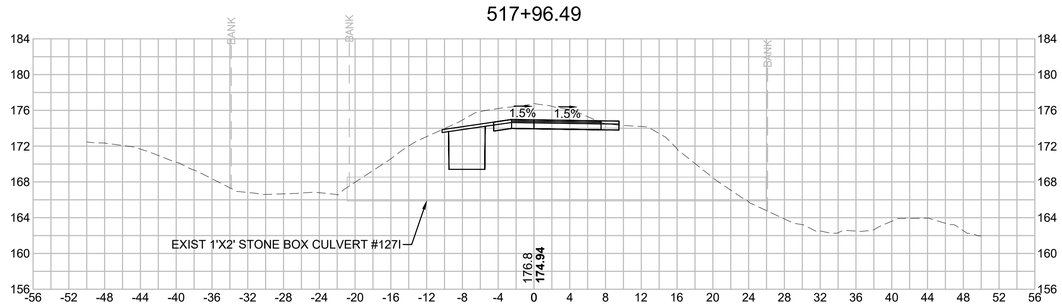
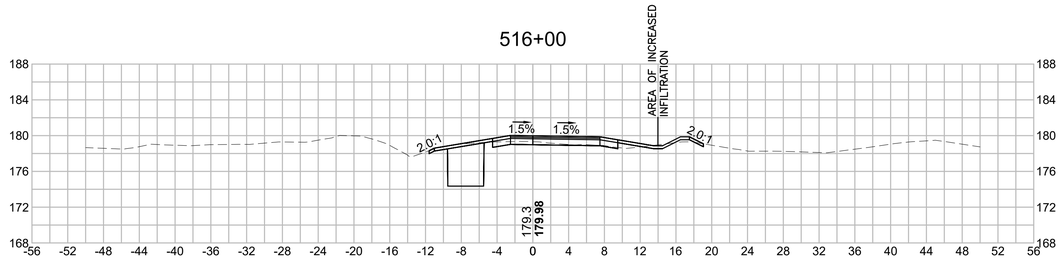
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

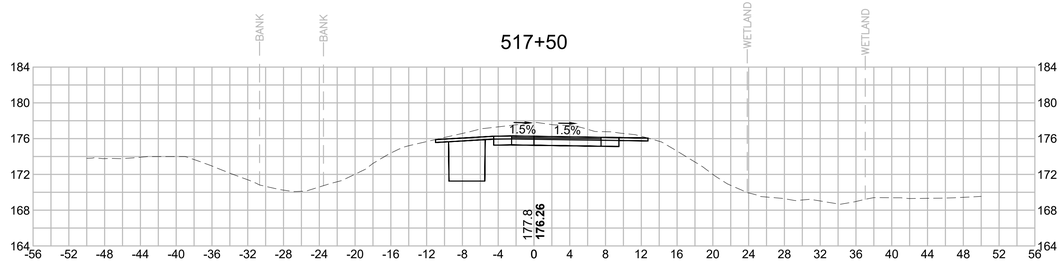












8 0 8 16
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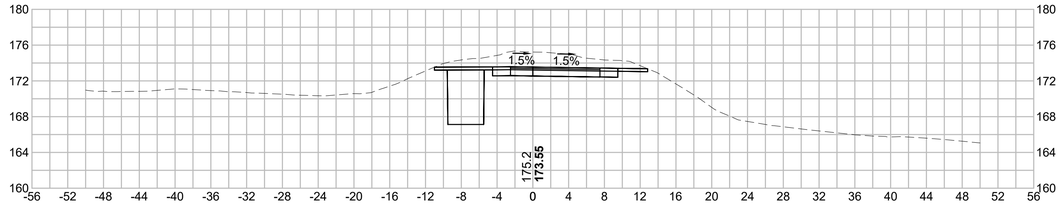
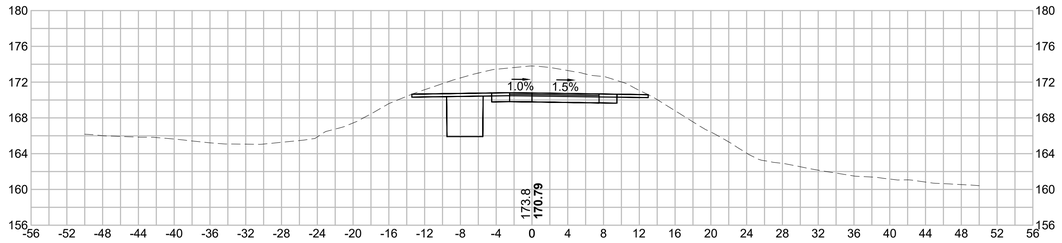
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

519+50



521+00



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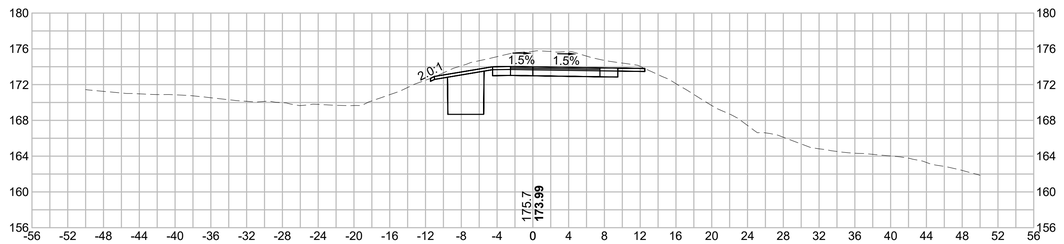
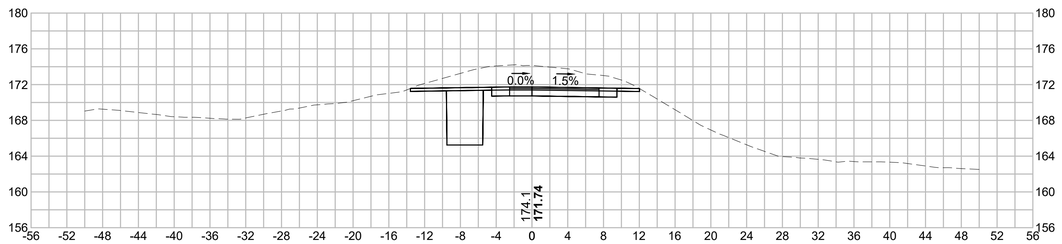
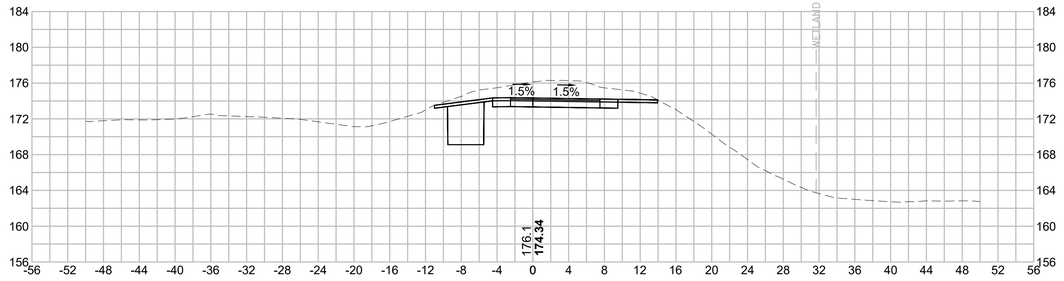


520+50



518+50



520+00

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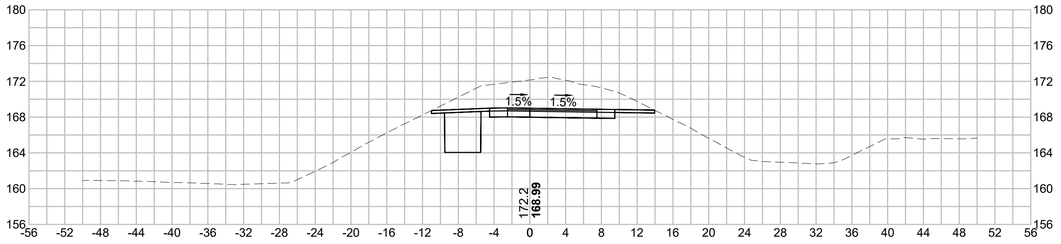
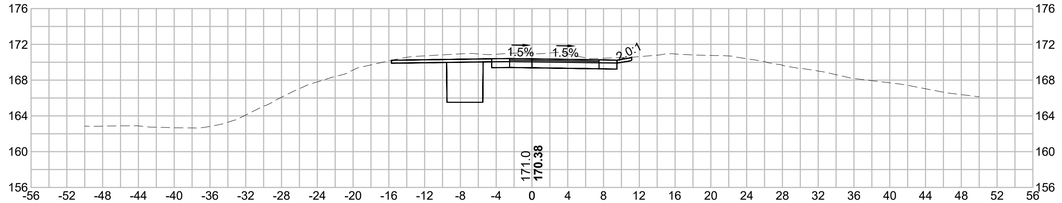
1"=8'	DEC 2021	MS	SK	MES	.	.

522+00



523+50



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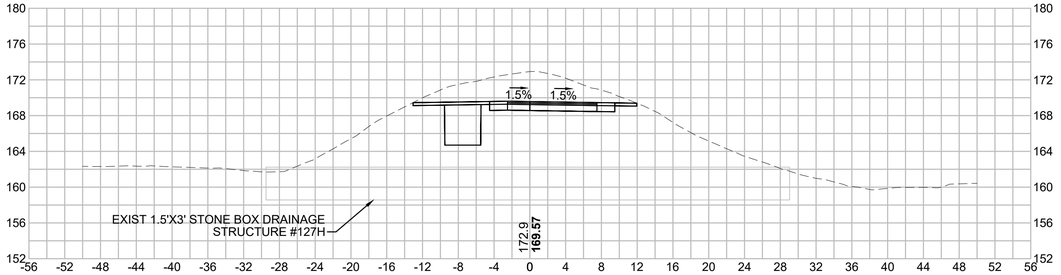
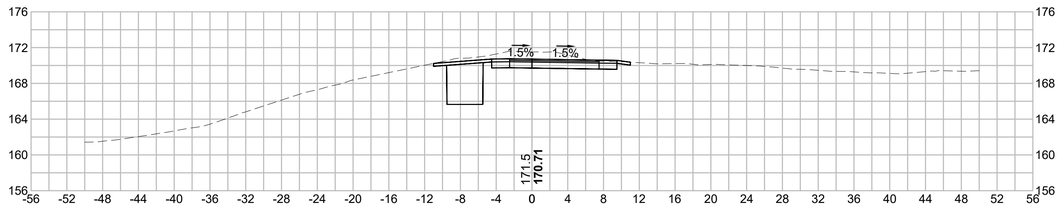


523+00



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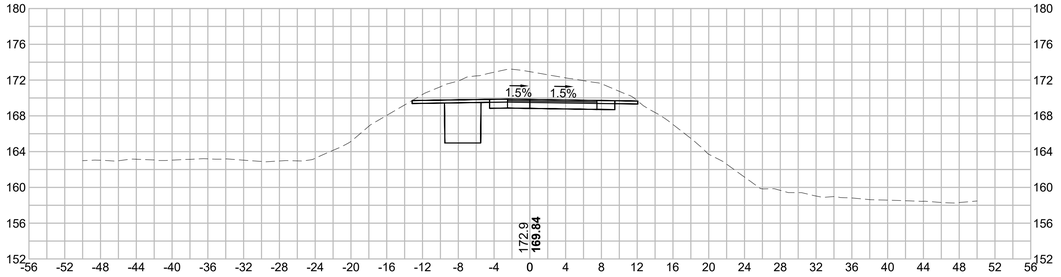

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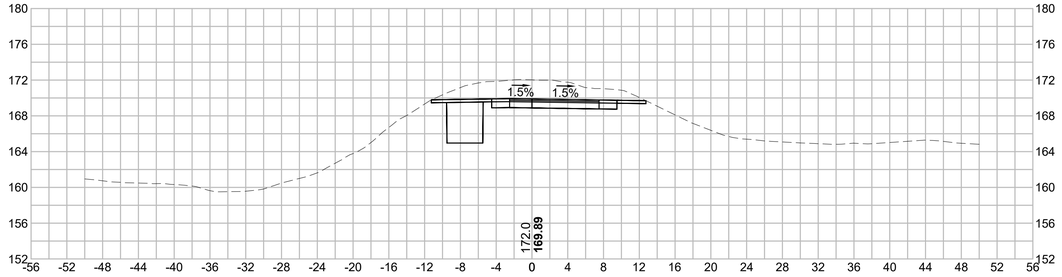

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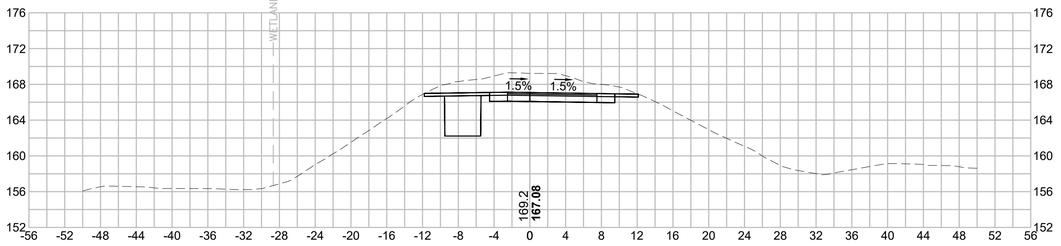
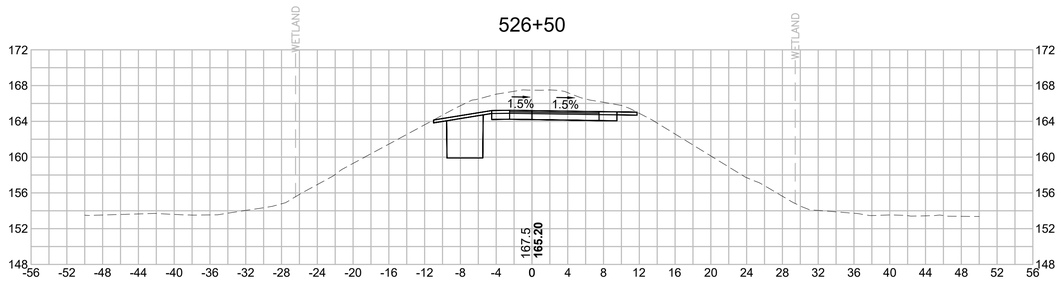
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

525+00



526+50



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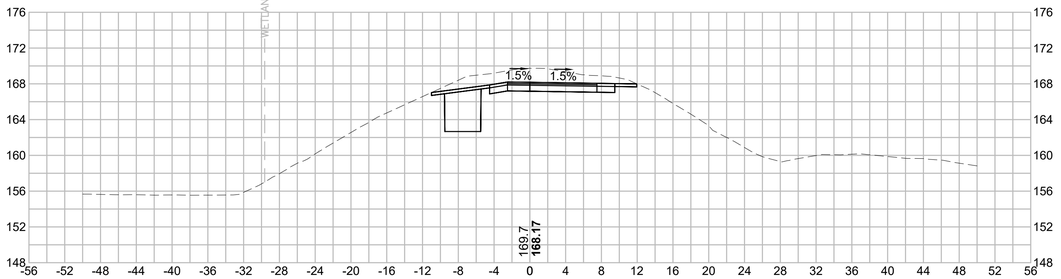
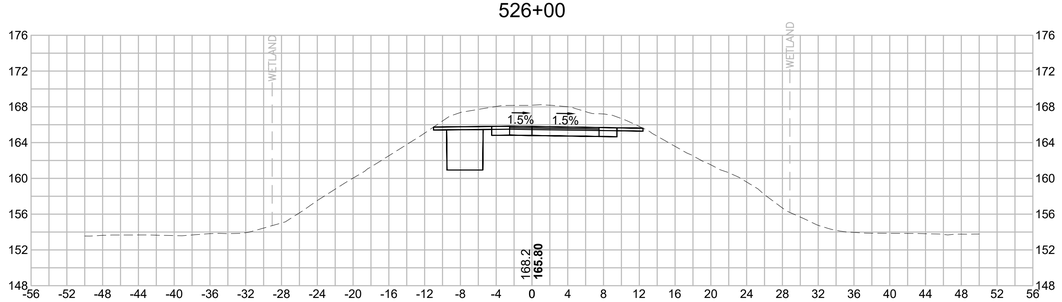


526+00



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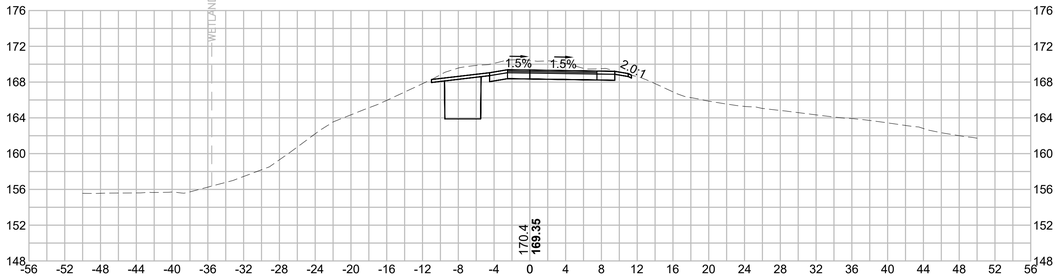

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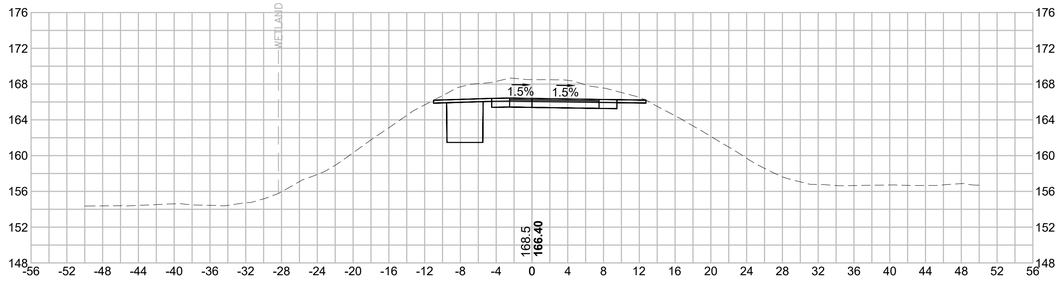

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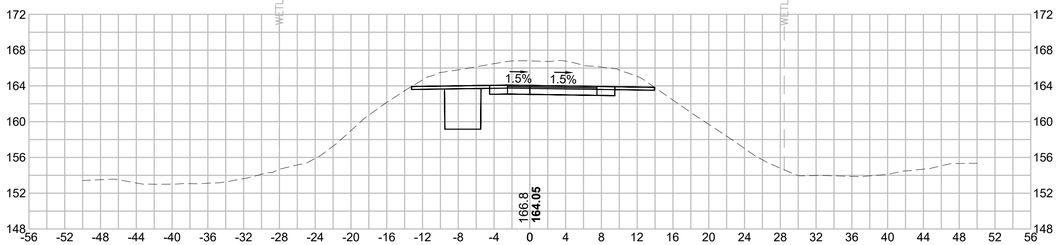
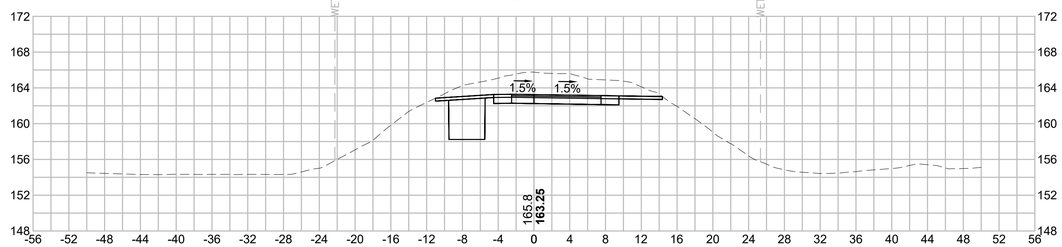
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

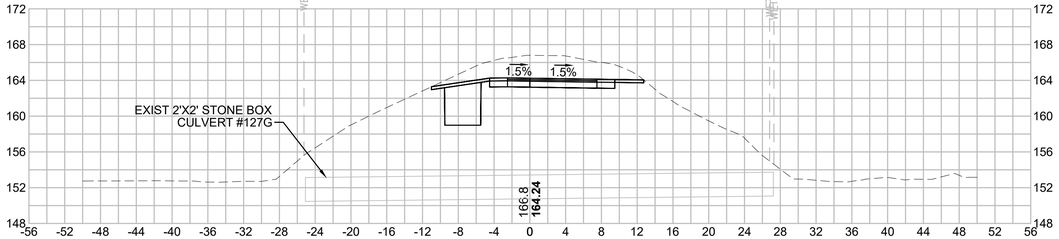
527+50



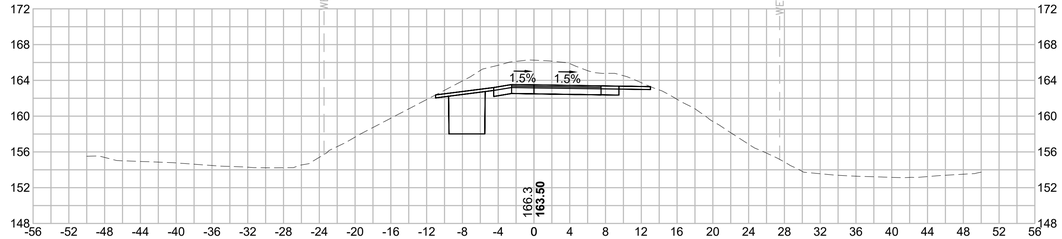
529+00



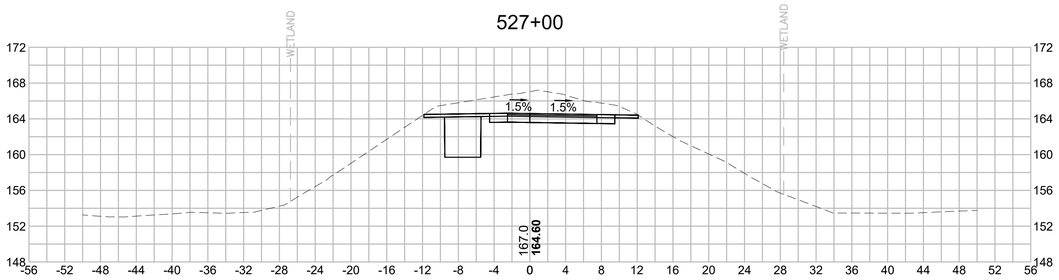
527+30



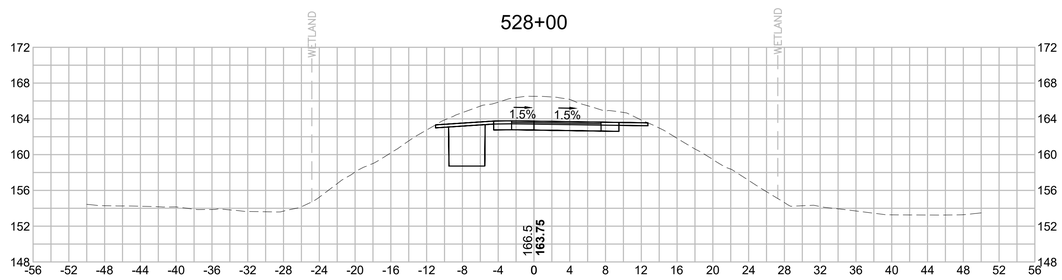
528+50



527+00



528+00



8 0 8 16
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NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

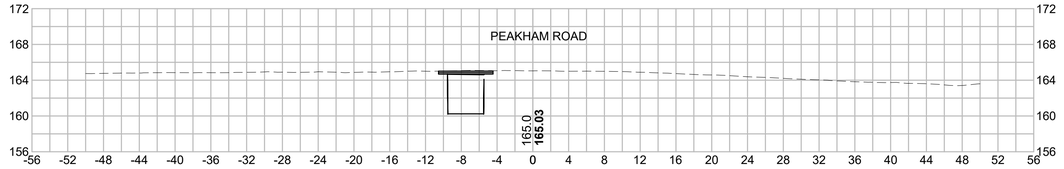
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

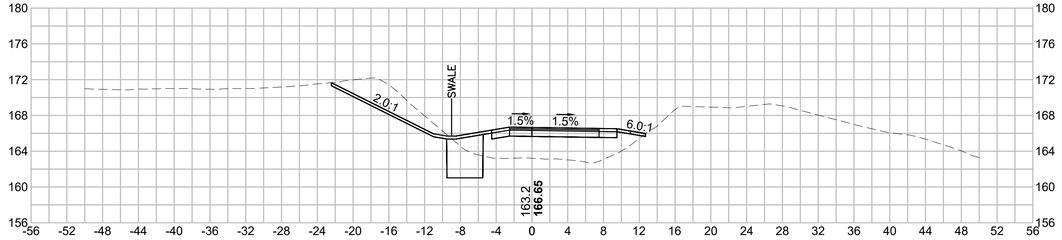
PLAN 296 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

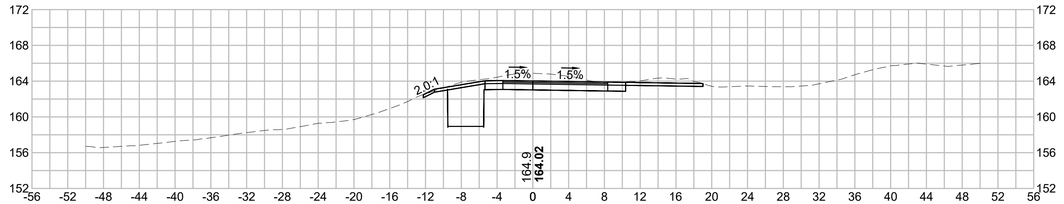
530+50



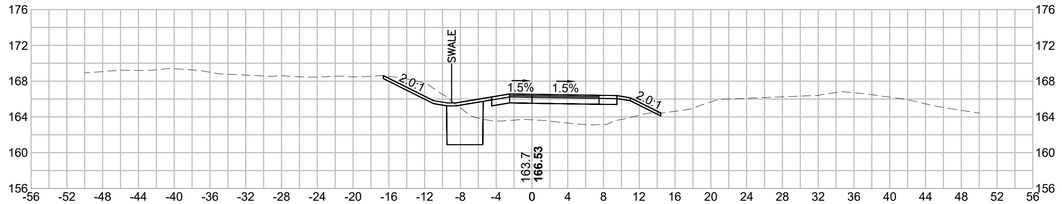
532+00



530+00



531+50



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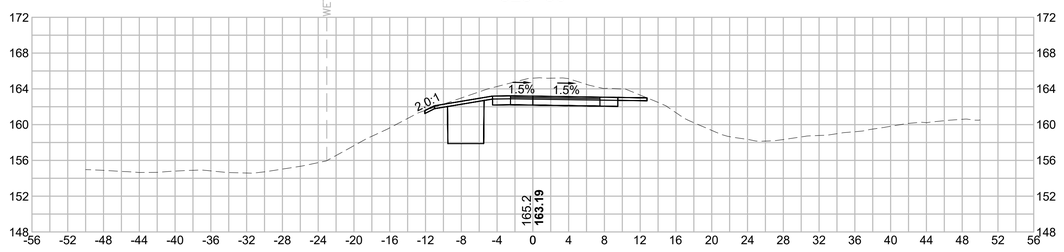

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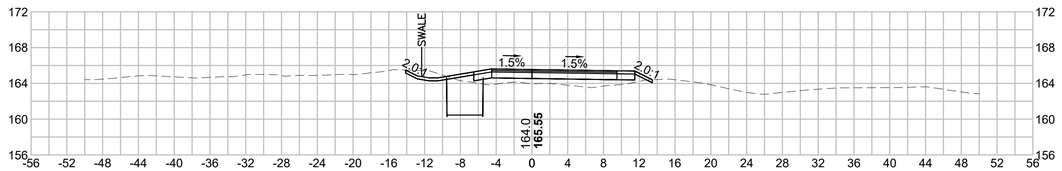

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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

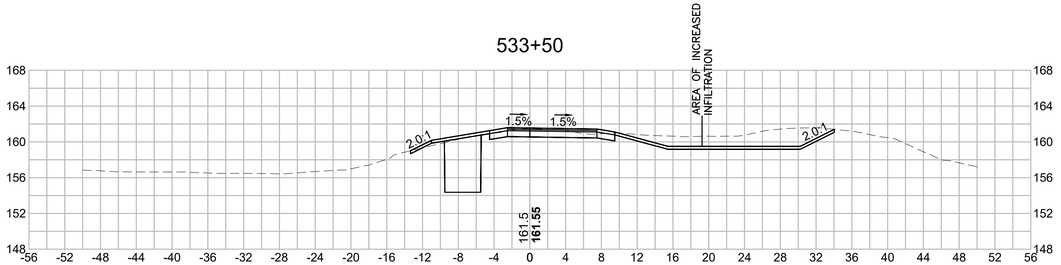
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

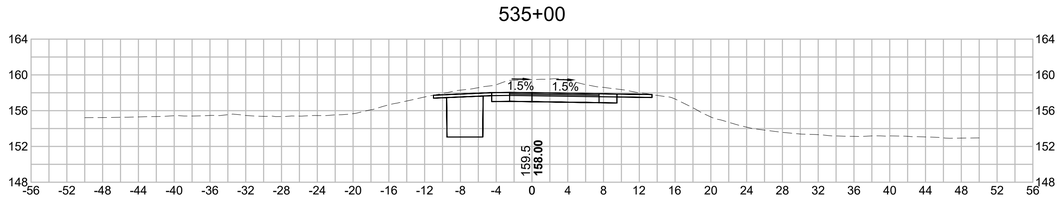
PLAN 297 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

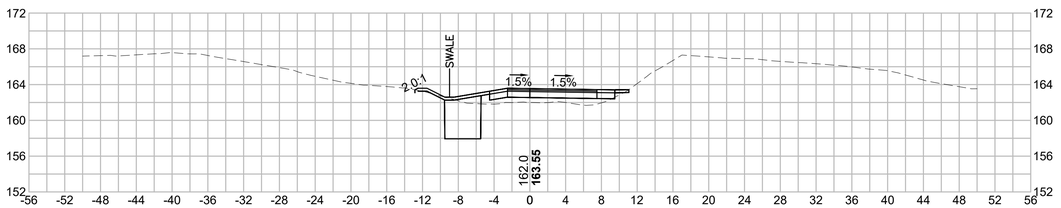
533+50



535+00



533+00



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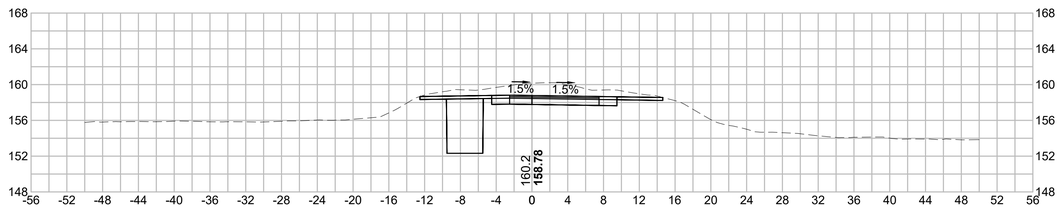

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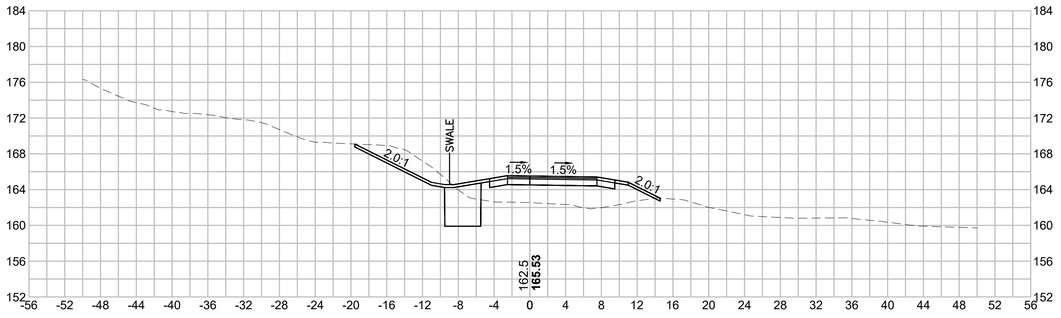
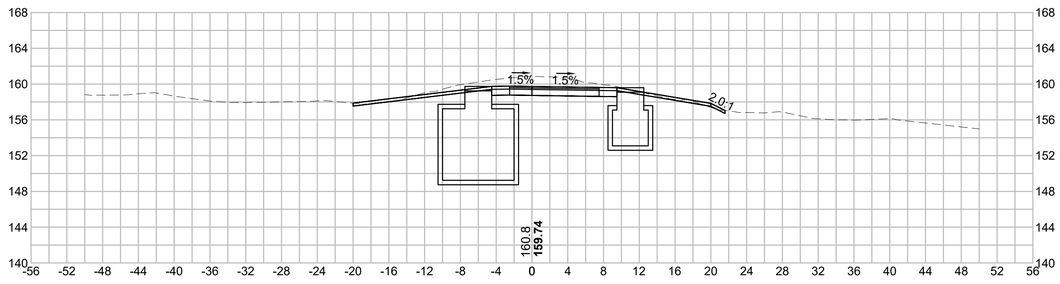


534+00



BLSF CROSSING STA 535 TO STA 542 - FEMA ZONE AE - DUDLEY BROOK
FEMA ELEVATION: UPSTREAM PORTION (152.2) AND DOWNSTREAM PORTION (148.6)
NO IMPACTS

8 0 8 16
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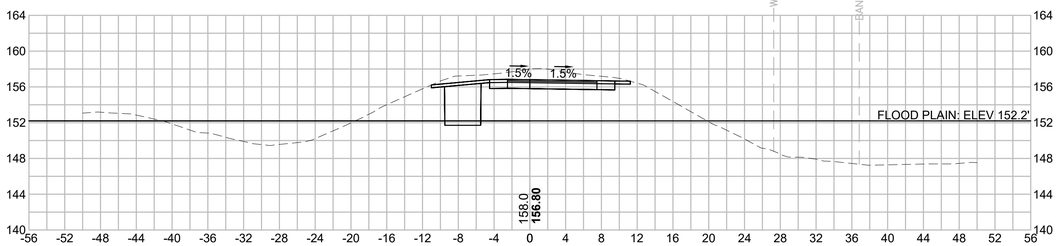
EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 298 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

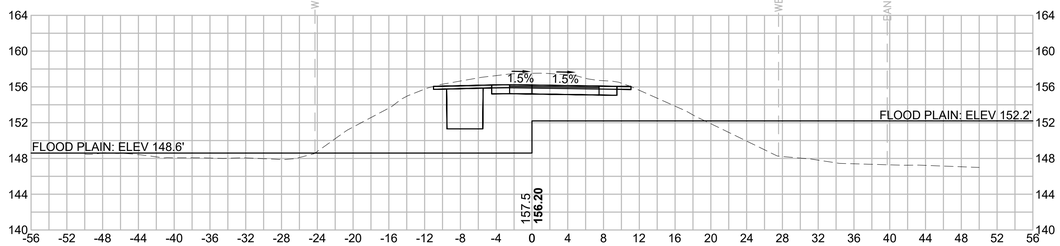
FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN

536+50



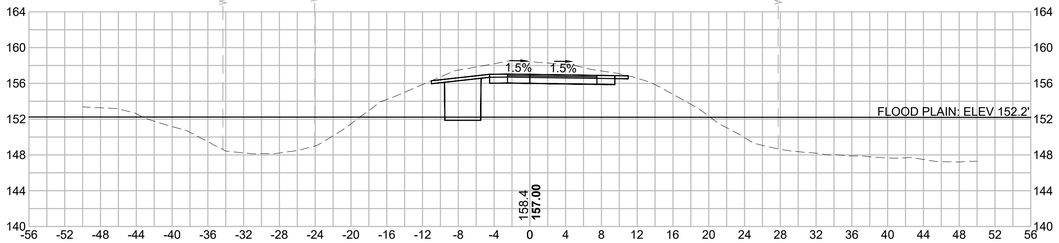
FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN

538+00



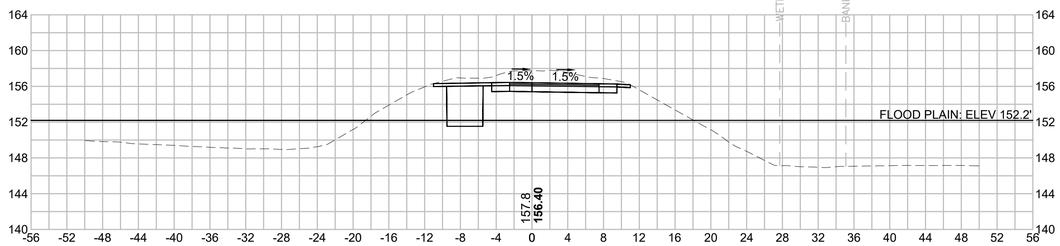
FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN

536+00



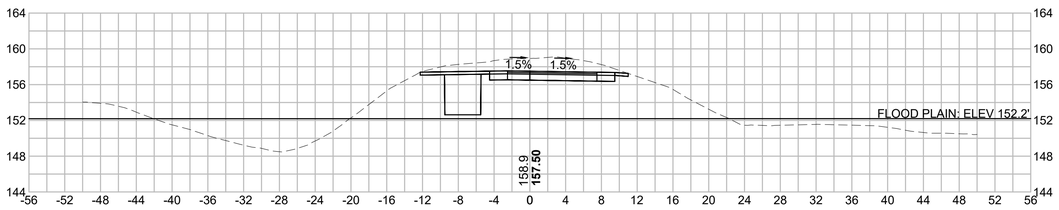
FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN

537+50



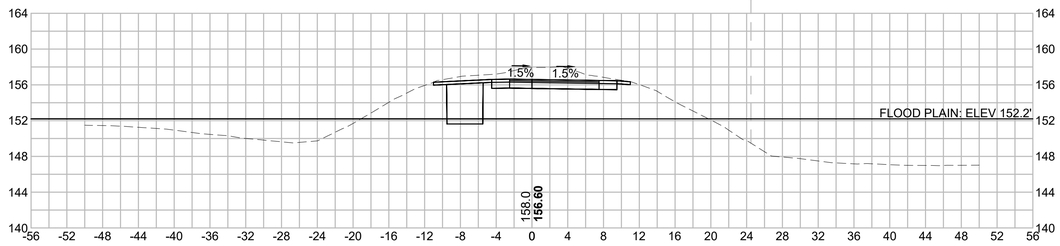
FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN

535+50



FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN

537+00



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NO.	DESCRIPTION	BY	DATE	APPR.
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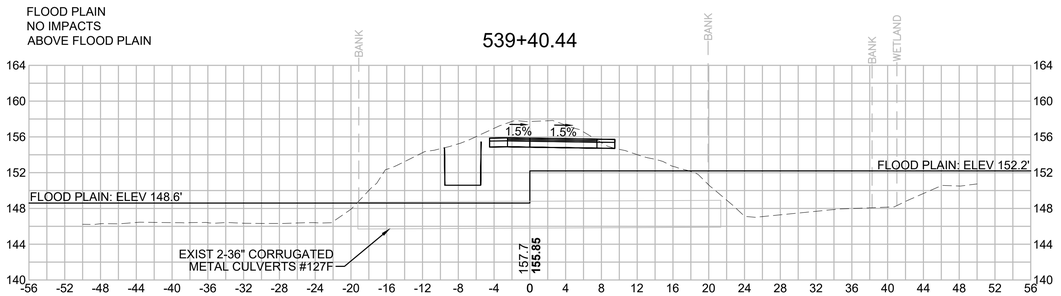
EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 299 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

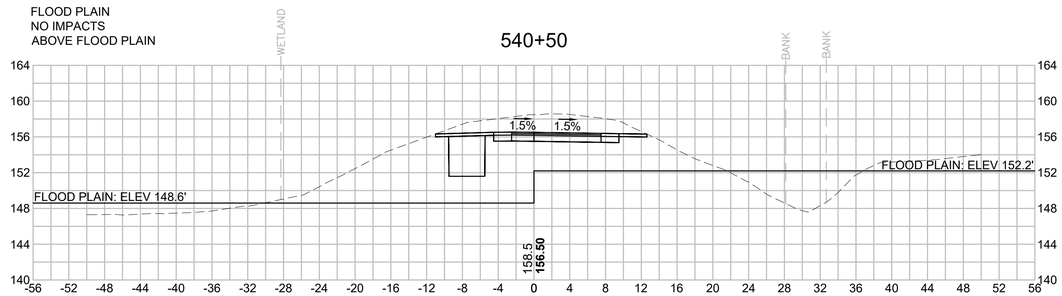
FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN

539+40.44



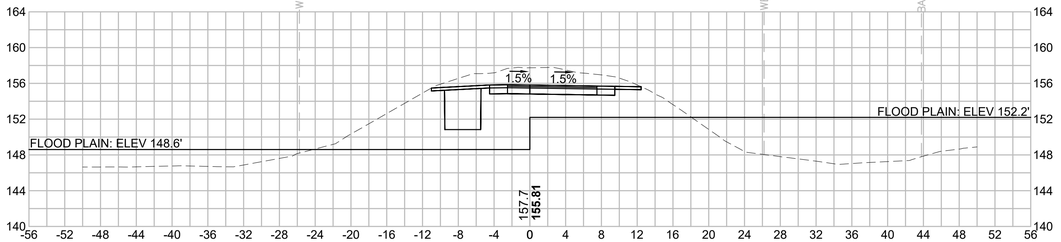
FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN

540+50



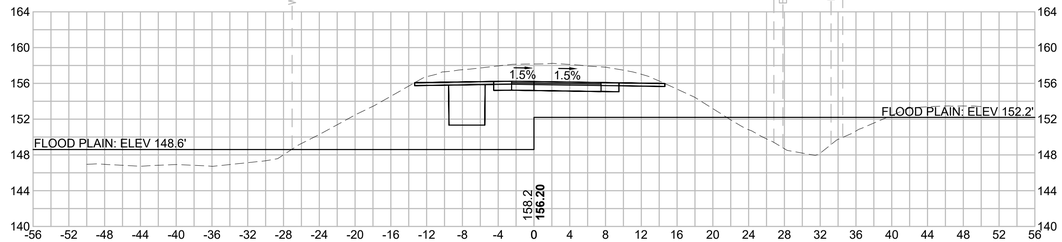
FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN

539+00



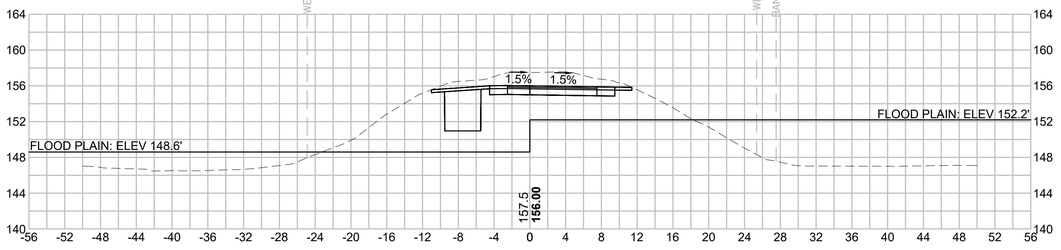
FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN

540+00



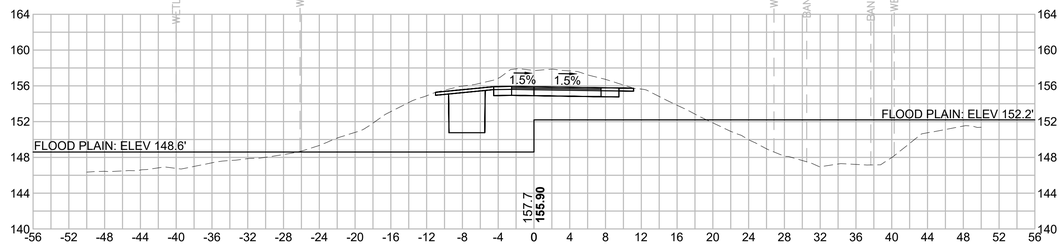
FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN

538+50



FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN

539+50



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Watertown, MA 02472
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NO.	DESCRIPTION	BY	DATE	APPR.

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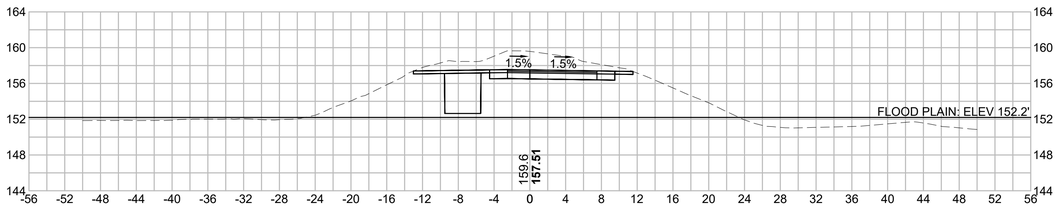
EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 300 OF 349

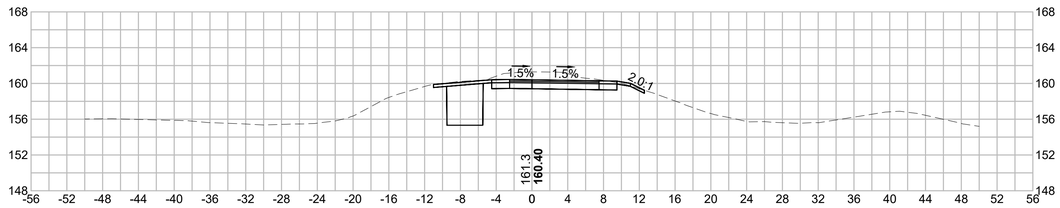
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN

542+00

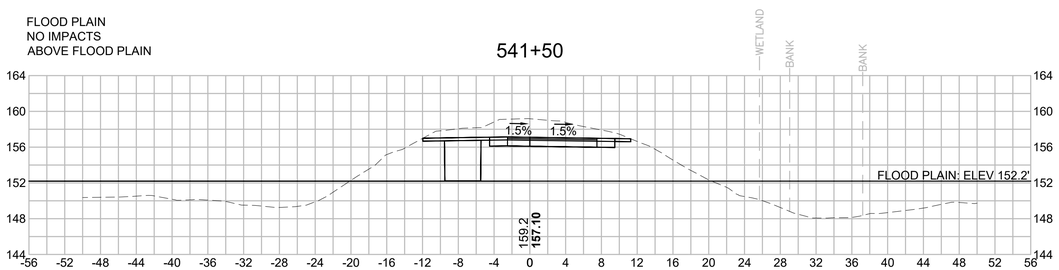


543+50

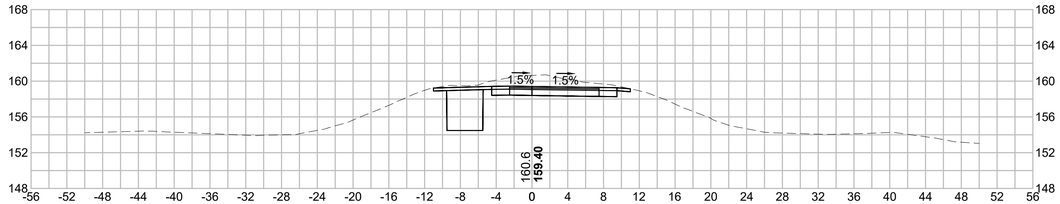


FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN

541+50

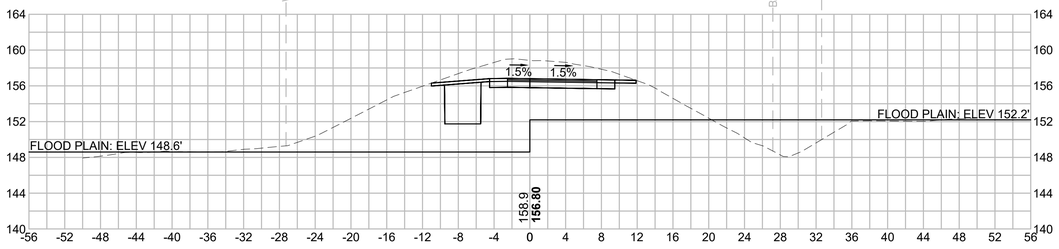


543+00



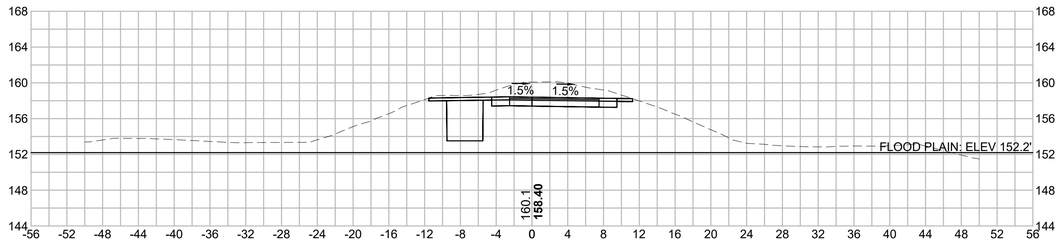
FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN

541+00



FLOOD PLAIN
NO IMPACTS
ABOVE FLOOD PLAIN

542+50



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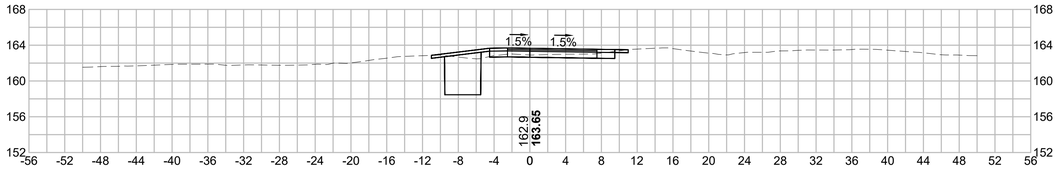
EVERSOURCE

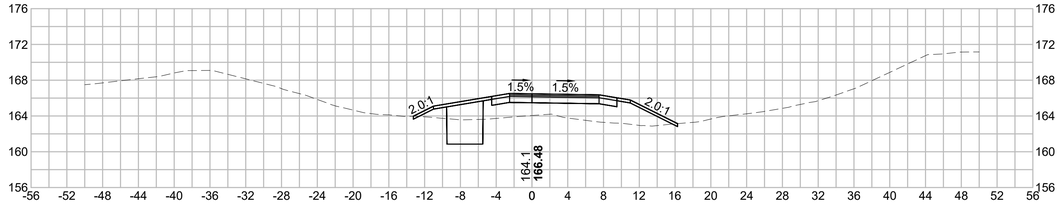
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 3010F 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

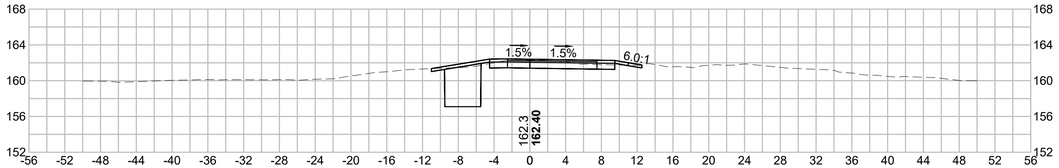
545+00



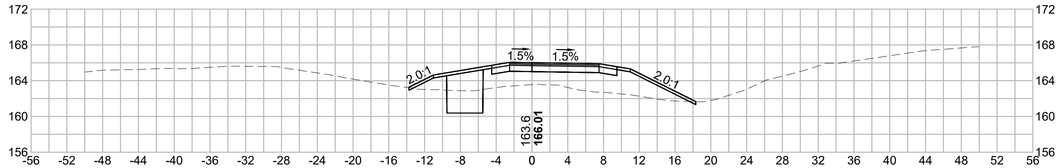
546+50



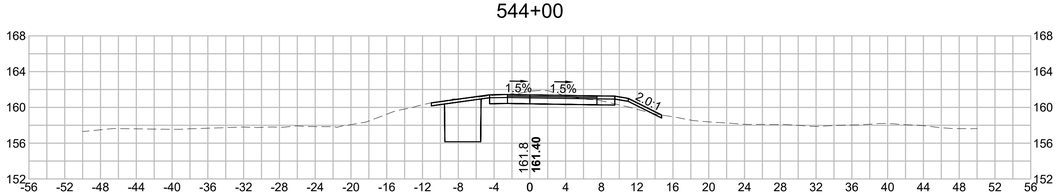
544+50



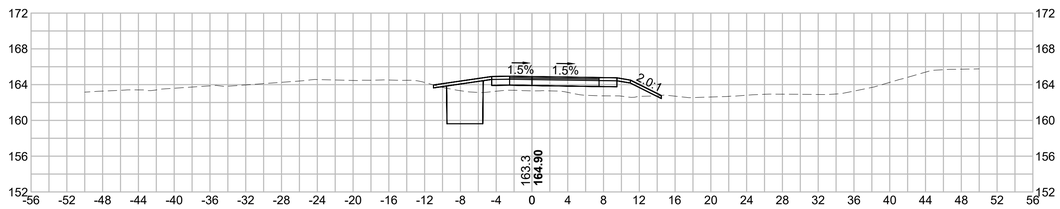
546+00



544+00



545+50



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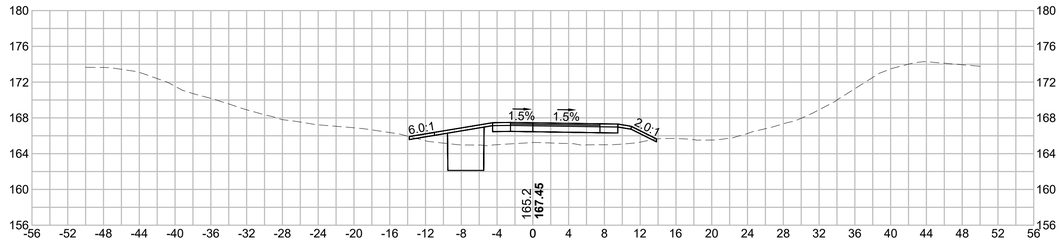
EVERSOURCE

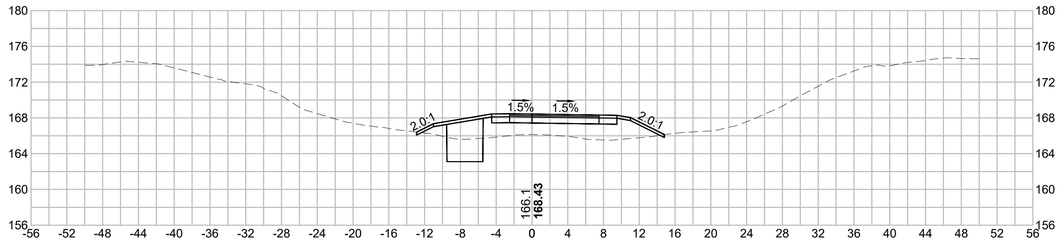
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 302 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

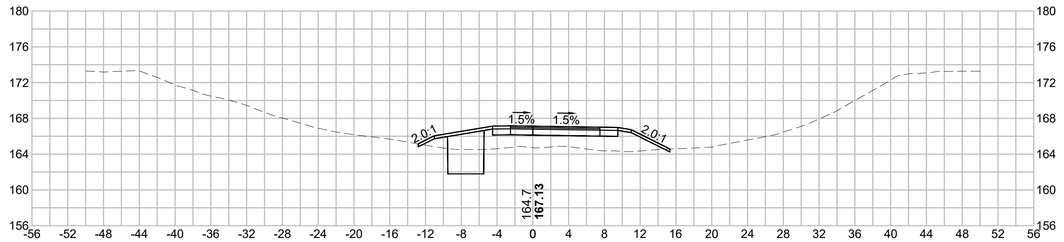
548+00



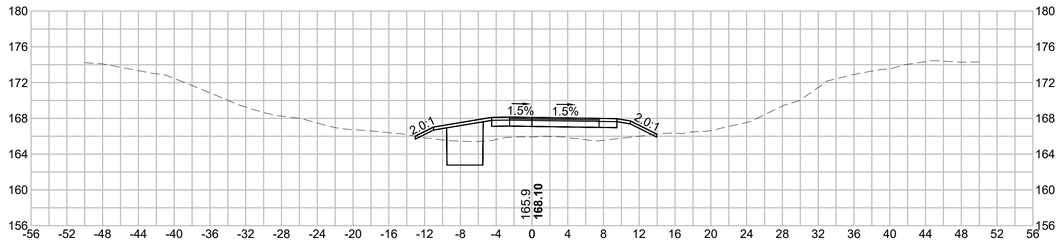
549+50



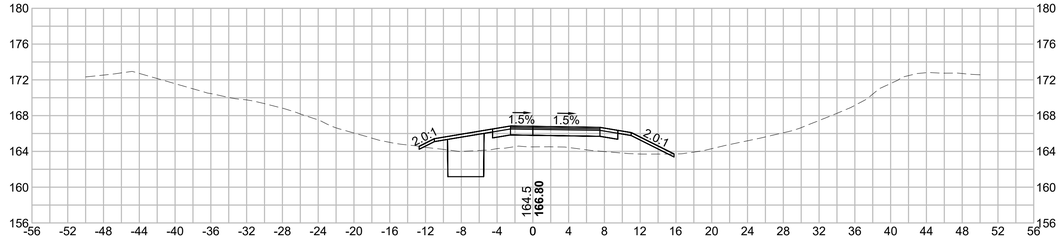
547+50



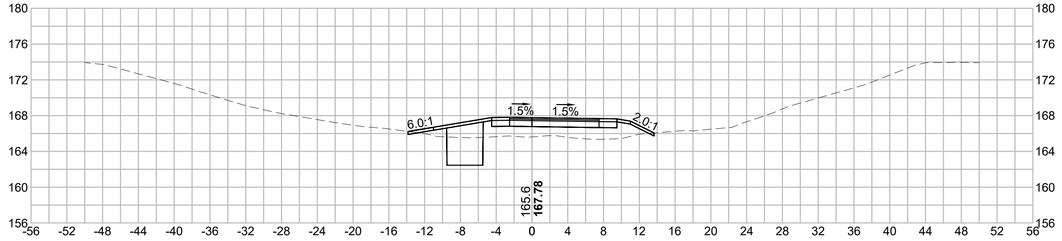
549+00



547+00



548+50



SCALE IN FEET

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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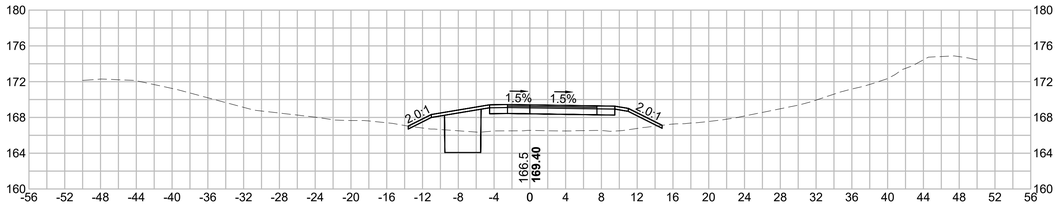
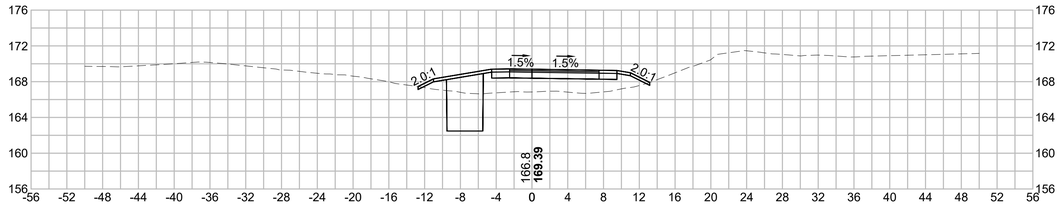
1"=8'	DEC 2021	MS	SK	MES	.	.

551+00



552+50



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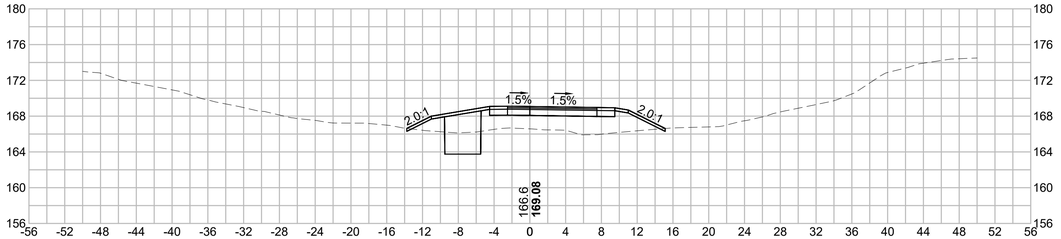
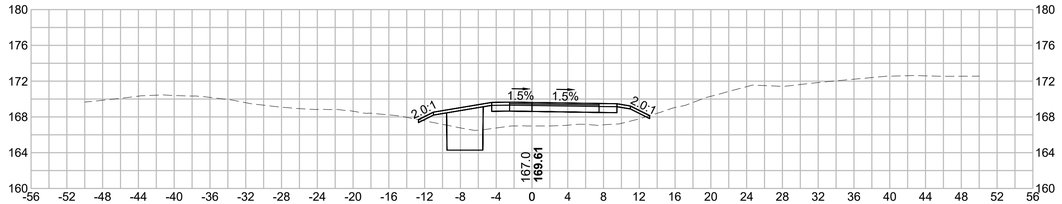


552+00



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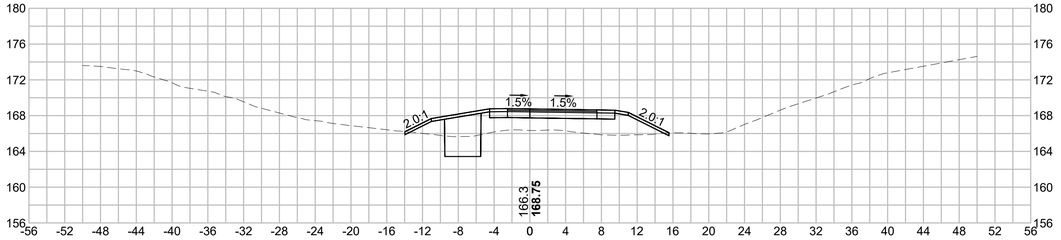

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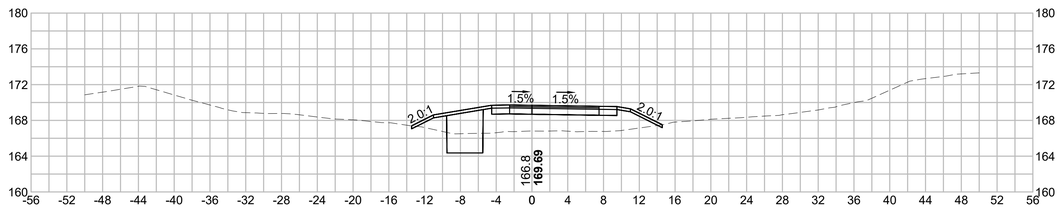

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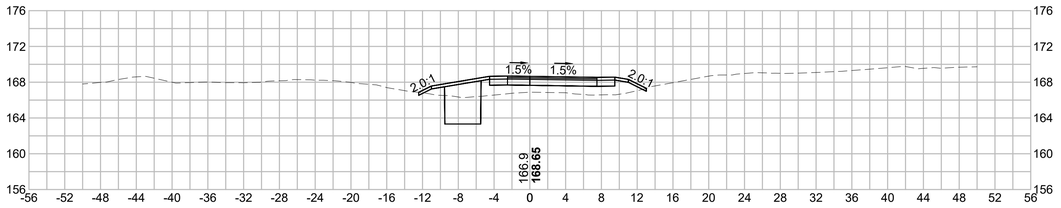
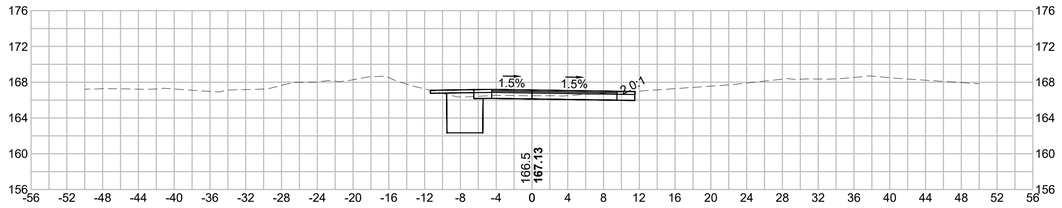
1"=8'	DEC 2021	MS	SK	MES	.	.

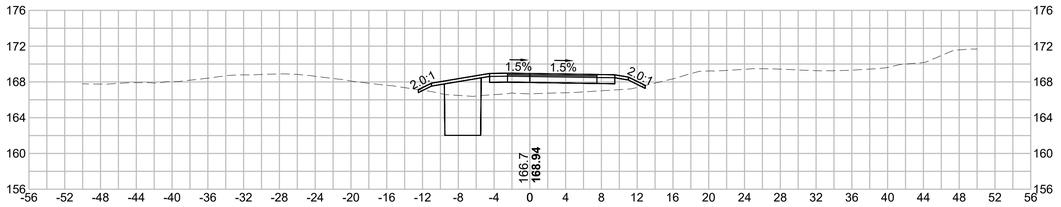
554+00



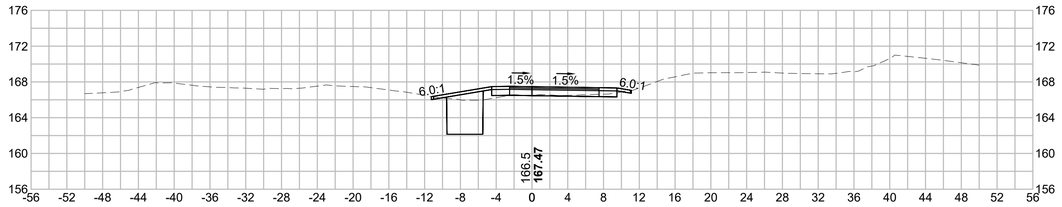
555+50



553+50



555+00



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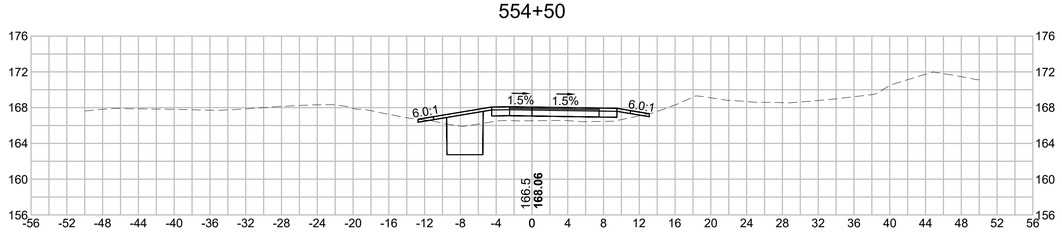
554+50



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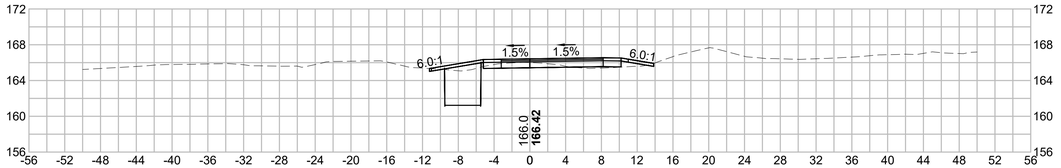
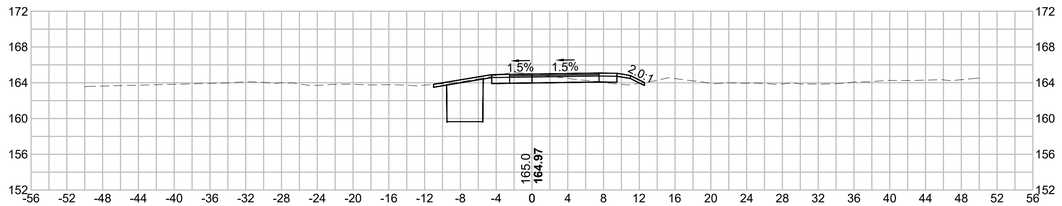
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

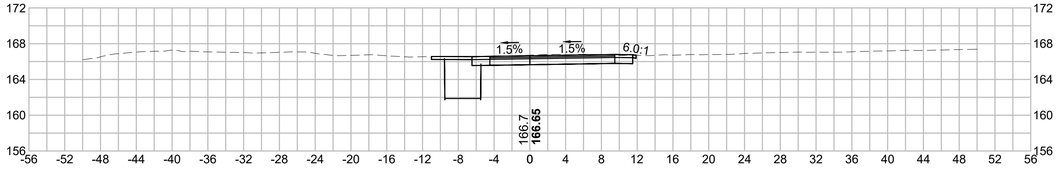
556+50



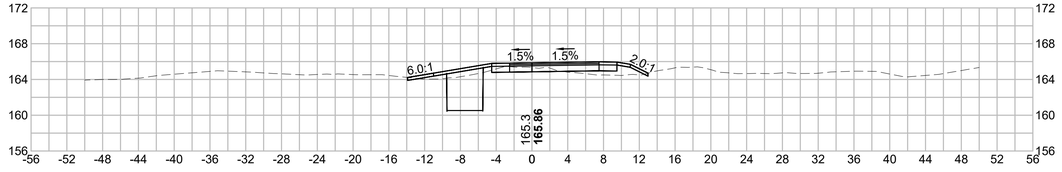
558+00



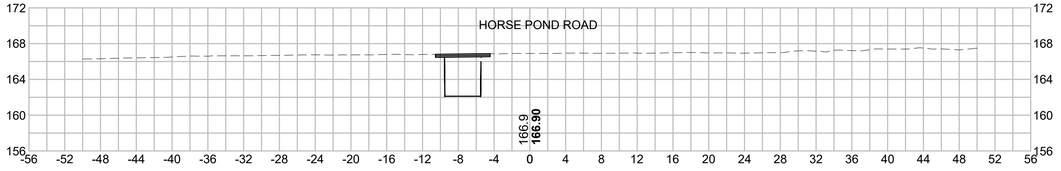
556+00



557+50



555+80.50



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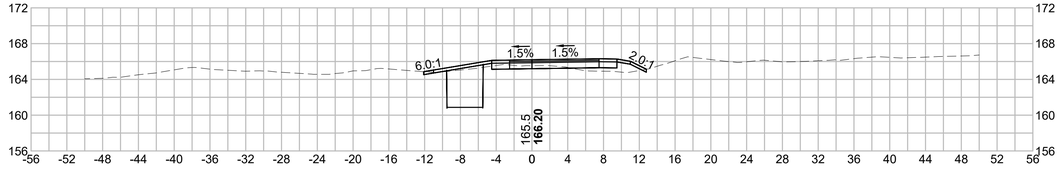

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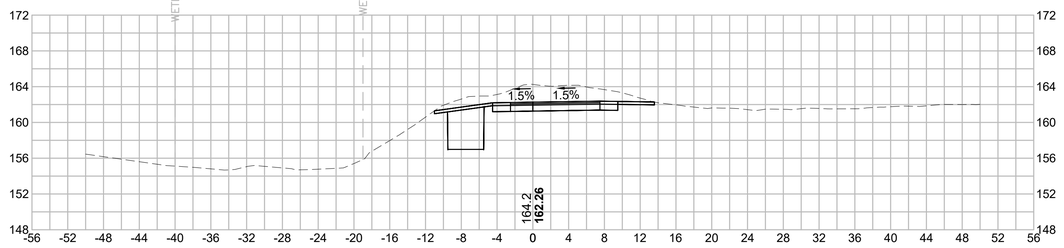
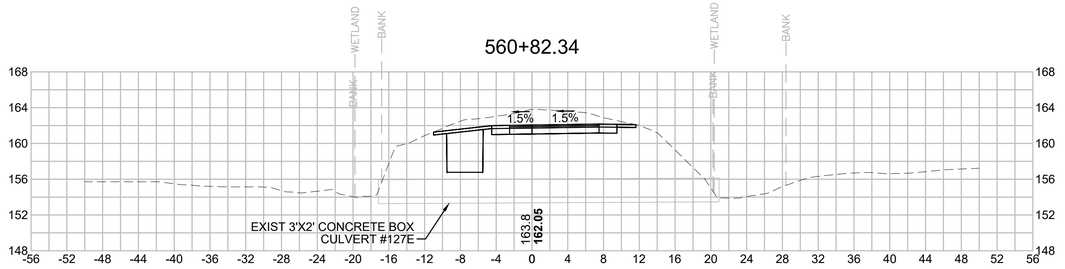
1"=8'	DEC 2021	MS	SK	MES	.	.

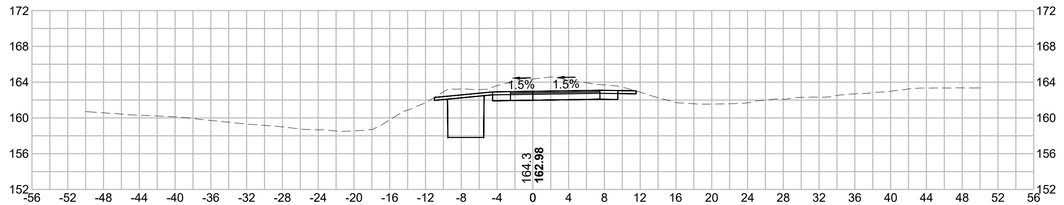
559+50



560+82.34



559+00



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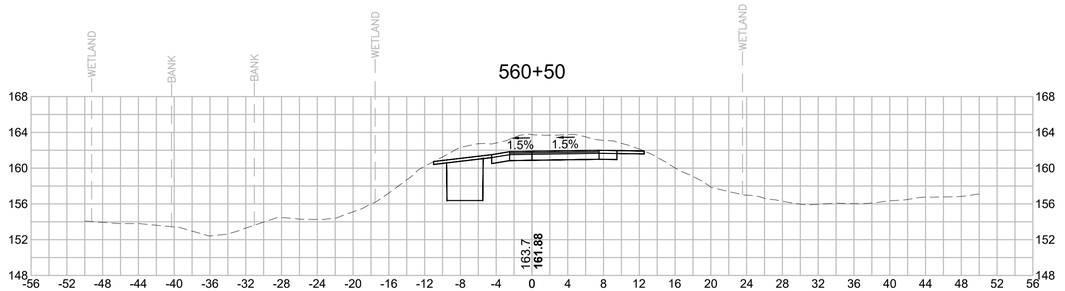

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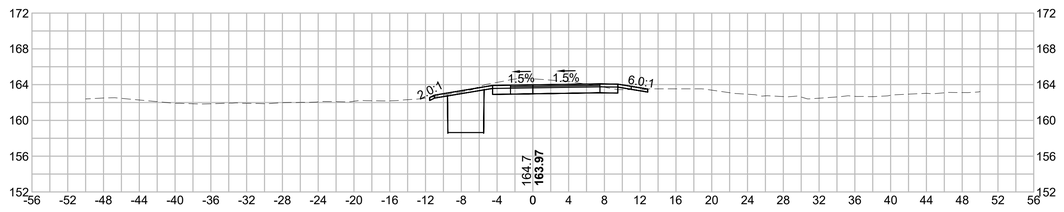

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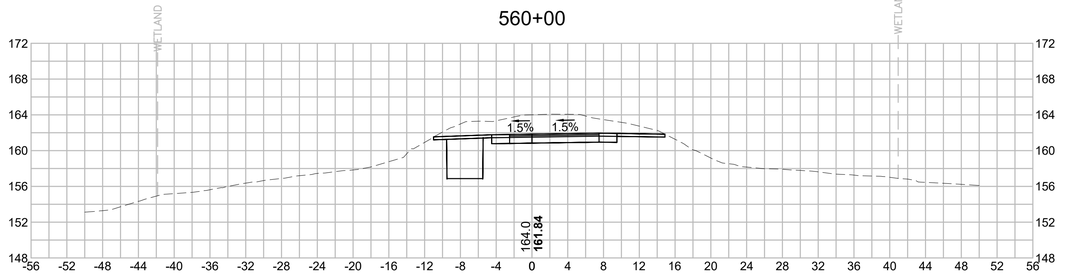

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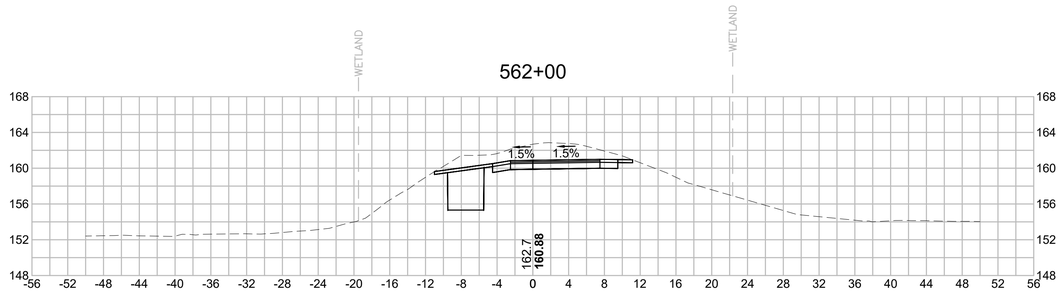
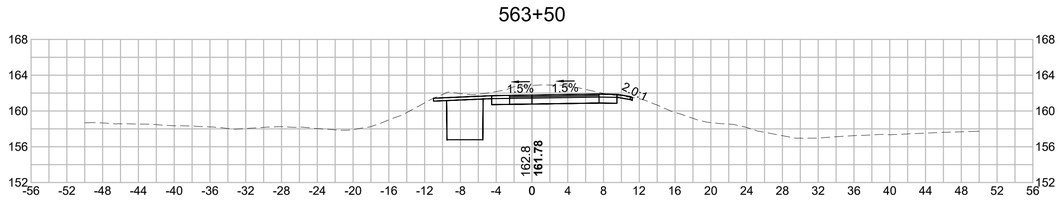
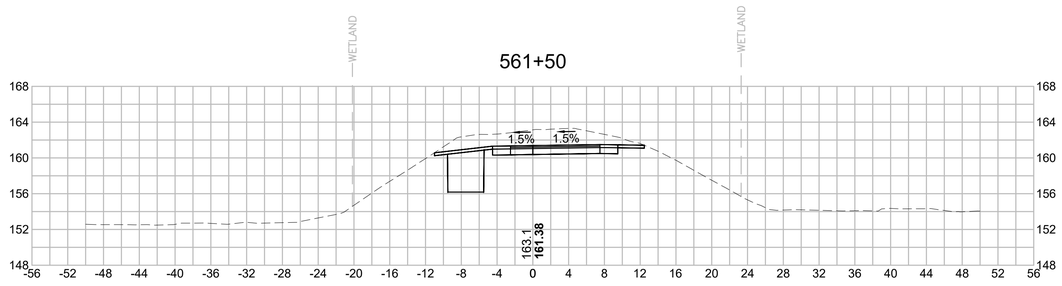
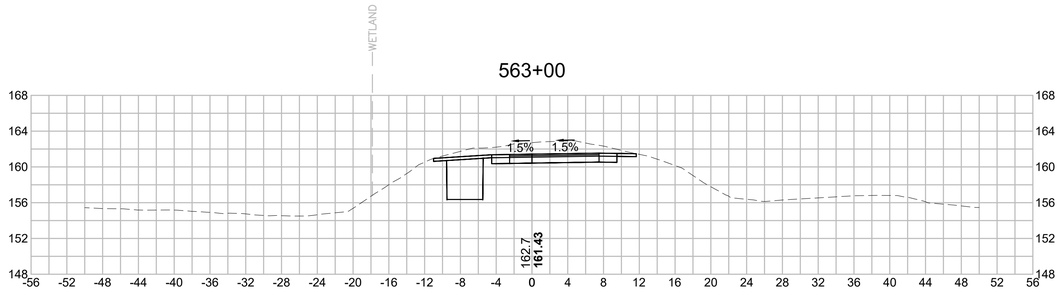
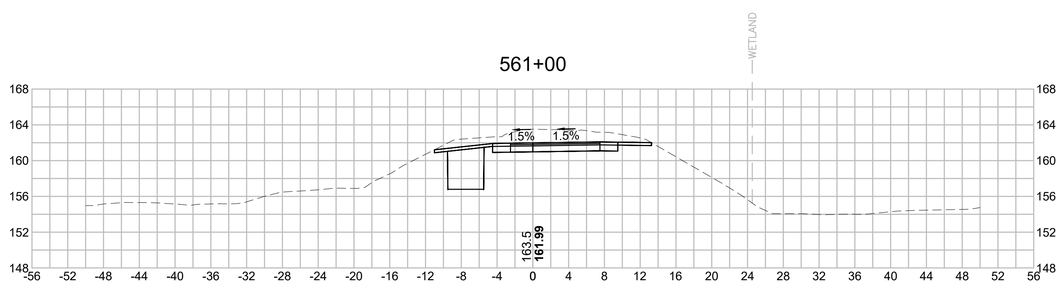
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

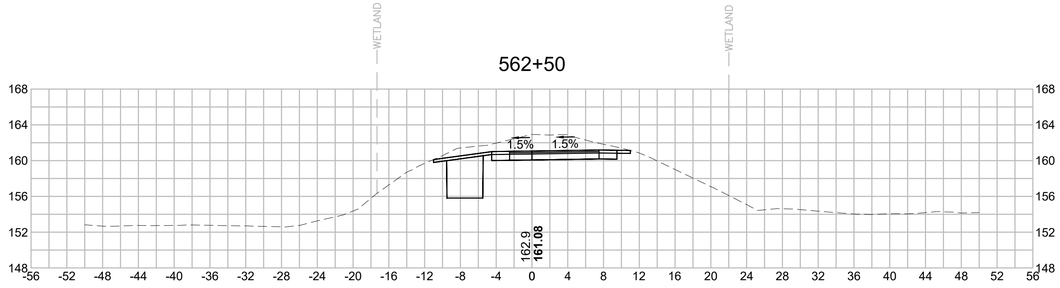












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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

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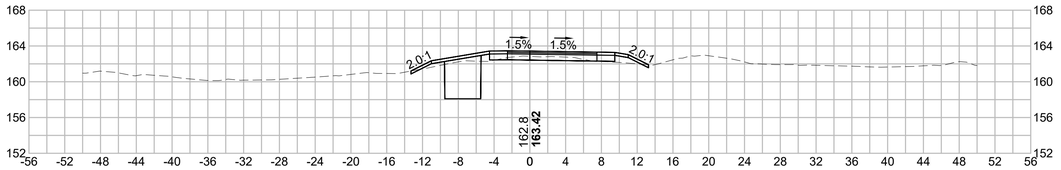
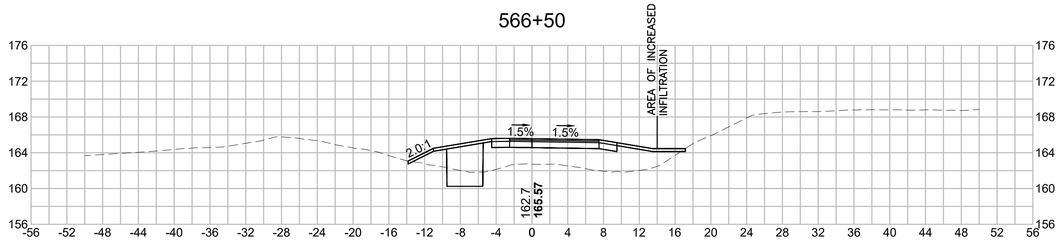
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

565+00



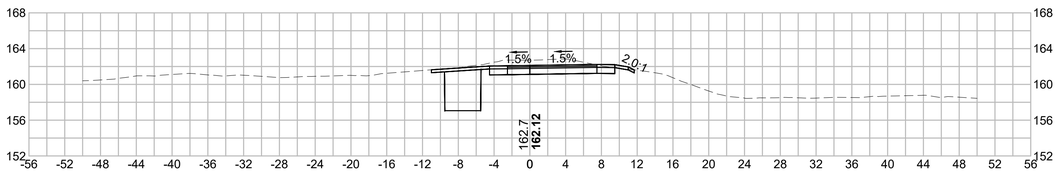
566+50



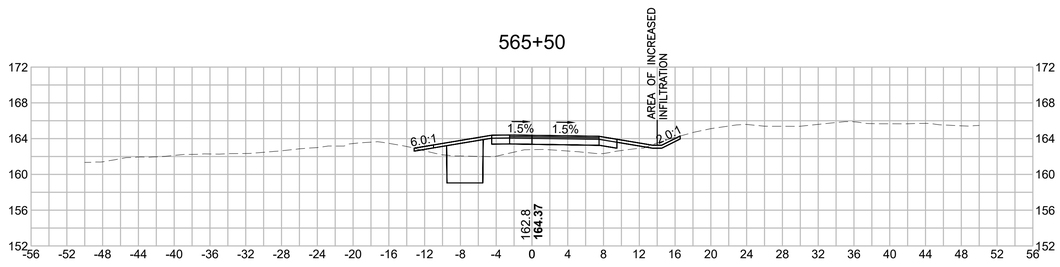
564+50

566+00

564+00



565+50



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SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
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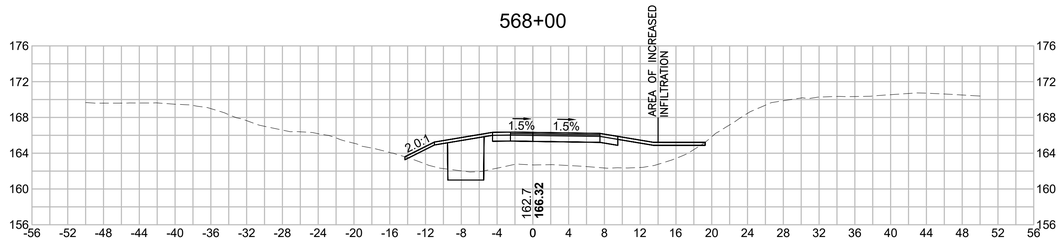

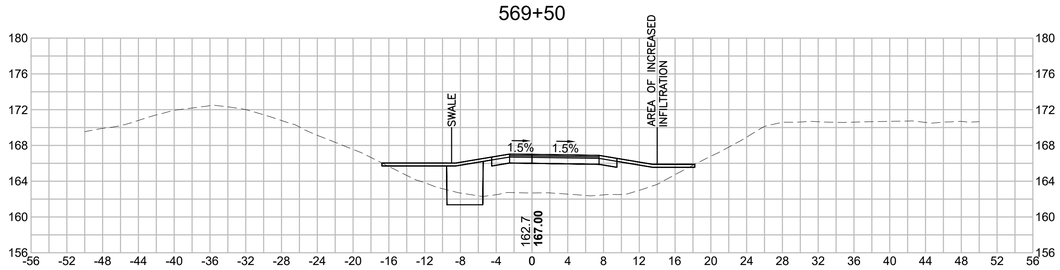

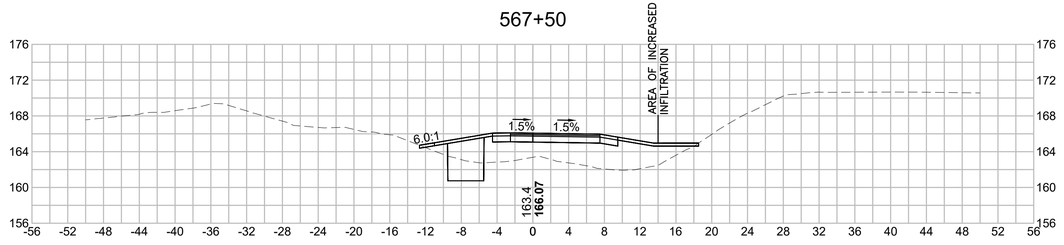

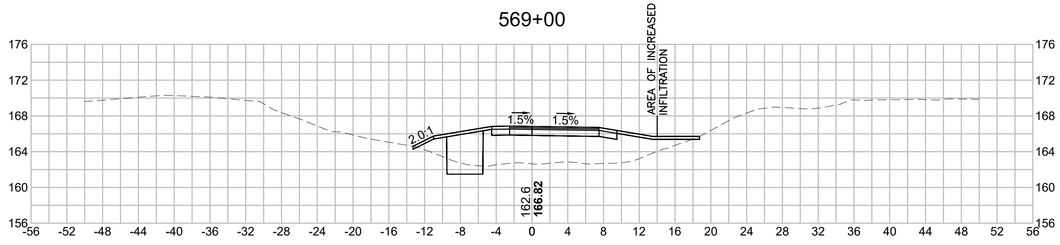

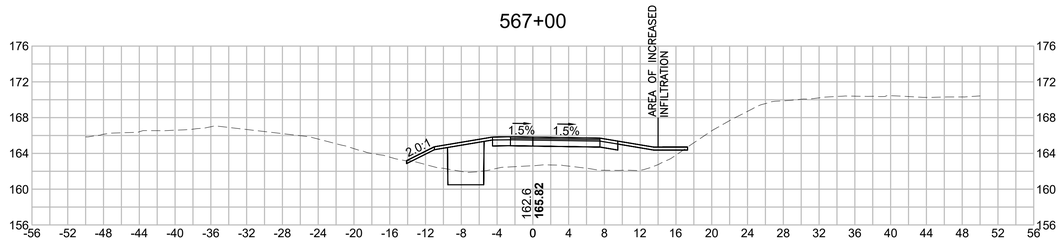

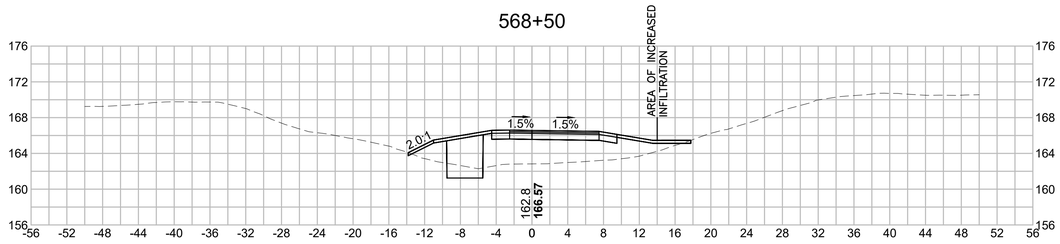

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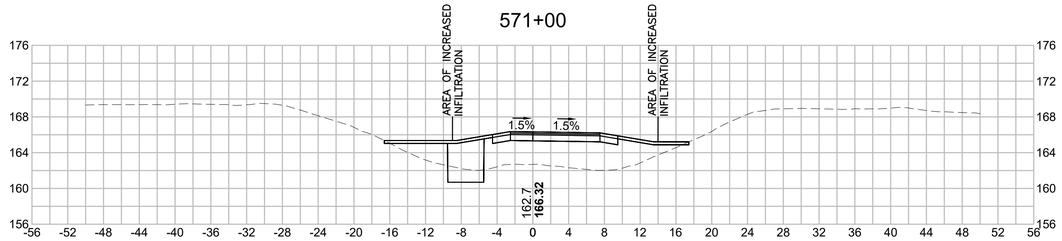
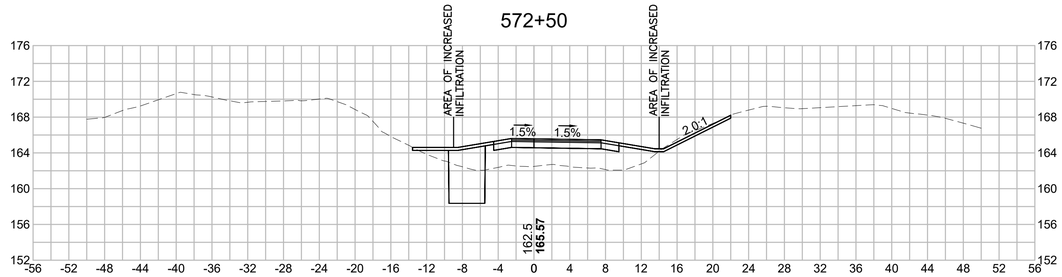
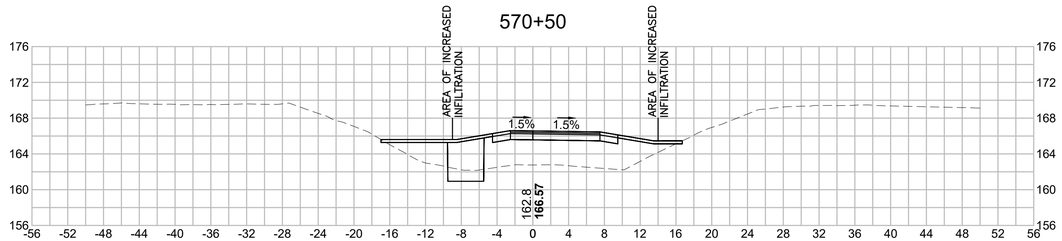
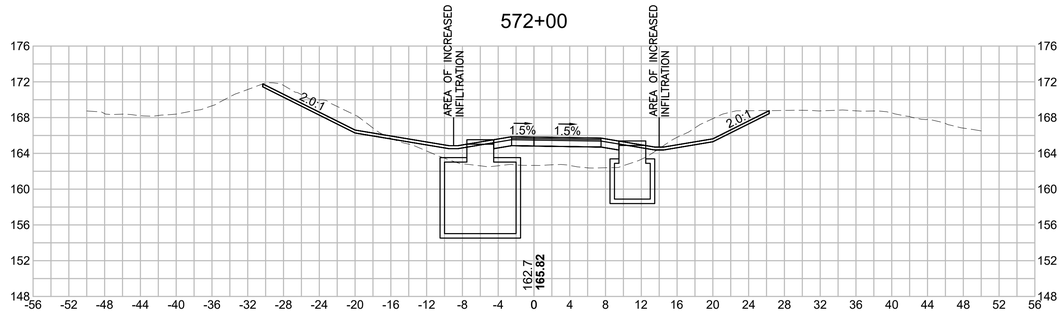
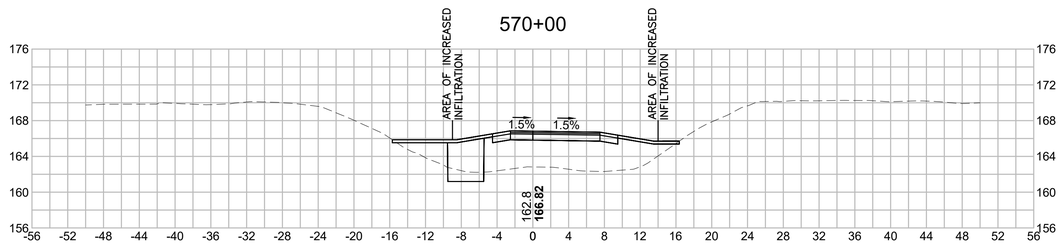
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

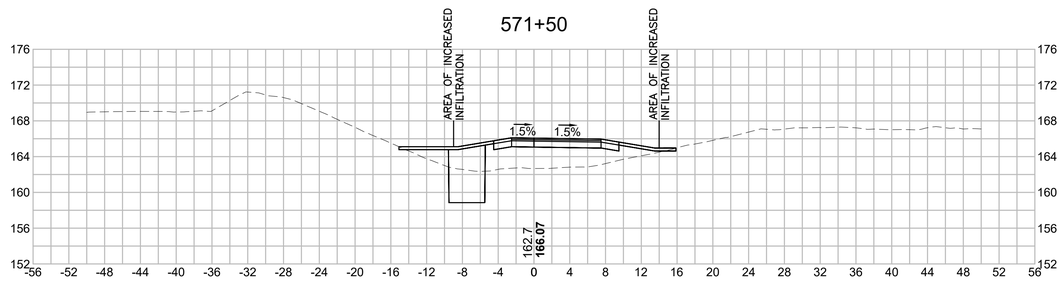












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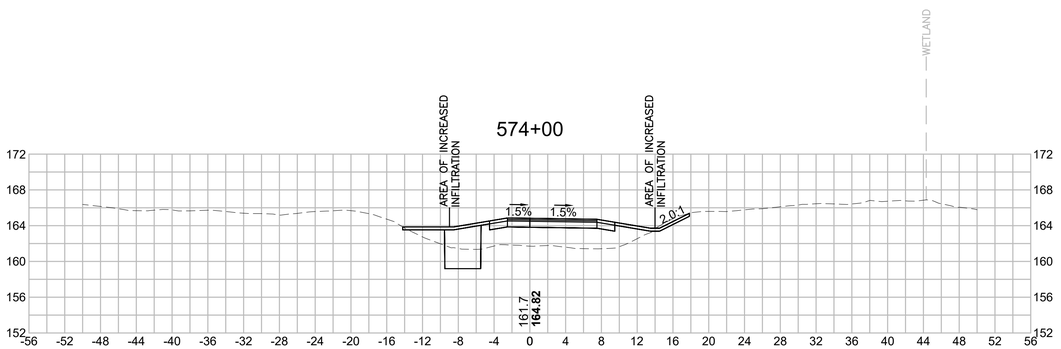
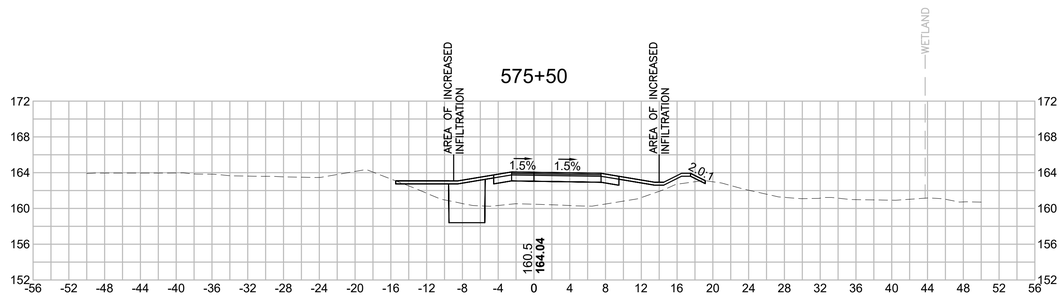
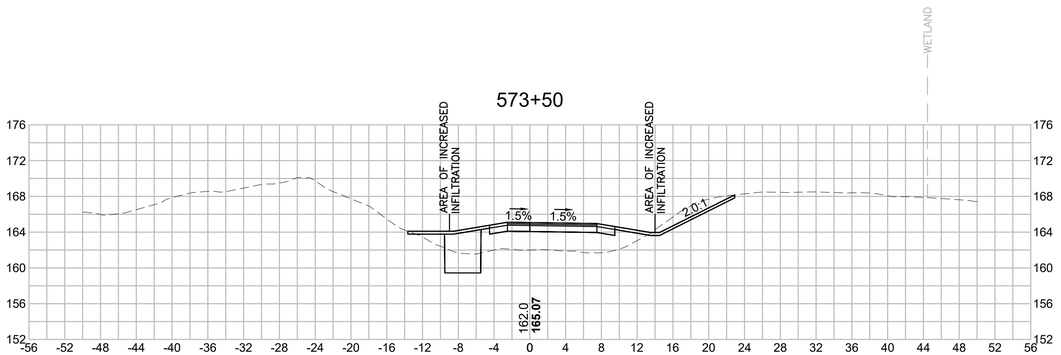
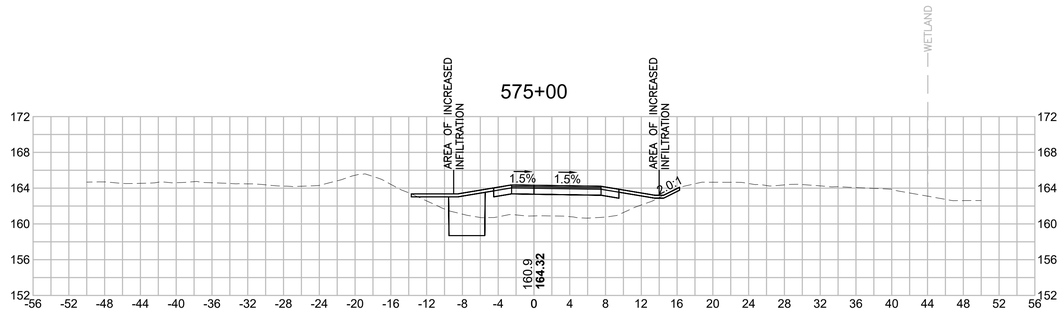
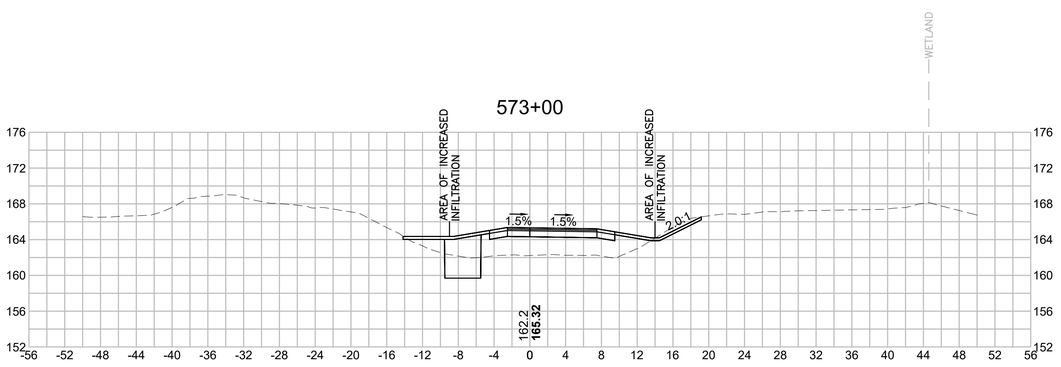
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

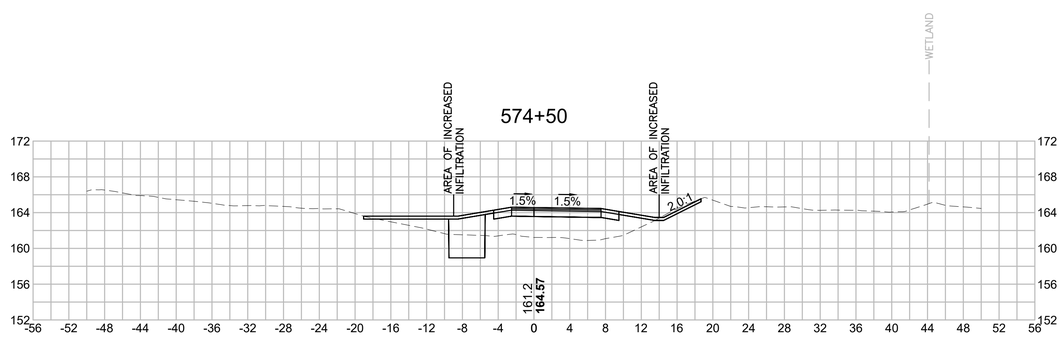












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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
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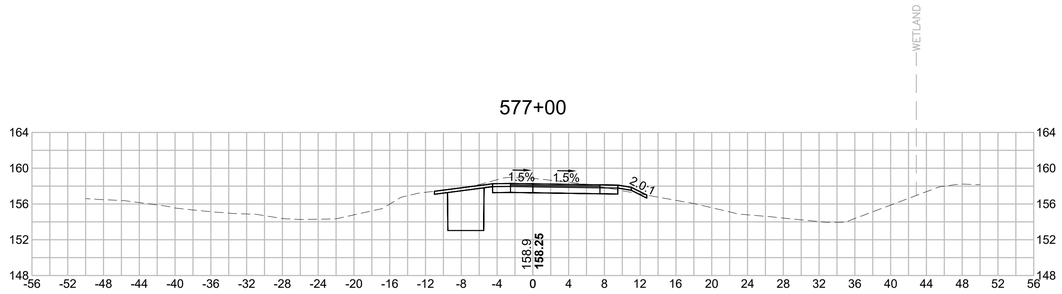
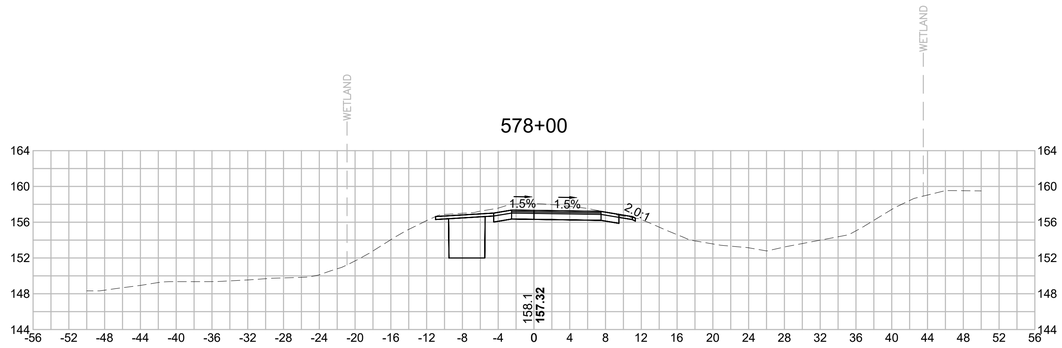
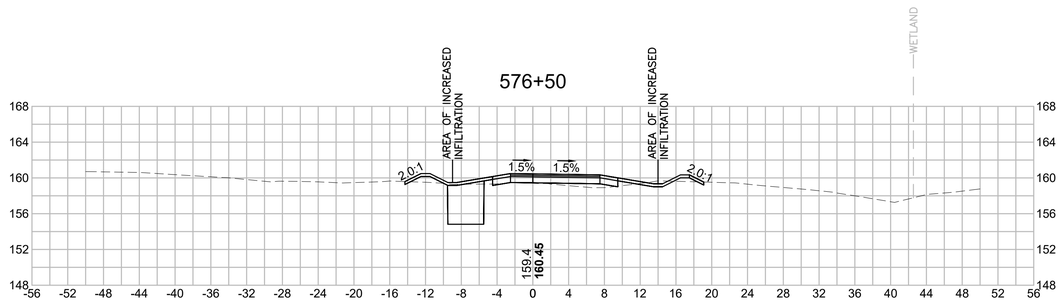
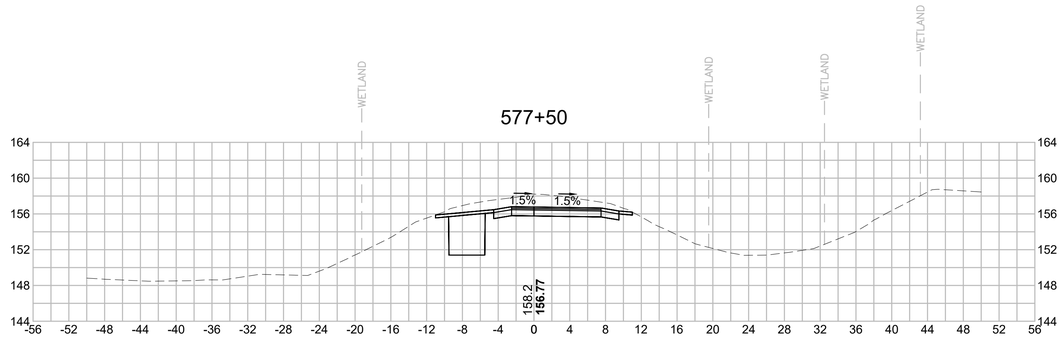
PLAN 312 OF 349

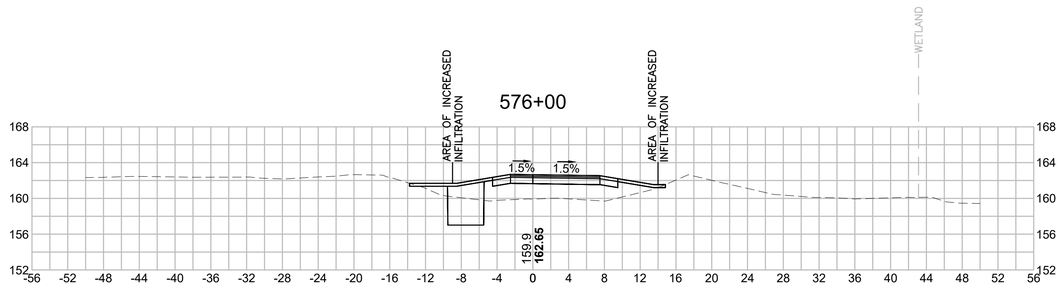
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

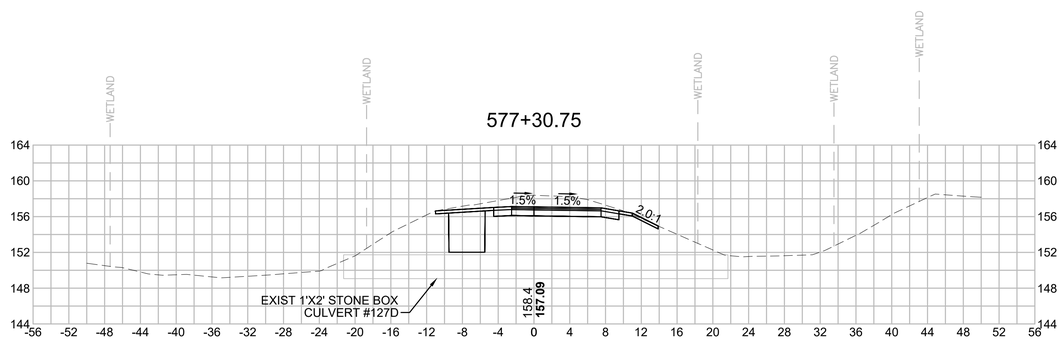












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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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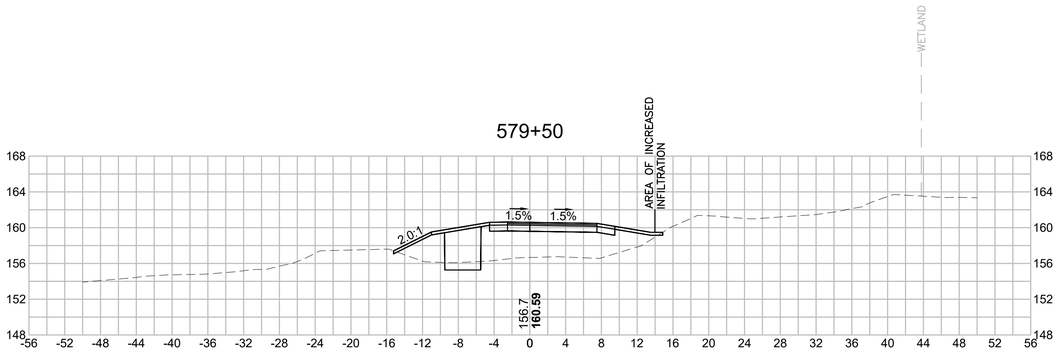

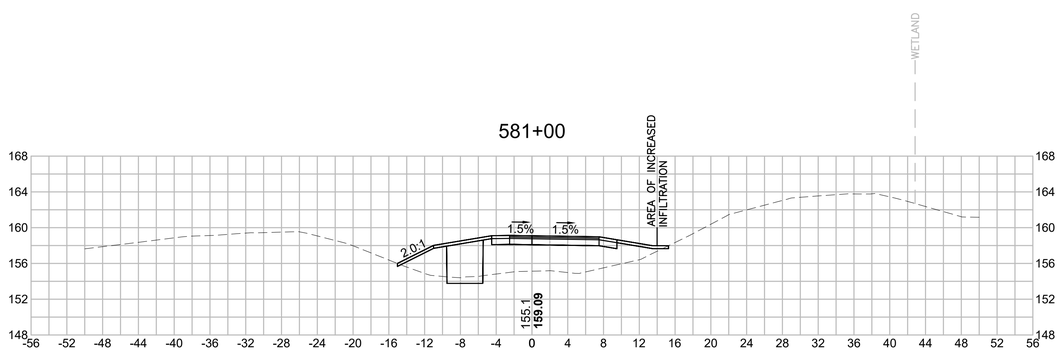

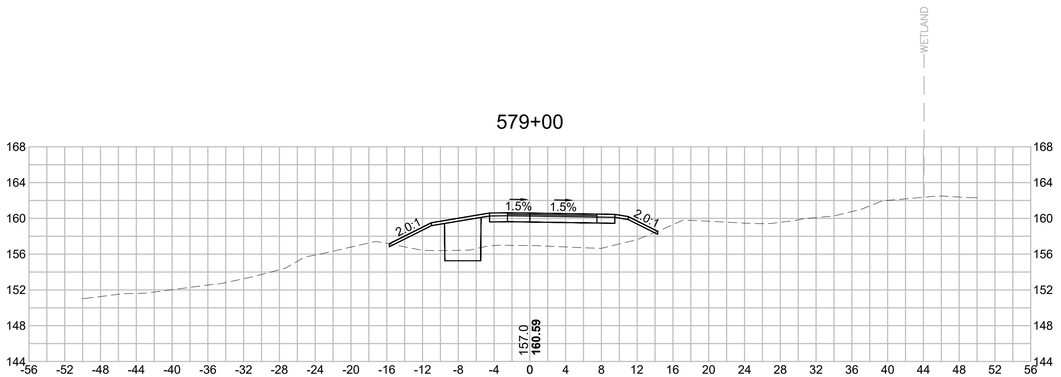

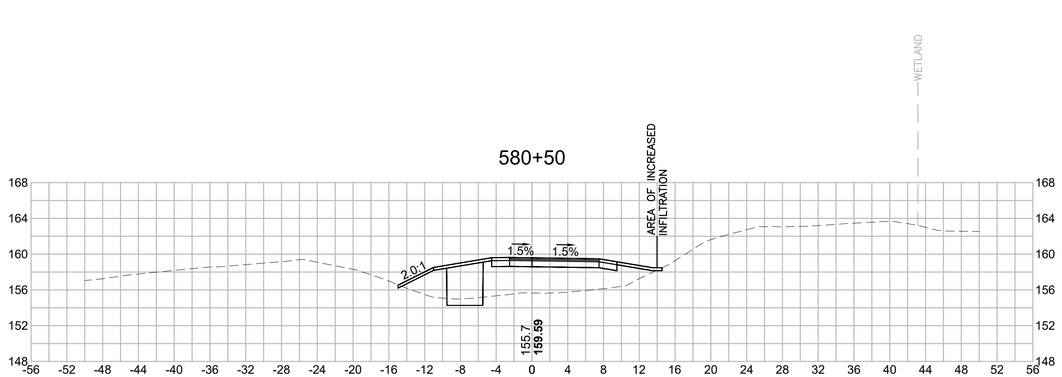

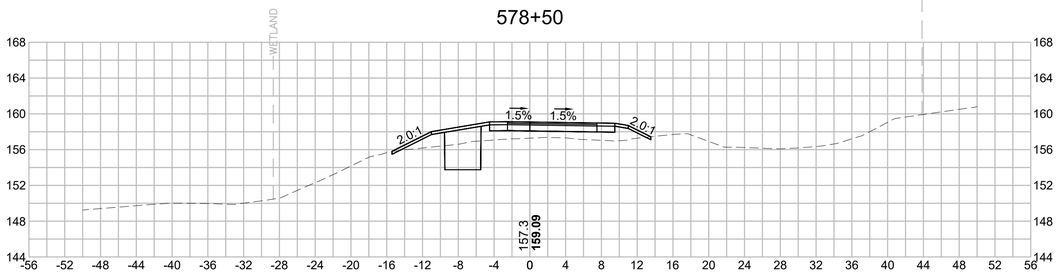

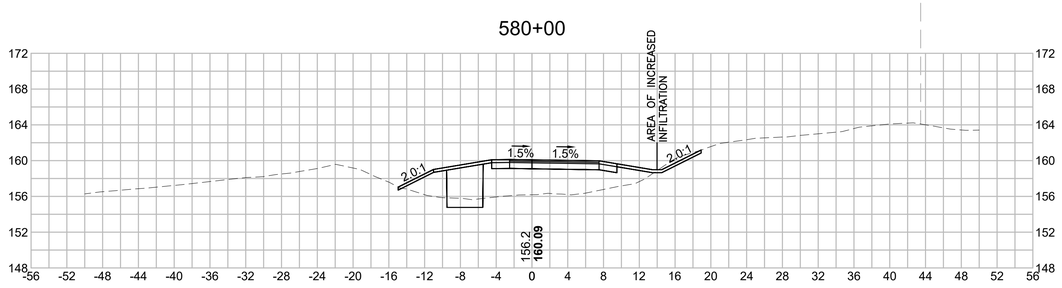

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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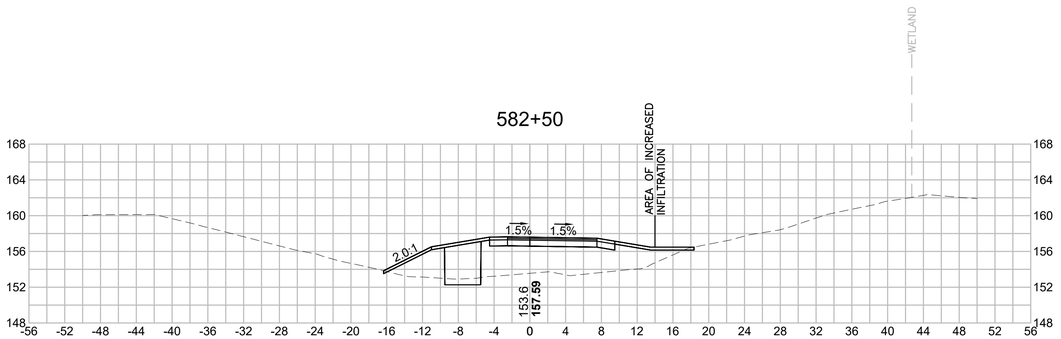

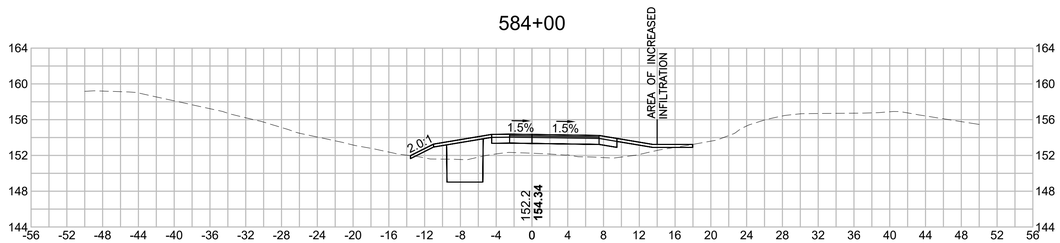

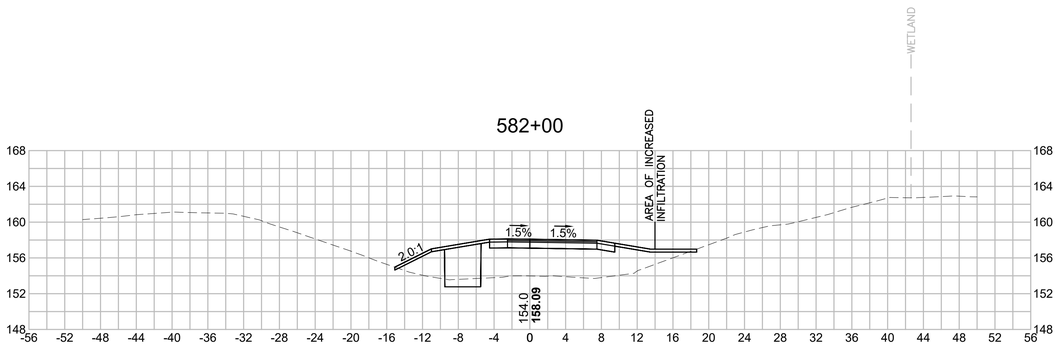

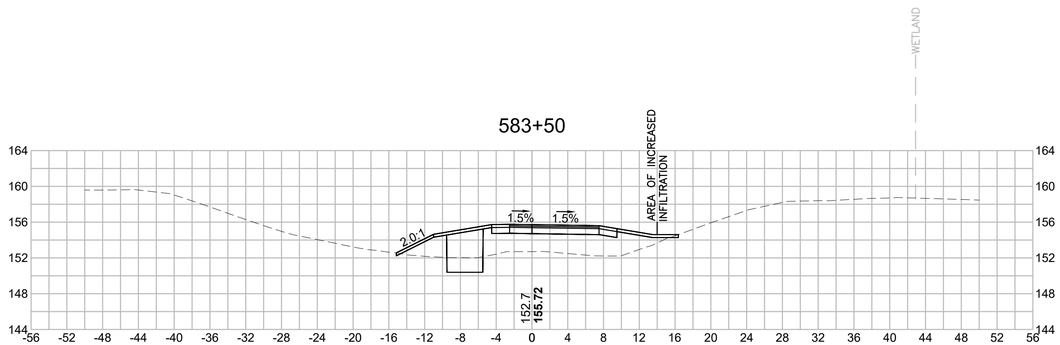

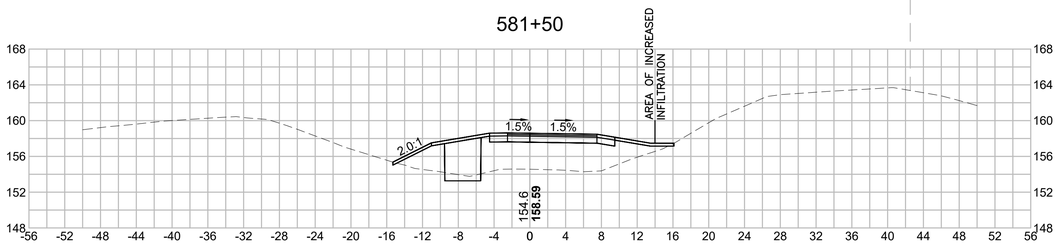

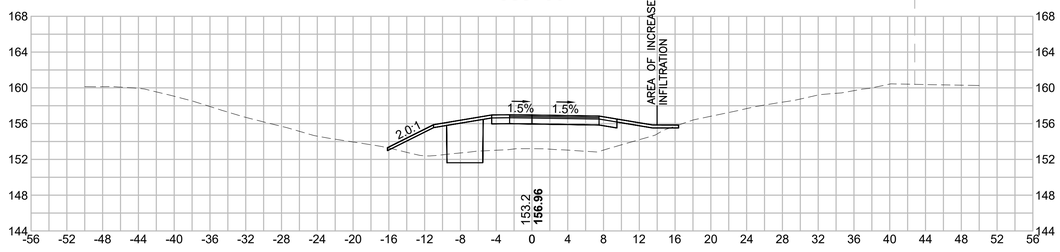

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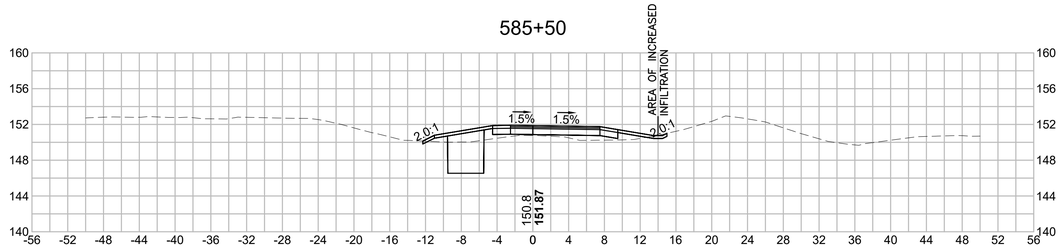

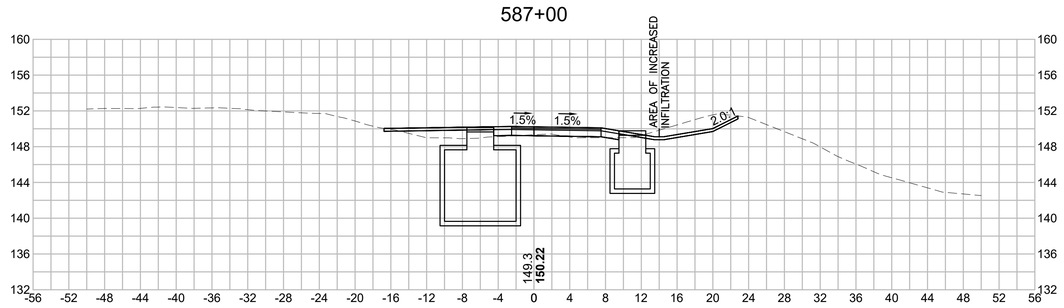

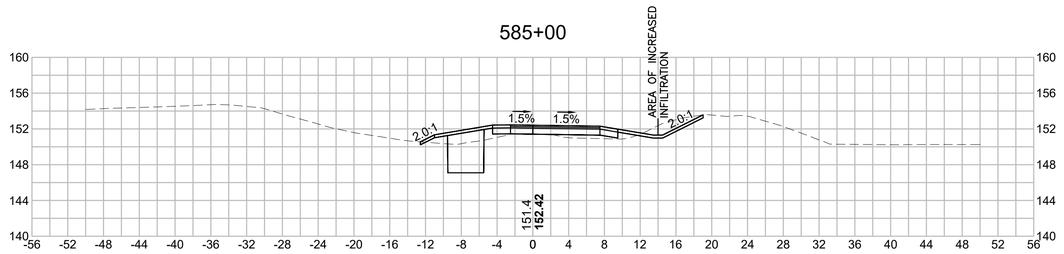

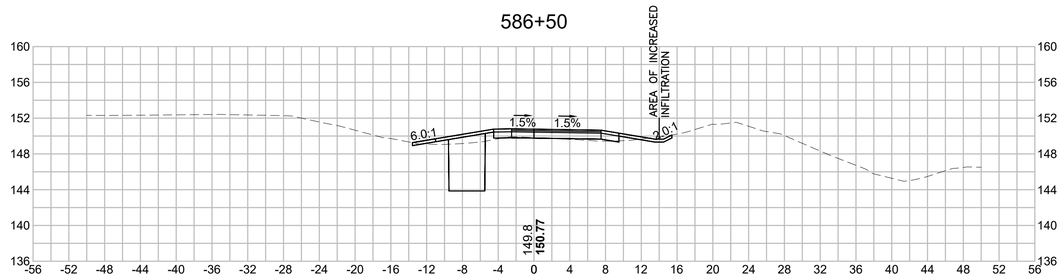

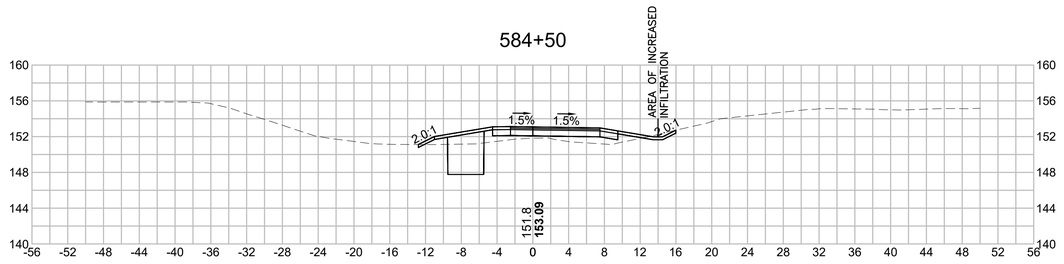

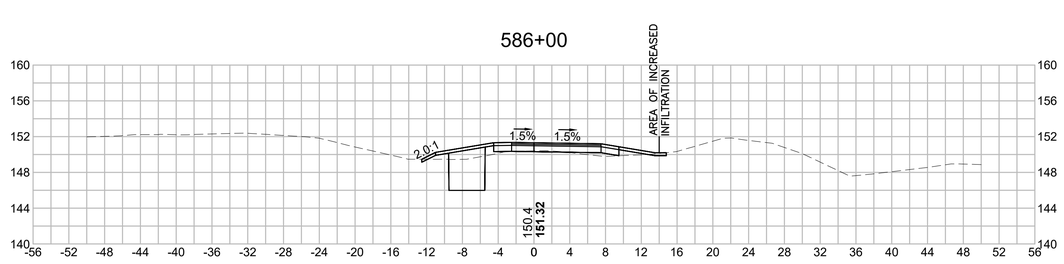

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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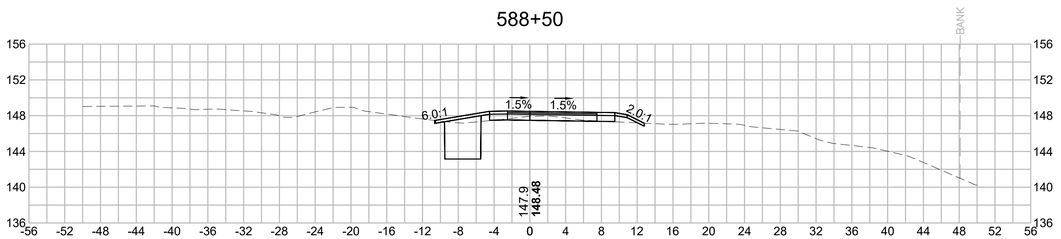

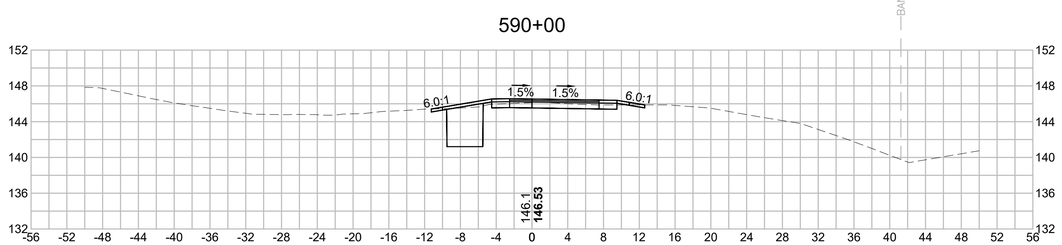

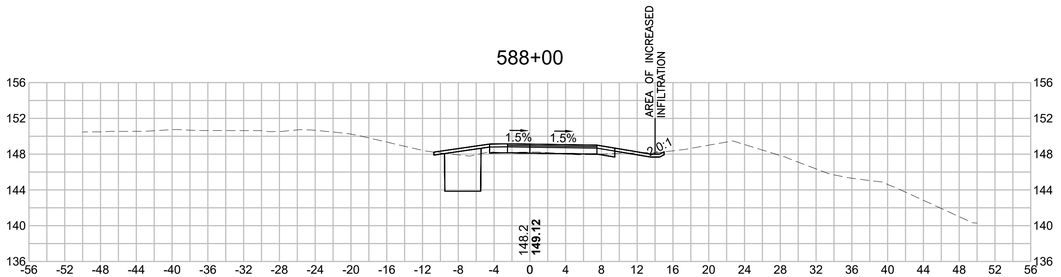

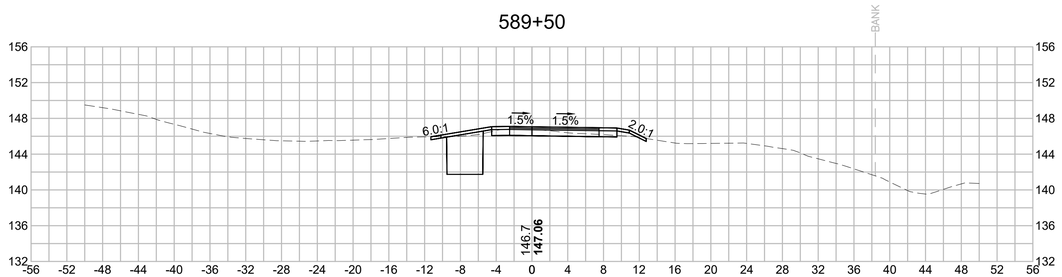

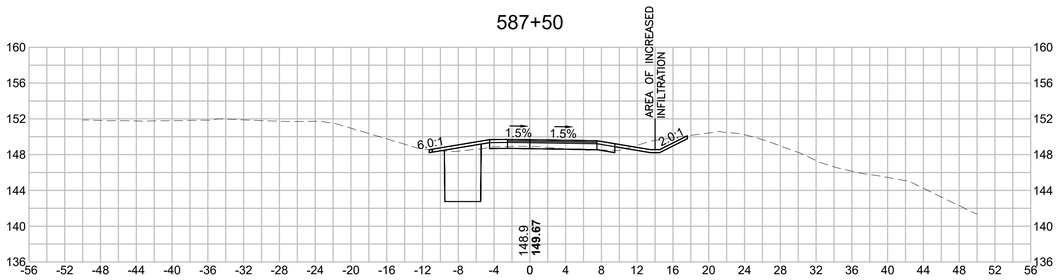

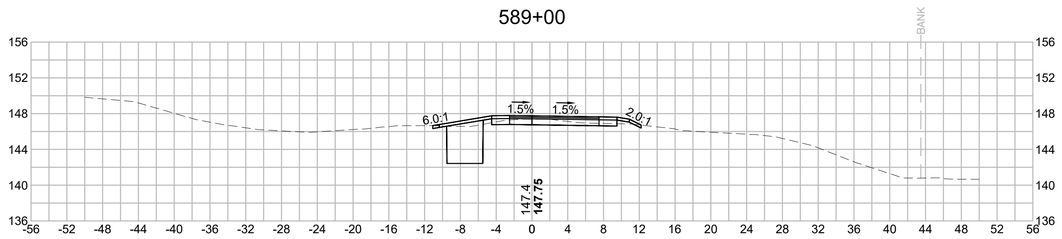

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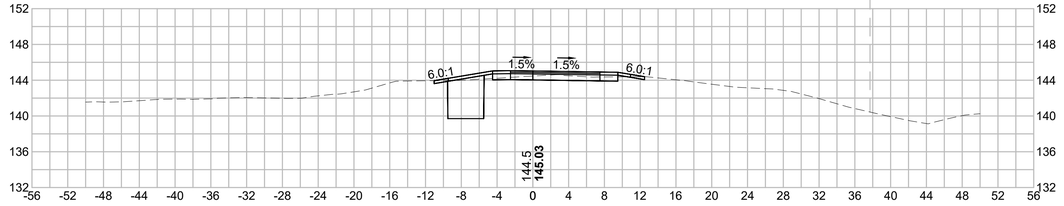

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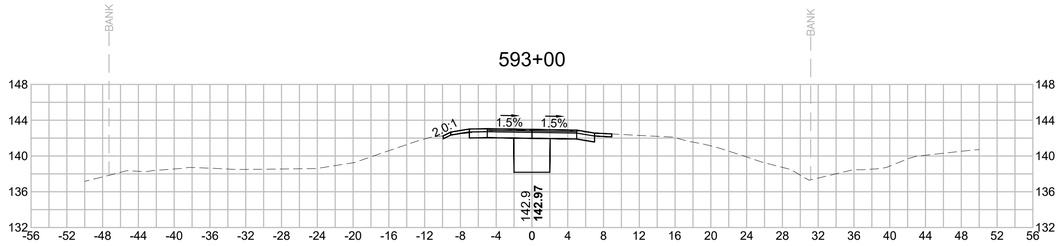

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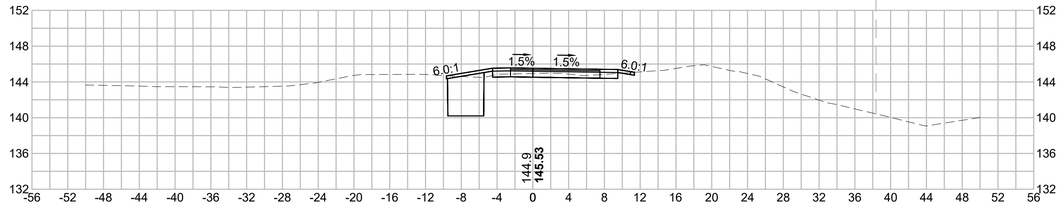

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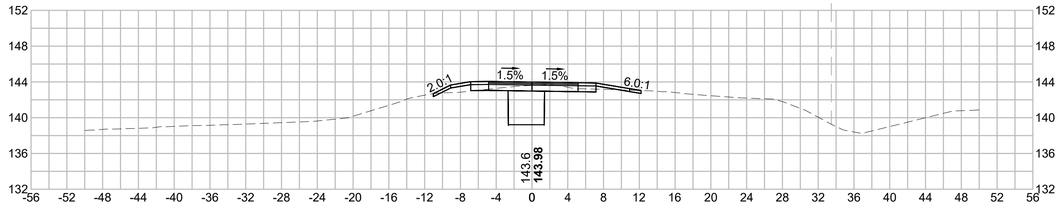

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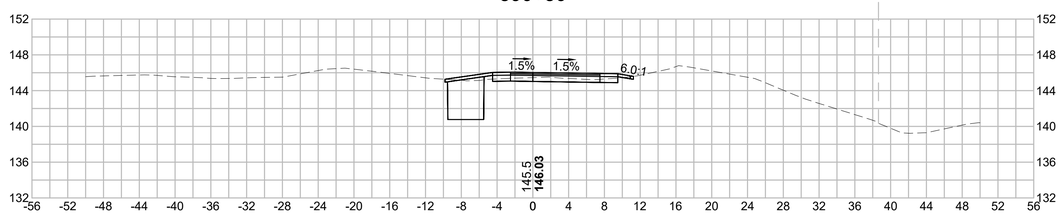

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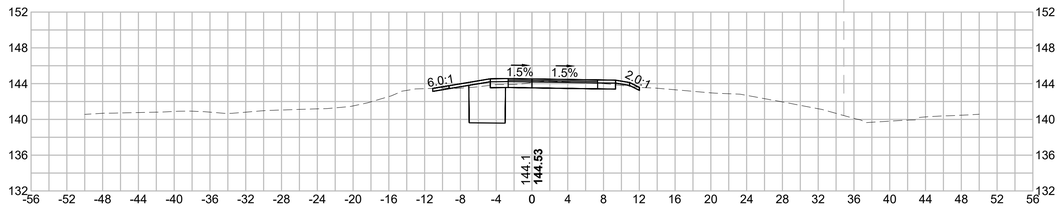

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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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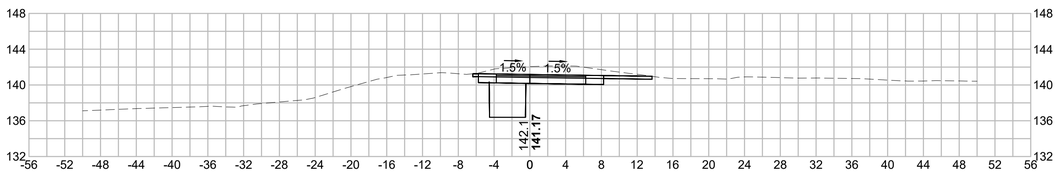

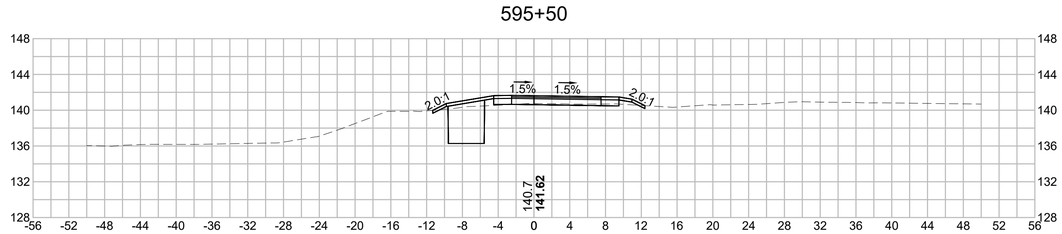

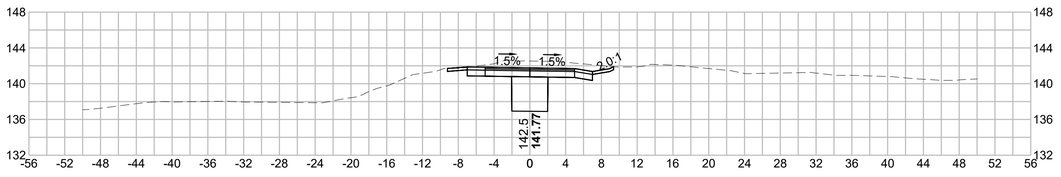

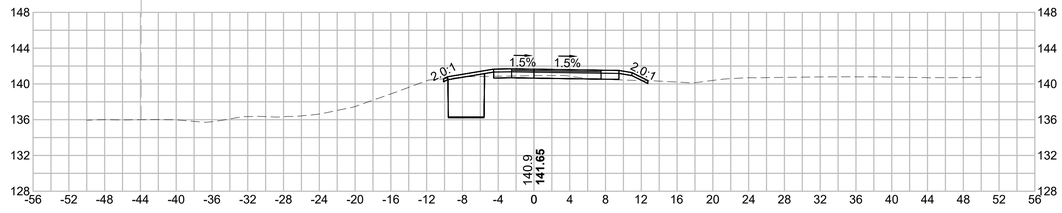

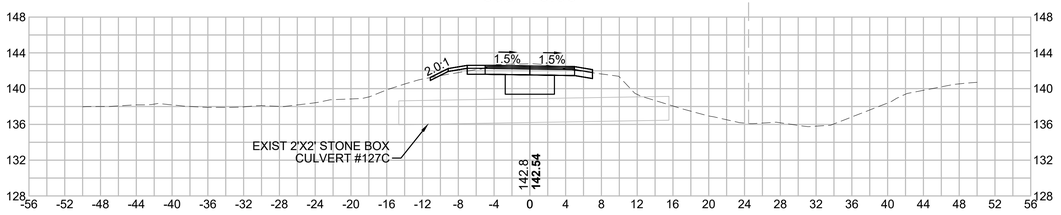

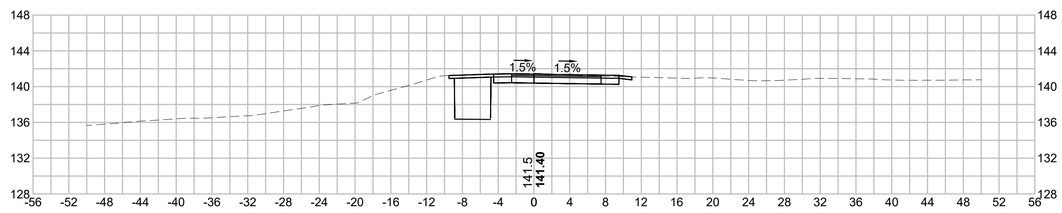

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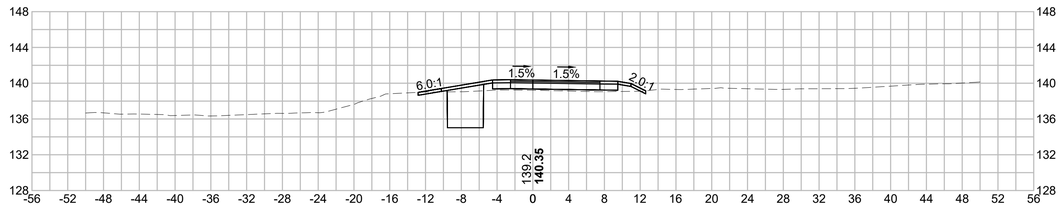
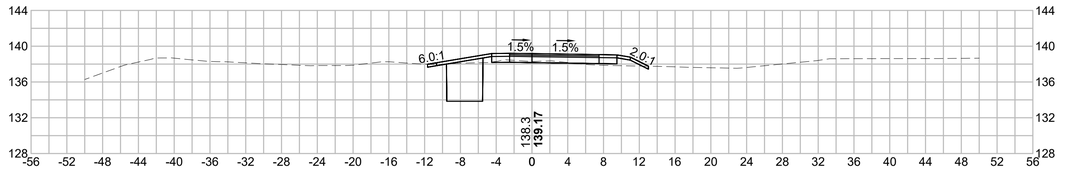
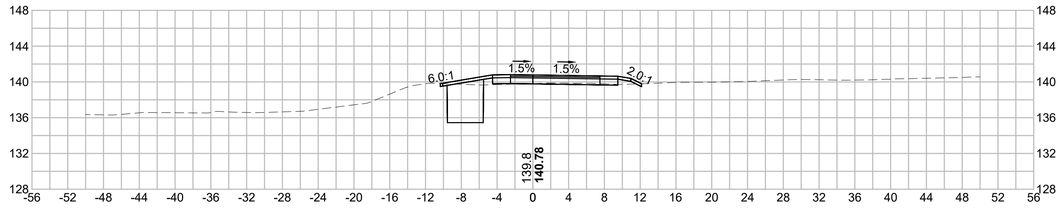
597+00



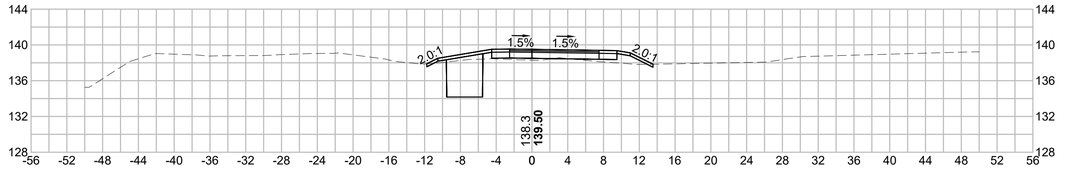
598+50



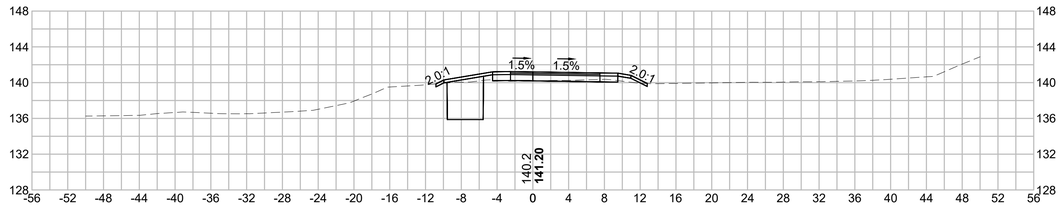
596+50



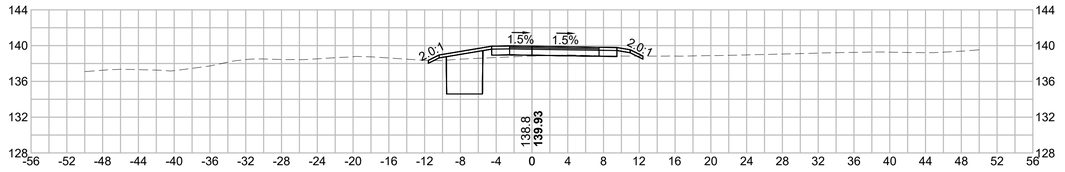
598+00



596+00



597+50



8 0 8 16
SCALE IN FEET

Vanasse Hangen Brustlin, Inc.
101 Walnut St., PO Box 9151
Watertown, MA 02472
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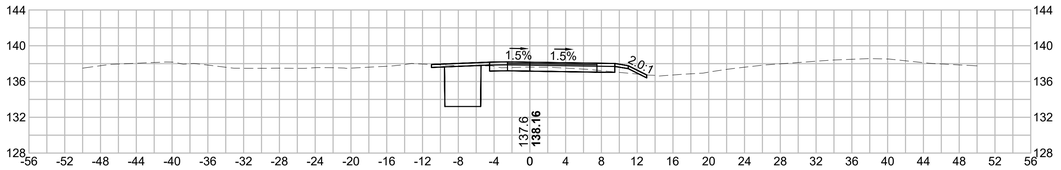
NO.	DESCRIPTION	BY	DATE	APPR.
	REVISION			

EVERSOURCE

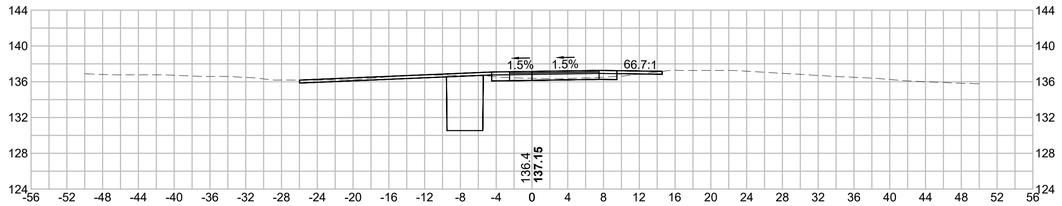
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 32 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

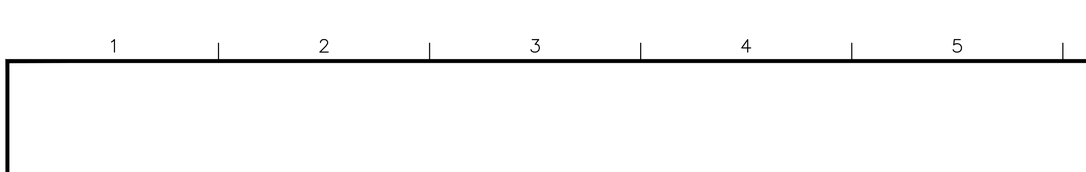
600+00



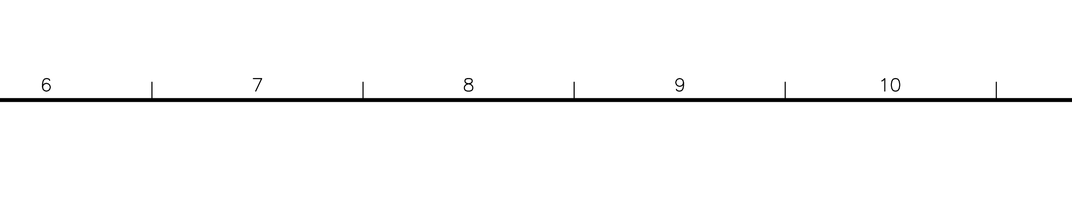
601+50



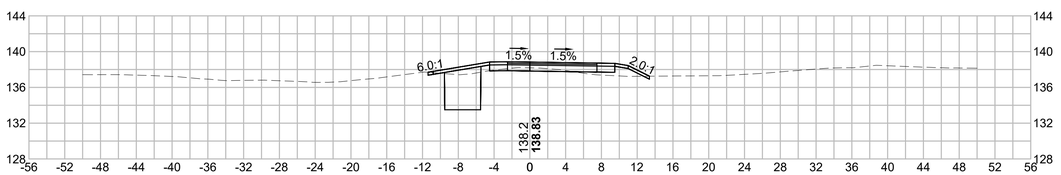
599+50



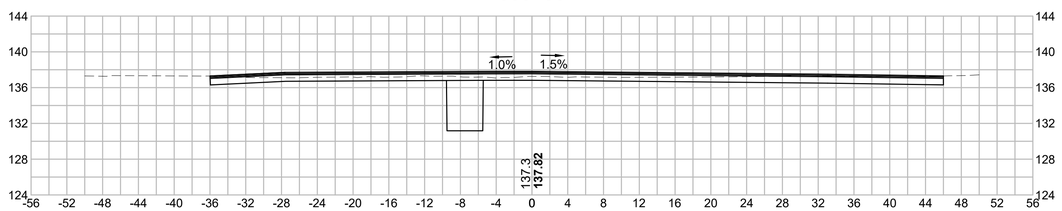
601+00



599+00



600+50



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Watertown, MA 02472
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NO.	DESCRIPTION	BY	DATE	APPR.
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EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

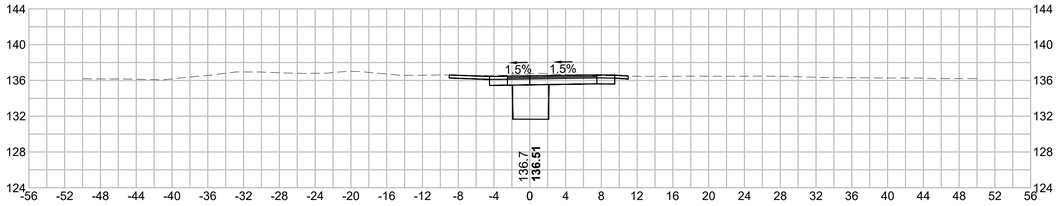
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

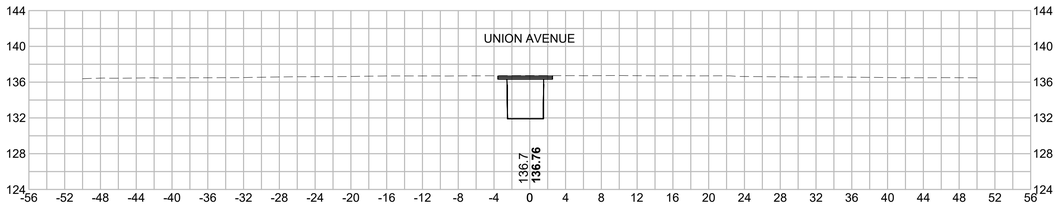
PLAN 3210F349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

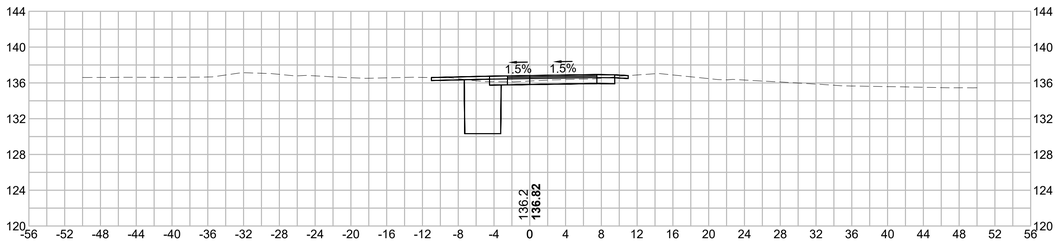
602+50



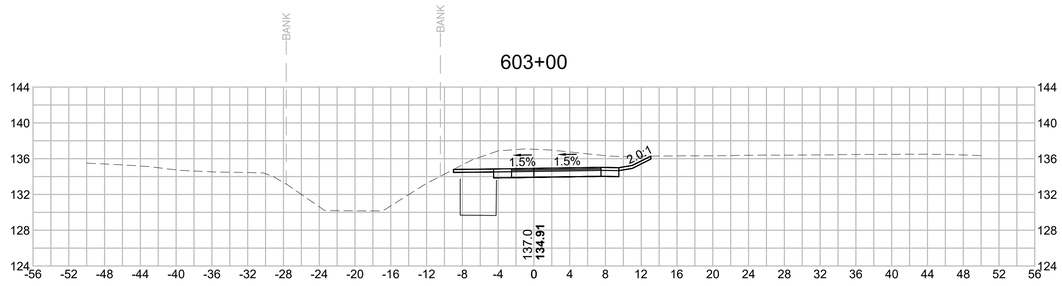
602+38.67



602+00



603+00



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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

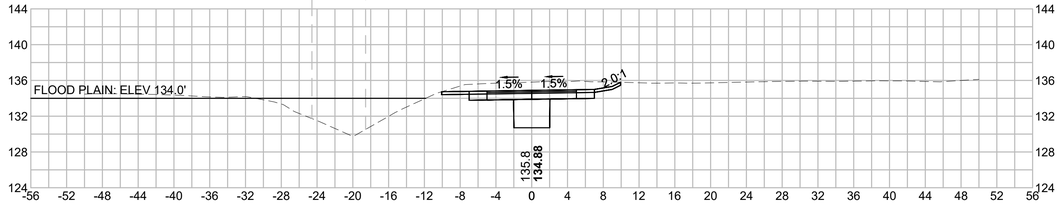
CROSS SECTIONS

PLAN 322 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

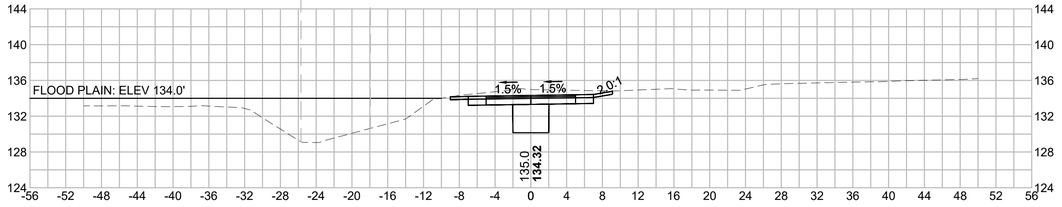
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

701+00



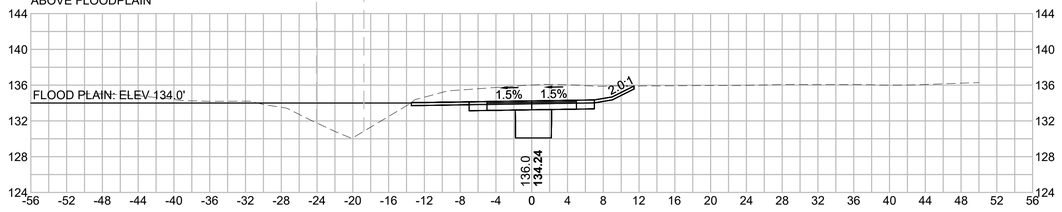
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

702+50



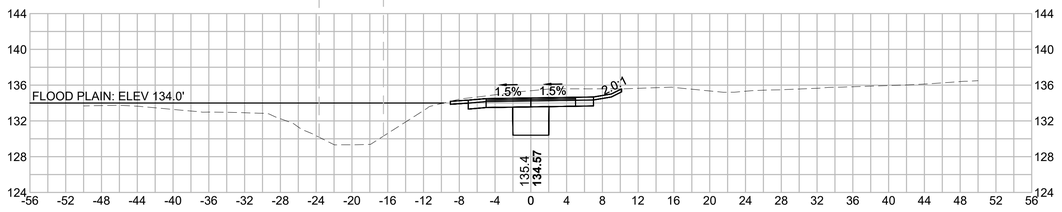
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

700+50



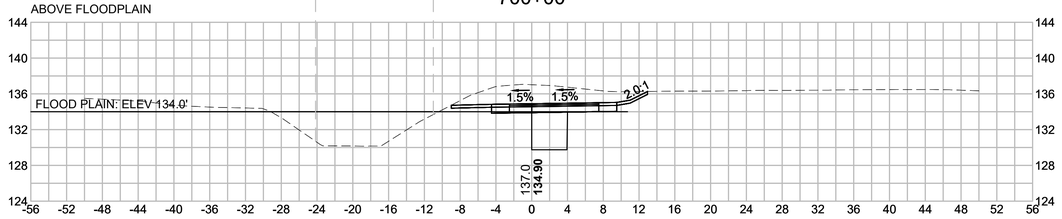
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

702+00



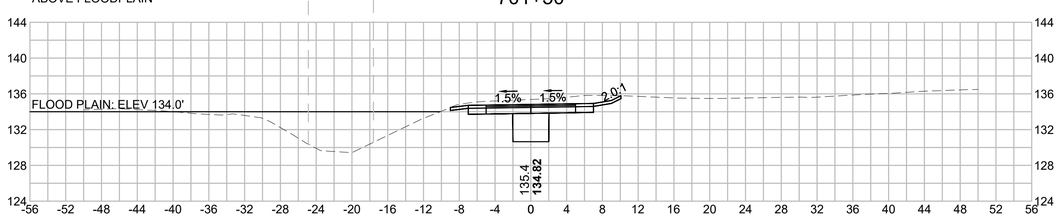
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

700+00



FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

701+50



BLSF CROSSING STA 700 TO STA 740 - FEMA ZONE AE - TRIBUTARY TO HOP BROOK AND HOP BROOK
FEMA ELEVATION VARIES

FILL:	CUT:
133'-134': 17.00 CY	133'-134': 46.91 CY
132'-133': 16.13 CY	132'-133': 20.22 CY
131'-132': 1.70 CY	131'-132': 5.50 CY
126'-127': 14.96 CY	126'-127': 17.00 CY
125'-126': 13.81 CY	125'-126': 67.04 CY
124'-125': 1.37 CY	124'-125': 6.11 CY
123'-124': 0.00 CY	123'-124': 0.43 CY

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	REVISION			

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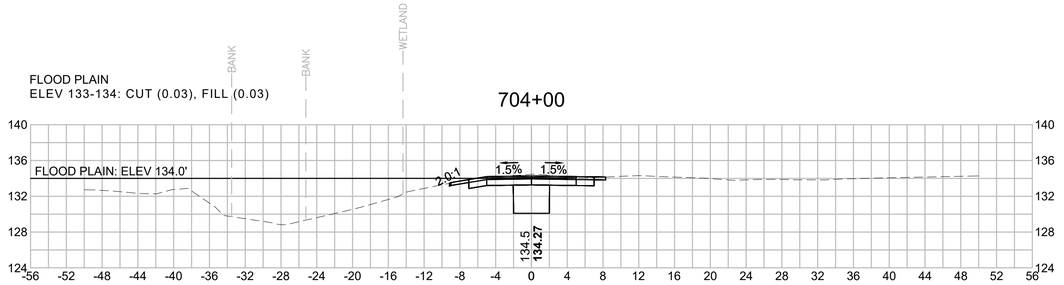
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 323 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

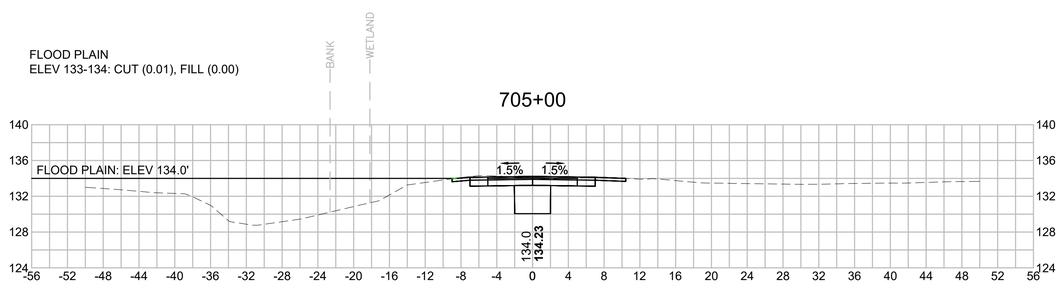
FLOOD PLAIN
ELEV 133-134: CUT (0.03), FILL (0.03)

704+00



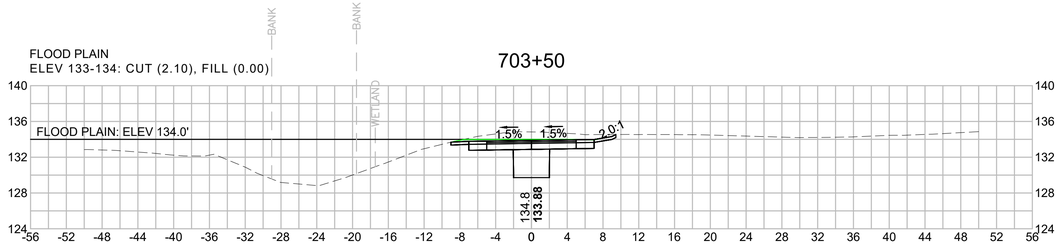
FLOOD PLAIN
ELEV 133-134: CUT (0.01), FILL (0.00)

705+00

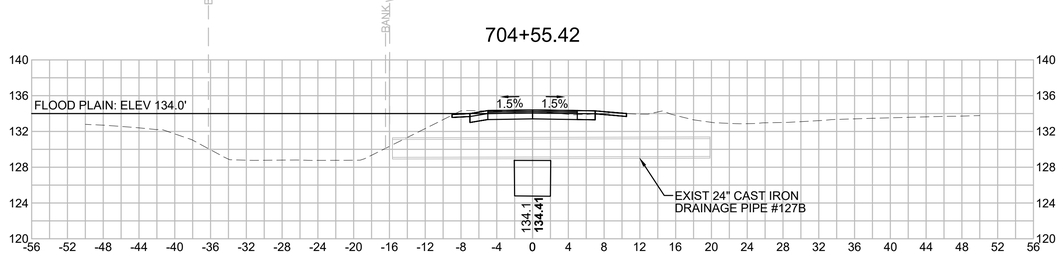


FLOOD PLAIN
ELEV 133-134: CUT (2.10), FILL (0.00)

703+50

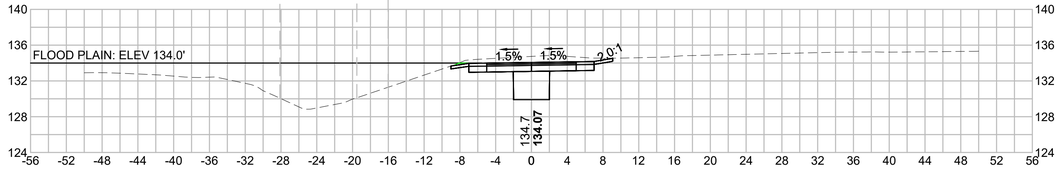


704+55.42



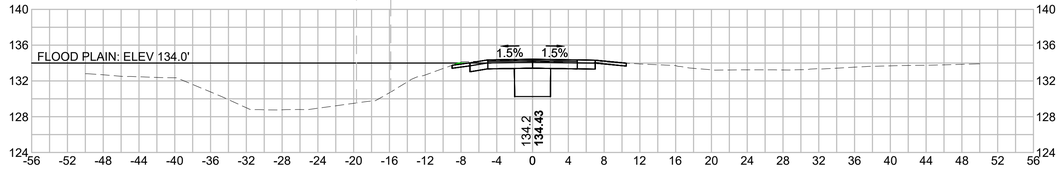
FLOOD PLAIN
ELEV 133-134: CUT (0.24), FILL (0.00)

703+00



FLOOD PLAIN
ELEV 133-134: CUT (0.15), FILL (0.00)

704+50



8 0 8 16
SCALE IN FEET

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	REVISION			

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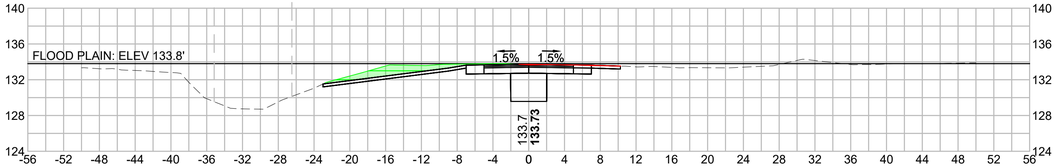
EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 324 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

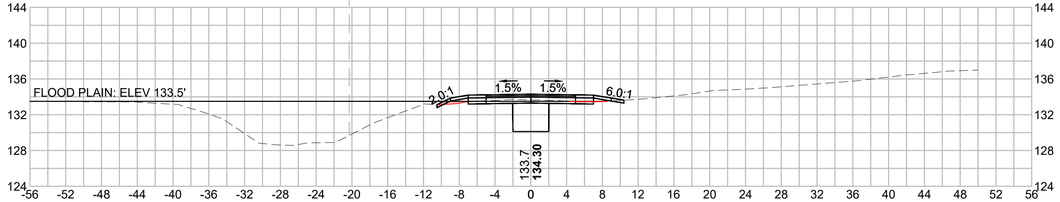
FLOOD PLAIN
ELEV 133-133.8: CUT (5.79), FILL (0.38)
ELEV 132-133: CUT (4.39), FILL (0.00)
ELEV 131-132: CUT (0.58), FILL (0.00)

706+50



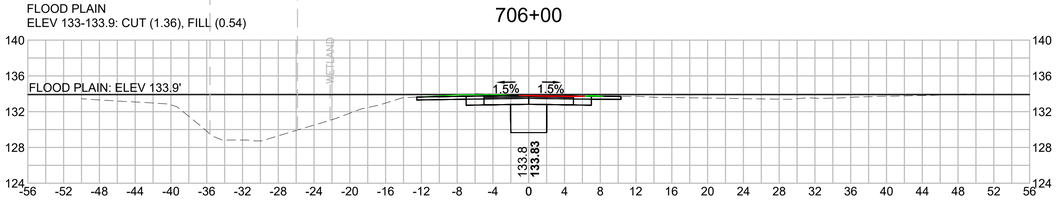
FLOOD PLAIN
ELEV 133-133.5: CUT (0.00), FILL (1.02)

708+00



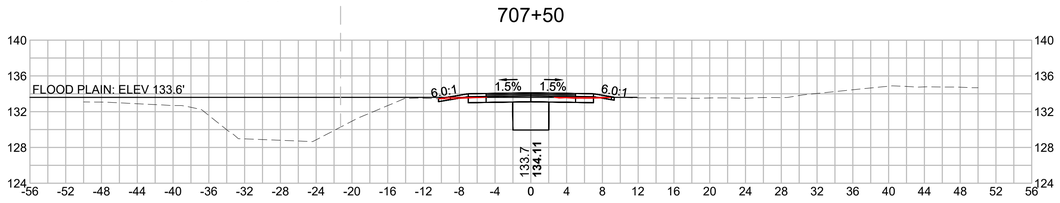
FLOOD PLAIN
ELEV 133-133.9: CUT (1.36), FILL (0.54)

706+00



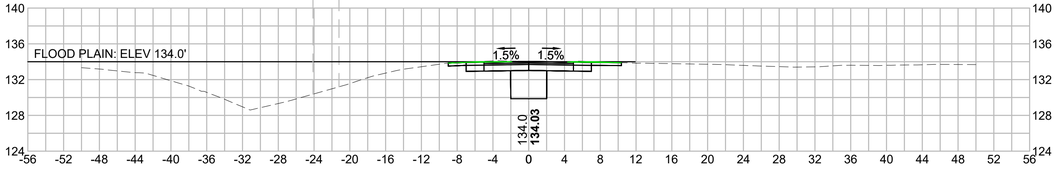
FLOOD PLAIN
ELEV 133-133.6: CUT (0.00), FILL (1.05)

707+50



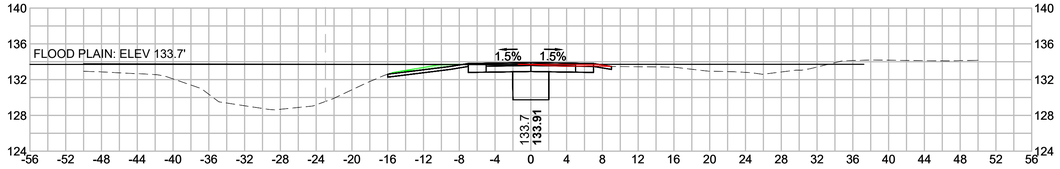
FLOOD PLAIN
ELEV 133-134: CUT (0.49), FILL (0.00)

705+50



FLOOD PLAIN
ELEV 133-133.7: CUT (1.48), FILL (1.44)
ELEV 132-133: CUT (0.34), FILL (0.00)

707+00



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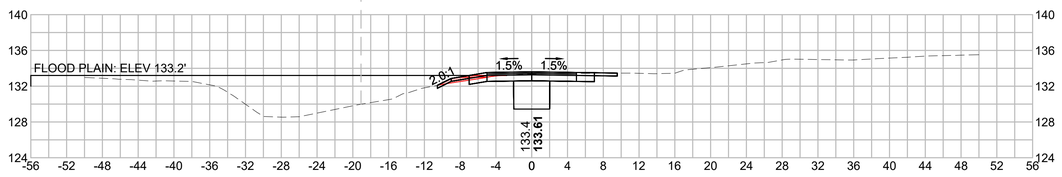
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 325 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

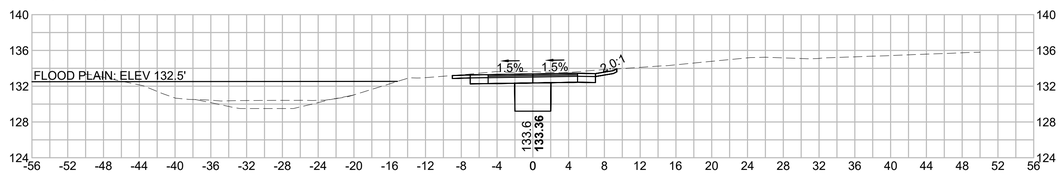
FLOOD PLAIN
ELEV 133-133.2: CUT (0.00), FILL (0.68)
ELEV 132-133: CUT (0.00), FILL (1.65)

709+50



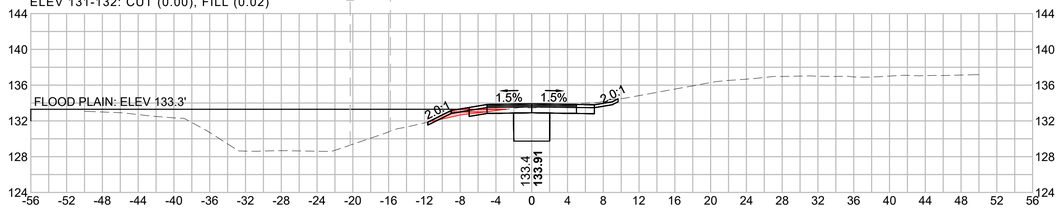
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

710+75



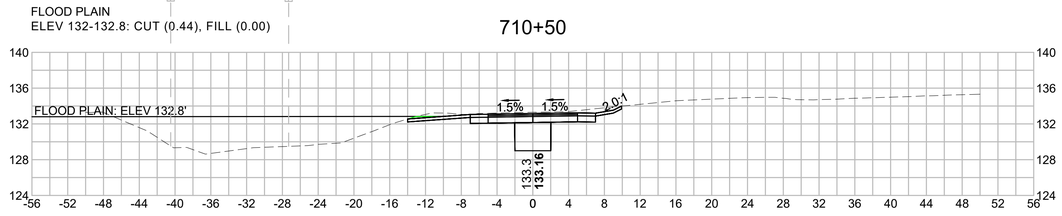
FLOOD PLAIN
ELEV 133-133.3: CUT (0.00), FILL (1.47)
ELEV 132-133: CUT (0.00), FILL (1.85)
ELEV 131-132: CUT (0.00), FILL (0.02)

709+00



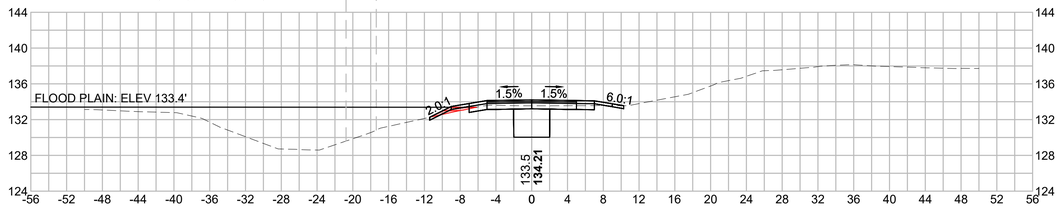
FLOOD PLAIN
ELEV 132-132.8: CUT (0.44), FILL (0.00)

710+50



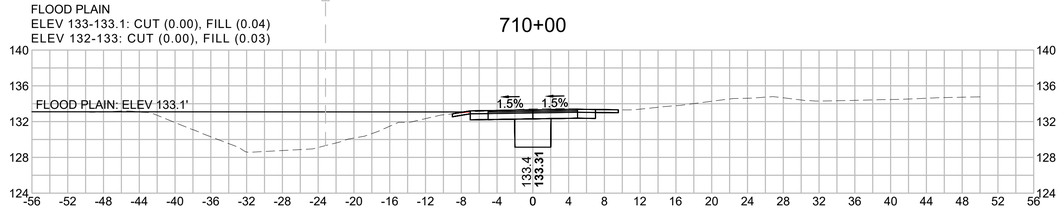
FLOOD PLAIN
ELEV 133-133.6: CUT (0.00), FILL (0.96)
ELEV 132-133: CUT (0.00), FILL (0.68)

708+50



FLOOD PLAIN
ELEV 133-133.1: CUT (0.00), FILL (0.04)
ELEV 132-133: CUT (0.00), FILL (0.03)

710+00



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NO.	DESCRIPTION	BY	DATE	APPR.

REVISION

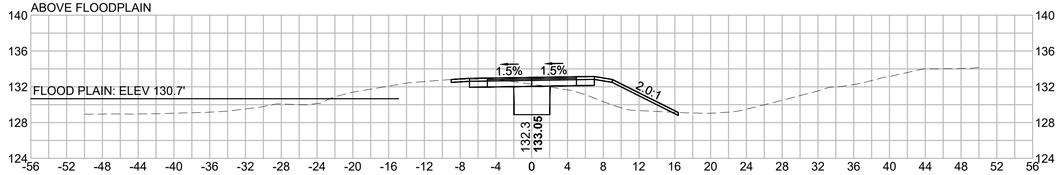
EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 326 OF 349

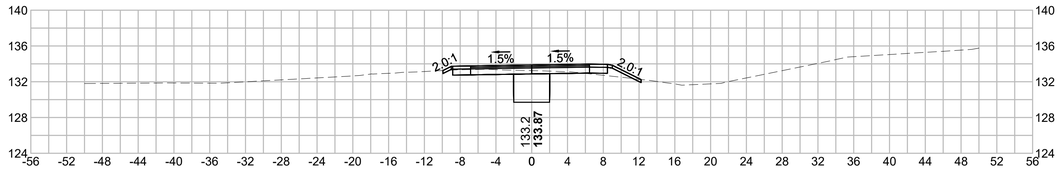
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

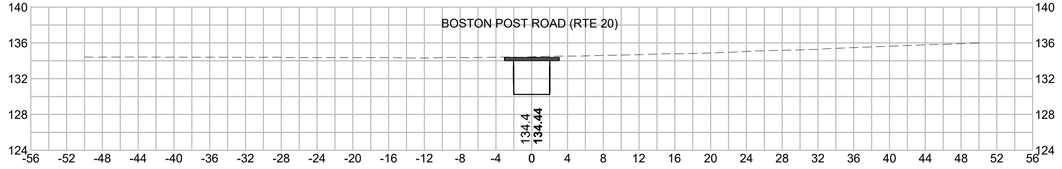
712+50



712+00

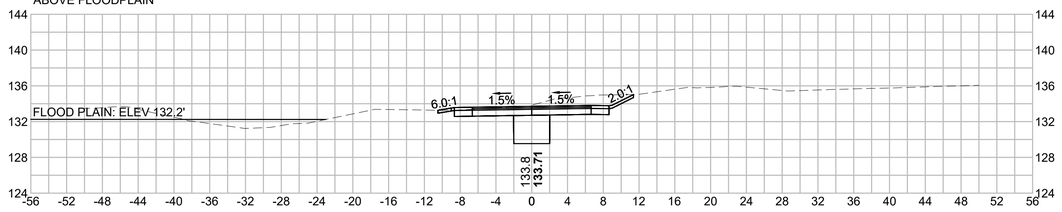


711+50



FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

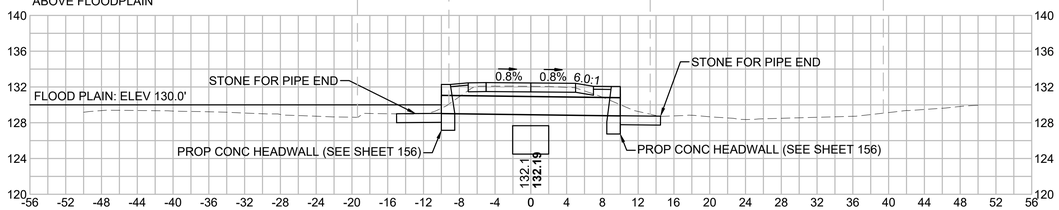
711+00



WETLAND

FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

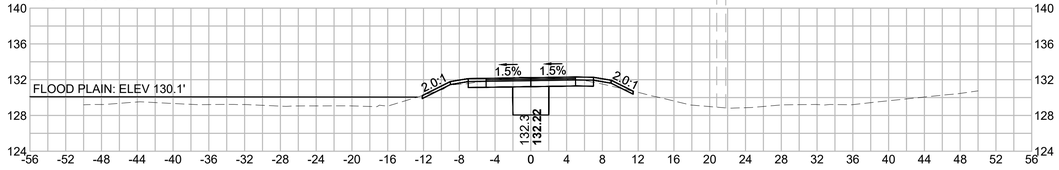
713+63.46



WETLAND
WETLAND

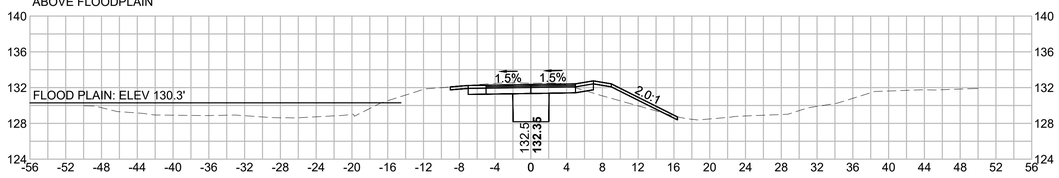
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

713+50



FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

713+00



8 0 8 16
SCALE IN FEET

NO.	DESCRIPTION	BY	DATE	APPR.
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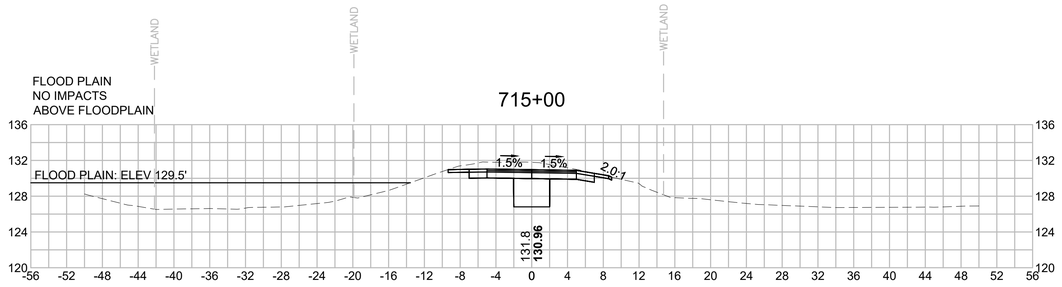
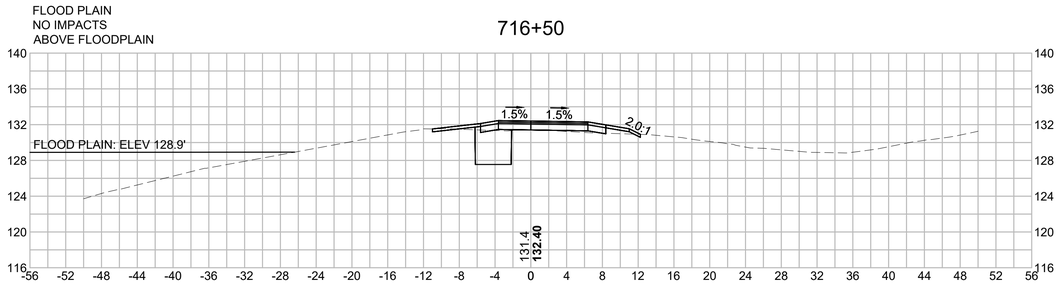
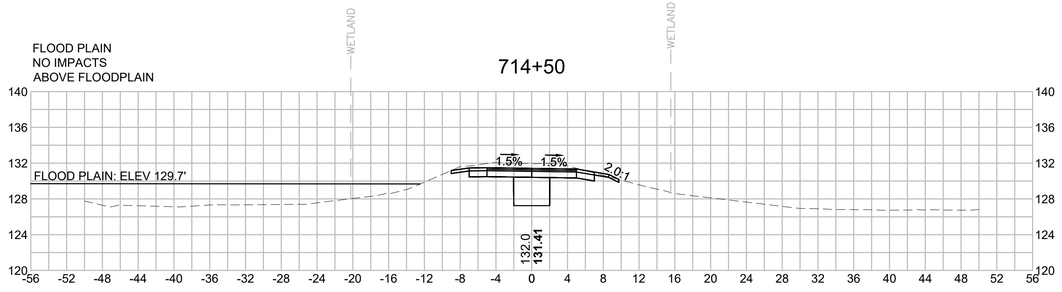
EVERSOURCE

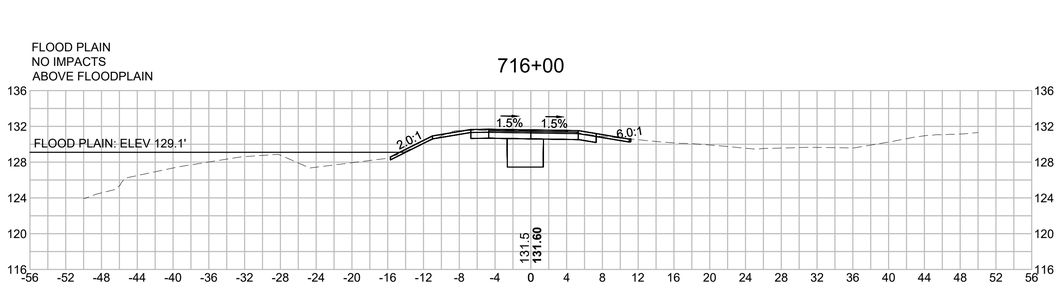
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 327 OF 349

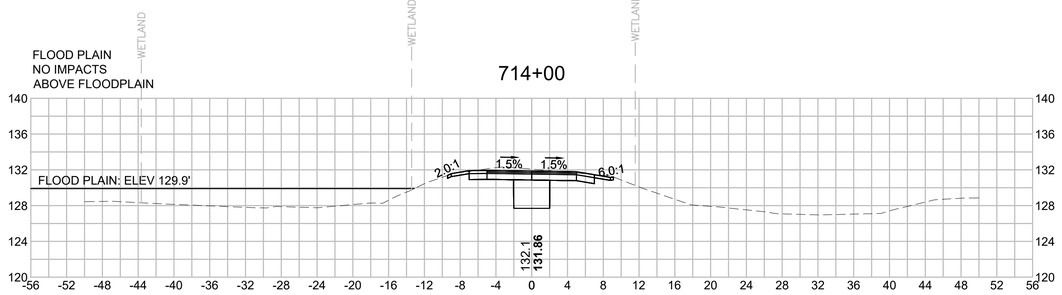
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

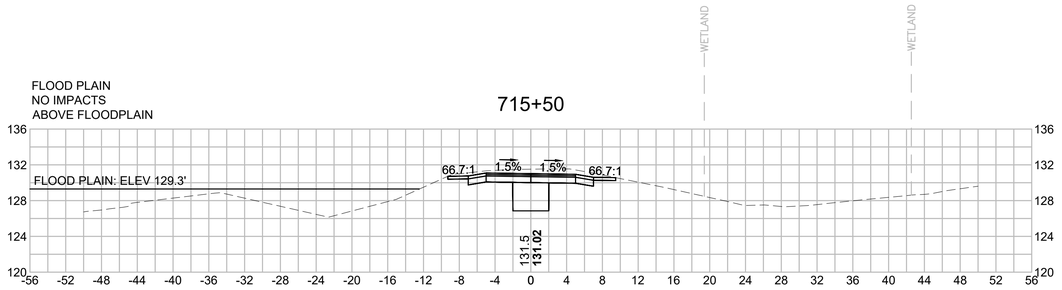












8 0 8 16
SCALE IN FEET

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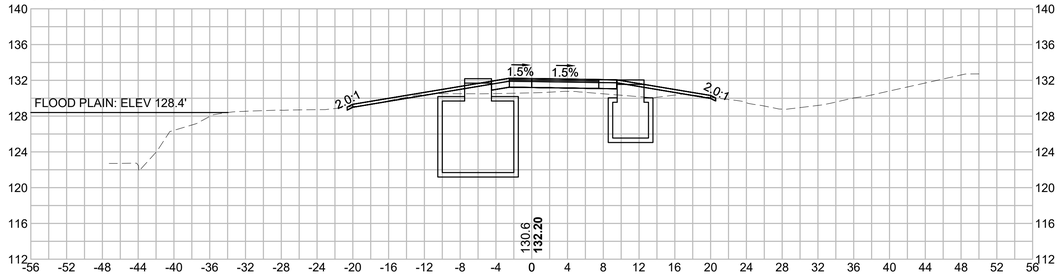
EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 328 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

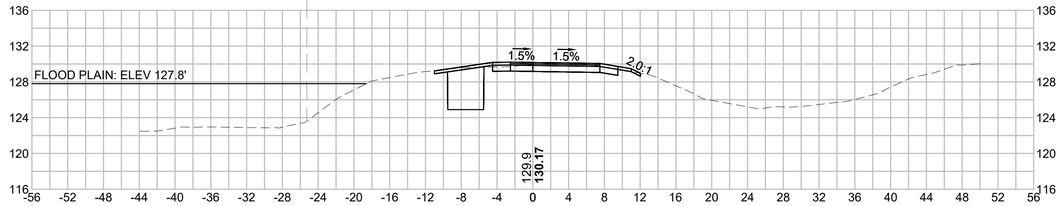
718+00



FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

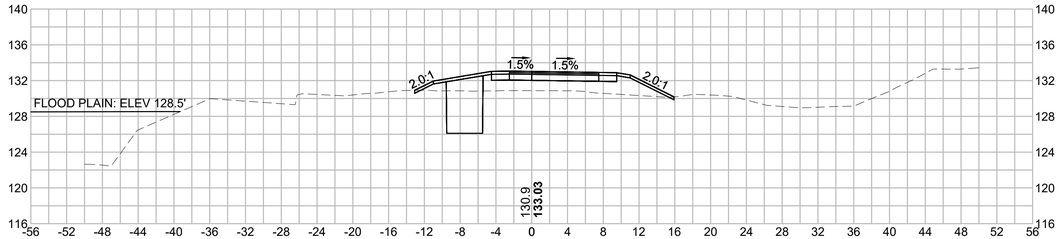
WETLAND

719+50



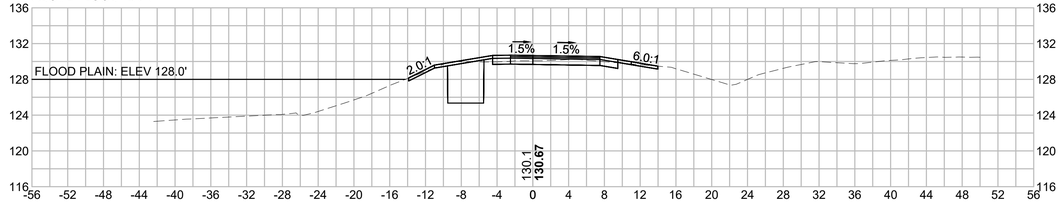
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

717+50



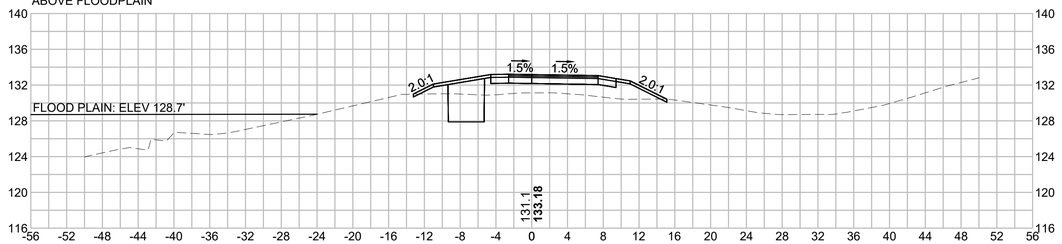
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

719+00



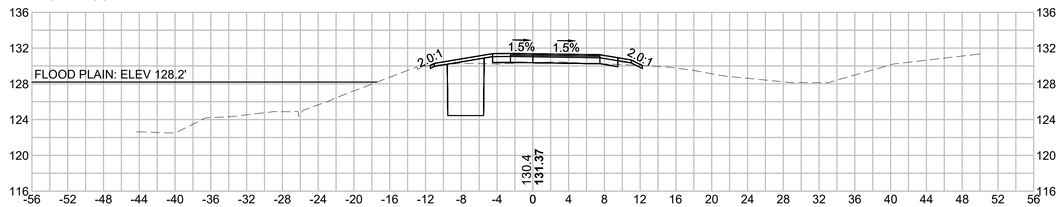
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

717+00



FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

718+50



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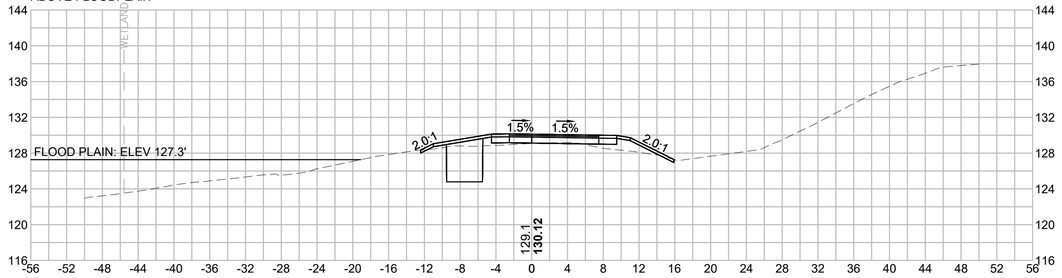
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 329 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

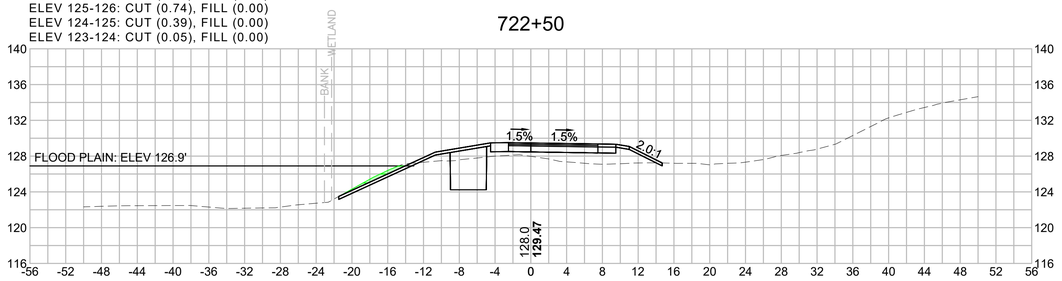
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

721+00



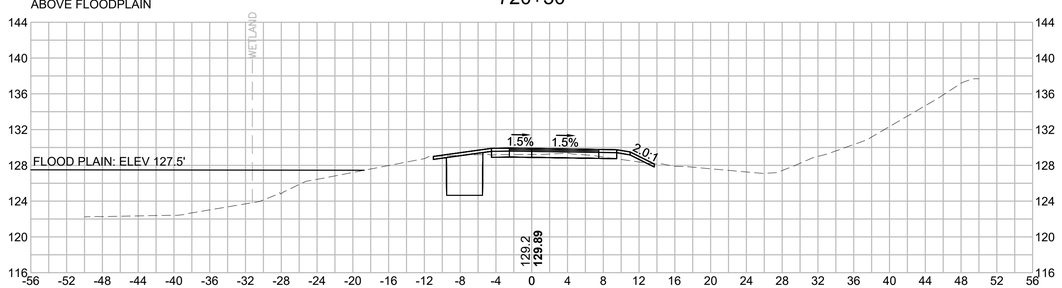
FLOOD PLAIN
ELEV 126-127: CUT (0.75), FILL (0.00)
ELEV 125-126: CUT (0.74), FILL (0.00)
ELEV 124-125: CUT (0.39), FILL (0.00)
ELEV 123-124: CUT (0.05), FILL (0.00)

722+50



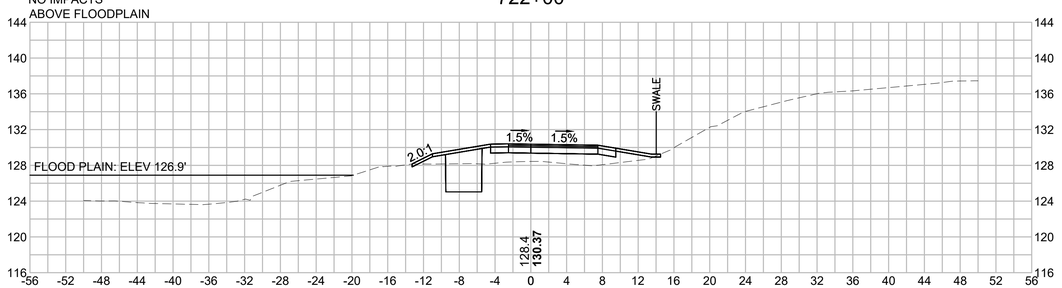
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

720+50



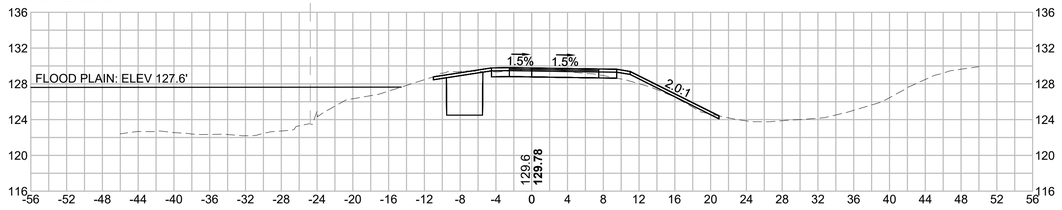
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

722+00



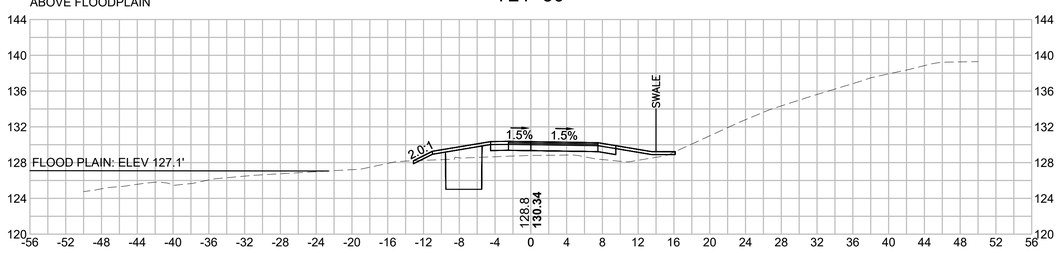
FLOODPLAIN
NO IMPACTS
ABOVE FLOODPLAIN

720+00



FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

721+50



8 0 8 16
SCALE IN FEET

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	REVISION			

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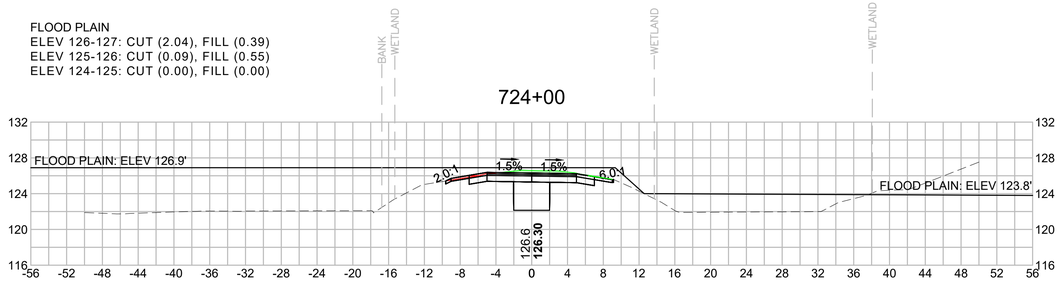
EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 330 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

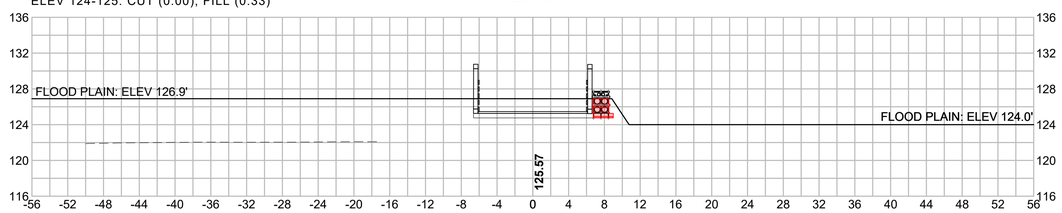
FLOOD PLAIN
ELEV 126-127: CUT (2.04), FILL (0.39)
ELEV 125-126: CUT (0.09), FILL (0.55)
ELEV 124-125: CUT (0.00), FILL (0.00)

724+00



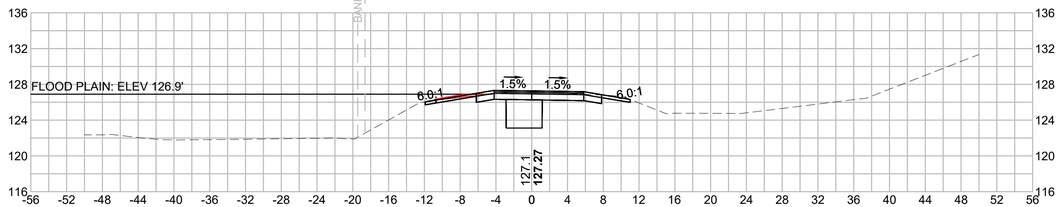
FLOOD PLAIN
ELEV 126-127: CUT (0.00), FILL (1.79)
ELEV 125-126: CUT (0.00), FILL (1.94)
ELEV 124-125: CUT (0.00), FILL (0.33)

725+50



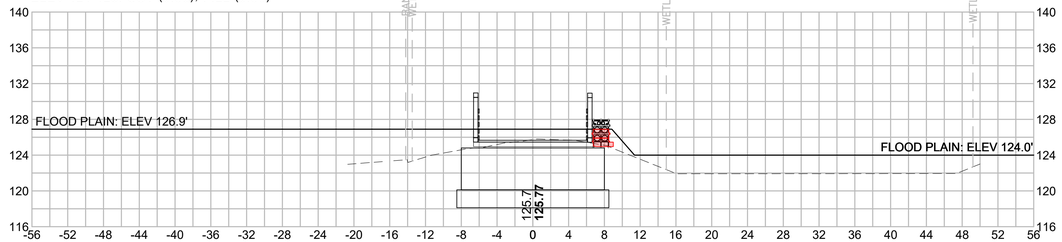
FLOOD PLAIN
ELEV 126-127: CUT (0.00), FILL (1.31)

723+50



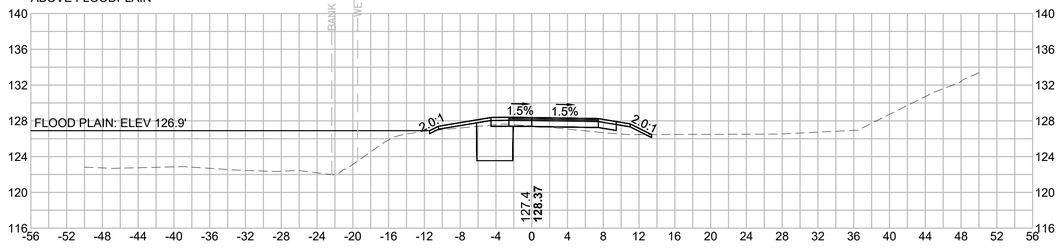
FLOOD PLAIN
ELEV 126-127: CUT (0.00), FILL (1.79)
ELEV 125-126: CUT (0.00), FILL (1.91)
ELEV 124-125: CUT (0.00), FILL (0.00)

725+00



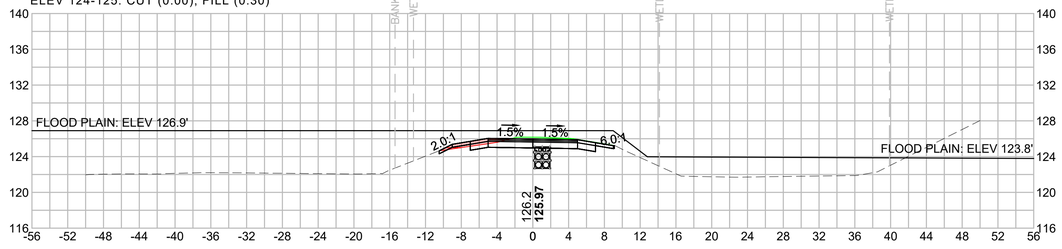
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

723+00



FLOOD PLAIN
ELEV 126-127: CUT (0.89), FILL (0.04)
ELEV 125-126: CUT (0.59), FILL (3.05)
ELEV 124-125: CUT (0.00), FILL (0.30)

724+50



8 0 8 16
SCALE IN FEET

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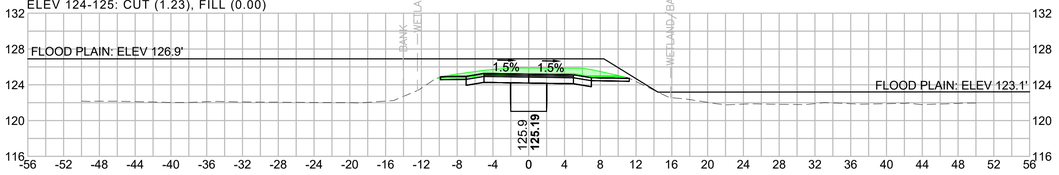
EVERSOURCE

SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 331OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

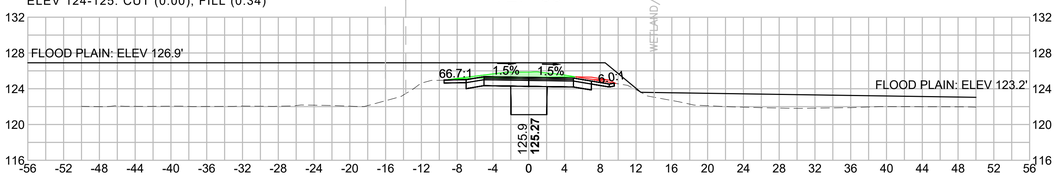
FLOOD PLAIN
ELEV 125-126: CUT (10.37), FILL (0.00)
ELEV 124-125: CUT (1.23), FILL (0.00)

727+50



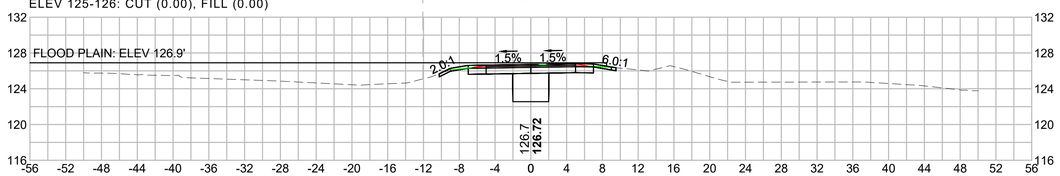
FLOOD PLAIN
ELEV 126-127: CUT (0.00), FILL (0.00)
ELEV 125-126: CUT (5.41), FILL (0.50)
ELEV 124-125: CUT (0.00), FILL (0.34)

727+00



FLOOD PLAIN
ELEV 126-127: CUT (0.17), FILL (0.88)
ELEV 125-126: CUT (0.00), FILL (0.00)

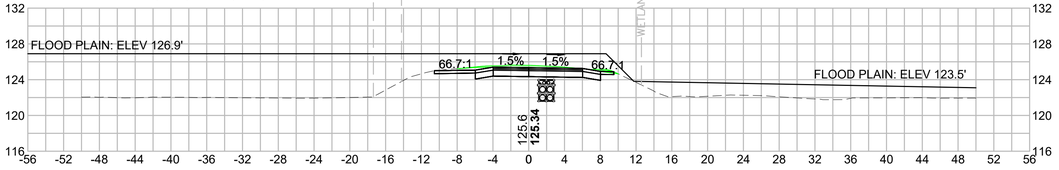
729+00



512+00

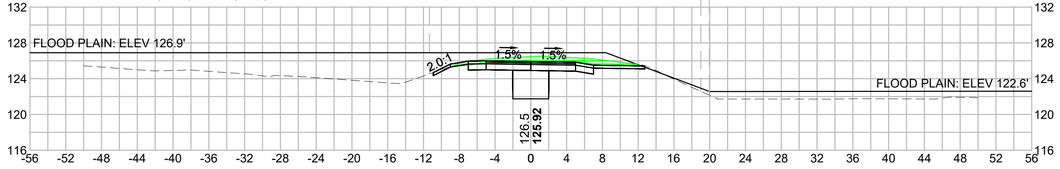
FLOOD PLAIN
ELEV 126-127: CUT (0.00), FILL (0.00)
ELEV 125-126: CUT (2.54), FILL (0.00)
ELEV 124-125: CUT (0.33), FILL (0.00)

726+50



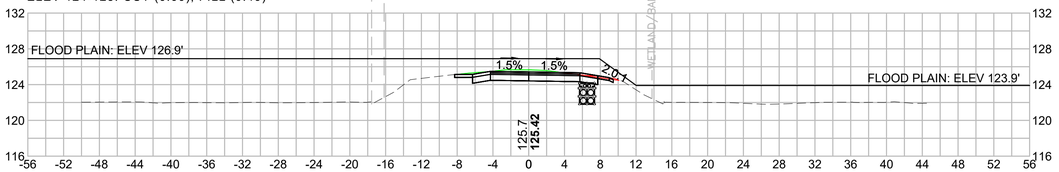
FLOOD PLAIN
ELEV 126-127: CUT (4.93), FILL (0.00)
ELEV 125-126: CUT (3.74), FILL (0.00)

728+50



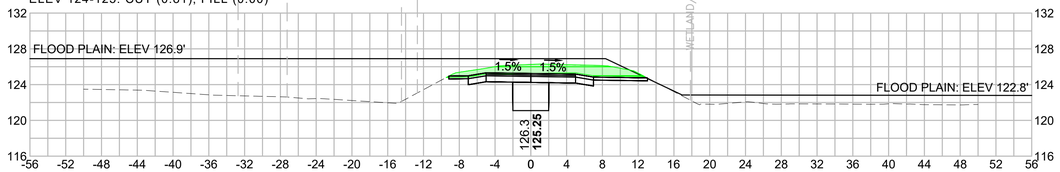
FLOOD PLAIN
ELEV 126-127: CUT (0.00), FILL (0.00)
ELEV 125-126: CUT (1.90), FILL (0.53)
ELEV 124-125: CUT (0.00), FILL (0.49)

726+00



FLOOD PLAIN
ELEV 126-127: CUT (2.57), FILL (0.00)
ELEV 125-126: CUT (15.34), FILL (0.00)
ELEV 124-125: CUT (0.81), FILL (0.00)

728+00



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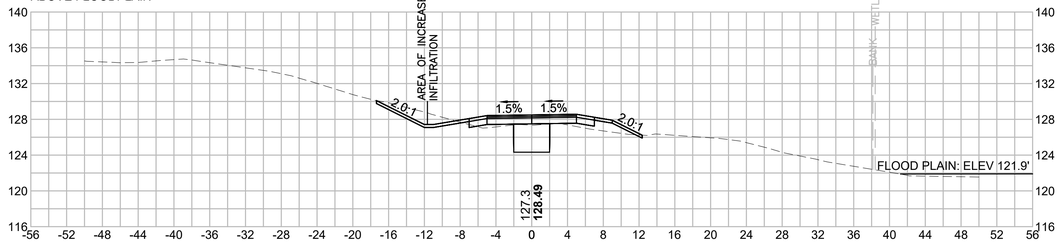
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 332 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

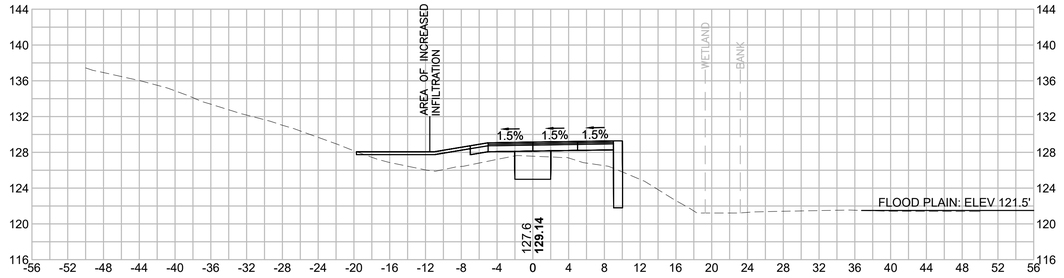
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

730+50

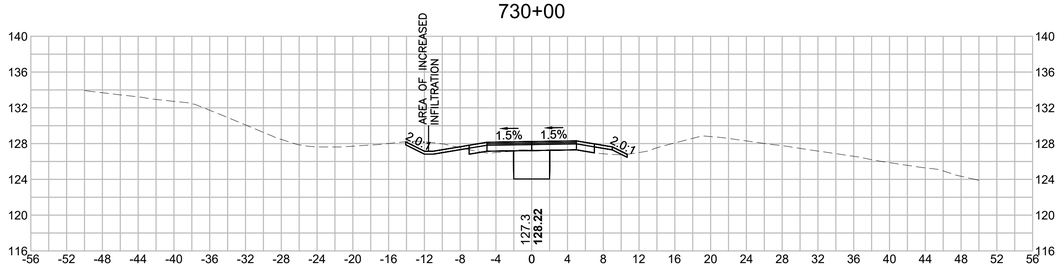


FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

732+00

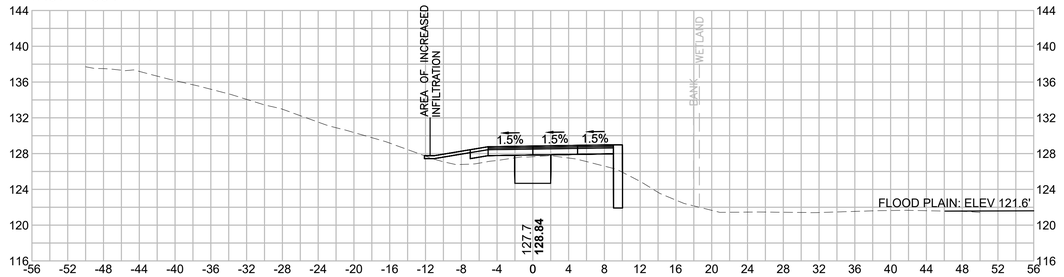


730+00



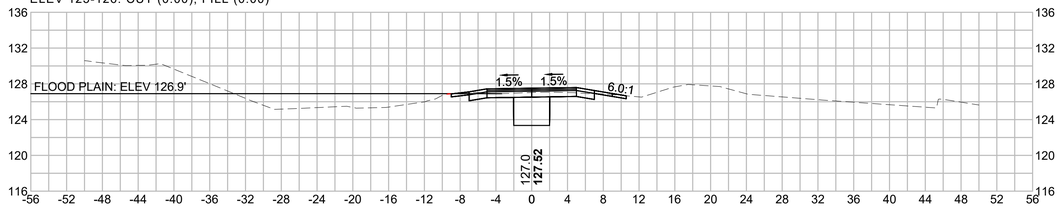
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

731+50



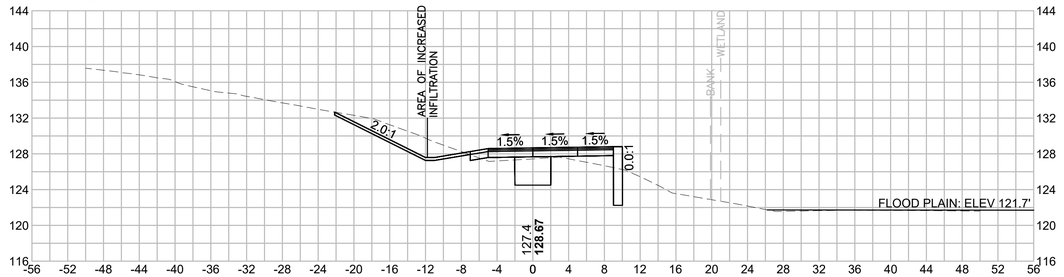
FLOOD PLAIN
ELEV 126-127: CUT (0.00), FILL (0.02)
ELEV 125-126: CUT (0.00), FILL (0.00)

729+50



FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

731+00



8 0 8 16
SCALE IN FEET

NO.	DESCRIPTION	BY	DATE	APPR.

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
CROSS SECTIONS
PLAN 333 OF 349

Vanasse Hangen Brustlin, Inc.
101 Walnut St, PO Box 9151
Watertown, MA 02472
617.924.1770 FAX 617.924.2286

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

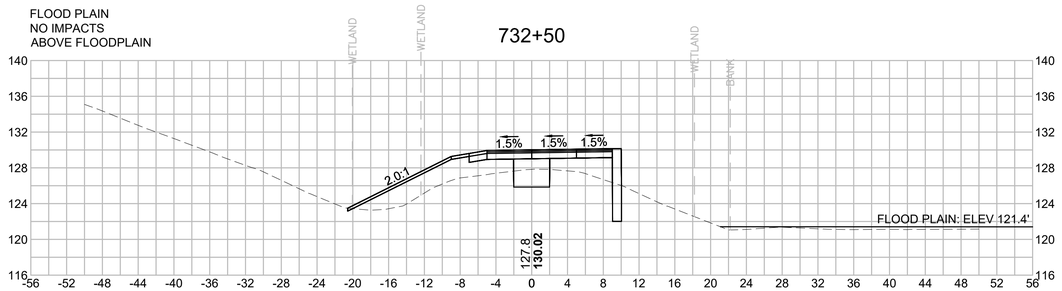
733+00

FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

734+00

FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

732+50



FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

733+50

8 0 8 16
SCALE IN FEET

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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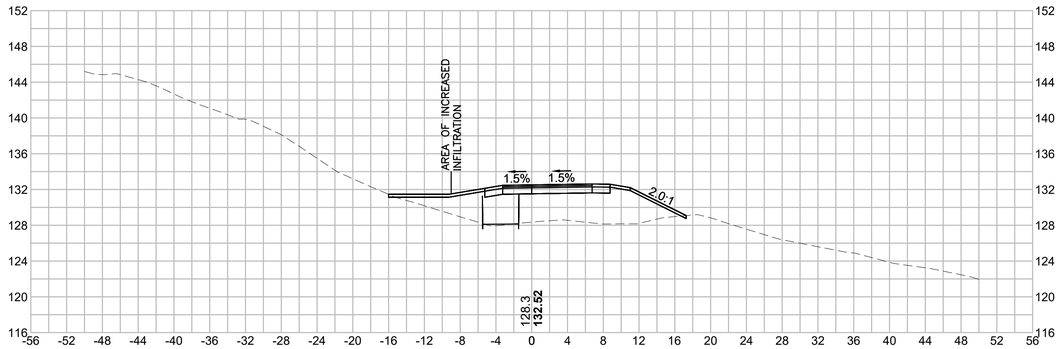
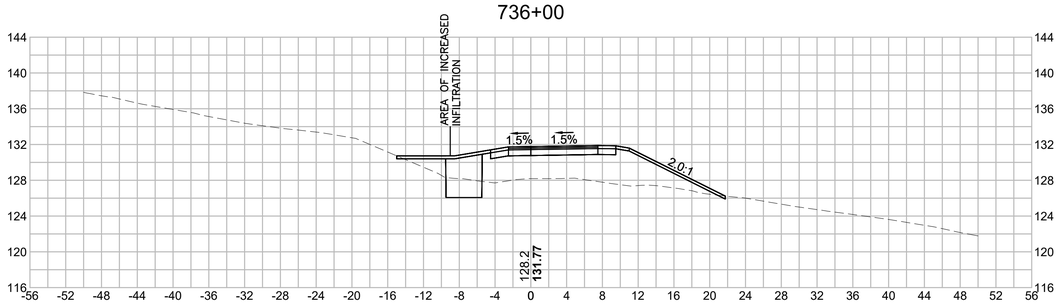
PLAN 334 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

735+00



736+00

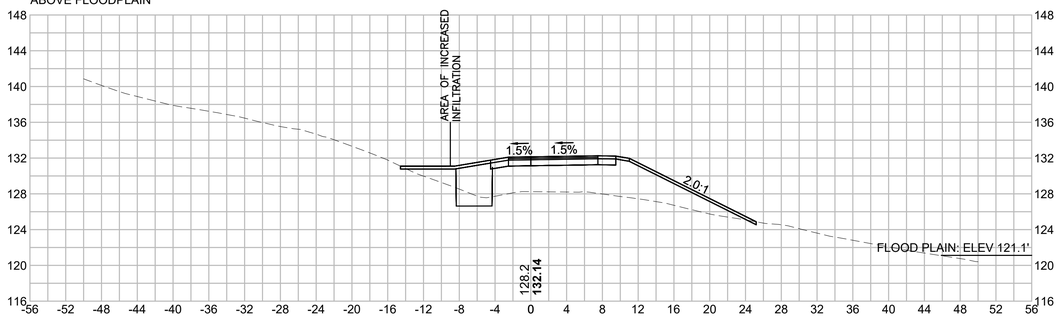


FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

734+50

FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

735+50



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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

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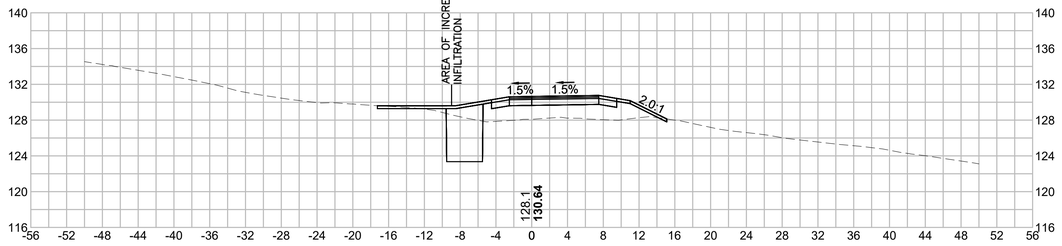
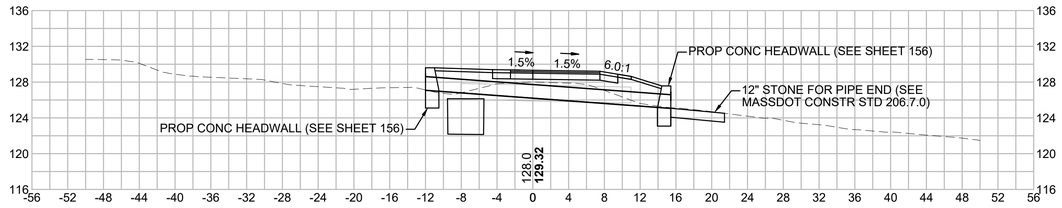
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

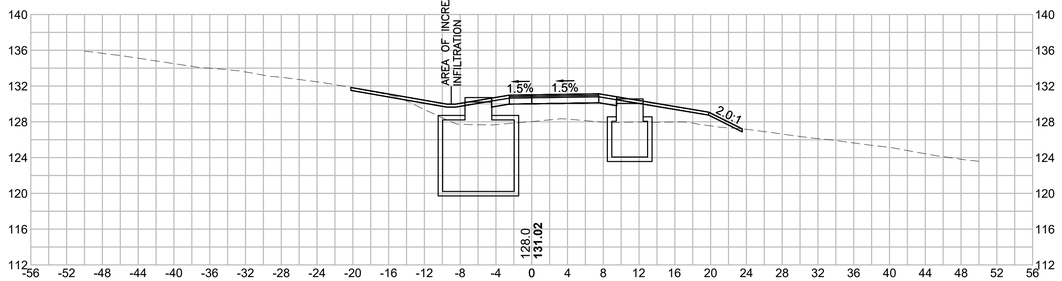
737+50



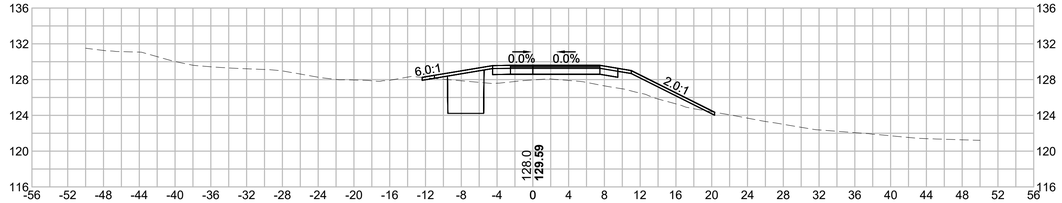
738+76.53



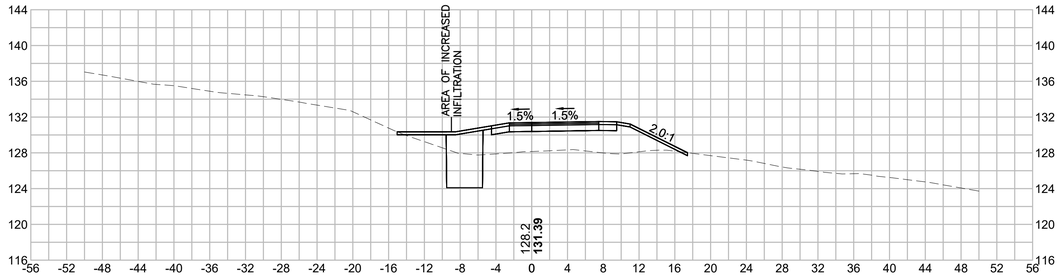
737+00



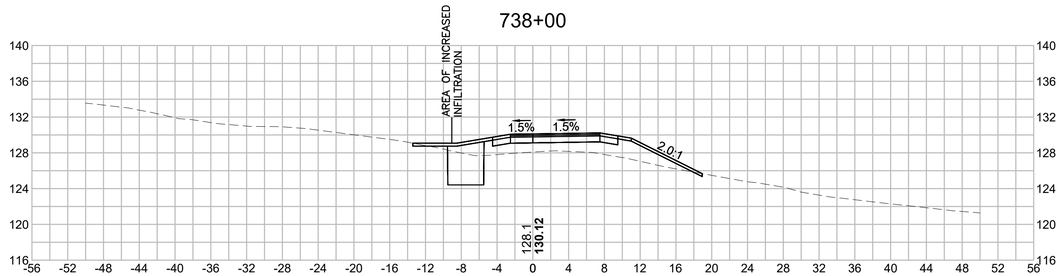
738+50



736+50



738+00



8 0 8 16
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NO.	DESCRIPTION	BY	DATE	APPR.

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

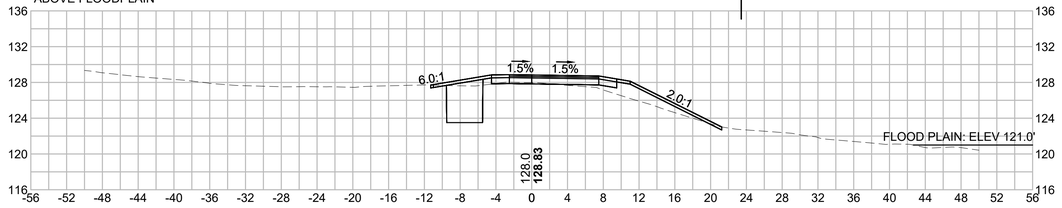
CROSS SECTIONS

PLAN 336 OF 349

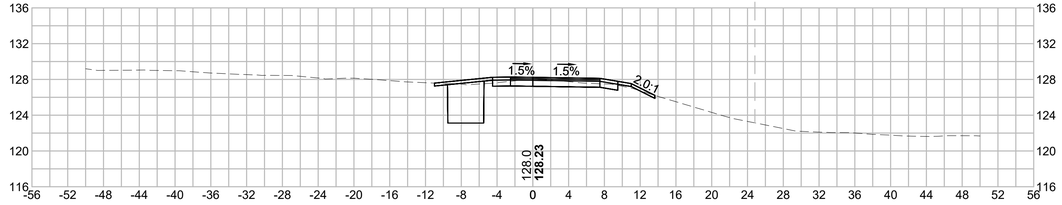
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

740+00

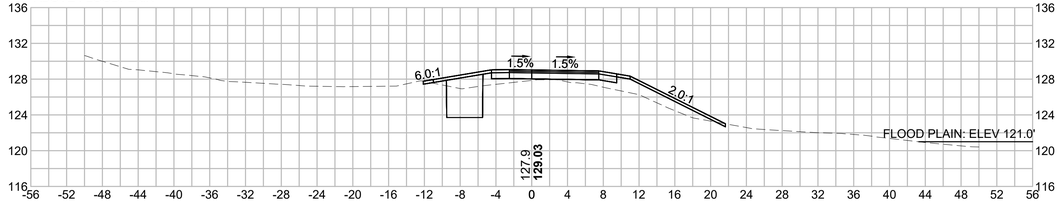


741+50



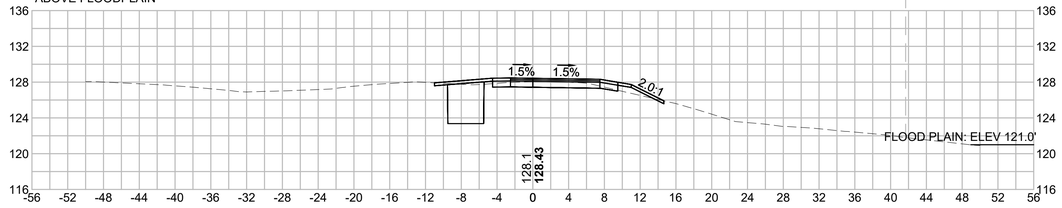
FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

739+50

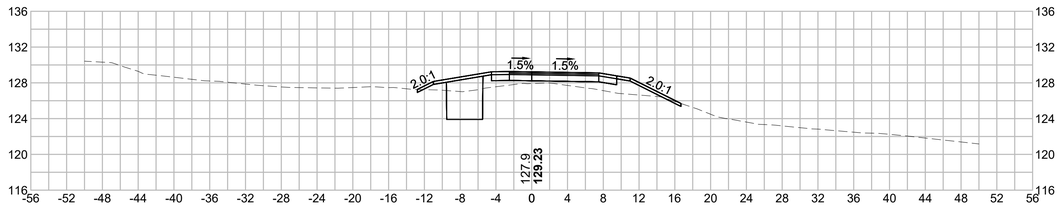


FLOOD PLAIN
NO IMPACTS
ABOVE FLOODPLAIN

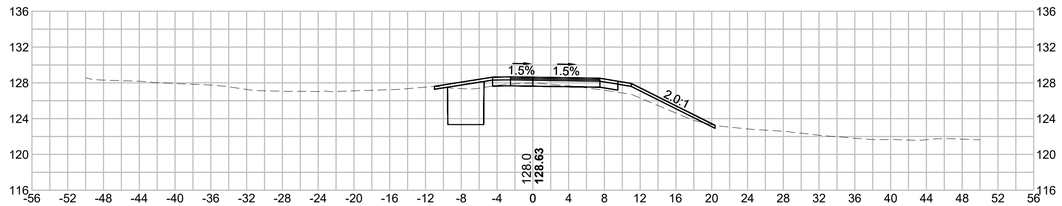
741+00



739+00



740+50



8 0 8 16
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS
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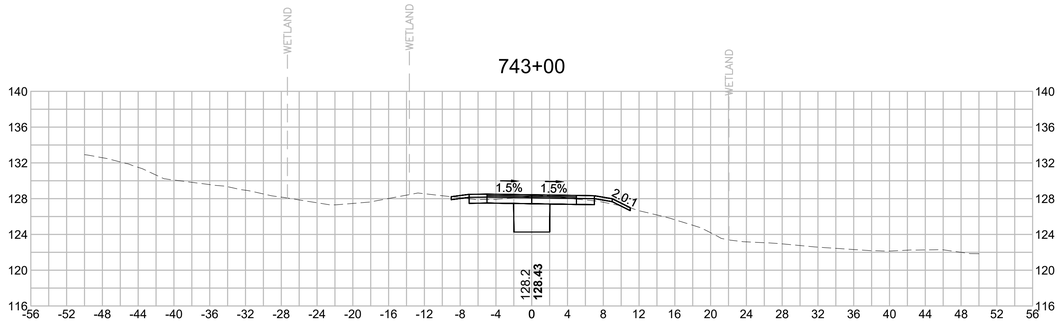
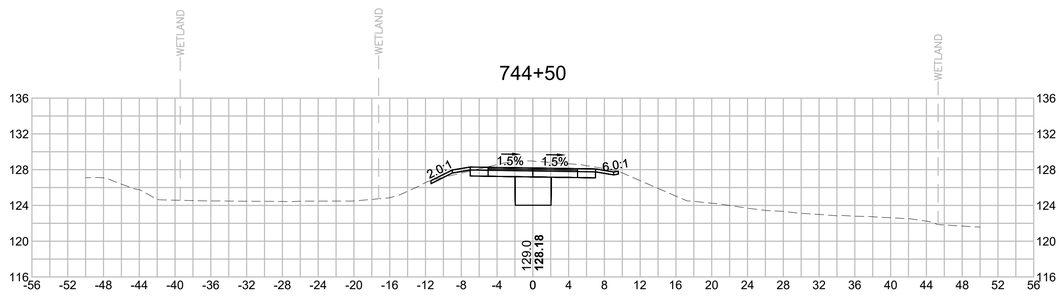
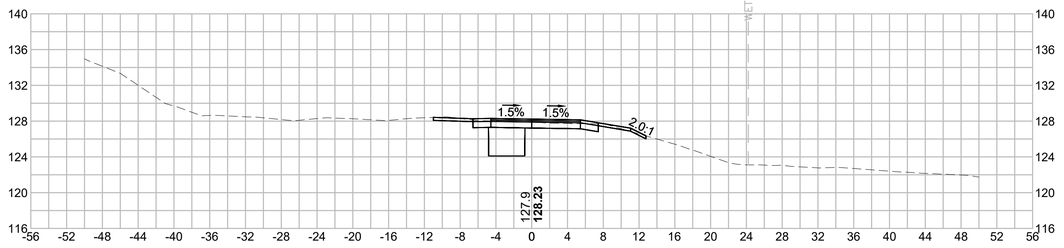
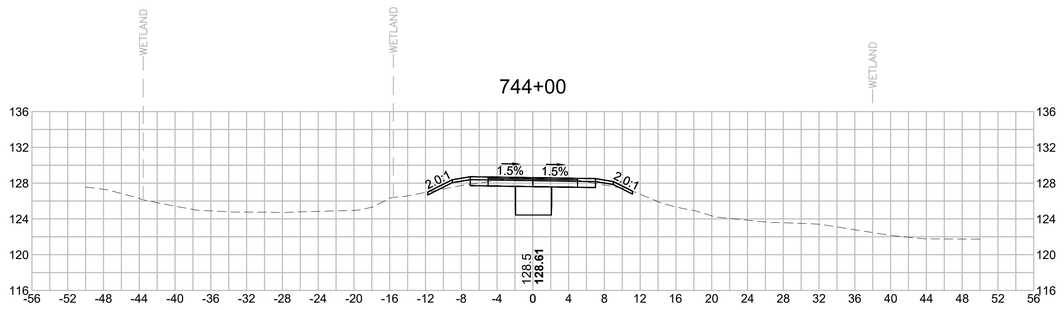
PLAN 337 OF 349

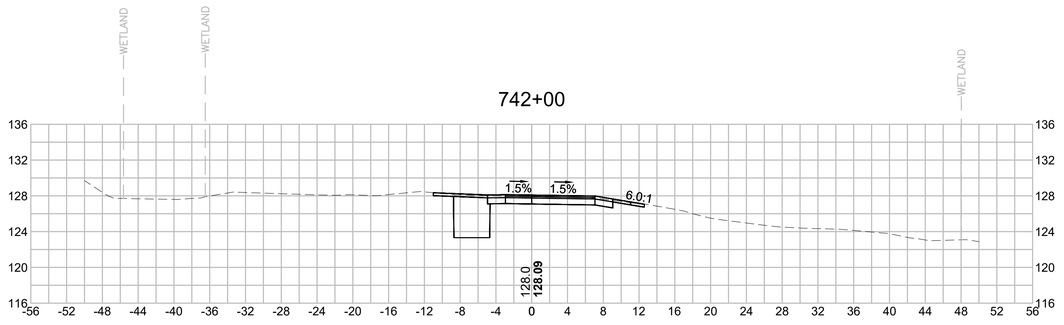
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

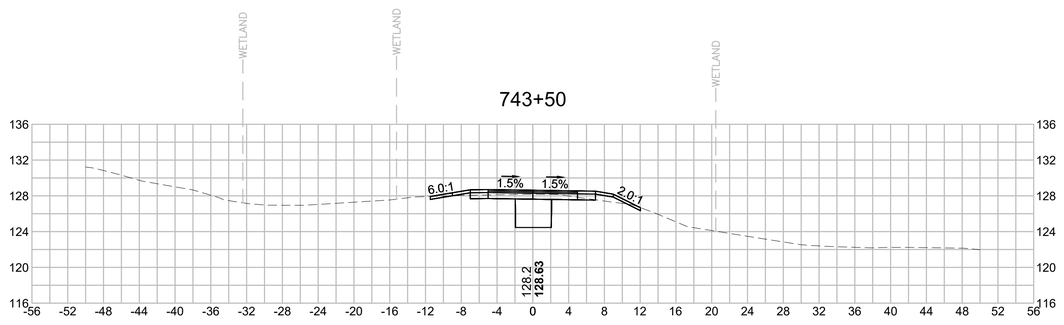












8 0 8 16
SCALE IN FEET

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NO.	DESCRIPTION	BY	DATE	APPR.

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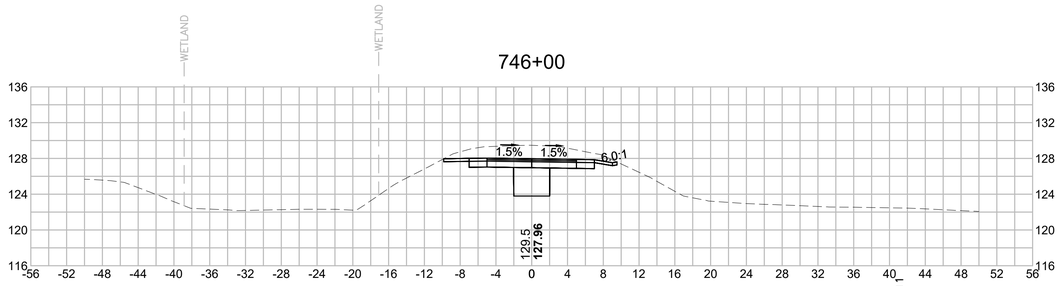
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

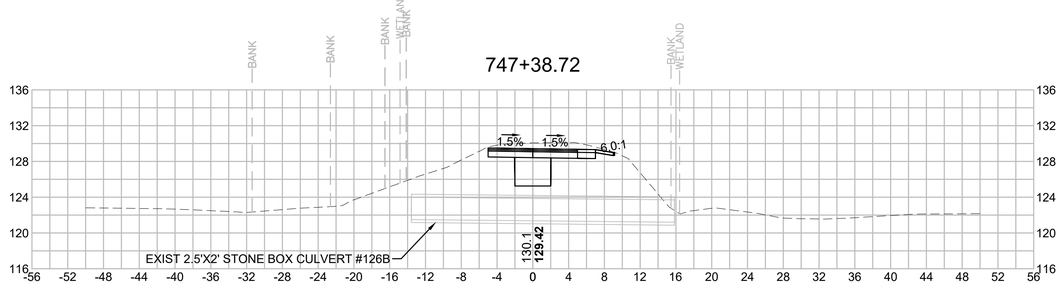
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

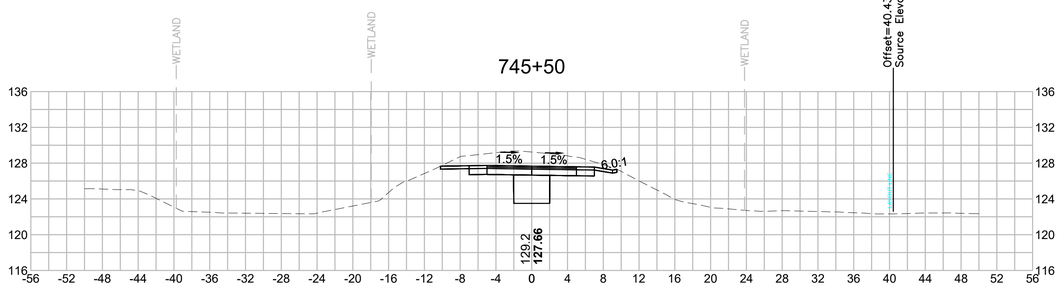
CROSS SECTIONS

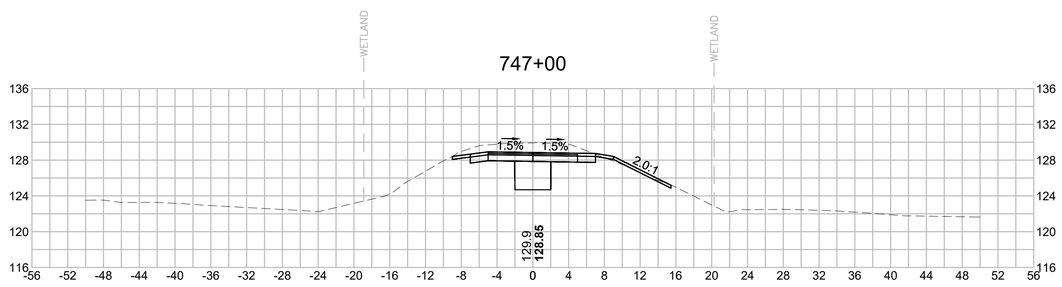
PLAN 338 OF 349

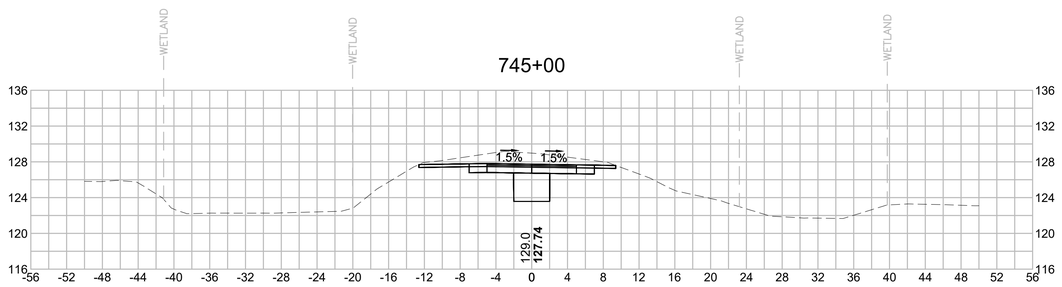
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

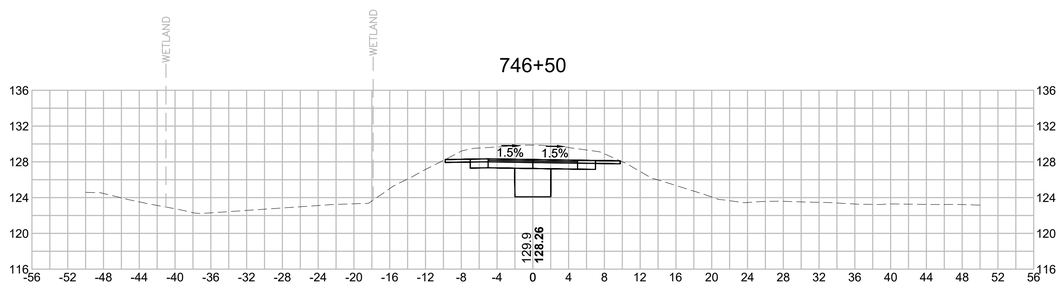












8 0 8 16
SCALE IN FEET

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NO.	DESCRIPTION	BY	DATE	APPR.
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EVERSOURCE

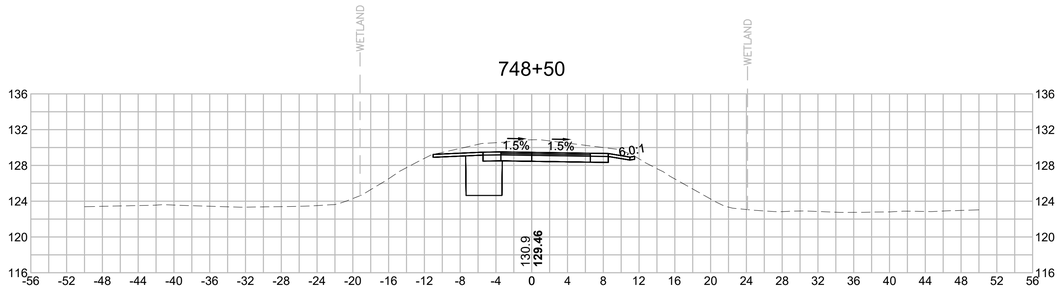
SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

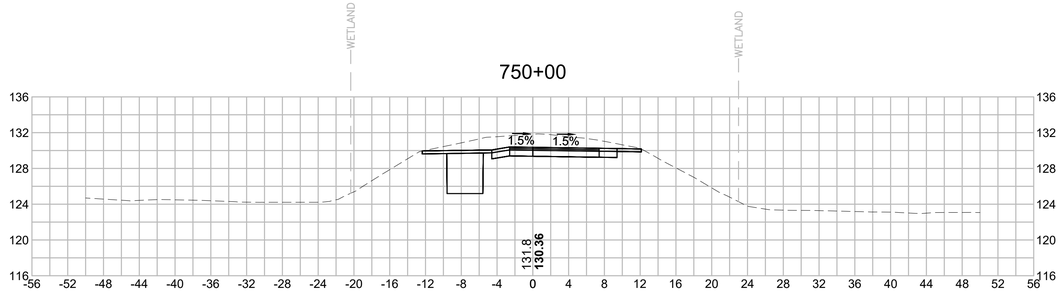
HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

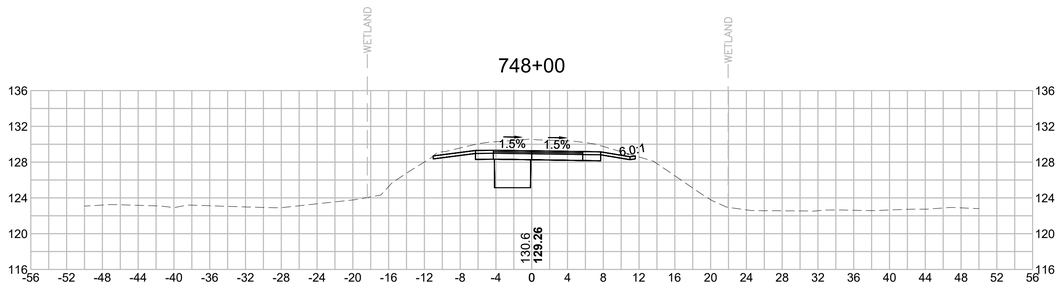
CROSS SECTIONS

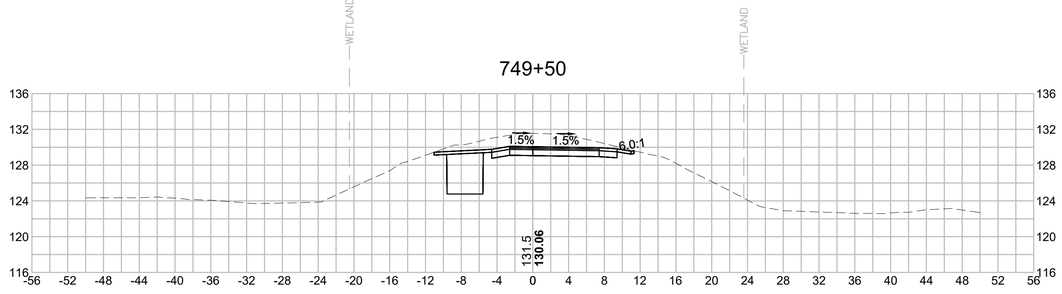
PLAN 339 OF 349

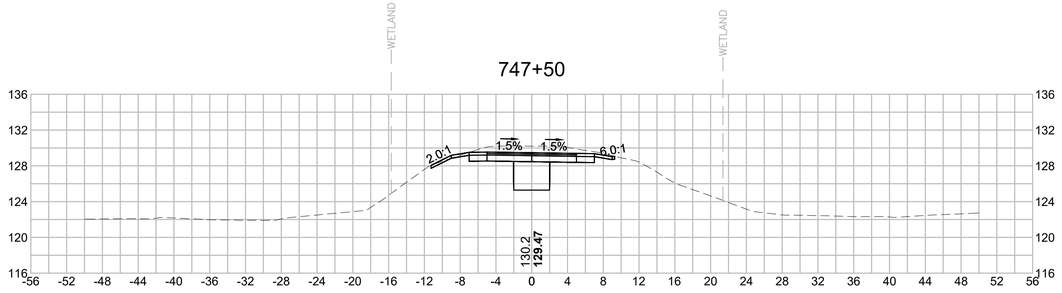
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

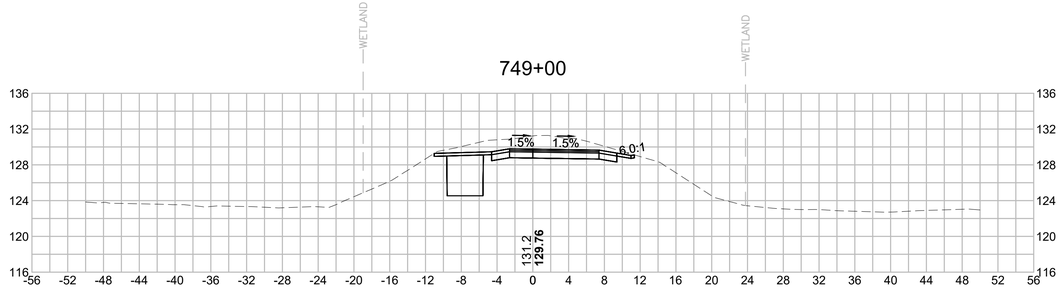












8 0 8 16
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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

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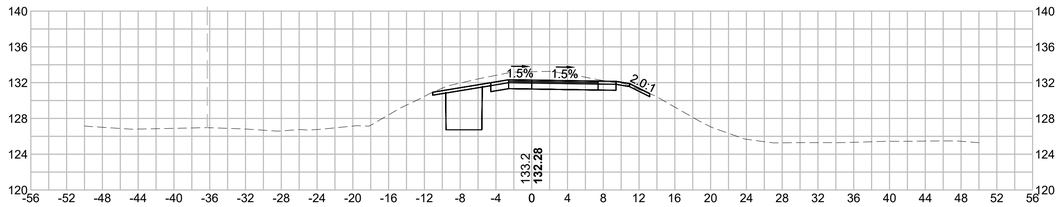
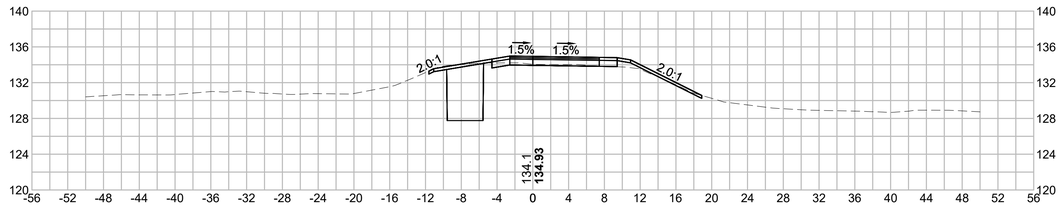
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

751+50

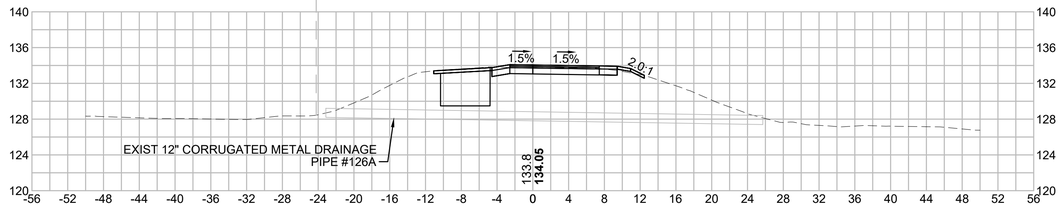


752+50

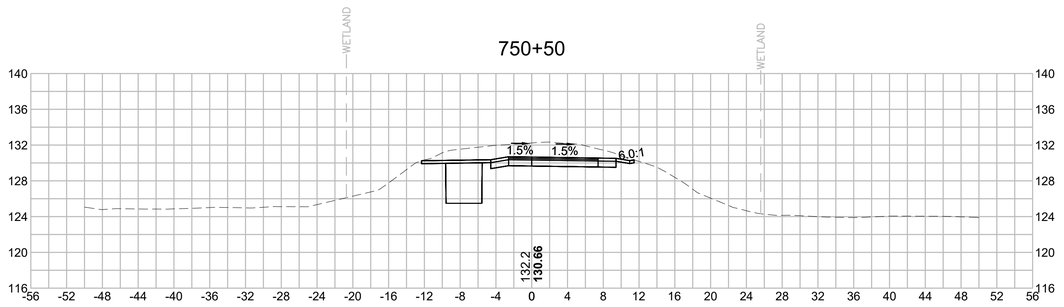


751+00

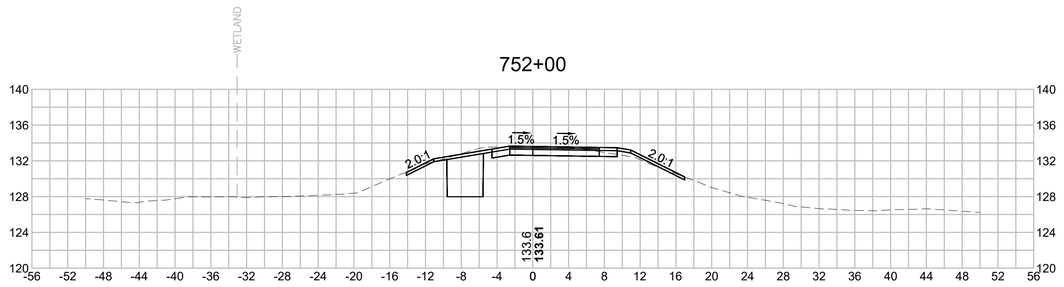
752+16.80



750+50



752+00



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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

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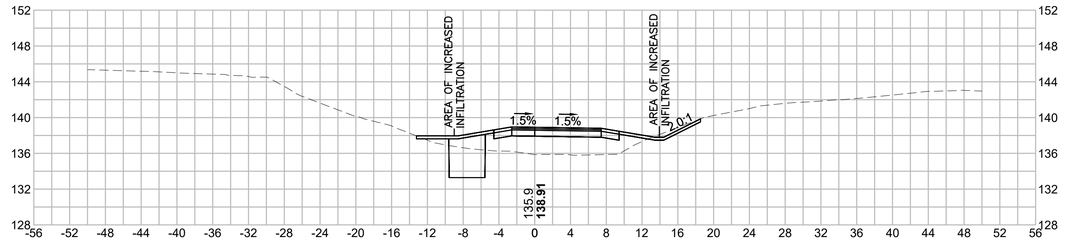
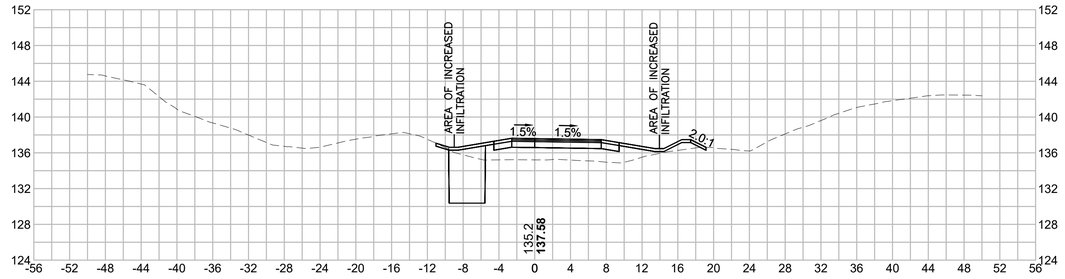
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MS	.	.

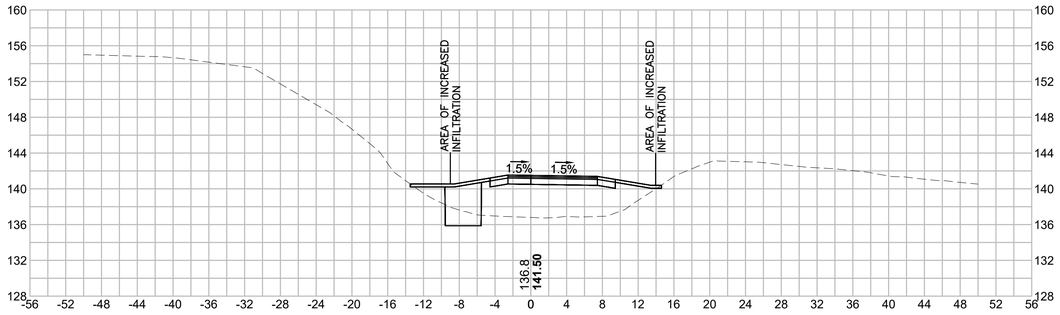
754+00



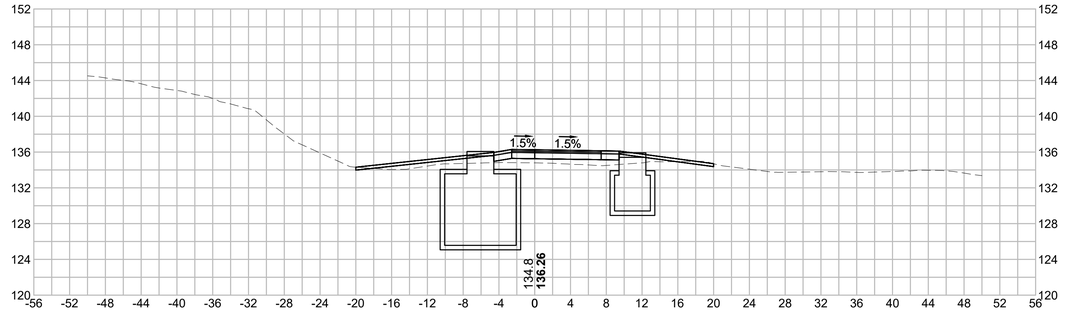
753+50



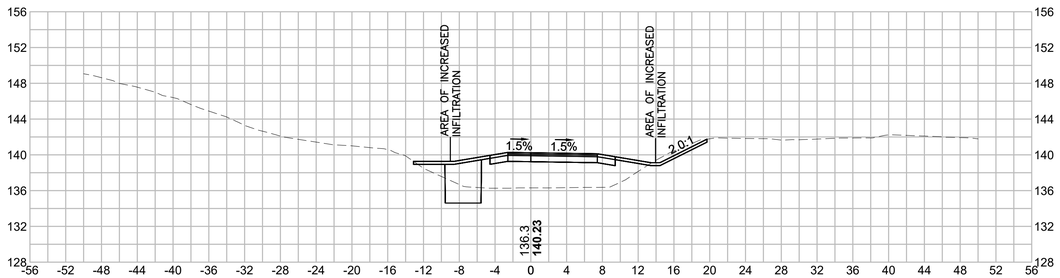
755+00



753+00



754+50



8 0 8 16
SCALE IN FEET

vhb
Vanasse Hangen Brustlin, Inc.
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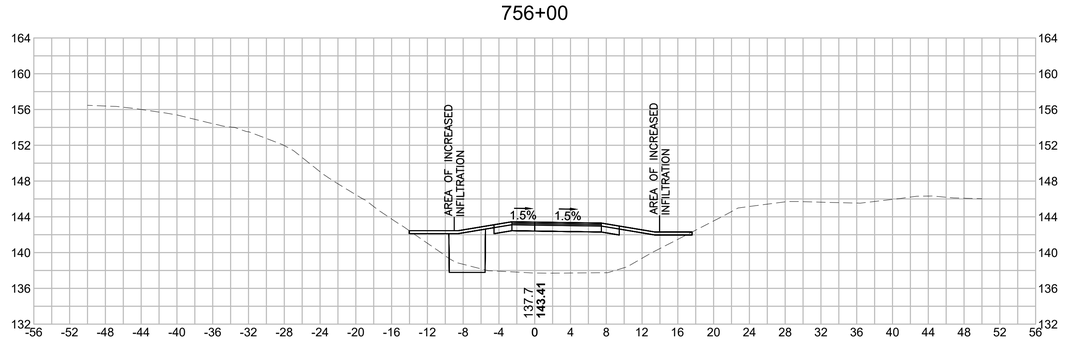
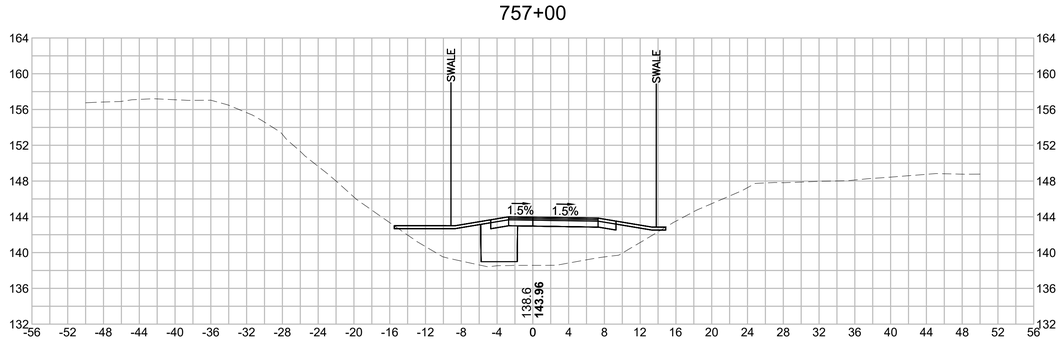
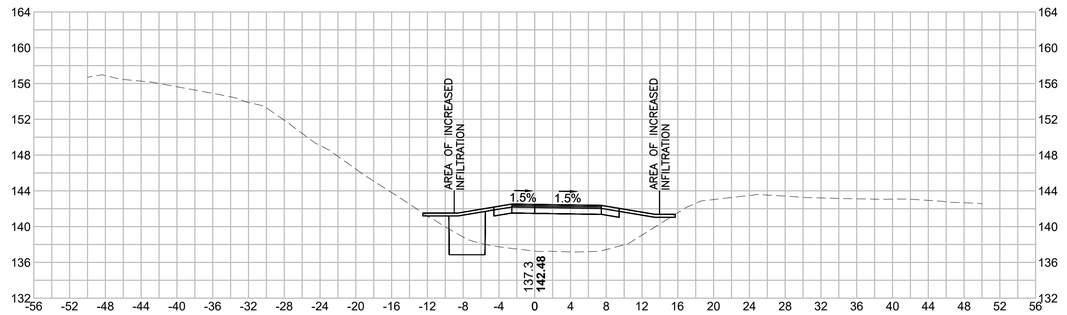
CROSS SECTIONS

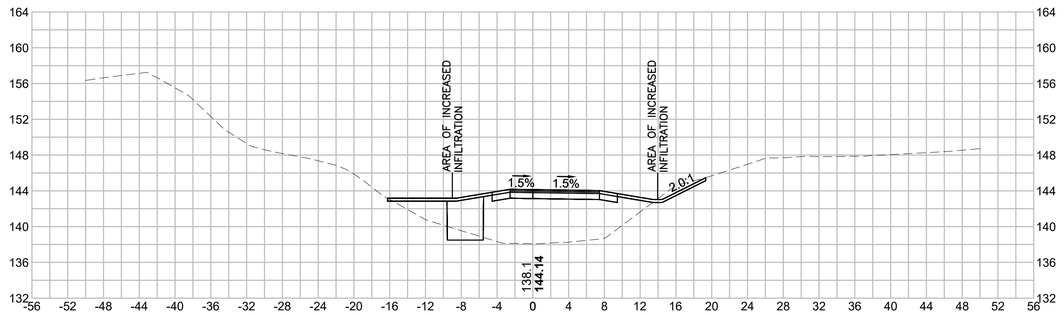
PLAN 342 OF 349

SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.









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SCALE IN FEET

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Watertown, MA 02472
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NO.	DESCRIPTION	BY	DATE	APPR.

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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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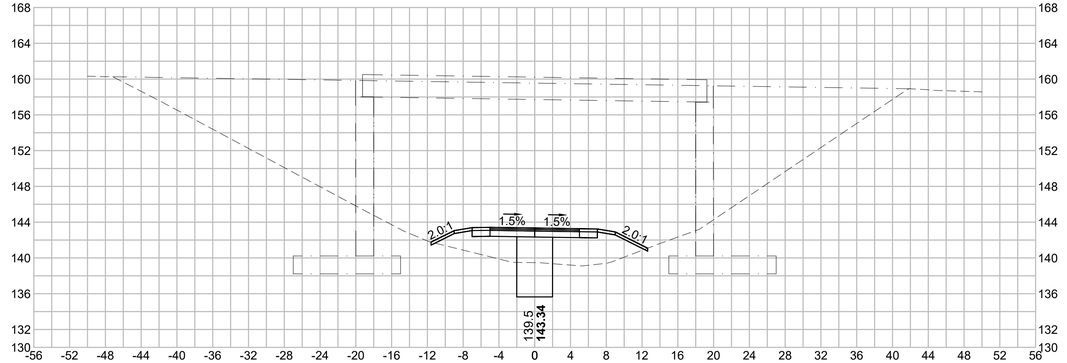
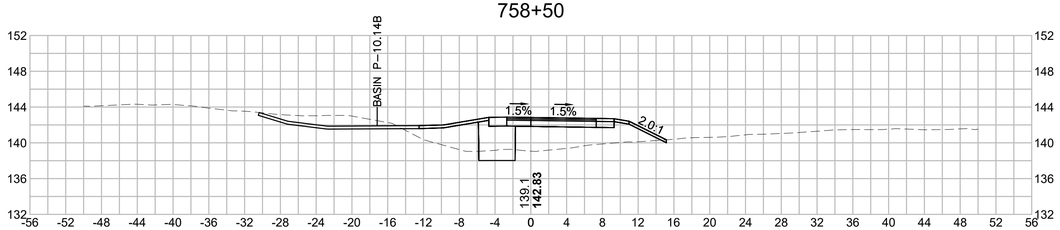
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

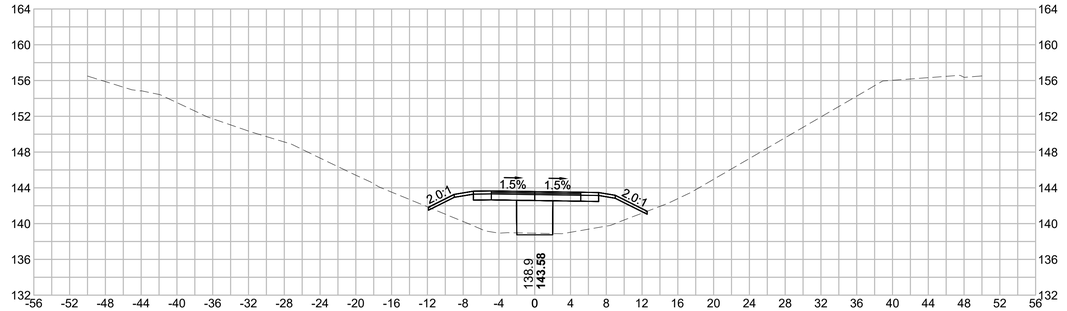
757+82.17



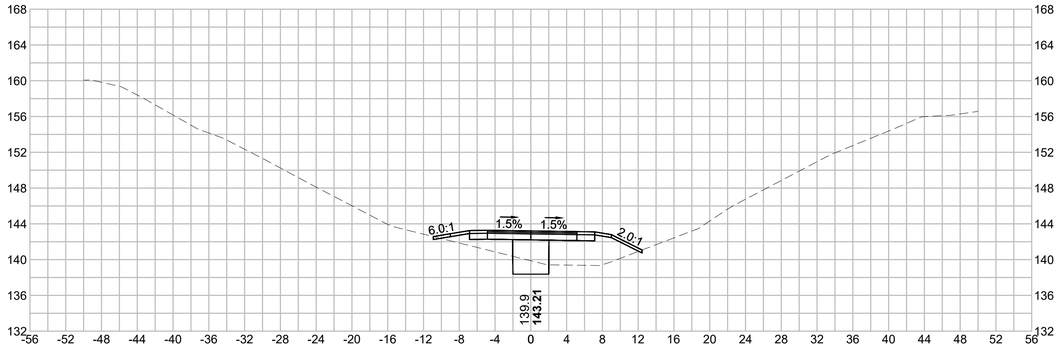
758+50



757+50



758+00



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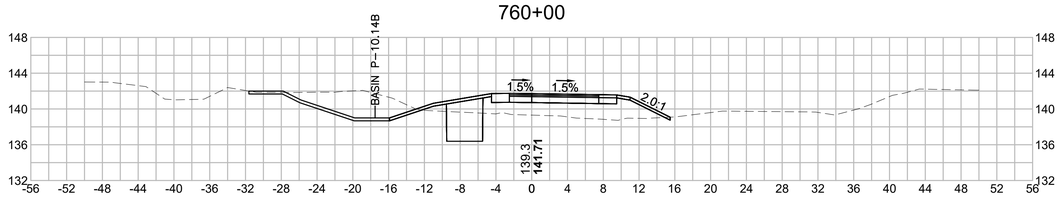
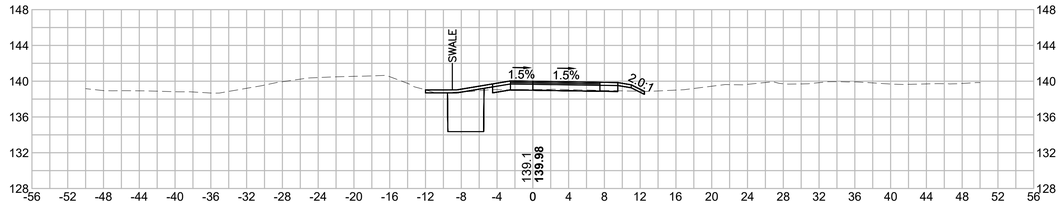
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

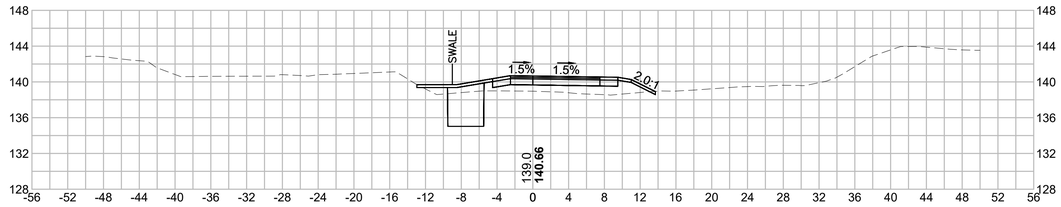
760+00



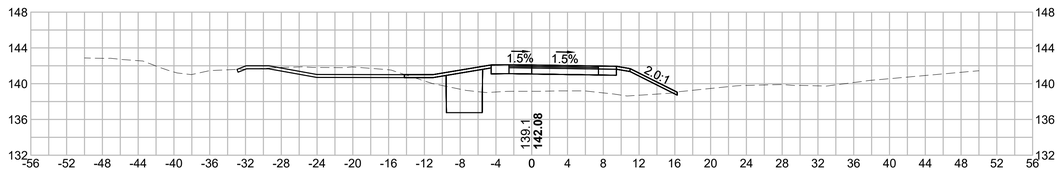
761+50



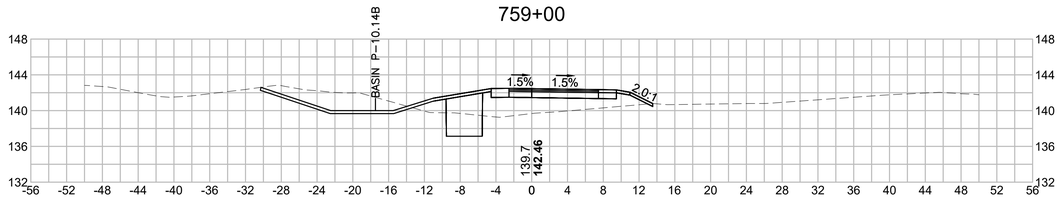
761+00



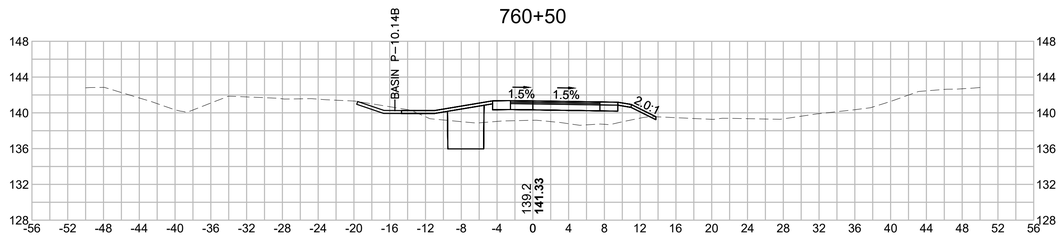
759+50



759+00



760+50



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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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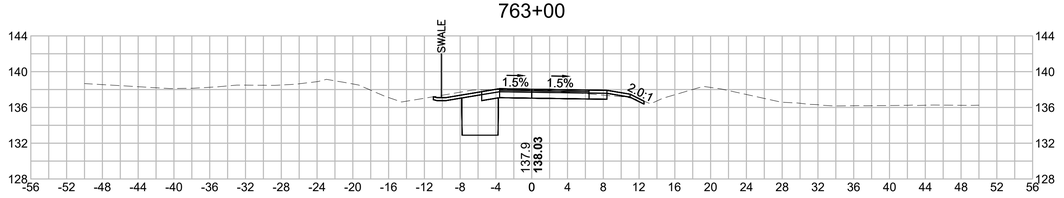
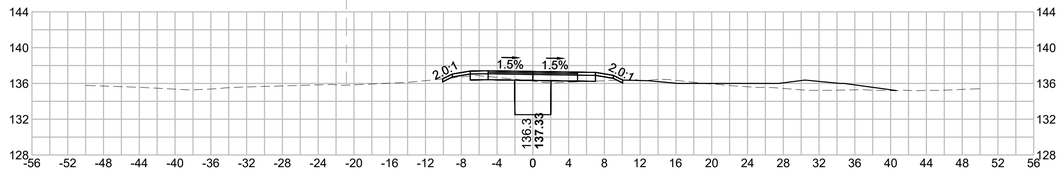
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

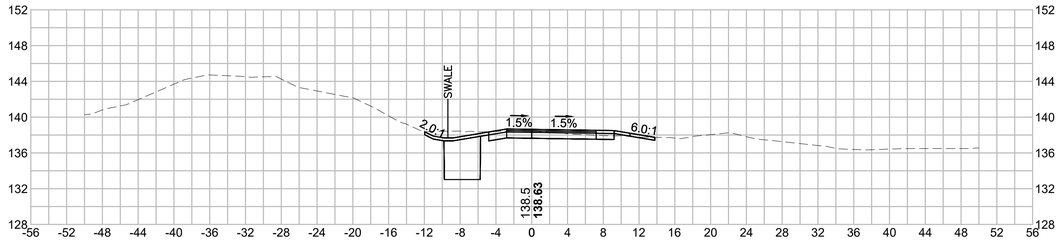
763+00



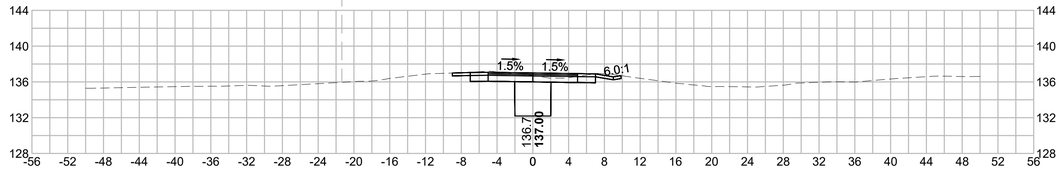
764+50



762+50



764+00



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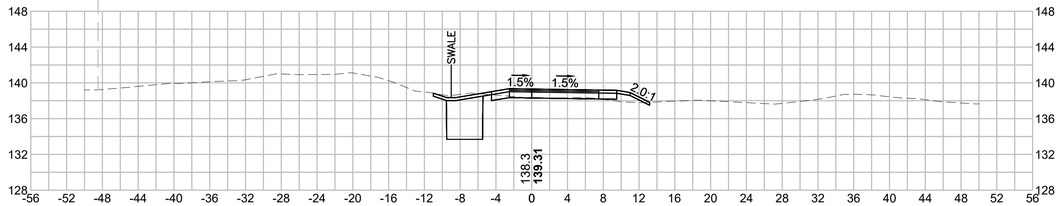
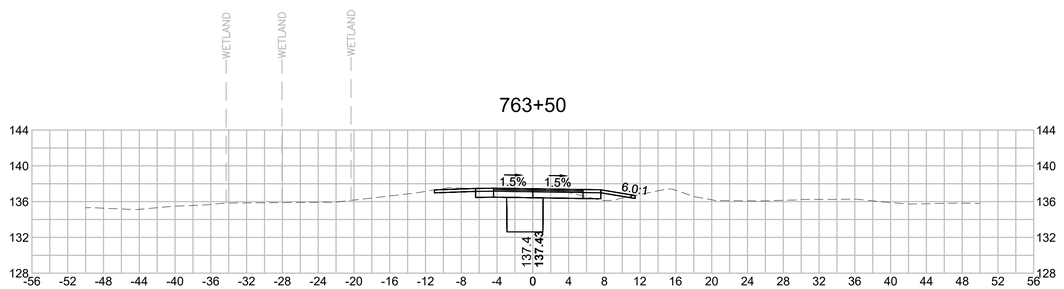


763+50



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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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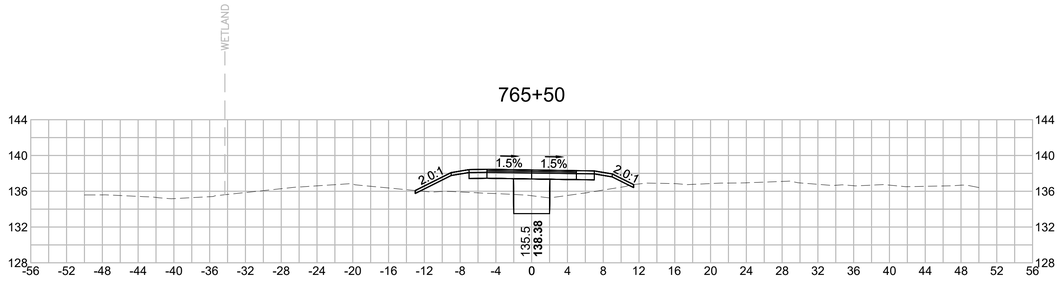
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

765+50



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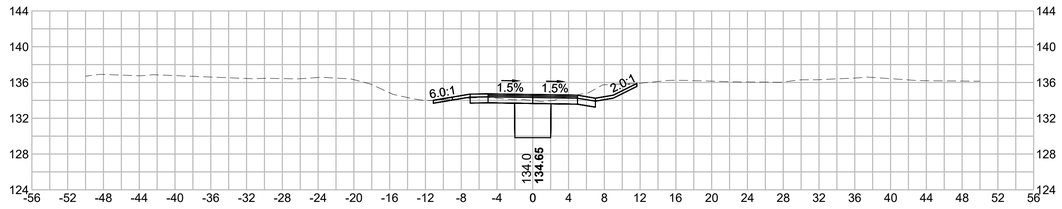
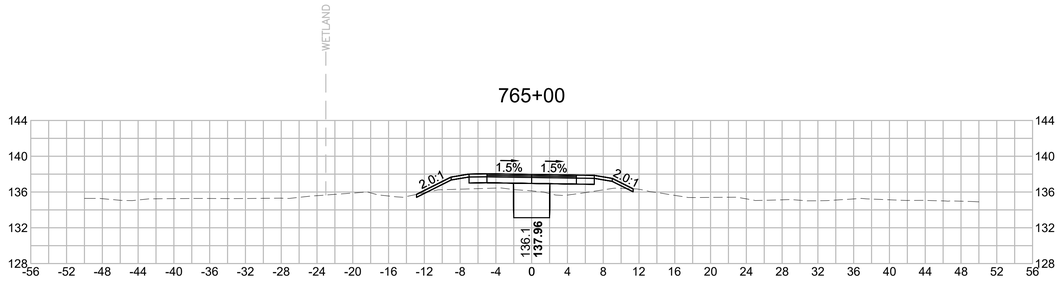


765+00



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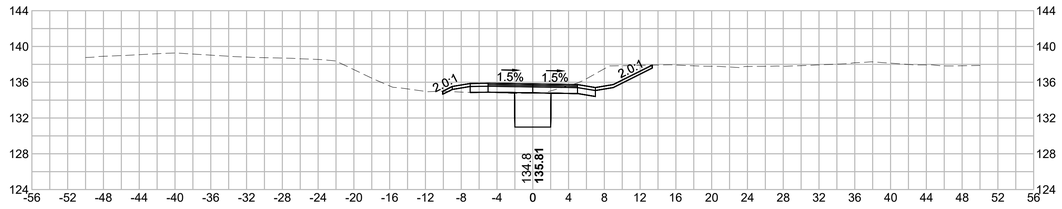
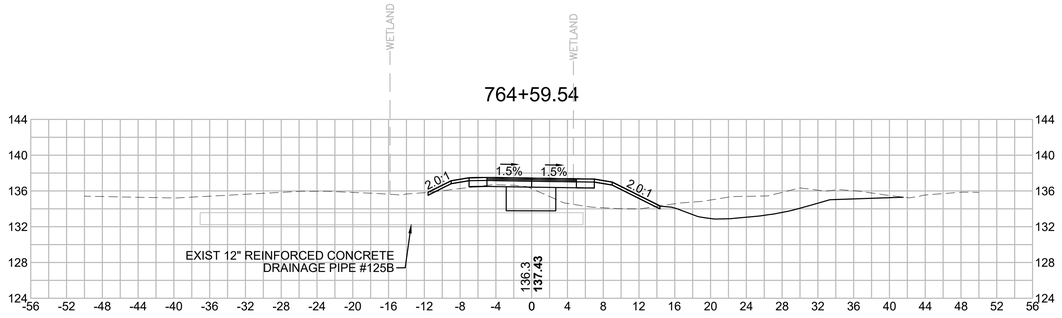


764+59.54



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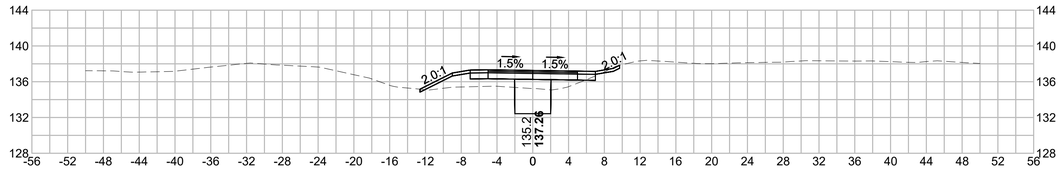

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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

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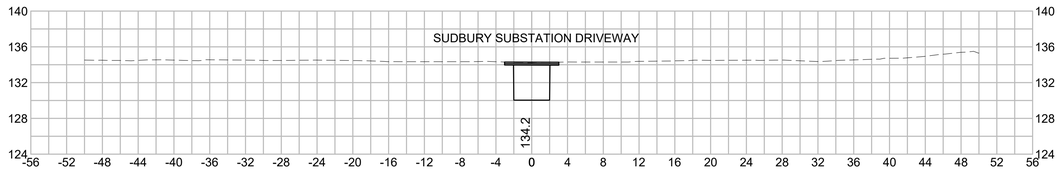
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MES	.	.

767+20.85



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HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

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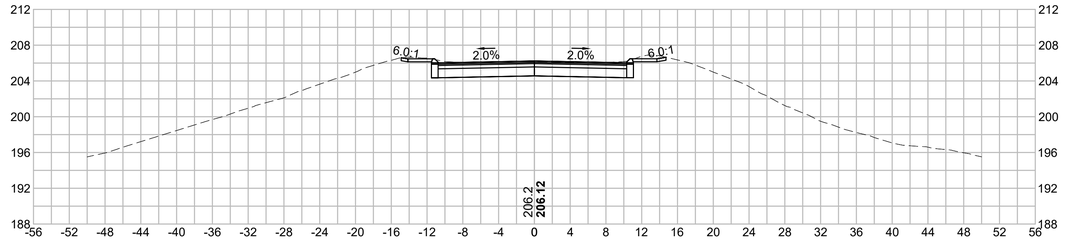
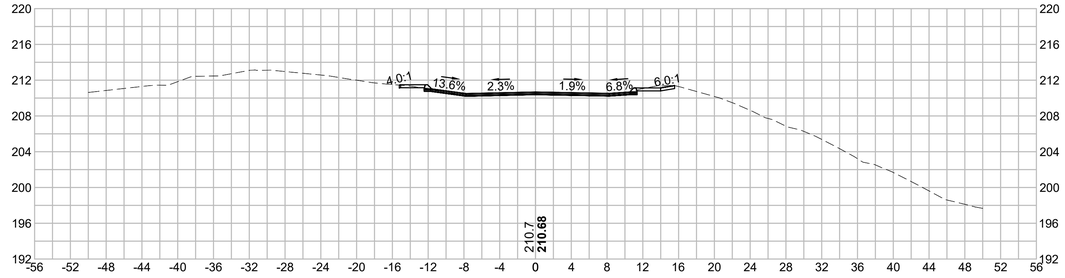
SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	DEC 2021	MS	SK	MS	.	.

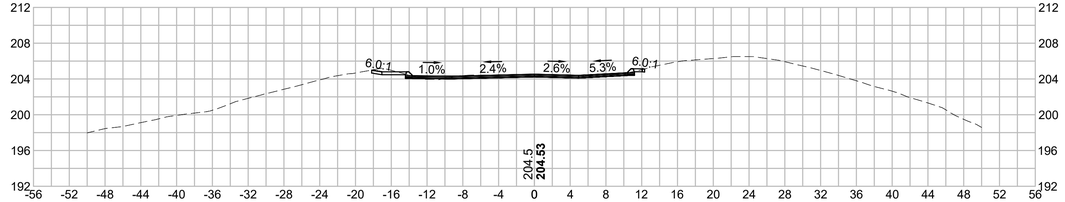
801+25



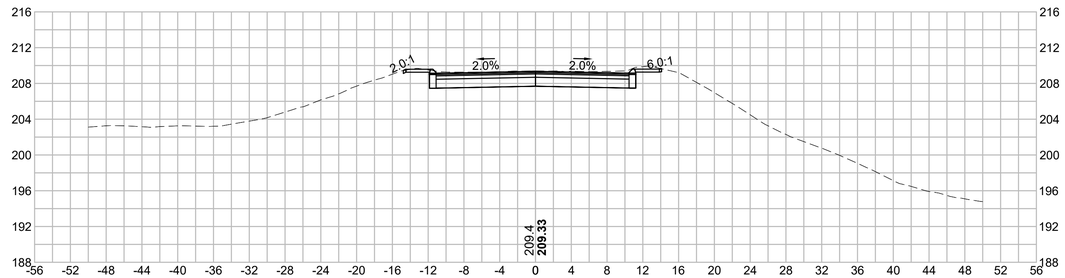
802+00



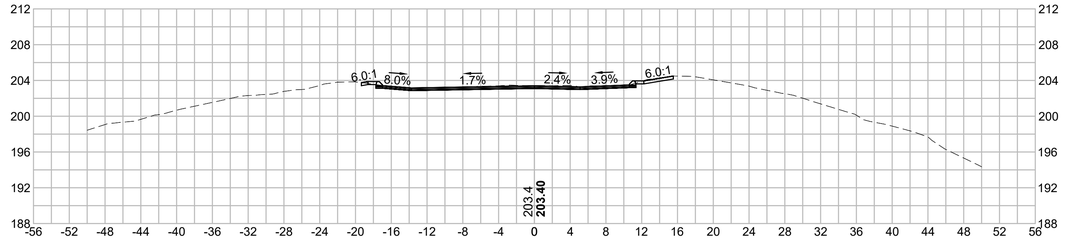
801+00



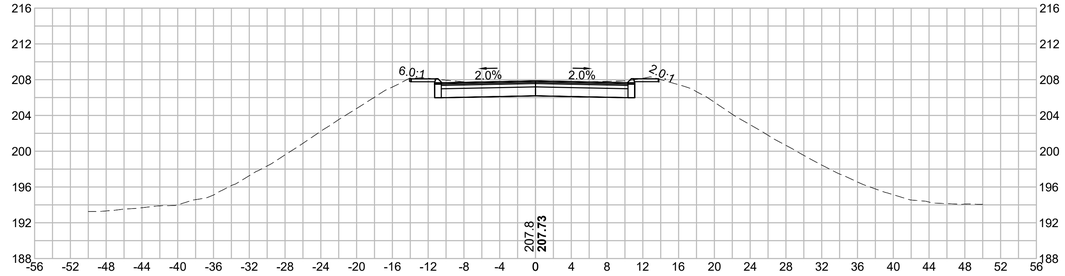
801+75



800+85



801+50



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SUDBURY–HUDSON TRANSMISSION RELIABILITY PROJECT

HUDSON, STOW, MARLBOROUGH & SUDBURY MASSACHUSETTS

CROSS SECTIONS

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SCALE: unless noted	DATE	DRAWN	CH'K D.	APPR.	DRAWING NO.	REV.
1"=8'	AUGUST 2020	MS	SK	MES	.	.

Attachment E

Endangered Species Act

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To: April 01, 2022
Project code: 2022-0027061
Project Name: Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project
Subject: Verification letter for the 'Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project' project under the January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions.

Dear Vivian Kimball:

The U.S. Fish and Wildlife Service (Service) received on April 01, 2022 your effects determination for the 'Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. This IPaC key assists users in determining whether a Federal action is consistent with the activities analyzed in the Service's January 5, 2016, Programmatic Biological Opinion (PBO). The PBO addresses activities excepted from "take"[1] prohibitions applicable to the northern long-eared bat under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, the Action is consistent with activities analyzed in the PBO. The Action may affect the northern long-eared bat; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the PBO satisfies and concludes your responsibilities for this Action under ESA Section 7(a)(2) with respect to the northern long-eared bat.

Please report to our office any changes to the information about the Action that you submitted in IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation. If the Action is not completed within one year of the date of this letter, you must update and resubmit the information required in the IPaC key.

This IPaC-assisted determination allows you to rely on the PBO for compliance with ESA Section 7(a)(2) only for the northern long-eared bat. It **does not** apply to the following ESA-protected species that also may occur in the Action area:

- Monarch Butterfly *Danaus plexippus* Candidate

If the Action may affect other federally listed species besides the northern long-eared bat, a proposed species, and/or designated critical habitat, additional consultation between you and this Service office is required. If the Action may disturb bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act is recommended.

---

[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project

2. Description

The following description was provided for the project 'Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project':

> New underground electric transmission line and rail trail within the same inactive railroad corridor.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.377388617789585,-71.46583587014024,14z

Determination Key Result

This Federal Action may affect the northern long-eared bat in a manner consistent with the description of activities addressed by the Service's PBO dated January 5, 2016. Any taking that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o). Therefore, the PBO satisfies your responsibilities for this Action under ESA Section 7(a)(2) relative to the northern long-eared bat.

Determination Key Description: Northern Long-eared Bat 4(d) Rule

This key was last updated in IPaC on May 15, 2017. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for Federal actions is to assist determinations as to whether proposed actions are consistent with those analyzed in the Service's PBO dated January 5, 2016.

Federal actions that may cause prohibited take of northern long-eared bats, affect ESA-listed species other than the northern long-eared bat, or affect any designated critical habitat, require

ESA Section 7(a)(2) consultation in addition to the use of this key. Federal actions that may affect species proposed for listing or critical habitat proposed for designation may require a conference under ESA Section 7(a)(4).

Determination Key Result

This project may affect the threatened Northern long-eared bat; therefore, consultation with the Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.) is required. However, based on the information you provided, this project may rely on the Service's January 5, 2016, *Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions* to fulfill its Section 7(a)(2) consultation obligation.

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

   Yes

2. Have you determined that the proposed action will have "no effect" on the northern long-eared bat? (If you are unsure select "No")

   No

3. Will your activity purposefully **Take** northern long-eared bats?

   No

4. [Semantic] Is the project action area located wholly outside the White-nose Syndrome Zone?

   Automatically answered
   No

5. Have you contacted the appropriate agency to determine if your project is near a known hibernaculum or maternity roost tree?

   Location information for northern long-eared bat hibernacula is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. A web page with links to state Natural Heritage Inventory databases and other sources of information on the locations of northern long-eared bat roost trees and hibernacula is available at www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html.

   Yes

6. Will the action affect a cave or mine where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

   No

7. Will the action involve Tree Removal?

   Yes

8. Will the action only remove hazardous trees for the protection of human life or property?

   No

9. Will the action remove trees within 0.25 miles of a known northern long-eared bat hibernaculum at any time of year?

   No

10. Will the action remove a known occupied northern long-eared bat maternity roost tree or any trees within 150 feet of a known occupied maternity roost tree from June 1 through July 31?

    No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.

1. Estimated total acres of forest conversion:

24.21

2. If known, estimated acres of forest conversion from April 1 to October 31

0

3. If known, estimated acres of forest conversion from June 1 to July 31

0

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?

0

IPaC User Contact Information

Agency: VHB
Name: Vivian Kimball
Address: 101 Walnut Street, P.O. Box 9151
City: Watertown
State: MA
Zip: 02471
Email vkimball@vhb.com
Phone: 5085132713

Lead Agency Contact Information

Lead Agency: Army Corps of Engineers

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To: April 01, 2022
Project Code: 2022-0027061
Project Name: Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the "**New England Field Office Endangered Species Project Review and Consultation**" website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

https://www.fws.gov/newengland/endangeredspecies/project-review/index.html

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Additional Info About Section 7 of the Act
Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

https://www.fws.gov/birds/policies-and-regulations.php

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Project Code: 2022-0027061
Event Code: None
Project Name: Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project
Project Type: Transmission Line - New Constr - Below Ground
Project Description: New underground electric transmission line and rail trail within the same inactive railroad corridor.
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.377388617789585,-71.46583587014024,14z

Counties: Middlesex County, Massachusetts

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC User Contact Information

Agency: VHB
Name: Vivian Kimball
Address: 101 Walnut Street, P.O. Box 9151
City: Watertown
State: MA
Zip: 02471
Email vkimball@vhb.com
Phone: 5085132713

Attachment F

Historic Preservation

March 19, 2018

The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

Barbara Newman
Chief, Permits and Enforcement Branch
Regulatory Division
US Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

RE: Sudbury-Hudson Transmission Reliability Project, Sudbury, Marlborough, Stow and Hudson, MA.
MHC #RC.62384. EEA #15703.

Dear Ms. Newman:

Staff of the Massachusetts Historical Commission (MHC), have reviewed the technical reports, *Archaeological Reconnaissance Survey for the Sudbury-Hudson Transmission Reliability Project, Towns of Sudbury, Hudson, Marlborough and Stow, Middlesex County, Massachusetts*, and *Sudbury-Hudson Transmission Reliability Project Reconnaissance-Level Historic Properties Survey*, prepared and submitted by Commonwealth Heritage Group (CHG) for the project referenced above. The MHC has also received 50% design drawings for four bridge crossings in the project area, including the Chestnut Street culvert, and Bridge 130 on Fort Meadow Brook, in Hudson; and Bridge 128 and Bridge 127 on Hop Brook in Sudbury.

The reconnaissance surveys for historic and archaeological resources have identified multiple historic properties and archaeologically sensitive locations within the project area of potential effect. The MHC will continue to review the project under Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800) in consultation with the Corps. Once identification efforts have been completed to identify potentially significant archaeological resources, the MHC looks forward to consultation with the Corps and to reviewing the Corps' findings and determinations for the project.

CHG has recommended intensive (locational) archaeological survey for archaeologically sensitive portions of the project impact area. The MHC looks forward to reviewing the State Archaeologist's permit application (950 CMR 70) from CHG to conduct the intensive (locational) archaeological survey for the project. The results of the surveys will assist in consultation to avoid, minimize or mitigate any adverse effects to significant historic and archaeological resources.

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800), Massachusetts General Laws, Chapter 9, Section 26-27C (950 CMR 70-71) and MEPA (301 CMR 11). If you have questions, please contact Jonathan K. Patton at this office.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
Massachusetts Historical Commission

xc: Denise Bartone, Eversource
Kate Atwood, USACOE-NED
Bettina Washington, Wampanoag Tribe of Gay Head (Aquinnah)
Ramona Peters, Mashpee Wampanoag Tribe
Secretary Matthew A. Beaton, EEA. Attn: Page Czepiga, MEPA Unit
EFSC
Local Historical Commissions; Towns of Sudbury, Marlborough, Stow and Hudson
Marc Bergeron, VHB, Inc.
Marty Dudek, Commonwealth Heritage Group

220 Morrissey Boulevard, Boston, Massachusetts 02125
(617) 727-8470 • Fax: (617) 727-5128
www.sec.state.ma.us/mhc

Attachment G

Training Logs and Attendance Forms

Sudbury-Hudson Transmission Reliability Project
(Sudbury, Marlborough, Stow, Hudson, Massachusetts)

Training Log: This log provides a table of contents for the completed trainings.

Date of Action	Notes:	Initials

Attach additional sheets as necessary.

Sudbury-Hudson Transmission Reliability Project
(Sudbury, Marlborough, Stow, Hudson, Massachusetts)

Stormwater Pollution Prevention Training Attendance Form

Date/Time of Training:	
Instructor (name/title):	
Training Location:	
Training Duration:	

Topics addressed in this training

- ☐ Sediment and Erosion Controls
- ☐ Stabilization Controls
- ☐ Pollution Prevention Measures
- ☐ Emergency Procedures
- ☐ Inspections/Corrective Actions
- ☐ Other: _____

Print Name of Attendee:	Initials

Attach additional sheets as necessary

Attachment H

SWPPP Amendment Log

Sudbury-Hudson Transmission Reliability Project
(Sudbury, Marlborough, Stow, Hudson, Massachusetts)

SWPPP Amendment Log: This log provides a table of contents for the completed SWPPP Amendments.

Date of Action	Notes:	Initials

Attach additional sheets as necessary.

Attachment I

Construction Activities Log

Sudbury-Hudson Transmission Reliability Project
(Sudbury, Marlborough, Stow, Hudson, Massachusetts)

Record the following activities in the Construction Activities log.

Type of Action:	Information to include in the Construction Activity Log
Site-mobilization activities commence	› Record the date
Install construction period stormwater controls	› Record the date that each stormwater control identified on the Sediment and Erosion Control Plan is installed. Record the date each control becomes operational.
Earth-disturbance activities commence	› Record the date, the location on the site, and the type of activity. Activities that must be recorded include: clearing, grubbing, mass grading, cutting/filling, final grading, stockpiling. Record the activity in the Grading and Stabilization Log.
Earth-disturbance activities cease	› Record the date, the location on the site, and the type of activity. › Activities that must be recorded include: clearing, grubbing, mass grading, cutting/filling, final grading, stockpiling. › Record the activity in the Grading and Stabilization Log.
Site stabilization measures commence (P/T)	› Record the date, the location on the site, and the type of site stabilization measure commenced. Indicate if the stabilization measure is temporary or permanent. Record the activity in the Grading and Stabilization Log.
Site stabilization measures cease (P/T)	› Record the date, the location on the site, and the type of site stabilization measure that has ceased. Record the date that the stabilization measure becomes operational.Record the activity in the Grading and Stabilization Log.
Removal of construction period stormwater controls	› Record the date that each stormwater control identified on the Sediment and Erosion Control Plan is removed.
Removal of construction equipment and vehicles	› Record the date that all equipment and vehicles vacate the site.
Cessation of pollutant-generating activities	› Record the date that all pollution generating activities on the site cease.
Construction activities cease	› Record the date.

Sudbury-Hudson Transmission Reliability Project
(Sudbury, Marlborough, Stow, Hudson, Massachusetts)

Construction Activities Log

Date	Type of Action	Notes:	Supplemental Log Entry Created[2]
			☐
			☐
			☐
			☐
			☐
			☐
			☐
			☐
			☐
			☐
			☐
			☐
			☐
			☐

Attach additional sheets as necessary.

[2] If the activity type is an earth disturbance activity or a site stabilization measure, then also record the activity in the separate Grading and Stabilization Log

Sudbury-Hudson Transmission Reliability Project
(Sudbury, Marlborough, Stow, Hudson, Massachusetts)

Grading and Stabilization Log: This log provides a table of contents for the completed grading and stabilization activities.

Date Grading Activity Initiated	Date Grading Activity Ceased	Description of Grading Activity	Date Stabilization Measure Initiated	Date Stabilization Achieved	P/T	Description of Stabilization Measure

P = Permanent, T = Temporary

Attach additional sheets as necessary

Attachment J

Inspection Log and Template Forms

Sudbury-Hudson Transmission Reliability Project
(Sudbury, Marlborough, Stow, Hudson, Massachusetts)

Inspection Log: This log provides a table of contents for the completed inspection forms. Insert completed inspection into the field binder.

Date of Action	Notes:	Initials

Attach additional sheets as necessary.

CONSTRUCTION MONITORING REPORT
Sudbury to Hudson Transmission Project

EVERSOURCE

☐ Weekly ☐ Storm Event ☐ Other Date: Time:

Inspector name(s), title(s) and qualifications:

Others present/affiliation(s):

Precipitation/Weather (since last inspection):

Weather conditions (time of inspection & future outlook):

Inspection Location Description (include segment # and stationing):

+Storm event info (approx): Start date/time:Duration:Amount of rainfall (inches):

Project Name:
Sudbury to Hudson Transmission Reliability Project

Project Location:
Sudbury, Hudson, Stow, and Marlborough, MA

USEPA #:

Summary of Activities/Locations Inspected (include segment # and stationing):

Inspection Notes:

Any Significant Discharges of Sediment (or other) or Non-Compliance Actions? ☐ Yes ☐ No

Identify presence of stockpiles and document when placed and when removed (week maximum for stockpiles) ☐ Yes ☐ No

Compliance with Previous Observations? ☐ Yes ☐ No

New Corrective Action Recommendations ☐ Yes ☐ No

ENVIRONMENTAL COMPLIANCE

Compliant with applicable permits and applicable environmental requirements? YES ☐ NO ☐ If not, explain: ____

Other Comments & Observations

Authorized Signature

Date

EVERSOURCE PROJECT MANAGER

Name: Mike Hager
Phone: 508-341-5815 (mobile)
Email: michael.hager@eversource.com

EVERSOURCE ENVIRONMENTAL CONTACT

Name: Matt Devlin
Phone: 508-596-0147
Email: matthew.devlin@eversource.com

EVERSOURCE CONSTRUCTION SUPERVISOR

Name:
Phone:
Email

ENVIRONMENTAL CONSULTANT

Primary Contact (Epsilon Associates)
Name: Marc Bergeron (Epsilon Associates)
Phone: 508-212-0420 (mobile)
Email: mbergeron@epsilonassociates.com

Secondary Contact (SWCA)
Name: Rebecca Weissman (SWCA)
Phone: 339-203-7045
Email: rebecca.weissman@swca.com

PRIME CONTRACTOR (BOND)

Primary Contact (BOND)
Name: Matt Stock
Phone: 617-512-6766
Email: mstock@bond-civilutility.com

SUB CONTRACTOR (ET&L Corp.)

Name: Daren Ducharme
Phone: (978) 793-1287
Email: dducharme@etlcorp.com

Section A – General Information

(If necessary, complete additional inspection reports for each separate inspection location.)

Inspector Information	
Inspector Name:	**Title:**
Company Name:	**Email:**
Address:	**Phone Number:**

Inspection Details	
Inspection Date:	**Inspection Location:**
Inspection Start Time:	**Inspection End Time:**
Current Phase of Construction:	**Weather Conditions During Inspection:**

Did you determine that any portion of your site was unsafe for inspection per CGP Part 4.5? ☐ Yes ■ No

If "Yes," provide the following information:

Location of unsafe conditions:

The conditions that prevented you inspecting this location:

Indicate the required inspection frequency: (Check all that apply. You may be subject to different inspection frequencies in different areas of the site.)

Standard Frequency (CGP Part 4.2):

☐ At least once every 7 calendar days; **OR**

☐ Once every 14 calendar days *and* within 24 hours of the occurrence of either:

- A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
- A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period

Increased Frequency (CGP Part 4.3.1) (If site discharges to sediment or nutrient-impaired waters or to waters designated as Tier 2, Tier 2.5, or Tier 3):

☐ Once every 7 calendar days *and* within 24 hours of the occurrence of either:

- A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
- A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period

Reduced Frequency (CGP Part 4.4):

☐ For stabilized areas: Twice during first month, no more than 14 calendar days apart; then once per month after first month until permit coverage is terminated

☐ For stabilized areas on "linear construction sites": Twice during first month, no more than 14 calendar days apart; then once more within 24 hours of the occurrence of either:

- A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
- A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period

☐ For arid, semi-arid, or drought-stricken areas during seasonally dry periods or during drought: Once per month and within 24 hours of the occurrence of either:

- A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
- A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period

☐ For frozen conditions where construction activities are being conducted: Once per month

Was this inspection triggered by a storm event producing 0.25 inches or more of rain within a 24-hour period? ☐ Yes ☐ No

If "Yes," how did you determine whether the storm produced 0.25 inches or more of rain?

☐ On-site rain gauge
☐ Weather station representative of site.
Weather station location:

Total rainfall amount that triggered the inspection (inches):

Was this inspection triggered by a snowmelt discharge from a storm event producing 3.25 inches or more of snow within a 24-hour period? ☐ Yes ☐ No

If "Yes," how did you determine whether the storm produced 3.25 inches or more of snow?

☐ On-site rain gauge
☐ Weather station representative of site.
Weather station location:

Total snowfall amount that triggered the inspection (inches):

Project Name: _____
NPDES ID Number: _____

Section B – Condition and Effectiveness of Erosion and Sediment (E&S) Controls (CGP Part 2.2) (Insert additional rows if needed)					
Type and Location of E&S Control	**Conditions Requiring Routine Maintenance?[1]**	**If "Yes," How Many Times (Including This Occurrence) Has This Condition Been Identified?**	**Conditions Requiring Corrective Action?[2, 3]**	**Date on Which Condition First Observed (If Applicable)?**	**Description of Conditions Observed**
1.	☐ Yes ☐ No		☐ Yes ☐ No		
2.	☐ Yes ☐ No		☐ Yes ☐ No		
3.	☐ Yes ☐ No		☐ Yes ☐ No		
4.	☐ Yes ☐ No		☐ Yes ☐ No		
5.	☐ Yes ☐ No		☐ Yes ☐ No		
If the same routine maintenance was found to be necessary three or more times for the same control at the same location (including this occurrence), follow the corrective action requirements and record the required information in your corrective action log, or describe here why you believe the specific condition should still be addressed as routine maintenance:					

[1] Routine maintenance includes minor repairs or other upkeep performed to ensure that the site's stormwater controls remain in effective operating condition, not including significant repairs or the need to install a new or replacement control. Routine maintenance is also required for specific conditions: (1) for perimeter controls, whenever sediment has accumulated to half or more the above-ground height of the control (CGP Part 2.2.3.c.i); (2) where sediment has been tracked-out from the site onto paved roads, sidewalks, or other paved areas (CGP Part 2.2.4.d); (3) for inlet protection measures, when sediment accumulates, the filter becomes clogged, and/or performance is compromised (CGP Part 2.2.10.b); and (4) for sediment basins, as necessary to maintain at least half of the design capacity of the basin (CGP Part 2.2.12.f)

[2] Corrective actions are triggered only for specific conditions (CGP Part 5.1):

1. A stormwater control needs a significant repair or a new or replacement control is needed, or, in accordance with Part 2.1.4.c, you find it necessary to repeatedly (i.e., three (3) or more times) conduct the same routine maintenance fix to the same control at the same location (unless you document in your inspection report under Part 4.7.1.c that the specific reoccurrence of this same problem should still be addressed as a routine maintenance fix under 2.1.4); or
2. A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly; or
3. Your discharges are not meeting applicable water quality standards; or
4. A prohibited discharge has occurred (see CGP Part 1.3); or
5. During the discharge from site dewatering activities:
   a. The weekly average of your turbidity monitoring results exceeds the 50 NTU benchmark (or alternate benchmark if approved by EPA pursuant to Part 3.3.2.b); or
   b. You observe or you are informed by EPA, State, or local authorities of the presence of the conditions specified in Part 4.6.3.e.

[3] If a condition on your site requires a corrective action, you must also fill out a corrective action log found at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates. See CGP Part 5.4 for more information.

Project Name: _____
NPDES ID Number: _____

Section C – Condition and Effectiveness of Pollution Prevention (P2) Practices and Controls (CGP Part 2.3) (Insert additional rows if needed)					
Type and Location of P2 Practices and Controls	**Conditions Requiring Routine Maintenance?[1]**	**If "Yes," How Many Times (Including This Occurrence) Has This Condition Been Identified?**	**Conditions Requiring Corrective Action?[2, 3]**	**Date on Which Condition First Observed (If Applicable)?**	**Description of Conditions Observed**
1.	☐ Yes ☐ No		☐ Yes ☐ No		
2.	☐ Yes ☐ No		☐ Yes ☐ No		
3.	☐ Yes ☐ No		☐ Yes ☐ No		
4.	☐ Yes ☐ No		☐ Yes ☐ No		
5.	☐ Yes ☐ No		☐ Yes ☐ No		
If the same routine maintenance was found to be necessary three or more times for the same control at the same location (including this occurrence), follow the corrective action requirements and record the required information in your corrective action log, or describe here why you believe the specific condition should still be addressed as routine maintenance:					

Project Name: _____
NPDES ID Number: _____

Section D – Stabilization of Exposed Soil (CGP Part 2.2.14) (Insert additional rows if needed)					
Specific Location That Has Been or Will Be Stabilized	**Stabilization Method and Applicable Deadline**	**Stabilization Initiated?**	**Final Stabilization Criteria Met?**	**Final Stabilization Photos Taken?**	**Notes**
1.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
2.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
3.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
4.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
5.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	

Section E – Description of Discharges (CGP Part 4.6.2)

(Insert additional rows if needed)

Was a discharge (not including dewatering) occurring from any part of your site at the time of the inspection?[4] ☐ Yes ☐ No

If "Yes," for each point of discharge, document the following:

- The visual quality of the discharge.
- The characteristics of the discharge, including color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indicators of stormwater pollutants.
- Signs of the above pollutant characteristics that are visible from your site and attributable to your discharge in receiving waters or in other constructed or natural site drainage features.

Discharge Location	Observations
1.	
2.	
3.	
4.	
5.	

[4] If a dewatering discharge was occurring, you must conduct a dewatering inspection pursuant to CGP Part 4.3.2 and complete a separate dewatering inspection report.

Section F – Signature and Certification (CGP Part 4.7.2)	
"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."	
MANDATORY: Signature of Operator or "Duly Authorized Representative:"	
Signature:	**Date:**
Printed Name:	**Affiliation:**
OPTIONAL: Signature of Contractor or Subcontractor	
Signature:	**Date:**
Printed Name:	**Affiliation:**

2022 Construction General Permit Dewatering Inspection Report

Project Name: _____

NPDES ID Number: _____

Section A – Dewatering Discharges (CGP Part 4.6.3) Complete this section within 24 hours of completing the inspection. (If necessary, complete additional inspection reports for each separate inspection location.)	
Inspector Information	
Inspector Name:	**Title:**
Company Name:	**Email:**
Address:	**Phone Number:**
Inspection Details	
Inspection Date:	**Inspection Location:**
Discharge Start Time:	**Discharge End Time:**
Rate of Discharge (gallons per day):	**Corrective Action Required?**[1] ☐ Yes ☐ No
Describe Indicators of Pollutant Discharge at Point of Dewatering Discharge:[1]	
Attach Photographs of: 1. Dewatering water prior to treatment by a dewatering control(s) and the final discharge after treatment; and 2. Dewatering control(s); and 3. Point of discharge to any receiving waters flowing through or immediately adjacent to the site and/or to constructed or natural site drainage features, storm drain inlets, and other conveyances to receiving waters.	

[1] If you observe any of the following indicators of pollutant discharge, you are required to take corrective action under Part 5.1.5.b:

- a sediment plume, suspended solids, unusual color, presence of odor, decreased clarity, or presence of foam; or
- a visible sheen on the water surface or visible oily deposits on the bottom or shoreline of the receiving water.

Project Name: _____
NPDES ID Number: _____

Section B – Signature and Certification (CGP Part 4.7.2)	
"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."	
MANDATORY: Signature of Operator or "Duly Authorized Representative:"	
Signature:	**Date:**
Printed Name:	**Affiliation:**
OPTIONAL: Signature of Contractor or Subcontractor	
Signature:	**Date:**
Printed Name:	**Affiliation:**

Appendix K – Turbidity Monitoring Report Form and Instructions

Part 3.3 requires you to use the EPA NPDES eReporting Tool, or "NeT" system, to prepare and submit your report electronically. However, if the EPA Regional Office grants you a waiver to use a paper form, and you elect to use it, you must complete and submit the following form.

NPDES Form 6100-065	EPA	U.S. Environmental Protection Agency Washington, DC 20460 Turbidity Monitoring Report Form for Dewatering Discharges to Sensitive Waters Under the 2022 NPDES Construction General Permit	OMB No. 2040-0305 Exp. Date 01/31/2025

SECTION I. APPROVAL TO USE PAPER FORM

Paper Form

Have you been granted a waiver from electronic reporting from the Regional Office*? ☐ Yes ☐ No

If yes, check which waiver you have been granted, and provide the name of the EPA Regional Office staff person who granted the waiver, and the date of approval:

Waiver granted:

☐ The owner/operator's headquarters is physically located in a geographic area (i.e., ZIP code or census tract) that is identified as under-served for broadband Internet access in the most recent report from the Federal Communications Commission.

☐ The owner/operator has issues regarding available computer access or computer capability.

Name of EPA staff person that granted the waiver	Date approval obtained (MM/DD/YYYY)

*** Note: You are required to obtain approval from the applicable Regional Office prior to using this paper form. If you have not obtained a waiver, you must file this form electronically using the NPDES eReporting Tool (NeT).**

SECTION II. PERMIT INFORMATION

Permit

NPDES ID

Does this report fulfill turbidity monitoring report obligations of other operators that are covered under this permit for the same project site? ☐ Yes ☐ No

If yes, provide the NPDES ID number(s) for all other such operators at the same project site: _____

SECTION III. OPERATOR INFORMATION

Operator Information

Operator Name

Mailing Address

Street

City	State	ZIP Code

County or Similar Government Division:

Phone Number	Email Address

Preparer

Complete if form was prepared by someone other than the certifier:

First Name	Middle Initial	Last Name

Organization

Phone Number	Email Address

SECTION IV. SITE INFORMATION

Site Address

Site Name

Site Address

Street/Location

City	State	ZIP Code

County or Similar Government Division:

SECTION IV. MONITORING QUARTER

Monitoring Quarter

Identify monitoring quarter (select only one):

- ☐ Quarter 1 (January 1 – March 31)
- ☐ Quarter 2 (April 1 – June 30)
- ☐ Quarter 3 (July 1 – September 30)
- ☐ Quarter 4 (October 1 – December 31)

SECTION IVI. TURBIDITY MONITORING DATA

Turbidity Monitoring Data

Discharge Point Description/ Name:

Was dewatering water discharged during the monitoring quarter? ☐ Yes (Enter the data below) ☐ No (Skip to Section VII)

Specific Week within Monitoring Quarter[1]	Weekly Average (NTU)[2]	Benchmark Threshold (NTU)	Alternate Benchmark Threshold (NTU)[3]	Average exceeds Benchmark?[4]
Week 1		50		☐ Yes ☐ No
Week 2		50		☐ Yes ☐ No
Week 3		50		☐ Yes ☐ No
Week 4		50		☐ Yes ☐ No
Week 5		50		☐ Yes ☐ No
Week 6		50		☐ Yes ☐ No
Week 7		50		☐ Yes ☐ No
Week 8		50		☐ Yes ☐ No
Week 9		50		☐ Yes ☐ No
Week 10		50		☐ Yes ☐ No
Week 11		50		☐ Yes ☐ No
Week 12		50		☐ Yes ☐ No
Week 13		50		☐ Yes ☐ No
Week 14		50		☐ Yes ☐ No

[1] Refer to Table K-1 to determine the specific monitoring week number for which you are reporting turbidity data for this quarter.

[2] Report to the nearest whole number. Enter "N/A" if no dewatering discharge occurred during any particular week.

[3] Prior approval from the EPA Regional Office is required pursuant to Part 3.3.2.b. Unless and until EPA approves your request to use an alternate benchmark, you are required to use the standard benchmark of 50 NTU and take any required corrective actions if an exceedance occurs. Enter "N/A" if you have not received approval for an alternate benchmark threshold.

[4] If "Yes," the operator must conduct follow-up corrective action pursuant to Part 5.2.2 and document any corrective action taken in the corrective action log in accordance with Part 5.4.

VII. CERTIFICATION INFORMATION

Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

First Name	Middle Initial	Last Name

Title

Signature	Date (MM/DD/YYYY)

Phone Number	Email Address

Attachment K

Corrective Action Log and Template Forms

Sudbury-Hudson Transmission Reliability Project
(Sudbury, Marlborough, Stow, Hudson, Massachusetts)

Corrective Action Log: This log provides a table of contents for the completed corrective action log forms. Insert completed corrective action reports into the field binder.

Date of Action	Notes:	Initials

Attach additional sheets as necessary.

2022 CGP Corrective Action Log

Project Name: _____

NPDES ID Number: _____

Section A – Individual Completing this Log	
Name:	**Title:**
Company Name:	**Email:**
Address:	**Phone Number:**
Section B – Details of the Problem (CGP Part 5.4.1.a) Complete this section within 24 hours of discovering the condition that triggered corrective action.	
Date problem was first identified:	**Time problem was first identified**:
What site conditions triggered this corrective action? *(Check the box that applies. See instructions for a description of each triggering condition (1 thru 6).)* ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5a ☐ 5b ☐ 6	
Specific location where problem identified:	
Provide a description of the specific condition that triggered the need for corrective action and the cause (if identifiable):	
Section C – Corrective Action Completion (CGP Part 5.4.1.b) Complete this section within 24 hours after completing the corrective action.	
For site condition # 1, 2, 3, 4, or 6 (those not related to a dewatering discharge) confirm that you met the following deadlines (CGP Part 5.2.1):	
☐ Immediately took all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events. **AND**	
☐ Completed corrective action by the close of the next business day, unless a new or replacement control, or significant repair, was required. **OR**	
☐ Completed corrective action within seven (7) calendar days from the time of discovery because a new or replacement control, or significant repair, was necessary to complete the installation of the new or modified control or complete the repair. **OR**	
☐ It was infeasible to complete the installation or repair within 7 calendar days from the time of discovery. Provide the following additional information: Explain why 7 calendar days was infeasible to complete the installation or repair:	
Provide your schedule for installing the stormwater control and making it operational as soon as feasible after the 7 calendar days:	

For site condition # 5a, 5b, or 6 (those related to a dewatering discharge), confirm that you met the following deadlines:

- ☐ Immediately took all reasonable steps to minimize or prevent the discharge of pollutants until a solution could be implemented, including shutting off the dewatering discharge as soon as possible depending on the severity of the condition taking safety considerations into account.
- ☐ Determined whether the dewatering controls were operating effectively and whether they were causing the conditions.
- ☐ Made any necessary adjustments, repairs, or replacements to the dewatering controls to lower the turbidity levels below the benchmark or remove the visible plume or sheen.

Describe any modification(s) made as part of corrective action: (Insert additional rows below if applicable)	**Date of completion:**	**SWPPP update necessary?**	**If yes, date SWPPP was updated:**
1.		☐ Yes ☐ No	
2.		☐ Yes ☐ No	

Section D - Signature and Certification (CGP Part 5.4.2)

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

MANDATORY: Signature of Operator or "Duly Authorized Representative:"	
Signature:	**Date:**
Printed Name:	**Affiliation:**
OPTIONAL: Signature of Contractor or Subcontractor	
Signature:	**Date:**
Printed Name:	**Affiliation:**

Attachment L

Spill Log and Template Forms

Sudbury-Hudson Transmission Reliability Project
(Sudbury, Marlborough, Stow, Hudson, Massachusetts)

Spill Log: This log provides a table of contents for recordable spill log forms. Insert spill forms into the field binder.

Date of Action	Notes:	Initials

Attach additional sheets as necessary.

Sudbury-Hudson Transmission Reliability Project
(Sudbury, Marlborough, Stow, Hudson, Massachusetts)

Hazardous Waste & Oil Spill Report

Date: _____ Time: _____ AM / PM

Exact location (Transformer #): _____

Type of equipment: _____ Make: _____ Size: _____

S / N: _____ Weather Conditions: _____

On or near water? ☐ Yes ☐ No If yes, name of body of water: _____

Type of chemical / oil spilled: _____

Amount of chemical / oil spilled: _____

Cause of spill: _____

Measures taken to contain or clean up spill: _____

Amount of chemical / oil recovered: _____ Method: _____

Material collected as a result of cleanup:

_____ drums containing _____

_____ drums containing _____

_____ drums containing _____

Location and method of debris disposal: _____

Name and address of any person, firm, or corporation suffering charges: _____

Procedures, method, and precautions instituted to prevent a similar occurrence from recurring: _____

Spill reported by General Office by: _____ Time: _____ AM / PM

Spill reported to DEP / National Response Center by: _____

DEP Date: _____ Time: _____ AM / PM Inspector: _____

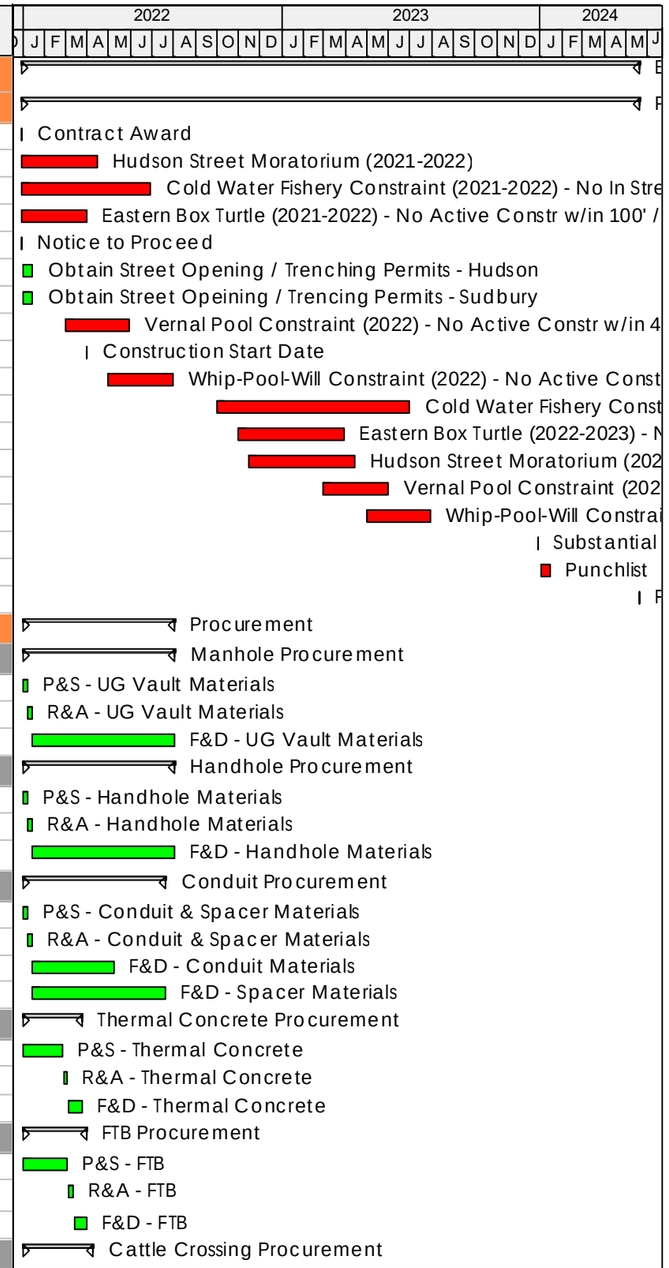
NRC Date: _____ Time: _____ AM / PM Inspector: _____

Additional comments: _____

Attachment M

Detailed Construction Schedule

Activity ID	Activity Name	Original Duration	Start	Finish	Comment	Comments
EVS Sudbury to Hudson 115kV		607	29-Dec-21	20-May-24		
Project Milestones		607	29-Dec-21	20-May-24		
A1000	Contract Award	1	29-Dec-21*	29-Dec-21		
A1040	Hudson Street Moratorium (2021-2022)	108	29-Dec-21*	15-Apr-22		
A5070	Cold Water Fishery Constraint (2021-2022) - No In Stream Work	184	29-Dec-21*	30-Jun-22		
A5090	Eastern Box Turtle (2021-2022) - No Active Constr w/in 100' / Access OK	93	29-Dec-21*	31-Mar-22		
A1010	Notice to Proceed	1	30-Dec-21*	30-Dec-21		
A1020	Obtain Street Opening / Trenching Permits - Hudson	10	31-Dec-21	13-Jan-22*		
A1030	Obtain Street Opeining / Trencing Permits - Sudbury	10	31-Dec-21	13-Jan-22		
A5050	Vernal Pool Constraint (2022) - No Active Constr w/in 450' / Access OK	92	01-Mar-22*	31-May-22		
A5110	Construction Start Date	1	01-Apr-22*	01-Apr-22		
A5030	Whip-Pool-Will Constraint (2022) - No Active Constr / Access OK	92	01-May-22*	31-Jul-22		
A5080	Cold Water Fishery Constraint (2022-2023) - No In Stream Work	273	01-Oct-22*	30-Jun-23		
A5100	Eastern Box Turtle (2022-2023) - No Active Constr w/in 100' / Access OK	151	01-Nov-22*	31-Mar-23		
A4460	Hudson Street Moratorium (2022-2023)	152	15-Nov-22*	15-Apr-23		
A5060	Vernal Pool Constraint (2023) - No Active Constr w/in 450' / Access OK	92	01-Mar-23*	31-May-23		
A5040	Whip-Pool-Will Constraint (2023) - No Active Constr / Access OK	92	01-May-23*	31-Jul-23		
A1050	Substantial Completion	1	29-Dec-23	29-Dec-23		
A4670	Punchlist	10	02-Jan-24	15-Jan-24		
A1060	Final Completion	1	20-May-24	20-May-24		
Procurement		150	31-Dec-21	03-Aug-22		
Manhole Procurement		150	31-Dec-21	03-Aug-22		
A5010	P&S - UG Vault Materials	5	31-Dec-21	06-Jan-22		
A1070	R&A - UG Vault Materials	5	07-Jan-22	13-Jan-22		
A1080	F&D - UG Vault Materials	140	14-Jan-22	03-Aug-22		
Handhole Procurement		150	31-Dec-21	03-Aug-22		
A4690	P&S - Handhole Materials	5	31-Dec-21	06-Jan-22		
A1150	R&A - Handhole Materials	5	07-Jan-22	13-Jan-22		
A1160	F&D - Handhole Materials	140	14-Jan-22	03-Aug-22		
Conduit Procurement		140	31-Dec-21	20-Jul-22		
A4700	P&S - Conduit & Spacer Materials	5	31-Dec-21	06-Jan-22		
A1090	R&A - Conduit & Spacer Materials	5	07-Jan-22	13-Jan-22		
A1100	F&D - Conduit Materials	80	14-Jan-22	09-May-22		
A4660	F&D - Spacer Materials	130	14-Jan-22	20-Jul-22		
Thermal Concrete Procurement		60	31-Dec-21	25-Mar-22		
A4710	P&S - Thermal Concrete	40	31-Dec-21	25-Feb-22		
A1110	R&A - Thermal Concrete	5	28-Feb-22	04-Mar-22		
A1120	F&D - Thermal Concrete	15	07-Mar-22	25-Mar-22		
FTB Procurement		65	31-Dec-21	01-Apr-22		
A4720	P&S - FTB	45	31-Dec-21	04-Mar-22		
A1130	R&A - FTB	5	07-Mar-22	11-Mar-22		
A1140	F&D - FTB	15	14-Mar-22	01-Apr-22		
Cattle Crossing Procurement		100	31-Dec-21	09-Apr-22		



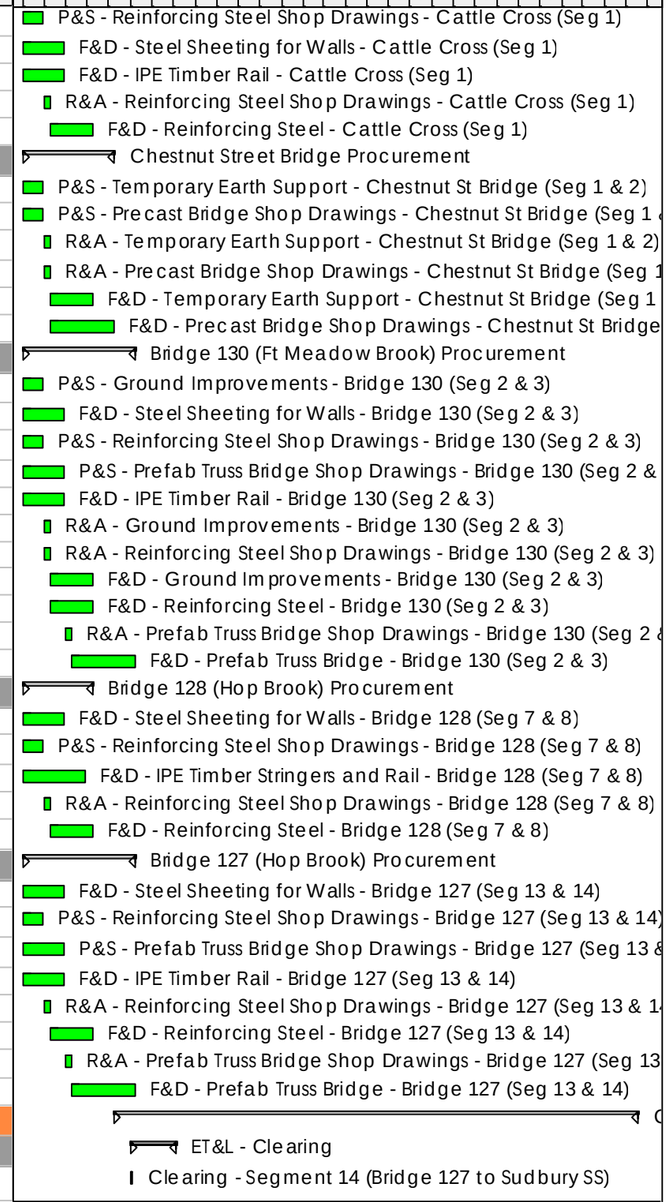
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

EVS Sudbury to Hudson 115kV
Preliminary Construction Schedule
Date: 29-Nov-21

BOND Brothers, Inc.
10 Cabot Road, Suite 306
Medford, MA 02155
phone 617.387.3400
web bondbrothers.com

BOND

Activity ID	Activity Name	Original Duration	Start	Finish	Comment	Comments
A3750	P&S - Reinforcing Steel Shop Drawings - Cattle Cross (Seg 1)	30	31-Dec-21	29-Jan-22		Seg 1
A3760	F&D - Steel Sheeting for Walls - Cattle Cross (Seg 1)	60	31-Dec-21	28-Feb-22		Seg 1
A3770	F&D - IPE Timber Rail - Cattle Cross (Seg 1)	60	31-Dec-21	28-Feb-22		Seg 1
A3780	R&A - Reinforcing Steel Shop Drawings - Cattle Cross (Seg 1)	10	30-Jan-22	08-Feb-22		Seg 1
A3790	F&D - Reinforcing Steel - Cattle Cross (Seg 1)	60	09-Feb-22	09-Apr-22		Seg 1
Chestnut Street Bridge Procurement		130	31-Dec-21	09-May-22		
A3800	P&S - Temporary Earth Support - Chestnut St Bridge (Seg 1 & 2)	30	31-Dec-21	29-Jan-22		Seg 1 & 2
A3810	P&S - Precast Bridge Shop Drawings - Chestnut St Bridge (Seg 1 & 2)	30	31-Dec-21	29-Jan-22		Seg 1 & 2
A3820	R&A - Temporary Earth Support - Chestnut St Bridge (Seg 1 & 2)	10	30-Jan-22	08-Feb-22		Seg 1 & 2
A3830	R&A - Precast Bridge Shop Drawings - Chestnut St Bridge (Seg 1 & 2)	10	30-Jan-22	08-Feb-22		Seg 1 & 2
A3840	F&D - Temporary Earth Support - Chestnut St Bridge (Seg 1 & 2)	60	09-Feb-22	09-Apr-22		Seg 1 & 2
A3850	F&D - Precast Bridge Shop Drawings - Chestnut St Bridge (Seg 1 & 2)	90	09-Feb-22	09-May-22		Seg 1 & 2
Bridge 130 (Ft Meadow Brook) Procurement		160	31-Dec-21	08-Jun-22		
A3860	P&S - Ground Improvements - Bridge 130 (Seg 2 & 3)	30	31-Dec-21	29-Jan-22		Seg 2 & 3
A3870	F&D - Steel Sheeting for Walls - Bridge 130 (Seg 2 & 3)	60	31-Dec-21	28-Feb-22		Seg 2 & 3
A3880	P&S - Reinforcing Steel Shop Drawings - Bridge 130 (Seg 2 & 3)	30	31-Dec-21	29-Jan-22		Seg 2 & 3
A3890	P&S - Prefab Truss Bridge Shop Drawings - Bridge 130 (Seg 2 & 3)	60	31-Dec-21	28-Feb-22		Seg 2 & 3
A3900	F&D - IPE Timber Rail - Bridge 130 (Seg 2 & 3)	60	31-Dec-21	28-Feb-22		Seg 2 & 3
A3910	R&A - Ground Improvements - Bridge 130 (Seg 2 & 3)	10	30-Jan-22	08-Feb-22		Seg 2 & 3
A3920	R&A - Reinforcing Steel Shop Drawings - Bridge 130 (Seg 2 & 3)	10	30-Jan-22	08-Feb-22		Seg 2 & 3
A3930	F&D - Ground Improvements - Bridge 130 (Seg 2 & 3)	60	09-Feb-22	09-Apr-22		Seg 2 & 3
A3940	F&D - Reinforcing Steel - Bridge 130 (Seg 2 & 3)	60	09-Feb-22	09-Apr-22		Seg 2 & 3
A3950	R&A - Prefab Truss Bridge Shop Drawings - Bridge 130 (Seg 2 & 3)	10	01-Mar-22	10-Mar-22		Seg 2 & 3
A3960	F&D - Prefab Truss Bridge - Bridge 130 (Seg 2 & 3)	90	11-Mar-22	08-Jun-22		Seg 2 & 3
Bridge 128 (Hop Brook) Procurement		100	31-Dec-21	09-Apr-22		
A4110	F&D - Steel Sheeting for Walls - Bridge 128 (Seg 7 & 8)	60	31-Dec-21	28-Feb-22		Seg 7 & 8
A4120	P&S - Reinforcing Steel Shop Drawings - Bridge 128 (Seg 7 & 8)	30	31-Dec-21	29-Jan-22		Seg 7 & 8
A4130	F&D - IPE Timber Stringers and Rail - Bridge 128 (Seg 7 & 8)	90	31-Dec-21	30-Mar-22		Seg 7 & 8
A4140	R&A - Reinforcing Steel Shop Drawings - Bridge 128 (Seg 7 & 8)	10	30-Jan-22	08-Feb-22		Seg 7 & 8
A4150	F&D - Reinforcing Steel - Bridge 128 (Seg 7 & 8)	60	09-Feb-22	09-Apr-22		Seg 7 & 8
Bridge 127 (Hop Brook) Procurement		160	31-Dec-21	08-Jun-22		
A4160	F&D - Steel Sheeting for Walls - Bridge 127 (Seg 13 & 14)	60	31-Dec-21	28-Feb-22		Seg 13 & 14
A4170	P&S - Reinforcing Steel Shop Drawings - Bridge 127 (Seg 13 & 14)	30	31-Dec-21	29-Jan-22		Seg 13 & 14
A4180	P&S - Prefab Truss Bridge Shop Drawings - Bridge 127 (Seg 13 & 14)	60	31-Dec-21	28-Feb-22		Seg 13 & 14
A4190	F&D - IPE Timber Rail - Bridge 127 (Seg 13 & 14)	60	31-Dec-21	28-Feb-22		Seg 13 & 14
A4200	R&A - Reinforcing Steel Shop Drawings - Bridge 127 (Seg 13 & 14)	10	30-Jan-22	08-Feb-22		Seg 13 & 14
A4210	F&D - Reinforcing Steel - Bridge 127 (Seg 13 & 14)	60	09-Feb-22	09-Apr-22		Seg 13 & 14
A4220	R&A - Prefab Truss Bridge Shop Drawings - Bridge 127 (Seg 13 & 14)	10	01-Mar-22	10-Mar-22		Seg 13 & 14
A4230	F&D - Prefab Truss Bridge - Bridge 127 (Seg 13 & 14)	90	11-Mar-22	08-Jun-22		Seg 13 & 14
Construction		514	10-May-22	17-May-24		
ET&L - Clearing		47	01-Jun-22	05-Aug-22		
A4860	Clearing - Segment 14 (Bridge 127 to Sudbury SS)	3	01-Jun-22*	03-Jun-22		Seg 14



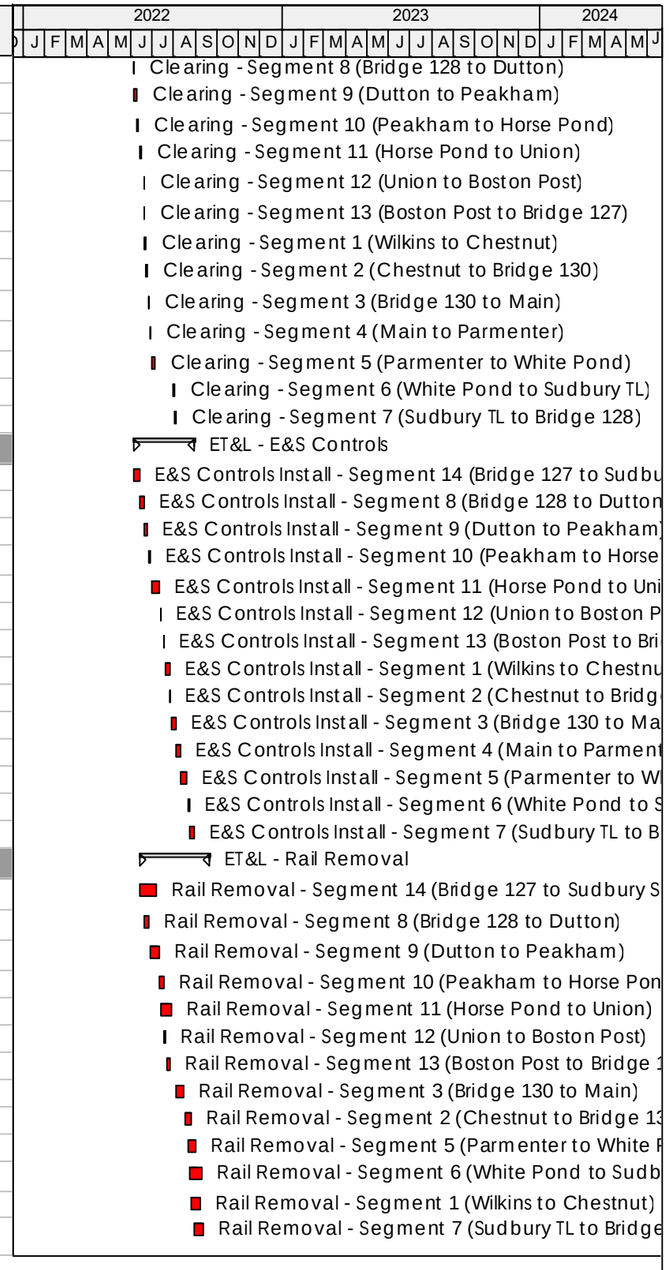
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

EVS Sudbury to Hudson 115kV
Preliminary Construction Schedule
Date: 29-Nov-21

BOND Brothers, Inc.
10 Cabot Road, Suite 306
Medford, MA 02155
phone 617.387.3400
web bondbrothers.com

BOND

Activity ID	Activity Name	Original Duration	Start	Finish	Comment	Comments
A4800	Clearing - Segment 8 (Bridge 128 to Dutton)	1	06-Jun-22	06-Jun-22		Seg 8
A4810	Clearing - Segment 9 (Dutton to Peakham)	3	07-Jun-22	09-Jun-22		Seg 9
A4820	Clearing - Segment 10 (Peakham to Horse Pond)	2	10-Jun-22	13-Jun-22		Seg 10
A4830	Clearing - Segment 11 (Horse Pond to Union)	4	14-Jun-22	17-Jun-22		Seg 11
A4840	Clearing - Segment 12 (Union to Boston Post)	1	20-Jun-22	20-Jun-22		Seg 12
A4850	Clearing - Segment 13 (Boston Post to Bridge 127)	1	21-Jun-22	21-Jun-22		Seg 13
A4730	Clearing - Segment 1 (Wilkins to Chestnut)	2	22-Jun-22	23-Jun-22		Seg 1
A4740	Clearing - Segment 2 (Chestnut to Bridge 130)	1	24-Jun-22	24-Jun-22		Seg 2
A4750	Clearing - Segment 3 (Bridge 130 to Main)	2	27-Jun-22	28-Jun-22		Seg 3
A4760	Clearing - Segment 4 (Main to Parmenter)	2	29-Jun-22	30-Jun-22		Seg 4
A5020	Clearing - Segment 5 (Parmenter to White Pond)	3	01-Jul-22	06-Jul-22		Seg 5
A4780	Clearing - Segment 6 (White Pond to Sudbury TL)	2	01-Aug-22	02-Aug-22		Seg 6
A4790	Clearing - Segment 7 (Sudbury TL to Bridge 128)	3	03-Aug-22	05-Aug-22		Seg 7
ET&L - E&S Controls		60	06-Jun-22	30-Aug-22		
A5000	E&S Controls Install - Segment 14 (Bridge 127 to Sudbury SS)	7	06-Jun-22	14-Jun-22		Seg 14
A4940	E&S Controls Install - Segment 8 (Bridge 128 to Dutton)	4	15-Jun-22	20-Jun-22		Seg 8
A4950	E&S Controls Install - Segment 9 (Dutton to Peakham)	4	21-Jun-22	24-Jun-22		Seg 9
A4960	E&S Controls Install - Segment 10 (Peakham to Horse Pond)	4	27-Jun-22	30-Jun-22		Seg 10
A4970	E&S Controls Install - Segment 11 (Horse Pond to Union)	8	01-Jul-22	13-Jul-22		Seg 11
A4980	E&S Controls Install - Segment 12 (Union to Boston Post)	2	14-Jul-22	15-Jul-22		Seg 12
A4990	E&S Controls Install - Segment 13 (Boston Post to Bridge 127)	2	18-Jul-22	19-Jul-22		Seg 13
A4870	E&S Controls Install - Segment 1 (Wilkins to Chestnut)	5	20-Jul-22	26-Jul-22		Seg 1
A4880	E&S Controls Install - Segment 2 (Chestnut to Bridge 130)	2	27-Jul-22	28-Jul-22		Seg 2
A4890	E&S Controls Install - Segment 3 (Bridge 130 to Main)	5	29-Jul-22	04-Aug-22		Seg 3
A4900	E&S Controls Install - Segment 4 (Main to Parmenter)	5	05-Aug-22	11-Aug-22		Seg 4
A4910	E&S Controls Install - Segment 5 (Parmenter to White Pond)	6	12-Aug-22	19-Aug-22		Seg 5
A4920	E&S Controls Install - Segment 6 (White Pond to Sudbury TL)	3	22-Aug-22	24-Aug-22		Seg 6
A4930	E&S Controls Install - Segment 7 (Sudbury TL to Bridge 128)	4	25-Aug-22	30-Aug-22		Seg 7
ET&L - Rail Removal		68	15-Jun-22	21-Sep-22		
A1300	Rail Removal - Segment 14 (Bridge 127 to Sudbury SS)	17	15-Jun-22	08-Jul-22	ET&L Rail 1	Seg 14
A1240	Rail Removal - Segment 8 (Bridge 128 to Dutton)	6	21-Jun-22	28-Jun-22	ET&L Rail 2	Seg 8
A1250	Rail Removal - Segment 9 (Dutton to Peakham)	8	29-Jun-22	11-Jul-22	ET&L Rail 2	Seg 9
A1260	Rail Removal - Segment 10 (Peakham to Horse Pond)	6	12-Jul-22	19-Jul-22	ET&L Rail 2	Seg 10
A1270	Rail Removal - Segment 11 (Horse Pond to Union)	12	14-Jul-22	29-Jul-22	ET&L Rail 3	Seg 11
A1280	Rail Removal - Segment 12 (Union to Boston Post)	4	18-Jul-22	21-Jul-22	ET&L Rail 1	Seg 12
A1290	Rail Removal - Segment 13 (Boston Post to Bridge 127)	5	22-Jul-22	28-Jul-22	ET&L Rail 1	Seg 13
A1190	Rail Removal - Segment 3 (Bridge 130 to Main)	8	05-Aug-22	16-Aug-22	ET&L Rail 1	Seg 3
A1180	Rail Removal - Segment 2 (Chestnut to Bridge 130)	7	17-Aug-22	25-Aug-22	ET&L Rail 1	Seg 2
A1210	Rail Removal - Segment 5 (Parmenter to White Pond)	9	22-Aug-22	01-Sep-22	ET&L Rail 2 (DT)	Seg 5
A1220	Rail Removal - Segment 6 (White Pond to Sudbury TL)	11	25-Aug-22	09-Sep-22	ET&L Rail 2	Seg 6
A1170	Rail Removal - Segment 1 (Wilkins to Chestnut)	8	26-Aug-22	07-Sep-22	ET&L Rail 1	Seg 1
A1230	Rail Removal - Segment 7 (Sudbury TL to Bridge 128)	9	31-Aug-22	13-Sep-22	ET&L Rail 1	Seg 7



Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

EVS Sudbury to Hudson 115kV
Preliminary Construction Schedule
Date: 29-Nov-21

BOND Brothers, Inc.
10 Cabot Road, Suite 306
Medford, MA 02155
phone 617.387.3400
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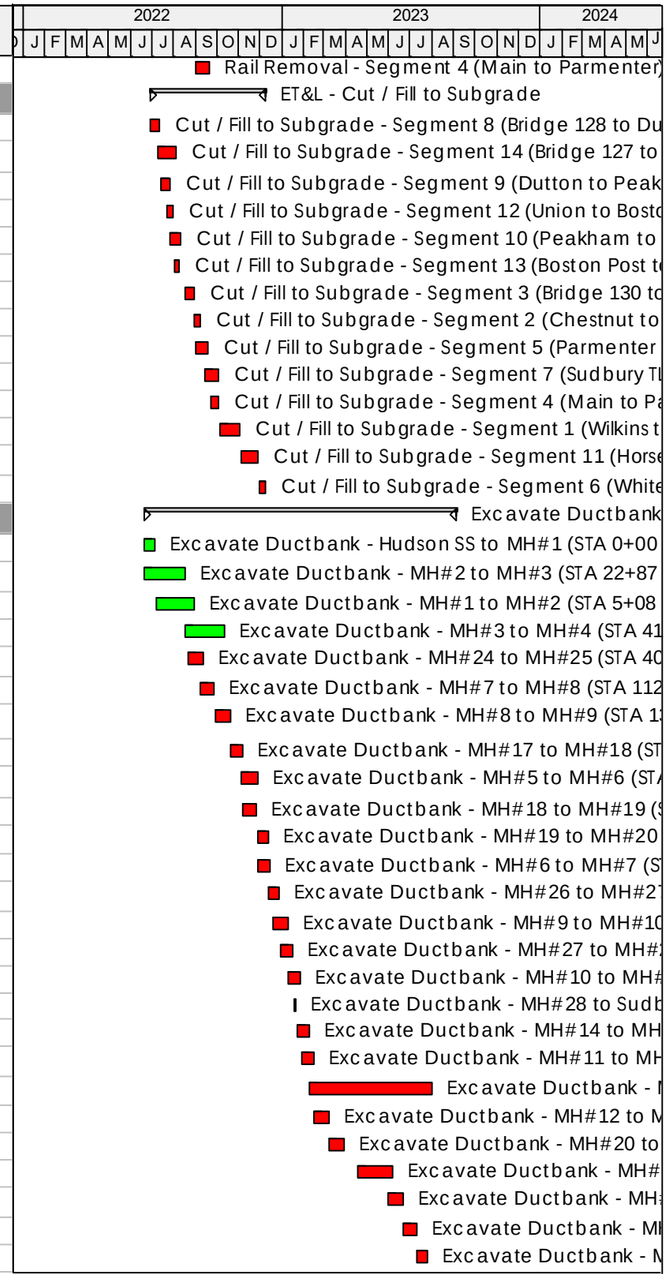
BOND

Activity ID	Activity Name	Original Duration	Start	Finish	Comment	Comments
A1200	Rail Removal - Segment 4 (Main to Parmenter)	13	02-Sep-22	21-Sep-22	ET&L Rail 2 (DT)	Seg 4
ET&L - Cut / Fill to Subgrade		112	29-Jun-22	08-Dec-22		
A1380	Cut / Fill to Subgrade - Segment 8 (Bridge 128 to Dutton)	10	29-Jun-22	13-Jul-22	ET&L Cut 1	Seg 8
A1440	Cut / Fill to Subgrade - Segment 14 (Bridge 127 to Sudbury SS)	20	11-Jul-22	05-Aug-22	ET&L Cut 2	Seg 14
A1390	Cut / Fill to Subgrade - Segment 9 (Dutton to Peakham)	10	14-Jul-22	27-Jul-22	ET&L Cut 1	Seg 9
A1420	Cut / Fill to Subgrade - Segment 12 (Union to Boston Post)	7	22-Jul-22	01-Aug-22	ET&L Cut 3	Seg 12
A1400	Cut / Fill to Subgrade - Segment 10 (Peakham to Horse Pond)	10	28-Jul-22	10-Aug-22	ET&L Cut 1	Seg 10
A1430	Cut / Fill to Subgrade - Segment 13 (Boston Post to Bridge 127)	5	02-Aug-22	08-Aug-22	ET&L Cut 3	Seg 13
A1330	Cut / Fill to Subgrade - Segment 3 (Bridge 130 to Main)	10	17-Aug-22	30-Aug-22	ET&L Cut 3	Seg 3
A1320	Cut / Fill to Subgrade - Segment 2 (Chestnut to Bridge 130)	5	31-Aug-22	07-Sep-22	ET&L Cut 3	Seg 2
A1350	Cut / Fill to Subgrade - Segment 5 (Parmenter to White Pond)	11	02-Sep-22	19-Sep-22	ET&L Cut 1	Seg 5
A1370	Cut / Fill to Subgrade - Segment 7 (Sudbury TL to Bridge 128)	15	14-Sep-22	04-Oct-22	ET&L Cut 2	Seg 7
A1340	Cut / Fill to Subgrade - Segment 4 (Main to Parmenter)	9	22-Sep-22	04-Oct-22	ET&L Cut 1	Seg 4
A1310	Cut / Fill to Subgrade - Segment 1 (Wilkins to Chestnut)	21	05-Oct-22	03-Nov-22	ET&L Cut 1	Seg 1
A1410	Cut / Fill to Subgrade - Segment 11 (Horse Pond to Union)	16	04-Nov-22	29-Nov-22	ET&L Cut 1	Seg 11
A1360	Cut / Fill to Subgrade - Segment 6 (White Pond to Sudbury TL)	7	30-Nov-22	08-Dec-22	ET&L Cut 1	Seg 6
Excavate Ductbank		306	20-Jun-22	05-Sep-23		
A1450	Excavate Ductbank - Hudson SS to MH#1 (STA 0+00 to 5+08)	12	20-Jun-22	06-Jul-22	BOND Road Exc 1	
A1470	Excavate Ductbank - MH#2 to MH#3 (STA 22+87 to 41+11)	42	20-Jun-22	17-Aug-22	BOND Road Exc 2	
A1460	Excavate Ductbank - MH#1 to MH#2 (STA 5+08 to 22+87)	40	07-Jul-22	31-Aug-22	BOND Road Exc 1	
A1480	Excavate Ductbank - MH#3 to MH#4 (STA 41+11 to 57+66)	38	18-Aug-22	12-Oct-22	BOND Road Exc 2	
A1690	Excavate Ductbank - MH#24 to MH#25 (STA 406+52 to 426+18)	15	22-Aug-22	12-Sep-22	BOND Exc 1	Seg 12 & 13
A1520	Excavate Ductbank - MH#7 to MH#8 (STA 112+68 to 131+71)	15	08-Sep-22	28-Sep-22	BOND Exc 2	Seg 2 & 3
A1530	Excavate Ductbank - MH#8 to MH#9 (STA 131+71 to 150+73)	15	29-Sep-22	20-Oct-22	BOND Exc 2	Seg 3
A1620	Excavate Ductbank - MH#17 to MH#18 (STA 292+80 to 309+16)	12	21-Oct-22	07-Nov-22	BOND Exc 2	Seg 8 & 9
A1500	Excavate Ductbank - MH#5 to MH#6 (STA 75+63 to 94+67)	15	04-Nov-22	28-Nov-22	BOND Exc 1	Seg 1
A1630	Excavate Ductbank - MH#18 to MH#19 (STA 309+16 to 325+16)	12	08-Nov-22	25-Nov-22	BOND Exc 2	Seg 9
A1640	Excavate Ductbank - MH#19 to MH#20 (STA 325+16 to 339+15)	11	28-Nov-22	12-Dec-22	BOND Exc 2	Seg 9 & 10
A1510	Excavate Ductbank - MH#6 to MH#7 (STA 94+67 to 112+68)	14	29-Nov-22	16-Dec-22	BOND Exc 1	Seg 1 & 2
A1710	Excavate Ductbank - MH#26 to MH#27 (STA 445+18 to 461+20)	12	13-Dec-22	29-Dec-22	BOND Exc 2	Seg 14
A1540	Excavate Ductbank - MH#9 to MH#10 (STA 150+73 to 169+66)	14	19-Dec-22	09-Jan-23	BOND Exc 1	Seg 3 & 4
A1720	Excavate Ductbank - MH#27 to MH#28 (STA 461+20 to 476+18)	12	30-Dec-22	17-Jan-23	BOND Exc 2	Seg 14
A1550	Excavate Ductbank - MH#10 to MH#11 (STA 169+66 to 188+29)	14	10-Jan-23	27-Jan-23	BOND Exc 1	Seg 4
A1730	Excavate Ductbank - MH#28 to Sudbury SS (STA 476+18 to 479+85)	3	18-Jan-23	20-Jan-23	BOND Exc 2	Seg 14
A1590	Excavate Ductbank - MH#14 to MH#15 (STA 241+29 to 259+29)	14	23-Jan-23	09-Feb-23	BOND Exc 2	Seg 6 & 7
A1560	Excavate Ductbank - MH#11 to MH#12 (STA 188+29 to 204+29)	12	30-Jan-23	15-Feb-23	BOND Exc 1	Seg 5
A1600	Excavate Ductbank - MH#15 to MH#16 (STA 259+29 to 278+29)	14	10-Feb-23	02-Aug-23	BOND Exc 2	Seg 7
A1570	Excavate Ductbank - MH#12 to MH#13 (STA 204+29 to 223+29)	15	16-Feb-23	08-Mar-23	BOND Exc 1	Seg 5
A1650	Excavate Ductbank - MH#20 to MH#21 (STA 339+15 to 358+15)	15	09-Mar-23	29-Mar-23	BOND Exc 1	Seg 10
A1490	Excavate Ductbank - MH#4 to MH#5 (STA 57+66 to 75+63)	35	18-Apr-23*	06-Jun-23	BOND Road Exc 3	
A1660	Excavate Ductbank - MH#21 to MH#22 (STA 358+15 to 377+16)	15	01-Jun-23	21-Jun-23	BOND Exc 1	Seg 11
A1670	Excavate Ductbank - MH#22 to MH#23 (STA 377+16 to 392+16)	12	22-Jun-23	10-Jul-23	BOND Exc 1	Seg 11
A1680	Excavate Ductbank - MH#23 to MH#24 (STA 392+16 to 406+52)	11	11-Jul-23	25-Jul-23	BOND Exc 1	Seg 11



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Date: 29-Nov-21

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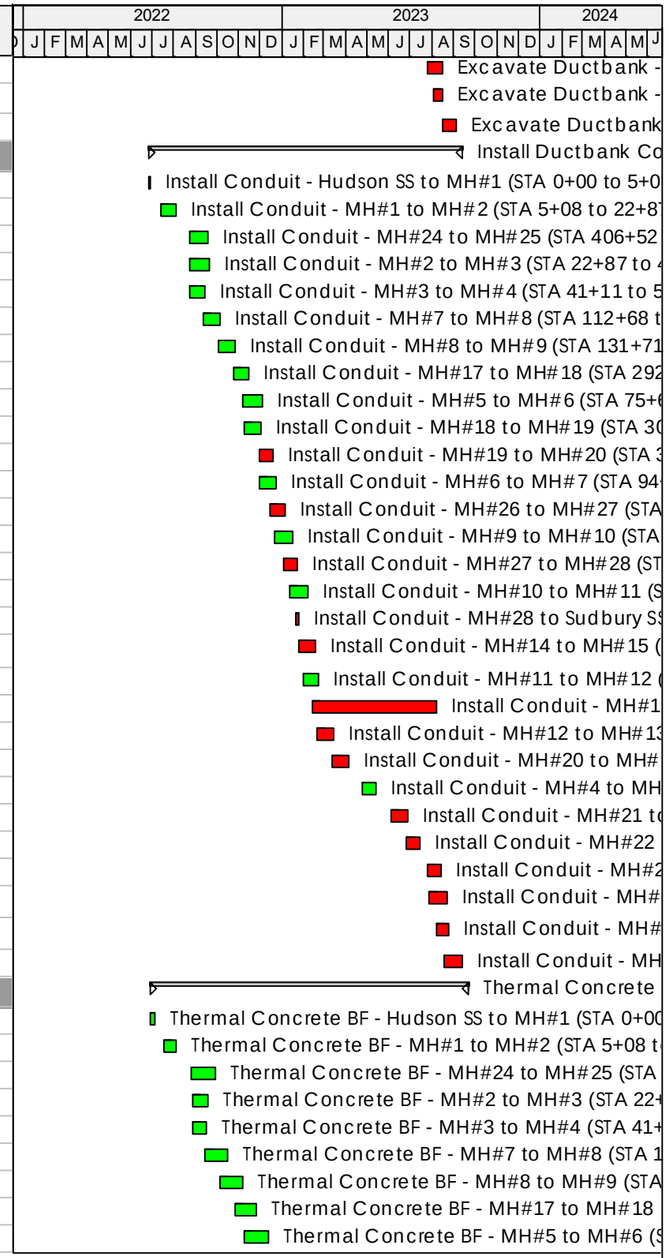
Activity ID	Activity Name	Original Duration	Start	Finish	Comment	Comments
A1700	Excavate Ductbank - MH#25 to MH#26 (STA 426+18 to 445+18)	15	26-Jul-23	15-Aug-23	BOND Exc 1	Seg 13 & 14
A1610	Excavate Ductbank - MH#16 to MH#17 (STA 278+29 to 292+80)	11	03-Aug-23	17-Aug-23	BOND Exc 2	Seg 7 & 8
A1580	Excavate Ductbank - MH#13 to MH#14 (STA 223+29 to 241+29)	14	16-Aug-23	05-Sep-23	BOND Exc 1	Seg 6
Install Ductbank Conduit		306	27-Jun-22	12-Sep-23		
A1740	Install Conduit - Hudson SS to MH#1 (STA 0+00 to 5+08)	4	27-Jun-22	30-Jun-22	BOND Road Cond #1	
A1750	Install Conduit - MH#1 to MH#2 (STA 5+08 to 22+87)	17	14-Jul-22	05-Aug-22	BOND Road Cond #1	
A1980	Install Conduit - MH#24 to MH#25 (STA 406+52 to 426+18)	18	24-Aug-22	19-Sep-22		Seg 12 & 13
A1760	Install Conduit - MH#2 to MH#3 (STA 22+87 to 41+11)	18	25-Aug-22	20-Sep-22	BOND Road Cond #1	
A1770	Install Conduit - MH#3 to MH#4 (STA 41+11 to 57+66)	14	25-Aug-22	14-Sep-22	BOND Road Cond #2	
A1810	Install Conduit - MH#7 to MH#8 (STA 112+68 to 131+71)	18	12-Sep-22	05-Oct-22		Seg 2 & 3
A1820	Install Conduit - MH#8 to MH#9 (STA 131+71 to 150+73)	18	03-Oct-22	27-Oct-22		Seg 3
A1910	Install Conduit - MH#17 to MH#18 (STA 292+80 to 309+16)	15	25-Oct-22	15-Nov-22		Seg 8 & 9
A1790	Install Conduit - MH#5 to MH#6 (STA 75+63 to 94+67)	18	08-Nov-22	05-Dec-22		Seg 1
A1920	Install Conduit - MH#18 to MH#19 (STA 309+16 to 325+16)	15	10-Nov-22	02-Dec-22		Seg 9
A1930	Install Conduit - MH#19 to MH#20 (STA 325+16 to 339+15)	14	30-Nov-22	19-Dec-22		Seg 9 & 10
A1800	Install Conduit - MH#6 to MH#7 (STA 94+67 to 112+68)	17	01-Dec-22	23-Dec-22		Seg 2 & 3
A2000	Install Conduit - MH#26 to MH#27 (STA 445+18 to 461+20)	15	15-Dec-22	06-Jan-23		Seg 14
A1830	Install Conduit - MH#9 to MH#10 (STA 150+73 to 169+66)	18	21-Dec-22	17-Jan-23		Seg 3 & 4
A2010	Install Conduit - MH#27 to MH#28 (STA 461+20 to 476+18)	14	04-Jan-23	23-Jan-23		Seg 14
A1840	Install Conduit - MH#10 to MH#11 (STA 169+66 to 188+29)	18	12-Jan-23	06-Feb-23		Seg 4
A2020	Install Conduit - MH#28 to Sudbury SS (STA 476+18 to 479+85)	3	20-Jan-23	24-Jan-23		Seg 14
A1880	Install Conduit - MH#14 to MH#15 (STA 241+29 to 259+29)	17	25-Jan-23	17-Feb-23		Seg 6 & 7
A1850	Install Conduit - MH#11 to MH#12 (STA 188+29 to 204+29)	15	01-Feb-23	22-Feb-23		Seg 5
A1890	Install Conduit - MH#15 to MH#16 (STA 259+29 to 278+29)	17	14-Feb-23	08-Aug-23		Seg 7
A1860	Install Conduit - MH#12 to MH#13 (STA 204+29 to 223+29)	18	20-Feb-23	15-Mar-23		Seg 5
A1940	Install Conduit - MH#20 to MH#21 (STA 339+15 to 358+15)	18	13-Mar-23	05-Apr-23		Seg10
A1780	Install Conduit - MH#4 to MH#5 (STA 57+66 to 75+63)	15	25-Apr-23	15-May-23	BOND Road Cond #3	
A1950	Install Conduit - MH#21 to MH#22 (STA 358+15 to 377+16)	18	05-Jun-23	28-Jun-23		Seg 11
A1960	Install Conduit - MH#22 to MH#23 (STA 377+16 to 392+16)	14	26-Jun-23	14-Jul-23		Seg 11
A1970	Install Conduit - MH#23 to MH#24 (STA 392+16 to 406+52)	14	26-Jul-23	14-Aug-23		Seg 11
A1990	Install Conduit - MH#25 to MH#26 (STA 426+18 to 445+18)	18	28-Jul-23	22-Aug-23		Seg 13 & 14
A1900	Install Conduit - MH#16 to MH#17 (STA 278+29 to 292+80)	14	07-Aug-23	24-Aug-23		Seg 7 & 8
A1870	Install Conduit - MH#13 to MH#14 (STA 223+29 to 241+29)	17	18-Aug-23	12-Sep-23		Seg 6
Thermal Concrete Backfill		312	29-Jun-22	22-Sep-23		
A2030	Thermal Concrete BF - Hudson SS to MH#1 (STA 0+00 to 5+08)	4	29-Jun-22	05-Jul-22	BOND Road Conc #1	
A2040	Thermal Concrete BF - MH#1 to MH#2 (STA 5+08 to 22+87)	15	18-Jul-22	05-Aug-22	BOND Road Conc #1	
A2270	Thermal Concrete BF - MH#24 to MH#25 (STA 406+52 to 426+18)	24	26-Aug-22	29-Sep-22		Seg 12 & 13
A2050	Thermal Concrete BF - MH#2 to MH#3 (STA 22+87 to 41+11)	15	29-Aug-22	19-Sep-22	BOND Road Conc #2	
A2060	Thermal Concrete BF - MH#3 to MH#4 (STA 41+11 to 57+66)	14	29-Aug-22	16-Sep-22	BOND Road Conc #1	
A2100	Thermal Concrete BF - MH#7 to MH#8 (STA 112+68 to 131+71)	23	14-Sep-22	17-Oct-22		Seg 2 & 3
A2110	Thermal Concrete BF - MH#8 to MH#9 (STA 131+71 to 150+73)	23	05-Oct-22	07-Nov-22		Seg 3
A2200	Thermal Concrete BF - MH#17 to MH#18 (STA 292+80 to 309+16)	20	27-Oct-22	25-Nov-22		Seg 8 & 9
A2080	Thermal Concrete BF - MH#5 to MH#6 (STA 75+63 to 94+67)	23	10-Nov-22	14-Dec-22		Seg 1



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Preliminary Construction Schedule
Date: 29-Nov-21

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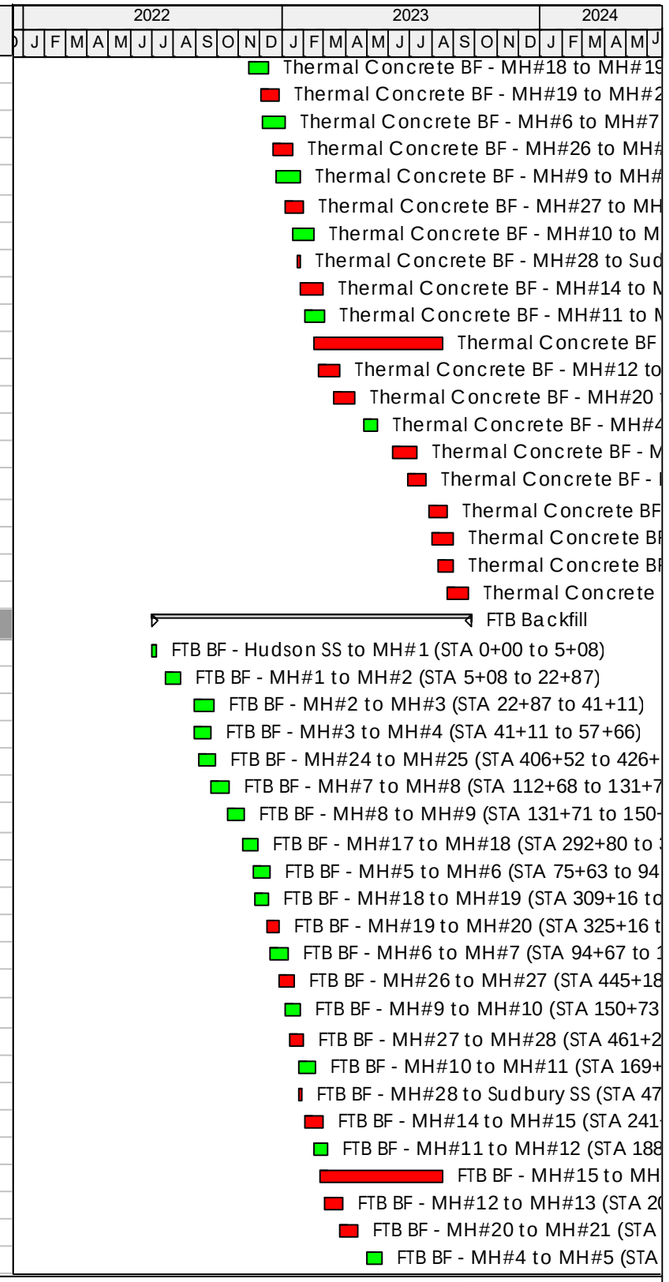
BOND

Activity ID	Activity Name	Original Duration	Start	Finish	Comment	Comments
A2210	Thermal Concrete BF - MH#18 to MH#19 (STA 309+16 to 325+16)	20	15-Nov-22	13-Dec-22		Seg 9
A2220	Thermal Concrete BF - MH#19 to MH#20 (STA 325+16 to 339+15)	17	02-Dec-22	27-Dec-22		Seg 9 & 10
A2090	Thermal Concrete BF - MH#6 to MH#7 (STA 94+67 to 112+68)	23	05-Dec-22	06-Jan-23		Seg 1 & 2
A2290	Thermal Concrete BF - MH#26 to MH#27 (STA 445+18 to 461+20)	20	19-Dec-22	17-Jan-23		Seg 14
A2120	Thermal Concrete BF - MH#9 to MH#10 (STA 150+73 to 169+66)	23	23-Dec-22	26-Jan-23		Seg 3 & 4
A2300	Thermal Concrete BF - MH#27 to MH#28 (STA 461+20 to 476+18)	18	06-Jan-23	31-Jan-23		Seg 14
A2130	Thermal Concrete BF - MH#10 to MH#11 (STA 169+66 to 188+29)	23	16-Jan-23	16-Feb-23		Seg 4
A2310	Thermal Concrete BF - MH#28 to Sudbury SS (STA 476+18 to 479+85)	4	24-Jan-23	27-Jan-23		Seg 14
A2170	Thermal Concrete BF - MH#14 to MH#15 (STA 241+29 to 259+29)	21	27-Jan-23	27-Feb-23		Seg 6 & 7
A2140	Thermal Concrete BF - MH#11 to MH#12 (STA 188+29 to 204+29)	20	03-Feb-23	03-Mar-23		Seg 5
A2180	Thermal Concrete BF - MH#15 to MH#16 (STA 259+29 to 278+29)	21	15-Feb-23	15-Aug-23		Seg 7
A2150	Thermal Concrete BF - MH#12 to MH#13 (STA 204+29 to 223+29)	23	22-Feb-23	24-Mar-23		Seg 5
A2230	Thermal Concrete BF - MH#20 to MH#21 (STA 339+15 to 358+15)	23	15-Mar-23	14-Apr-23		Seg 10
A2070	Thermal Concrete BF - MH#4 to MH#5 (STA 57+66 to 75+63)	14	27-Apr-23	16-May-23	BOND Road Conc #3	
A2240	Thermal Concrete BF - MH#21 to MH#22 (STA 358+15 to 377+16)	23	07-Jun-23	10-Jul-23		Seg 11
A2250	Thermal Concrete BF - MH#22 to MH#23 (STA 377+16 to 392+16)	18	28-Jun-23	24-Jul-23		Seg 11
A2260	Thermal Concrete BF - MH#23 to MH#24 (STA 392+16 to 406+52)	18	28-Jul-23	22-Aug-23		Seg 11
A2280	Thermal Concrete BF - MH#25 to MH#26 (STA 426+18 to 445+18)	23	01-Aug-23	31-Aug-23		Seg 13 & 14
A2190	Thermal Concrete BF - MH#16 to MH#17 (STA 278+29 to 292+80)	18	09-Aug-23	01-Sep-23		Seg 7 & 8
A2160	Thermal Concrete BF - MH#13 to MH#14 (STA 223+29 to 241+29)	23	22-Aug-23	22-Sep-23		Seg 6
FTB Backfill		311	01-Jul-22	25-Sep-23		
A2320	FTB BF - Hudson SS to MH#1 (STA 0+00 to 5+08)	4	01-Jul-22	07-Jul-22	BOND Road FTB #1	
A2330	FTB BF - MH#1 to MH#2 (STA 5+08 to 22+87)	18	20-Jul-22	12-Aug-22	BOND Road FTB #1	
A2340	FTB BF - MH#2 to MH#3 (STA 22+87 to 41+11)	18	31-Aug-22	26-Sep-22	BOND Road FTB #1	
A2350	FTB BF - MH#3 to MH#4 (STA 41+11 to 57+66)	17	31-Aug-22	23-Sep-22	BOND Road FTB #2	
A2560	FTB BF - MH#24 to MH#25 (STA 406+52 to 426+18)	17	07-Sep-22	29-Sep-22		Seg 12 & 13
A2390	FTB BF - MH#7 to MH#8 (STA 112+68 to 131+71)	17	23-Sep-22	18-Oct-22		Seg 2 & 3
A2400	FTB BF - MH#8 to MH#9 (STA 131+71 to 150+73)	17	17-Oct-22	08-Nov-22		Seg 3
A2490	FTB BF - MH#17 to MH#18 (STA 292+80 to 309+16)	14	07-Nov-22	28-Nov-22		Seg 8 & 9
A2370	FTB BF - MH#5 to MH#6 (STA 75+63 to 94+67)	17	22-Nov-22	15-Dec-22		Seg 1
A2500	FTB BF - MH#18 to MH#19 (STA 309+16 to 325+16)	14	25-Nov-22	14-Dec-22		Seg 9
A2510	FTB BF - MH#19 to MH#20 (STA 325+16 to 339+15)	12	12-Dec-22	28-Dec-22		Seg 9
A2380	FTB BF - MH#6 to MH#7 (STA 94+67 to 112+68)	15	16-Dec-22	09-Jan-23		Seg 1 & 2
A2580	FTB BF - MH#26 to MH#27 (STA 445+18 to 461+20)	14	29-Dec-22	18-Jan-23		Seg 14
A2410	FTB BF - MH#9 to MH#10 (STA 150+73 to 169+66)	17	05-Jan-23	27-Jan-23		Seg 3 & 4
A2590	FTB BF - MH#27 to MH#28 (STA 461+20 to 476+18)	14	13-Jan-23	01-Feb-23		Seg 14
A2420	FTB BF - MH#10 to MH#11 (STA 169+66 to 188+29)	17	25-Jan-23	17-Feb-23		Seg 4
A2600	FTB BF - MH#28 to Sudbury SS (STA 476+18 to 479+85)	3	26-Jan-23	30-Jan-23		Seg 14
A2460	FTB BF - MH#14 to MH#15 (STA 241+29 to 259+29)	17	03-Feb-23	28-Feb-23		Seg 6 & 7
A2430	FTB BF - MH#11 to MH#12 (STA 188+29 to 204+29)	14	15-Feb-23	06-Mar-23		Seg 5
A2470	FTB BF - MH#15 to MH#16 (STA 259+29 to 278+29)	15	24-Feb-23	16-Aug-23		Seg 7
A2440	FTB BF - MH#12 to MH#13 (STA 204+29 to 223+29)	17	03-Mar-23	27-Mar-23		Seg 5
A2520	FTB BF - MH#20 to MH#21 (STA 339+15 to 358+15)	17	24-Mar-23	18-Apr-23		Seg 10
A2360	FTB BF - MH#4 to MH#5 (STA 57+66 to 75+63)	17	01-May-23	23-May-23	BOND Road FTB #3	



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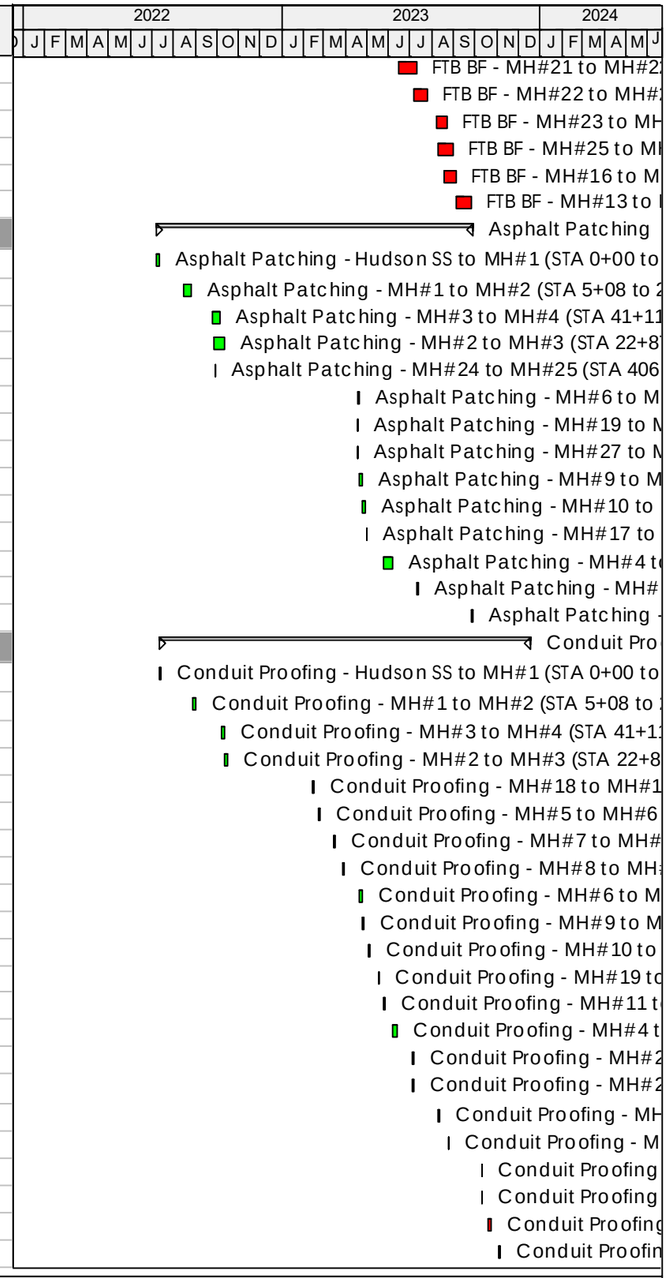
Activity ID	Activity Name	Original Duration	Start	Finish	Comment	Comments
A2530	FTB BF - MH#21 to MH#22 (STA 358+15 to 377+16)	17	16-Jun-23	11-Jul-23		Seg 11
A2540	FTB BF - MH#22 to MH#23 (STA 377+16 to 392+16)	14	06-Jul-23	25-Jul-23		Seg 11
A2550	FTB BF - MH#23 to MH#24 (STA 392+16 to 406+52)	12	08-Aug-23	23-Aug-23		Seg 11
A2570	FTB BF - MH#25 to MH#26 (STA 426+18 to 445+18)	17	10-Aug-23	01-Sep-23		Seg 13 & 14
A2480	FTB BF - MH#16 to MH#17 (STA 278+29 to 292+80)	12	18-Aug-23	05-Sep-23		Seg 7 & 8
A2450	FTB BF - MH#13 to MH#14 (STA 223+29 to 241+29)	15	05-Sep-23	25-Sep-23		Seg 6
Asphalt Patching		204	08-Jul-22	28-Sep-23		
A2620	Asphalt Patching - Hudson SS to MH#1 (STA 0+00 to 5+08)	3	08-Jul-22	12-Jul-22	BOND Road Asph #1	
A2630	Asphalt Patching - MH#1 to MH#2 (STA 5+08 to 22+87)	10	15-Aug-22	26-Aug-22	BOND Road Asph #1	
A2650	Asphalt Patching - MH#3 to MH#4 (STA 41+11 to 57+66)	9	26-Sep-22	06-Oct-22	BOND Road Asph #1	
A2640	Asphalt Patching - MH#2 to MH#3 (STA 22+87 to 41+11)	10	27-Sep-22	11-Oct-22	BOND Road Asph #2	
A2740	Asphalt Patching - MH#24 to MH#25 (STA 406+52 to 426+18)	1	30-Sep-22	30-Sep-22		Seg 12 & 13
A2670	Asphalt Patching - MH#6 to MH#7 (STA 94+67 to 112+68)	3	18-Apr-23	20-Apr-23		Seg 1 & 2
A2720	Asphalt Patching - MH#19 to MH#20 (STA 325+16 to 339+15)	1	18-Apr-23	18-Apr-23		Seg 9
A2750	Asphalt Patching - MH#27 to MH#28 (STA 461+20 to 476+18)	1	18-Apr-23	18-Apr-23		Seg 14
A2680	Asphalt Patching - MH#9 to MH#10 (STA 150+73 to 169+66)	3	21-Apr-23	25-Apr-23		Seg 3 & 4
A2690	Asphalt Patching - MH#10 to MH#11 (STA 169+66 to 188+29)	3	26-Apr-23	28-Apr-23		Seg 4
A2710	Asphalt Patching - MH#17 to MH#18 (STA 292+80 to 309+16)	1	01-May-23	01-May-23		Seg 8 & 9
A2660	Asphalt Patching - MH#4 to MH#5 (STA 57+66 to 75+63)	9	24-May-23	06-Jun-23	BOND Road Asph #3	
A2730	Asphalt Patching - MH#21 to MH#22 (STA 358+15 to 377+16)	1	12-Jul-23	12-Jul-23		Seg 11
A2700	Asphalt Patching - MH#13 to MH#14 (STA 223+29 to 241+29)	3	26-Sep-23	28-Sep-23		Seg 6
Conduit Proofing		361	13-Jul-22	18-Dec-23		
A2760	Conduit Proofing - Hudson SS to MH#1 (STA 0+00 to 5+08)	2	13-Jul-22	14-Jul-22		
A2770	Conduit Proofing - MH#1 to MH#2 (STA 5+08 to 22+87)	4	29-Aug-22	01-Sep-22		
A2790	Conduit Proofing - MH#3 to MH#4 (STA 41+11 to 57+66)	4	07-Oct-22	13-Oct-22		
A2780	Conduit Proofing - MH#2 to MH#3 (STA 22+87 to 41+11)	4	12-Oct-22	17-Oct-22		
A2940	Conduit Proofing - MH#18 to MH#19 (STA 309+16 to 325+16)	2	14-Feb-23	15-Feb-23		Seg 9
A2810	Conduit Proofing - MH#5 to MH#6 (STA 75+63 to 94+67)	2	23-Feb-23	24-Feb-23		Seg 1
A2830	Conduit Proofing - MH#7 to MH#8 (STA 112+68 to 131+71)	2	16-Mar-23	17-Mar-23		Seg 2 & 3
A2840	Conduit Proofing - MH#8 to MH#9 (STA 131+71 to 150+73)	2	29-Mar-23	30-Mar-23		Seg 3
A2820	Conduit Proofing - MH#6 to MH#7 (STA 94+67 to 112+68)	2	21-Apr-23	24-Apr-23		Seg 1 & 2
A2850	Conduit Proofing - MH#9 to MH#10 (STA 150+73 to 169+66)	2	26-Apr-23	27-Apr-23		Seg 3 & 4
A2860	Conduit Proofing - MH#10 to MH#11 (STA 169+66 to 188+29)	2	04-May-23	05-May-23		Seg 4
A2950	Conduit Proofing - MH#19 to MH#20 (STA 325+16 to 339+15)	2	18-May-23	19-May-23		Seg 9 & 10
A2870	Conduit Proofing - MH#11 to MH#12 (STA 188+29 to 204+29)	2	25-May-23	26-May-23		Seg 5
A2800	Conduit Proofing - MH#4 to MH#5 (STA 57+66 to 75+63)	4	07-Jun-23	12-Jun-23		
A3030	Conduit Proofing - MH#27 to MH#28 (STA 461+20 to 476+18)	2	05-Jul-23	06-Jul-23		Seg 14
A3040	Conduit Proofing - MH#28 to Sudbury SS (STA 476+18 to 479+85)	2	05-Jul-23	06-Jul-23		Seg 14
A2960	Conduit Proofing - MH#20 to MH#21 (STA 339+15 to 358+15)	2	10-Aug-23	11-Aug-23		Seg 10
A2970	Conduit Proofing - MH#21 to MH#22 (STA 358+15 to 377+16)	2	24-Aug-23	25-Aug-23		Seg 11
A2980	Conduit Proofing - MH#22 to MH#23 (STA 377+16 to 392+16)	2	10-Oct-23	11-Oct-23		Seg 11
A2990	Conduit Proofing - MH#23 to MH#24 (STA 392+16 to 406+52)	2	10-Oct-23	11-Oct-23		Seg 11
A2910	Conduit Proofing - MH#15 to MH#16 (STA 259+29 to 278+29)	2	20-Oct-23	23-Oct-23		Seg 7
A3000	Conduit Proofing - MH#24 to MH#25 (STA 406+52 to 426+18)	2	03-Nov-23	06-Nov-23		Seg 12 & 13



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Date: 29-Nov-21

BOND Brothers, Inc.
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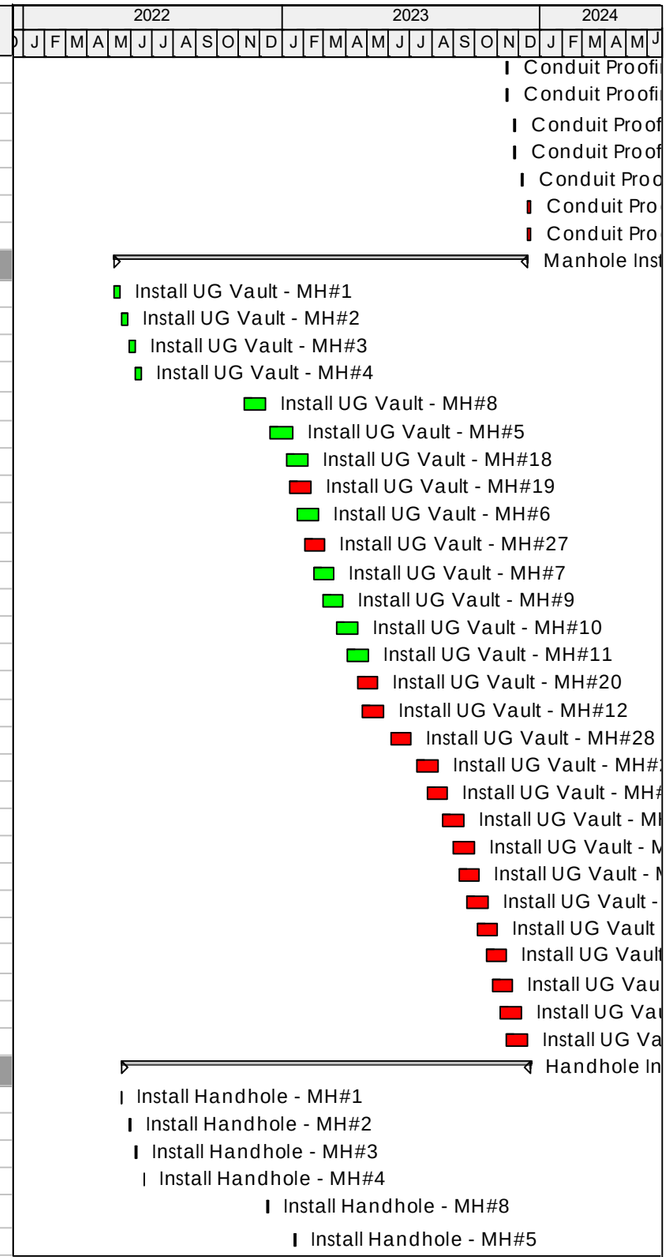
Activity ID	Activity Name	Original Duration	Start	Finish	Comment	Comments
A2920	Conduit Proofing - MH#16 to MH#17 (STA 278+29 to 292+80)	2	15-Nov-23	16-Nov-23		Seg 7 & 8
A2930	Conduit Proofing - MH#17 to MH#18 (STA 292+80 to 309+16)	2	15-Nov-23	16-Nov-23		Seg 8 & 9
A3010	Conduit Proofing - MH#25 to MH#26 (STA 426+18 to 445+18)	2	24-Nov-23	27-Nov-23		Seg 13 & 14
A3020	Conduit Proofing - MH#26 to MH#27 (STA 445+18 to 461+20)	2	24-Nov-23	27-Nov-23		Seg 14
A2880	Conduit Proofing - MH#12 to MH#13 (STA 204+29 to 223+29)	2	06-Dec-23	07-Dec-23		Seg 5
A2890	Conduit Proofing - MH#13 to MH#14 (STA 223+29 to 241+29)	2	15-Dec-23	18-Dec-23		Seg 6
A2900	Conduit Proofing - MH#14 to MH#15 (STA 241+29 to 259+29)	2	15-Dec-23	18-Dec-23		Seg 6 & 7
Manhole Installation		405	10-May-22	14-Dec-23		
A3050	Install UG Vault - MH#1	7	10-May-22	18-May-22	BOND MH 1	
A3060	Install UG Vault - MH#2	7	19-May-22	27-May-22	BOND MH 1	
A3070	Install UG Vault - MH#3	7	31-May-22	08-Jun-22	BOND MH 1	
A3080	Install UG Vault - MH#4	7	09-Jun-22	17-Jun-22	BOND MH 1	
A3120	Install UG Vault - MH#8	21	09-Nov-22	09-Dec-22		Seg 3
A3090	Install UG Vault - MH#5	21	16-Dec-22	17-Jan-23		Seg 1
A3220	Install UG Vault - MH#18	21	09-Jan-23	06-Feb-23		Seg 9
A3230	Install UG Vault - MH#19	21	13-Jan-23	10-Feb-23		Seg 9
A3100	Install UG Vault - MH#6	21	24-Jan-23	22-Feb-23		Seg 1
A3310	Install UG Vault - MH#27	21	02-Feb-23	03-Mar-23		Seg 14
A3110	Install UG Vault - MH#7	21	15-Feb-23	15-Mar-23		Seg 2
A3130	Install UG Vault - MH#9	21	28-Feb-23	28-Mar-23		Seg 3
A3140	Install UG Vault - MH#10	21	20-Mar-23	18-Apr-23		Seg 4
A3150	Install UG Vault - MH#11	21	04-Apr-23	03-May-23		Seg 5
A3240	Install UG Vault - MH#20	21	19-Apr-23	17-May-23		Seg 10
A3160	Install UG Vault - MH#12	21	26-Apr-23	24-May-23		Seg 5
A3320	Install UG Vault - MH#28	21	05-Jun-23	03-Jul-23		Seg 14
A3250	Install UG Vault - MH#21	21	12-Jul-23	09-Aug-23		Seg 11
A3260	Install UG Vault - MH#22	21	26-Jul-23	23-Aug-23		Seg 11
A3190	Install UG Vault - MH#15	21	17-Aug-23	15-Sep-23		Seg 7
A3280	Install UG Vault - MH#24	21	31-Aug-23	29-Sep-23		Seg 12
A3270	Install UG Vault - MH#23	21	08-Sep-23	06-Oct-23		Seg 11
A3200	Install UG Vault - MH#16	21	20-Sep-23	19-Oct-23		Seg 7
A3290	Install UG Vault - MH#25	21	04-Oct-23	02-Nov-23		Seg 13
A3210	Install UG Vault - MH#17	21	17-Oct-23	14-Nov-23		Seg 8
A3300	Install UG Vault - MH#26	21	25-Oct-23	22-Nov-23		Seg 14
A3170	Install UG Vault - MH#13	21	06-Nov-23	05-Dec-23		Seg 6
A3180	Install UG Vault - MH#14	21	15-Nov-23	14-Dec-23		Seg 6
Handhole Installation		401	19-May-22	19-Dec-23		
A3330	Install Handhole - MH#1	2	19-May-22	20-May-22	BOND MH 1	
A3340	Install Handhole - MH#2	2	31-May-22	01-Jun-22	BOND MH 1	
A3350	Install Handhole - MH#3	2	09-Jun-22	10-Jun-22	BOND MH 1	
A3360	Install Handhole - MH#4	2	20-Jun-22	21-Jun-22	BOND MH 1	
A3400	Install Handhole - MH#8	3	12-Dec-22	14-Dec-22		Seg 3
A3370	Install Handhole - MH#5	3	18-Jan-23	20-Jan-23		Seg 1



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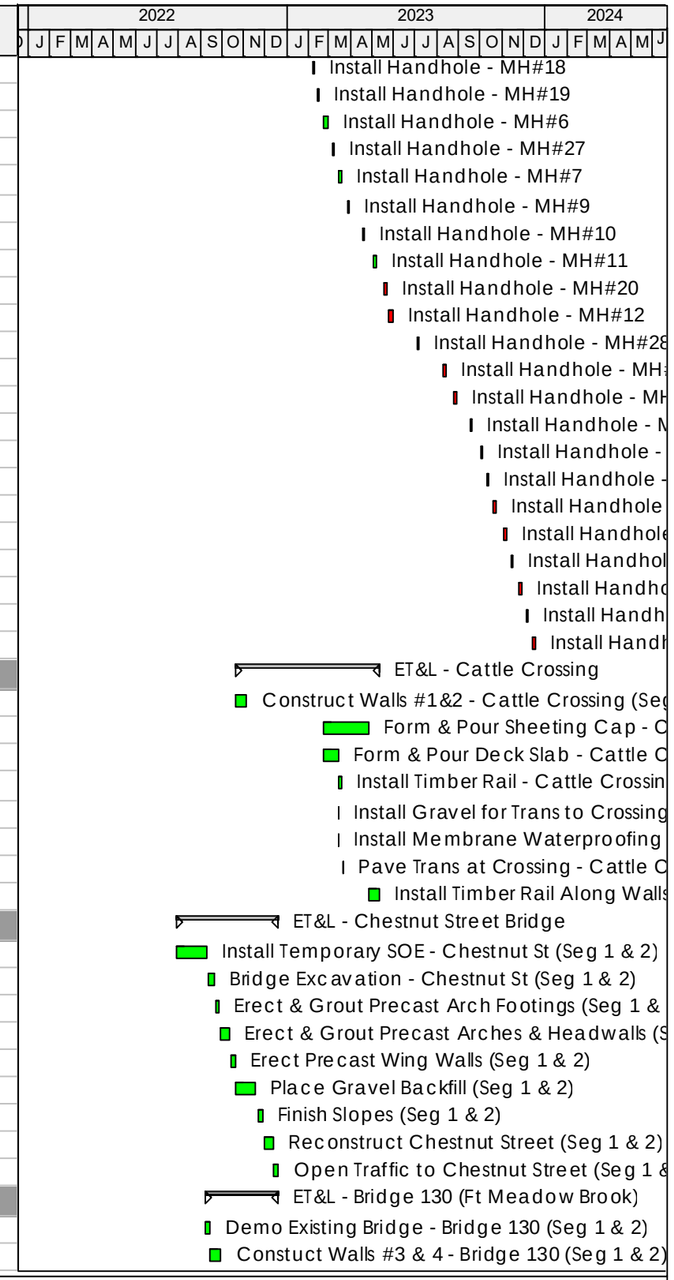
A3500	Install Handhole - MH#18	3	07-Feb-23	09-Feb-23		Seg 9
A3510	Install Handhole - MH#19	3	14-Feb-23	16-Feb-23		Seg 9
A3380	Install Handhole - MH#6	3	23-Feb-23	27-Feb-23		Seg 1
A3590	Install Handhole - MH#27	3	06-Mar-23	08-Mar-23		Seg 14
A3390	Install Handhole - MH#7	3	16-Mar-23	20-Mar-23		Seg 2
A3410	Install Handhole - MH#9	3	29-Mar-23	31-Mar-23		Seg 3
A3420	Install Handhole - MH#10	3	19-Apr-23	21-Apr-23		Seg 4
A3430	Install Handhole - MH#11	3	04-May-23	08-May-23		Seg 5
A3520	Install Handhole - MH#20	3	18-May-23	22-May-23		Seg 10
A3440	Install Handhole - MH#12	3	25-May-23	30-May-23		Seg 5
A3600	Install Handhole - MH#28	3	05-Jul-23	07-Jul-23		Seg 14
A3530	Install Handhole - MH#21	3	10-Aug-23	14-Aug-23		Seg 11
A3540	Install Handhole - MH#22	3	24-Aug-23	28-Aug-23		Seg 11
A3470	Install Handhole - MH#15	3	18-Sep-23	20-Sep-23		Seg 7
A3560	Install Handhole - MH#24	3	02-Oct-23	04-Oct-23		Seg 12
A3550	Install Handhole - MH#23	3	10-Oct-23	12-Oct-23		Seg 11
A3480	Install Handhole - MH#16	3	20-Oct-23	24-Oct-23		Seg 7
A3570	Install Handhole - MH#25	3	03-Nov-23	07-Nov-23		Seg 13
A3490	Install Handhole - MH#17	3	15-Nov-23	17-Nov-23		Seg 8
A3580	Install Handhole - MH#26	3	24-Nov-23	28-Nov-23		Seg 14
A3450	Install Handhole - MH#13	3	06-Dec-23	08-Dec-23		Seg 6
A3460	Install Handhole - MH#14	3	15-Dec-23	19-Dec-23		Seg 6
ET&L - Cattle Crossing		141	20-Oct-22	12-May-23		
A4240	Construct Walls #1&2 - Cattle Crossing (Seg 1)	12	20-Oct-22	04-Nov-22		Seg 1
A4250	Form & Pour Sheeting Cap - Cattle Crossing (Seg 1)	45	23-Feb-23	27-Apr-23		Seg 1
A4260	Form & Pour Deck Slab - Cattle Crossing (Seg 1)	15	23-Feb-23	15-Mar-23		Seg 1
A4270	Install Timber Rail - Cattle Crossing (Seg 1)	3	16-Mar-23	20-Mar-23		Seg 1
A4280	Install Gravel for Trans to Crossing - Cattle Crossing (Seg 1)	1	16-Mar-23	16-Mar-23		Seg 1
A4290	Install Membrane Waterproofing - Cattle Crossing (Seg 1)	1	16-Mar-23	16-Mar-23		Seg 1
A4300	Pave Trans at Crossing - Cattle Crossing (Seg 1)	1	21-Mar-23	21-Mar-23		Seg 1
A4310	Install Timber Rail Along Walls - Cattle Crossing (Seg 1)	11	28-Apr-23	12-May-23		Seg 1
ET&L - Chestnut Street Bridge		99	29-Jul-22	20-Dec-22		
A4320	Install Temporary SOE - Chestnut St (Seg 1 & 2)	30	29-Jul-22	09-Sep-22		Seg 1 & 2
A4330	Bridge Excavation - Chestnut St (Seg 1 & 2)	8	12-Sep-22	21-Sep-22		Seg 1 & 2
A4340	Erect & Grout Precast Arch Footings (Seg 1 & 2)	5	22-Sep-22	28-Sep-22		Seg 1 & 2
A4350	Erect & Grout Precast Arches & Headwalls (Seg 1 & 2)	10	29-Sep-22	13-Oct-22		Seg 1 & 2
A4470	Erect Precast Wing Walls (Seg 1 & 2)	5	14-Oct-22	20-Oct-22		Seg 1 & 2
A4480	Place Gravel Backfill (Seg 1 & 2)	20	21-Oct-22	18-Nov-22		Seg 1 & 2
A4490	Finish Slopes (Seg 1 & 2)	6	21-Nov-22	29-Nov-22		Seg 1 & 2
A4500	Reconstruct Chestnut Street (Seg 1 & 2)	10	30-Nov-22	13-Dec-22		Seg 1 & 2
A4510	Open Traffic to Chestnut Street (Seg 1 & 2)	5	14-Dec-22	20-Dec-22		Seg 1 & 2
ET&L - Bridge 130 (Ft Meadow Brook)		71	08-Sep-22	20-Dec-22		
A4360	Demo Existing Bridge - Bridge 130 (Seg 1 & 2)	5	08-Sep-22	14-Sep-22		Seg 1 & 2
A4380	Constuct Walls #3 & 4 - Bridge 130 (Seg 1 & 2)	12	15-Sep-22	30-Sep-22		Seg 1 & 2



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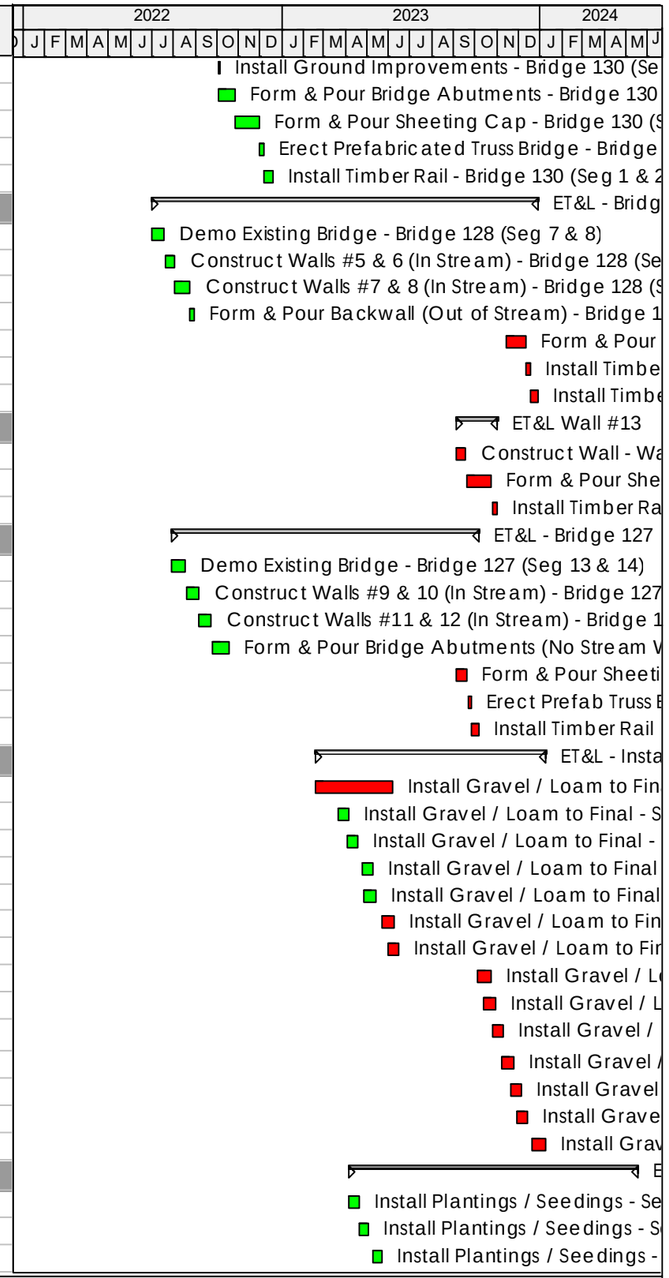
Activity ID	Activity Name	Original Duration	Start	Finish	Comment	Comments
A4370	Install Ground Improvements - Bridge 130 (Seg 1 & 2)	4	03-Oct-22	06-Oct-22		Seg 1 & 2
A4520	Form & Pour Bridge Abutments - Bridge 130 (Seg 1 & 2)	18	03-Oct-22	27-Oct-22		Seg 1 & 2
A4530	Form & Pour Sheeting Cap - Bridge 130 (Seg 1 & 2)	22	28-Oct-22	30-Nov-22		Seg 1 & 2
A4540	Erect Prefabricated Truss Bridge - Bridge 130 (Seg 1 & 2)	4	01-Dec-22	06-Dec-22		Seg 1 & 2
A4550	Install Timber Rail - Bridge 130 (Seg 1 & 2)	10	07-Dec-22	20-Dec-22		Seg 1 & 2
ET&L - Bridge 128 (Hop Brook)		377	01-Jul-22	28-Dec-23		
A4390	Demo Existing Bridge - Bridge 128 (Seg 7 & 8)	12	01-Jul-22	19-Jul-22		Seg 7 & 8
A4400	Construct Walls #5 & 6 (In Stream) - Bridge 128 (Seg 7 & 8)	10	20-Jul-22	02-Aug-22		Seg 7 & 8
A4560	Construct Walls #7 & 8 (In Stream) - Bridge 128 (Seg 7 & 8)	15	03-Aug-22	23-Aug-22		Seg 7 & 8
A4410	Form & Pour Backwall (Out of Stream) - Bridge 128 (Seg 7 & 8)	5	24-Aug-22	30-Aug-22		Seg 7 & 8
A4570	Form & Pour Sheeting Cap (Out of Stream) - Bridge 128 (Seg 7 & 8)	18	15-Nov-23	11-Dec-23		Seg 7 & 8
A4580	Install Timber Beams & Decking (Out of Stream) - Bridge 128 (Seg 7 & 8)	5	12-Dec-23	18-Dec-23		Seg 7 & 8
A4590	Install Timber Rail (Out of Stream) - Bridge 128 (Seg 7 & 8)	7	19-Dec-23	28-Dec-23		Seg 7 & 8
ET&L Wall #13		42	05-Sep-23	02-Nov-23		
A4420	Construct Wall - Wall #13 (Seg 14)	10	05-Sep-23	18-Sep-23		Seg 14
A4600	Form & Pour Sheeting Cap - Wall #13 (Seg 14)	25	19-Sep-23	24-Oct-23		Seg 14
A4610	Install Timber Rail - Wall #13 (Seg 14)	7	25-Oct-23	02-Nov-23		Seg 14
ET&L - Bridge 127 (Hop Brook)		301	29-Jul-22	06-Oct-23		
A4430	Demo Existing Bridge - Bridge 127 (Seg 13 & 14)	15	29-Jul-22	18-Aug-22		Seg 13 & 14
A4440	Construct Walls #9 & 10 (In Stream) - Bridge 127 (Seg 13 & 14)	12	19-Aug-22	06-Sep-22		Seg 13 & 14
A4620	Construct Walls #11 & 12 (In Stream) - Bridge 127 (Seg 13 & 14)	13	07-Sep-22	23-Sep-22		Seg 13 & 14
A4450	Form & Pour Bridge Abutments (No Stream Work) - Bridge 127 (Seg 13 &	16	26-Sep-22	18-Oct-22		Seg 13 & 14
A4630	Form & Pour Sheeting Cap (No Stream Work) - Bridge 127 (Seg 13 & 14)	12	05-Sep-23	20-Sep-23		Seg 13 & 14
A4640	Erect Prefab Truss Bridge (No Stream Work) - Bridge 127 (Seg 13 & 14)	4	21-Sep-23	26-Sep-23		Seg 13 & 14
A4650	Install Timber Rail (No Stream Work) - Bridge 127 (Seg 13 & 14)	8	27-Sep-23	06-Oct-23		Seg 13 & 14
ET&L - Install Gravel / Loam to Final Grade		225	17-Feb-23	08-Jan-24		
A3690	Install Gravel / Loam to Final - Segment 9 (Dutton to Peakham)	12	17-Feb-23	06-Jun-23		Seg 9
A3620	Install Gravel / Loam to Final - Segment 2 (Chestnut to Bridge 130)	12	21-Mar-23	05-Apr-23		Seg 2
A3630	Install Gravel / Loam to Final - Segment 3 (Bridge 130 to Main)	12	03-Apr-23	19-Apr-23		Seg 3
A3640	Install Gravel / Loam to Final - Segment 4 (Main to Parmenter)	12	24-Apr-23	09-May-23		Seg 4
A3610	Install Gravel / Loam to Final - Segment 1 (Wilkins to Chestnut)	12	28-Apr-23	15-May-23		Seg 1
A3700	Install Gravel / Loam to Final - Segment 10 (Peakham to Horse Pond)	12	23-May-23	08-Jun-23		Seg 10
A3650	Install Gravel / Loam to Final - Segment 5 (Parmenter to White Pond)	12	31-May-23	15-Jun-23		Seg 5
A3720	Install Gravel / Loam to Final - Segment 12 (Union to Boston Post)	12	05-Oct-23	23-Oct-23		Seg 12
A3710	Install Gravel / Loam to Final - Segment 11 (Horse Pond to Union)	12	13-Oct-23	30-Oct-23		Seg 11
A3670	Install Gravel / Loam to Final - Segment 7 (Sudbury TL to Bridge 128)	12	25-Oct-23	09-Nov-23		Seg 7
A3730	Install Gravel / Loam to Final - Segment 13 (Boston Post to Bridge 127)	12	08-Nov-23	24-Nov-23		Seg 13
A3680	Install Gravel / Loam to Final - Segment 8 (Bridge 128 to Dutton)	12	20-Nov-23	06-Dec-23		Seg 8
A3740	Install Gravel / Loam to Final - Segment 14 (Bridge 127 to Sudbury SS)	12	29-Nov-23	14-Dec-23		Seg 14
A3660	Install Gravel / Loam to Final - Segment 6 (White Pond to Sudbury TL)	12	20-Dec-23	08-Jan-24		Seg 6
ET&L - Install Plantings / Seedings		124	06-Apr-23	17-May-24		
A3980	Install Plantings / Seedings - Segment 2 (Chestnut to Bridge 130)	10	06-Apr-23	20-Apr-23		Seg 2
A3990	Install Plantings / Seedings - Segment 3 (Bridge 130 to Main)	10	20-Apr-23	03-May-23		Seg 3
A4000	Install Plantings / Seedings - Segment 4 (Main to Parmenter)	10	10-May-23	23-May-23		Seg 4



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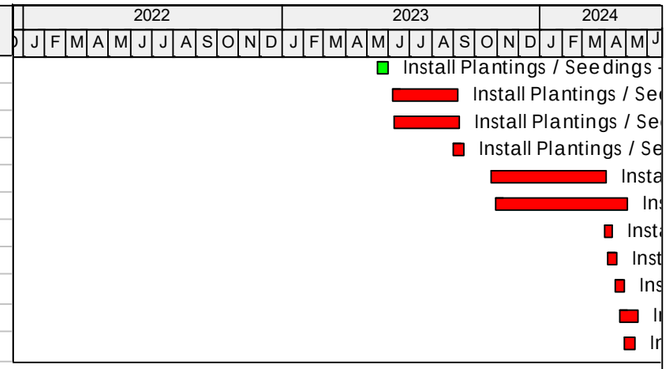
A3970	Install Plantings / Seedings - Segment 1 (Wilkins to Chestnut)	10	16-May-23	30-May-23		Seg 1
A4050	Install Plantings / Seedings - Segment 9 (Dutton to Peakham)	10	07-Jun-23	06-Sep-23		Seg 9
A4060	Install Plantings / Seedings - Segment 10 (Peakham to Horse Pond)	10	09-Jun-23	08-Sep-23		Seg 10
A4010	Install Plantings / Seedings - Segment 5 (Parmenter to White Pond)	10	01-Sep-23	15-Sep-23		Seg 5
A4080	Install Plantings / Seedings - Segment 12 (Union to Boston Post)	10	24-Oct-23	04-Apr-24		Seg 12
A4070	Install Plantings / Seedings - Segment 11 (Horse Pond to Union)	25	31-Oct-23	03-May-24		Seg 11
A4020	Install Plantings / Seedings - Segment 6 (White Pond to Sudbury TL)	10	01-Apr-24	12-Apr-24		Seg 6
A4090	Install Plantings / Seedings - Segment 13 (Boston Post to Bridge 127)	10	05-Apr-24	19-Apr-24		Seg 13
A4030	Install Plantings / Seedings - Segment 7 (Sudbury TL to Bridge 128)	10	16-Apr-24	29-Apr-24		Seg 7
A4100	Install Plantings / Seedings - Segment 14 (Bridge 127 to Sudbury SS)	20	22-Apr-24	17-May-24		Seg 14
A4040	Install Plantings / Seedings - Segment 8 (Bridge 128 to Dutton)	10	30-Apr-24	13-May-24		Seg 8



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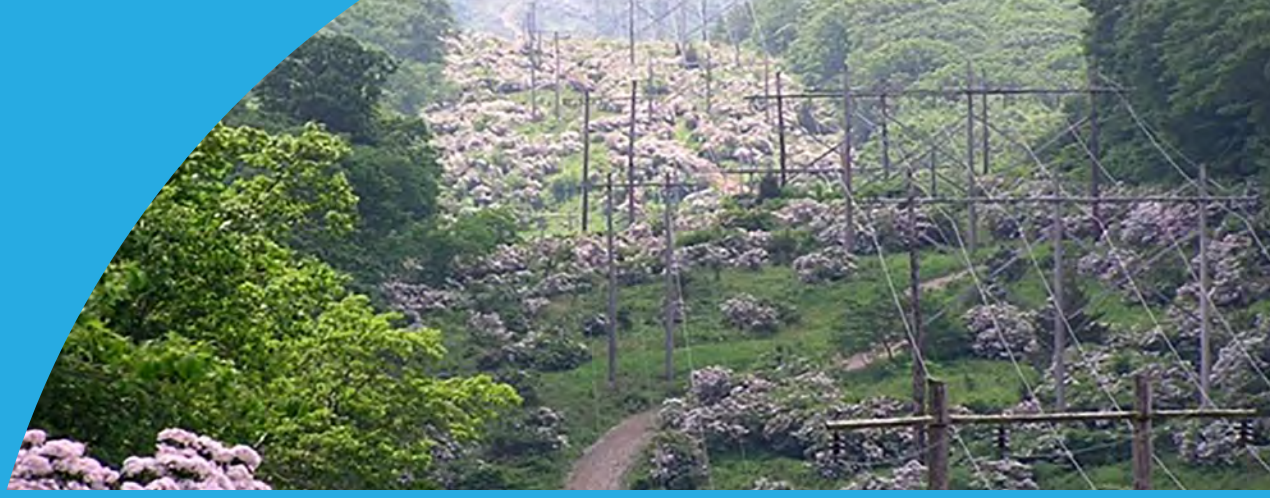
Attachment N

Eversource BMP Manual



CONSTRUCTION & MAINTENANCE ENVIRONMENTAL REQUIREMENTS

Best Management Practices Manual for Massachusetts and Connecticut

APRIL 2022

Prepared for:
Eversource Energy Environmental Licensing and Permitting Group

EVERSOURCE

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A BMP Typical Details

SECTION 1

Section 1
Introduction

1.1 Purpose

As a matter of Eversource Energy (herein, "Eversource") policy with regard to environmental stewardship and in accordance with local, state, and federal regulations, all construction and maintenance projects shall use environmentally sound best management practices (BMPs) to minimize or eliminate environmental impacts that may result from construction activities. Regardless of whether a specific permit is needed for the work, construction and maintenance projects must follow internal environmental performance standards, which is the purpose of these BMPs.

In many cases, maintenance activities are exempt from regulatory authorization. Permits are usually required for new work. Contractors will be provided with copies of any project-specific permits and will be required to adhere to any and all conditions of the permit(s). Project-specific permit conditions may supersede the BMPs outlined in this manual. However, where certain construction elements are not addressed by permit conditions, or where permitting is not required, or for emergency situations where obtaining a permit before the work occurs may not be feasible, these BMPs shall be considered as Eversource's standards. In some cases, and at the discretion of the Eversource Environmental Licensing and Permitting staff, the BMPs presented herein may be modified to be more appropriate for site-specific conditions.

1.2 Scope and Applicability

These BMPs primarily address the disturbance of soil, water, and vegetation incidental to construction within on- and off-road utility corridors, substations, including the establishment of access roads and work areas, within rights of way (ROWs) and on private property, in and near wetlands, watercourses, or other sensitive natural areas (such as protected species), including storm drain systems (e.g., catch basins). Types of construction include, but are not limited to, installation or maintenance of underground and overhead utilities, access road repair/improvement or construction, and upgrades or maintenance of substations and other facilities. Other common construction issues such as noise, air pollution, oil spill procedures, handling of contaminated soils, and work safety rules are addressed in the Eversource Energy Contractor Work Rules and related appendices.

1.3 Definitions

The following definitions are provided to clarify use of common terms throughout this document.

Best Management Practice (BMP): A means to reduce and minimize impact to natural resources.

Casing: A galvanized steel corrugated pipe that serves as the form for a utility structure foundation.

Emergency Projects: Actions needed to maintain the operational integrity of the system or activities necessary to restore the system and affected facilities in response to a sudden and unexpected loss of electric or gas service or events that affect public health and safety.

Embedded Culvert: A culvert that is installed in such a way that the bottom of the structure is below the stream bed and there is substrate in the culvert.

Environmentally Sensitive Areas: An area containing natural features, cultural resources, or ecological functions of such significance to warrant protection. Some examples are rivers, streams, ponds, lakes, wetlands, rare species habitat, water supply protection areas, archaeological sites, parks, and agricultural land.

Erosion Control: A measure to prevent soil from detachment and transportation by water, wind, or gravity.

Existing Access Roads: Previously permitted or grandfathered access roads that are used to access structures that are clearly visible or can be found by mowing or by the presence of road materials in soil cores.

Grubbing: A site preparation method that is used to clear the ground of roots and stumps.

Intermittent Watercourse: An intermittent watercourse, or stream, is broadly defined as a channel that a flowing body of water follows at irregular intervals and does not have continuous or steady flow. Regulatory definitions for intermittent watercourses are:

- **Connecticut** – Per the Connecticut Inland Wetland and Watercourses Act, intermittent watercourses are delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (A) Evidence of scour or deposits of recent alluvium or detritus, (B) the presence of standing or flowing water for a duration longer than a particular storm incident, and (C) the presence of hydrophytic vegetation.
- **Massachusetts** – Under the Massachusetts Wetlands Protection Act (MAWPA), a jurisdictional intermittent watercourse is defined as a body of running water which moves in a definite channel in the ground due to a hydraulic gradient, does not flow throughout the year, and which flows within, into or out of an area subject to protection under the MAWPA. Intermittent watercourses upgradient of any Bordering Vegetated Wetlands or Ponds are not jurisdictional under the MAWPA. A watercourse can be determined to be intermittent if it meets MAWPA criteria with regard to its depiction on the most current USGS topographic map of the area (i.e., shown as intermittent or not shown), and watershed size and predicted flow rates as determined by the USGS StreamStats method or documented observations of no flow at least once per day over the course of four days in any consecutive 12-month period barring drought conditions, withdrawals, or other human-made flow reductions or diversions (subject to conservation commission and/or MassDEP review and approval).

Limit of Work/Disturbance: The boundaries of the approved project within regulated areas. All project related activities in regulated areas must be conducted within the approved limit of work/disturbance. The limit of work/disturbance should be depicted on the approved permit site plans, which may require the limits to be survey located and identified in the field by flagging, construction fencing, and/or perimeter erosion controls.

Low Ground Pressure Vehicle: Vehicles that have a lesser impact on an environmentally sensitive area due to the vehicle being smaller, lighter, or different in another way than a vehicle which would have a greater impact. Low ground pressure is

measured in pounds per square inch (psi) when loaded and as defined by the US Army Corps of Engineers (ACOE).

CT = < 3 psi

MA = < 3 psi

Low impact vehicles could include off-road vehicles (ORVs) or all-terrain vehicles/ utility vehicles (ATVs/UTVs), tracked vehicles with low ground pressure, or vehicles with oversized balloon-type tires.

Maintenance Projects: Typically consist of activities limited to the repair and/or replacement of existing and lawfully located utility structures and/or facilities where no substantial change in the original structure or footprint is proposed. Maintenance activities also include vegetation management.

Minimization: Causing as little disturbance to an area as practicable during construction.

New Construction: Construction of new transmission or distribution facilities that previously did not exist or construction that substantially modifies existing facilities. All new (and existing) construction projects are required to go through a full permit review by Eversource Environmental Licensing and Permitting.

Pre-Construction Notification (PCN): Project activities that do not qualify for Self-Verification (SV) or where otherwise required by the terms of the Massachusetts (MA) and Connecticut (CT) General Permits (GPs) must submit a PCN and obtain written verification before starting work in ACOE jurisdiction. Refer to MA and CT GPs for PCN thresholds. Projects that cannot be completed under a PCN must file for an Individual Permit with the ACOE. In CT, for coastal projects, notification is provided to ACOE by the CT Department of Energy and Environmental Protection (CT DEEP), Office of Long Island Sound Programs (OLISP) or by applicants as necessary. Written approval from ACOE is required.

Protected Species: Species named and protected under the Massachusetts Endangered Species Act (MESA) regulations and/or the Connecticut Endangered Species Act (C.G.S. §§ 26-303 through 26-315).

Rare Species: *See Protected Species.*

Restoration: To return a disturbed area to its former, original or unimpaired condition. A site is considered fully restored when it has returned (as closely as practicable) to its original state. Restoration of disturbed areas should occur as soon as practicable following the completion of activities at that location.

Revegetation: Establishment of plant material for temporary or permanent soil stabilization.

Right of Way (ROW): A pathway, road, or corridor of land where Eversource has legal rights (either fee ownership, lease, or easement) to construct, operate, and maintain an electric power line and/or natural gas pipeline.

Sediment Control: The practice of managing the erosion of soil materials mobilized by water, typically stormwater runoff, on-site for the purpose of protecting nearby wetland and water resources.

Self-Verification (SV): Activities that are eligible for SV are authorized under the MA and CT GPs and may commence without written verification from the ACOE provided the prospective permittee has:

i. Confirmed that the activity will meet the terms and conditions of applicable MA and CT GPs.

ii. Submitted the Self-Verification Notification Form (SVNF) to the ACOE.

In CT, coastal projects do not require filing of a SVNF. ACOE relies on CT DEEP submittals.

Sensitive Environmental Area: For the purposes of this BMP Manual, this term shall be inclusive of all wetlands, streams, waterways, waterbodies, buffer zones, rare species habitat, and historical/cultural resources.

Stabilization: A system of permanent or temporary measures used alone or in combination to minimize erosion from disturbed areas.

Work: For the purposes of this BMP Manual, any form of temporary or permanent draining, dumping, damming, discharging, excavating, filling or grading; the erection, reconstruction, replacement or expansion of any buildings or structures; the driving of piles; the construction or improvement of roads and other ways; the changing of run-off characteristics; the intercepting or diverging of ground or surface water; the installation of storm drain systems (e.g., catch basins); the discharging of pollutants; the destruction of plant life; and any other changing of the physical characteristics of land including, but not limited to: on- and off-road utility corridors and substations. Types of work include but are not limited to the installation or maintenance of underground and overhead utilities, substations and other facilities.

1.4 Acronyms and Abbreviations

The following acronyms and abbreviated are provided to clarify use of common terms throughout this document.

All-terrain Vehicle	ATV
Best Management Practice	BMP
Certified Vernal Pool	CVP
Connecticut	CT
Connecticut Department of Energy & Environmental Protection	CT DEEP
Connecticut Department of Transportation	ConnDOT
Connecticut General Statute	Conn. Gen. Stat.
Cross-Linked Polyethylene	XLPE
Eastern Box Turtle	EBT
Environmental Affairs Department	EAD
Eversource Energy	Eversource
General Permits	GPs
Geographic Information System	GIS
High-Pressure Fluid-Filled	HPFF
Horizontal Directional Drilling	HDD
Kilovolt	kV
Massachusetts	MA
Massachusetts Department of Agriculture	MA DAR
Massachusetts Department of Conservation and Recreation	MA DCR

Massachusetts Department of Environmental Protection	MassDEP
Massachusetts Endangered Species Act	MESA
Massachusetts Wetlands Protection Act	MAWPA
Massachusetts General Law	M.G.L.
Natural Diversity Database	NDDB
Natural Heritage and Endangered Species Program	NHESP
New England Cottontail	NEC
Off-Road Vehicle	ORV
Outstanding Resource Water	ORW
Pounds per Square Inch	psi
Pre-Construction Notification	PCN
Right of Way	ROW
Self-Verification	SV
Self-Verification Notification Form	SVNF
Species	spp.
Time of Year	TOY
United States	U.S.
United States Army Corps of Engineers	ACOE
United States Department of Agriculture	USDA
United States Geologic Survey	USGS
Utility Vehicle	UTV
Vegetation Management Plan	VMP

1.5 BMP References

The following table lists the public guidance documents utilized during the preparation of this BMP manual. Refer to these documents for additional information.

BMP References

General
Best Management Practices (BMPs) Manual for Access Road Crossings of Wetlands and Waterbodies, EPRI, Palo Alto, CA (2002) 1005188.
Gas Research Institute. Horizontal Directional Drilling Best Management Practices Manual (2002) ENSR Corporation, Westford, MA and Trenchless Engineering Corp., Houston, TX.
Connecticut
Connecticut Department of Transportation (ConnDOT). ConnDOT Drainage Manual (October 2000) http://www.ct.gov/dot/cwp/view.asp?a=1385&Q=260116

BMP References

Connecticut Standard Specifications for Roads, Bridges and Incidental Construction, FORM 816 (2004) http://www.ct.gov/dot/cwp/view.asp?a=3609&q=430362

Connecticut Department of Energy & Environmental Protection. Connecticut Guidelines for Erosion and Sediment Control. (2002) http://www.ct.gov/deep/cwp/view.asp?a=2720&q=325660&deepNav_GID=1654%20

Connecticut Department of Energy & Environmental Protection, Bureau of Natural Resources, Division of Forestry. Best Management Practices for Water Quality While Harvesting Forest Products (2012) https://portal.ct.gov/-/media/DEEP/forestry/best_management_practices/BestPracticesManualpdf.pdf

Regulations of Connecticut State Agencies (RCSA). Control of Particulate Matter and Visible Emissions. Section 22a-174-18. https://eregulations.ct.gov/eRegsPortal/Browse/RCSA/Title_22aSubtitle_22a-174Section_22a-174-18/

Massachusetts

Commonwealth of Massachusetts Department of Public Works Standard Specifications for Highways and Bridges (2020) https://www.mass.gov/doc/2020-standard-specifications-for-highways-and-bridges/download

Massachusetts River and Stream Crossing Standards (Revised March 1, 2011) https://www.nae.usace.army.mil/Portals/74/docs/regulatory/StreamRiverContinuity/MA_RiverStreamCrossingStandards.pdf

Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas. Original Print: March 1997. *Reprint: May 2003*. https://www.mass.gov/doc/complete-erosion-and-sedimentation-control-guidelines-a-guide-for-planners-designers-and/download

The Massachusetts Unpaved Roads BMP Manual (Winter 2001) https://www.mass.gov/doc/unpaved-roads-bmp-manual/download

The Massachusetts Anti-Idling Law. M.G.L. Chapter 90, Section 16A and 310 CMR 7.11. https://www.mass.gov/doc/massdep-faq-the-massachusetts-anti-idling-law/download

SECTION 2

Section 2
Project Planning

After undergoing an initial screening review by the department conducting the proposed project, if sensitive environmental areas are identified, the project is required to go through a permit review by Eversource Environmental Licensing and Permitting. The permit review process is supported by Geographic Information Systems (GIS) or a similar program that references the most current spatial data for the project areas in question. Through the GIS review process various geo-processing tools are used to compose maps and provide a spatial reference to environmentally sensitive areas. In consultation with Eversource Environmental Licensing and Permitting, the Project Engineer, permitting specialist, or other project planner should determine regulatory jurisdiction and which (if any) environmental permits or approvals are required before starting any project. Questions regarding which activities may be conducted in regulated areas or within environmentally sensitive areas should be referred to Eversource Environmental Licensing and Permitting. Summaries of potentially applicable laws and regulations are provided in Appendices B and C of this document.

Eversource employs a best practice mitigation hierarchy to 1) avoid environmental impacts wherever possible, followed by 2) minimization of environmental impacts where they cannot be avoided, and 3) mitigating and restoring any environmental impacts where necessary.

2.1 Regulated Areas

2.1.1 Types of Wetlands

Wetland areas common to New England and common to both Connecticut and Massachusetts include, but are not limited to, the following:

Forested Wetlands

Forested wetlands are wetlands that are dominated by trees that are 20 feet or taller. These wetlands are typically drier with standing water typically occurring during periods of high precipitation, seasonally high groundwater, snowmelt, and runoff (e.g., early spring through mid-summer). Tree species typical of this type of wetland include red maple (*Acer rubrum*) and eastern hemlock (*Tsuga canadensis*). "Pit and mound" topography is common in forested wetlands, where mature trees grow on the higher and drier mounds and obligate wetland species are found in the lower pits.

Scrub-Shrub Wetlands

Scrub-shrub wetlands are dominated by woody vegetation less than 20 feet tall and may include peat bogs. Typical bog species include leatherleaf (*Chamaedaphne calyculata*), cotton grasses (*Eriophorum* sp.), cranberry (*Vaccinium macrocarpon, V. oxycoccus*), and black spruce (*Picea mariana*). Other non-bog scrub-shrub wetlands are characterized by buttonbush (*Cephalanthus occidentalis*), alders (*Alnus* spp.), dogwoods (*Swida* spp.), and arrowwoods (*Viburnum* spp.).

Marshes

Marshes are dominated by erect, herbaceous vegetation and appear as grasslands or stands of reedy growth. These wetlands are commonly referred to by a host of terms, including marsh, wet meadow, or fen. These areas are flooded all or most of the year and, in New England, tend to be dominated by cattails (*Typha* spp.).

Wet Meadows

Typical wet meadow species include grasses such as bluejoint (*Calamagrostis canadensis*) and reed canary grass (*Phalaris arundinacea*), sedges (*Carex* spp.) and rushes (*Juncus* spp.), and various other forbs such as Joe-Pye-weeds (*Eutrochium* spp.) and asters (*Aster* spp.).

Floodplains

A floodplain is generally defined as an area of low-lying ground adjacent to a stream or river that is formed mainly of river sediments and is subject to inundation from floodwaters. State-specific regulatory definitions vary and are described as follows:

- In Connecticut, areas that contain alluvial or floodplain soils are regulated as wetlands. These areas may flood so infrequently or be so freely drained that hydrophytic vegetation and hydric soils are not present. Soils in these areas must be examined carefully to determine whether well drained alluvial or floodplain soils are present.
- In Massachusetts, a floodplain is a type of wetland resource area that floods following storms, prolonged rainfall, or snowmelt. There are three types of floodplain areas protected under the MAWPA: coastal areas, areas bordering rivers and streams, and isolated depressions that flood at least once a year.

Streams

A stream is any natural flowing body of water that empties to any ocean, lake, pond or other river. Perennial streams, or rivers, have flows throughout the year. Intermittent streams do not have surface flows throughout the year, though surface water may remain in isolated pockets.

Vernal Pools

Vernal pools are typically contained basin depressions lacking permanent aboveground outlets. These areas fill with water with the rising water table of fall and winter and/or with the meltwater and runoff of winter and spring snow and rain. The pools contain water for a few months in the spring and early summer. Due to periodic drying cycles, vernal pools do not support breeding fish populations and can thus serve as breeding grounds for a variety of organisms, including some rare and/or protected species of frogs and salamanders.

2.1.2 Rare Species

Utility ROWs within Connecticut and Massachusetts overlap with, and in some circumstances create or enhance, habitat of rare/protected species of plants, vertebrate and invertebrate animals. Special requirements may need to be evaluated as part of new construction and/or some maintenance activities.

2.1.3 Historical/Cultural

Other regulated factors taken into consideration during the project planning process include the presence of protected (i.e., threatened or endangered) species, non- native, invasive plant species and/or historical/cultural resources. Special requirements may need to be evaluated as part of new construction and/or some maintenance activities.

2.2 Meetings

A pre-construction meeting is typically held prior to the commencement of all work with the purpose to appoint responsible parties, discuss timing of work, and further consider options to avoid and/or minimize disturbance to sensitive areas. The meeting confirms that there is consensus on work methods and responsibilities and ensures that tasks will be fulfilled with as little disturbance to the environment as practicable. These meetings can occur on or off-site and should include all the applicable stakeholders (i.e., Eversource, contractors, consultants, inspectors and/or monitors, and regulatory agency personnel). A short and less formal briefing should suffice for smaller maintenance projects.

2.3 Site Staging and Parking

During the project planning and permitting process, locations should be identified for designated crew parking areas, material storage, and staging areas. Where possible, these areas should be located outside of buffer zones, watershed protection areas, and other environmentally sensitive areas. Any proposed locations should be evaluated for all sensitive receptors and for new projects requiring permitting, should be incorporated onto permitting and access plans.

2.4 Construction Monitoring

Construction projects require environmental monitoring, which can be conducted either internally or by consultants. Some permitted projects require oversight by designated and pre-approved compliance monitors. Environmental monitoring is a way to keep a chronological record of pre-construction site conditions, progress, and changes that are made, as well as to document issues and authorized solutions.

If work will occur in a sensitive environmental area, permit conditions may dictate that construction be monitored by a qualified and pre-approved wetland or wildlife specialist.

2.5 Signage/Limit of Boundaries

Where appropriate, wetland delineation flagging or signage shall be installed that makes clear where critical boundaries (i.e., the limits of jurisdictional wetland resource areas, rare species habitat, and/or historical/cultural resources) and setbacks occur. Appropriate signage shall also be installed to indicate regulatory authorization by agencies and to prohibit certain uses on ROWs, such as ORV traffic.

Where appropriate, signage shall be installed along sediment and erosion control barriers at appropriate intervals, heights, and sizes to ensure that the presence and location of said barriers is clear to construction personnel during deep snow or other low visibility conditions. Inspection and maintenance of this signage shall be conducted on a regular basis to ensure effectiveness.

Examples of signage at wetlands

SECTION 3

Section 3
Construction Considerations

This section addresses BMPs specific to construction of new access roads, repair of existing access roads, the installation of work pads, structure-related work, and soil stockpile management. Information regarding recommended erosion and sedimentation controls or stormwater controls is also discussed. Please refer to Appendix A for typical details and representative photographs of BMPs used for erosion and sedimentation control and water diversion during construction.

During all project activities (e.g., maintenance, new construction), federal, state, and local regulatory authorities require steps be taken to avoid, minimize, and/or mitigate disturbance to the environment. Sensitive environmental areas should be avoided whenever practicable. However, some projects may require entrance into these areas in order to perform work. This section discusses measures that should be taken to minimize disturbance to if work must occur within sensitive environmental areas.

BMPs were developed to aid in this process and should be carefully selected and implemented based on the proposed activities and the nature of sensitive area(s) encountered at each site. Proper selection of BMPs should take into consideration the project goals, permit requirements, and site-specific information. Once an assessment of the area is made and requirements of the project are established, all BMPs should be considered and implemented as appropriate.

3.1 Avoidance and Minimization

Avoidance and minimization should always be considered before beginning any construction or maintenance project. Eversource and their contractors should utilize appropriate measures to avoid construction impacts to sensitive environmental areas including, but not limited to: wetlands, waterways, rare species habitats, known below and above ground historical/archeological resources, and other environmentally sensitive areas. Use existing ROW access whenever practicable. Keep to approved routes and roads and do not widen or deviate from them. Consult with the Eversource Environmental Licensing and Permitting Group, when avoidance is not practicable, to determine measures to minimize the extent of construction impacts. Alternate access routes and/or staging areas that will minimize construction impacts to the natural environment may be considered.

3.2 Rare Species Habitat

Eversource Environmental Licensing and Permitting coordinates with state and local agencies when work is within areas designated as rare and/or sensitive species habitat.

In order to protect these resources in Connecticut, the following must be reviewed:

- Natural Diversity Database (NDDB) area mapping.
- Critical Habitat mapping.
- Eversource's New England Cottontail (NEC) BMP map.
- Prior NDDB Determinations.

The NDDB mapping is updated approximately every six months and is posted on the State's GIS data download webpage. The Critical Habitat mapping is less frequently updated and also on the State's GIS data download page. Eversource's NEC BMP map and mapping which depicts prior NDDB Determinations shall be provided through Eversource Environmental Licensing and Permitting.

In Massachusetts, Eversource has an annual Operations and Management Plan (OMP) which is updated and renewed at the start of each calendar year with the Natural Heritage Endangered Species Program (NHESP) which designates Priority Habitat (PH) in the State. All work in PH requires review of and compliance with the OMP which may include consultation with NHESP. The OMP establishes guidelines for work within known rare species habitat based on the type of species presence. These guidelines may include time of year (TOY) restrictions or similar measures to avoid impacts to rare species.

Regardless of the State in which construction is taking place, the following shall be employed in all mapped, State-listed species and designated Critical Habitat areas:

- Make every effort to avoid impacts to known populations of State-listed plants and other stationary resources.
- Limit permanent impact through the use of temporary construction matting as opposed to gravel for access road and work pad construction.
- If State-listed resources cannot be avoided, mitigation planning shall be discussed with Environmental Licensing and Permitting.
- Consider time-of-year (TOY) restrictions to avoid impact to sensitive resources during critical life stages including but not limited to nesting season for ground and shrub nesting birds, pup rearing season for bats (if tree removal is necessary), flowering and seeding times for State-listed plants.

Certain species, including the timber rattlesnake (*Crotalus horridus*), are one of the few venomous species in New England which can be a threat to worker safety. Protection measures provided by the respective State agency shall be followed and may require snake sweeps by a qualified herpetologist, contractor education, and field demarcation of hibernacula/known rattlesnake dens.

3.3 Hiking Trails

The following practices shall be implemented in the event project areas intersect or overlap with recreational hiking trails.

- Avoid using hiking trails as access roads or access routes for vehicles and equipment.
- If a hiking trail must be used for vehicle or equipment access coordination with Eversource Vegetation Management Compliance or Oversight staff and/or Eversource Environmental Licensing and Permitting staff is required prior to use.
- Utilize existing access roads to cross hiking trails to the maximum extent practicable.
- If no existing access roads exist and a hiking trail must be crossed, minimize trail crossings by designating one location for use by equipment.
- Signs, barriers, spotters or other means to alert the public to the work shall be

implemented.

- Stockpiling logs and other cut material within 25 feet of hiking trails is not allowed unless approved by Eversource Vegetation Management Compliance or Oversight staff.
- Spreading wood chips on hiking trails is not allowed unless approved by Eversource Vegetation Management Compliance or Oversight staff.
- At the end of each workday all cut material must be removed from hiking trails.
- As soon as possible after work is complete disturbed portions of hiking trails shall be returned as close to pre-construction condition as possible. This may include hand raking, hand cutting of stumps and/or hand removal of cut vegetation.
- If any trees that are marked for trail navigation must be cut, the property manager or trail maintainer must be notified.
- Posts or other markers that are used for trail navigation shall be protected at all times. Replacement in kind shall be completed by the contractor if disturbed or damaged during completion of the work.

3.4 Work on State-owned land in Connecticut

For all work on State of Connecticut-owned land as depicted on the "DEEP Property" data layer available through the State's GIS data download page, matting shall be employed to the greatest extent possible. Gravel access roads and work pads shall only be installed when terrain prohibits the installation of matting. All work must be coordinated through Eversource Environmental Licensing and Permitting for acquisition of necessary authorization prior to the start of construction on State-owned properties.

3.5 Historic/Cultural Resources

Historic and cultural resources are diverse and include, but are not limited to, archaeological sites, historic structures, historic districts, stone walls, and ceremonial stone landscapes. Construction activities near or within significant resources are subject to restrictions outlined in any site or project-specific avoidance/protection plans. The locations of archaeological sites and other sensitive resources such as ceremonial stone landscapes and burials are considered confidential and may only be disclosed on a need-to-know basis.

3.5.1 Stone Walls

Stone walls can be considered significant resources for a number of reasons including unique construction methods, their function as a property boundary, their association with other historic resources such as archaeological sites or farmsteads, and/or their importance to the underlying landowner(s). Non-impact methods of managing work and access near stone walls should always be prioritized and removal, dismantlement, or other alterations to stone walls should be avoided, when possible. Non-impact methods of managing work near stone walls include:

- Avoiding the stone wall altogether - This may involve re-routing an access road or selecting a new access point. Care should be taken not to incur additional impacts to other sensitive environmental areas (e.g., wetlands or rare species habitat).
- Traversing the wall through an existing breach - In this scenario, the breach is

used as-is and the breach is not widened or expanded in any way.

- Traversing the wall using timber matting to temporarily bridge over the wall (e.g., "air bridge") - Although the construction of individual air bridges will vary depending on the surrounding topography, the height of the wall, and the individual operator, the timber mats should not touch the stone wall on any side, and a sufficient air gap between the top of the stone wall and the timber matting directly above should be left to ensure the stone wall is not damaged during the passage of heavy machinery. Before and after photographs of the portion of the stone wall to be crossed should be taken and provided to Eversource Environmental Licensing and Permitting.
- Elevating work pads near stone walls using timber matting - If work pads cannot be reduced in size to avoid stone walls, timber matting may be used to elevate the work pad, or portions thereof, above the stone wall to avoid impacts. None of the timber mats should be in contact with the stone wall and before and after photographs of the stone wall should be taken.

If implementation of the four non-impact measures noted above is not feasible and either temporary or permanent alterations to a stone wall are necessary, Eversource Environmental Licensing and Permitting must be contacted prior to any alterations occurring to secure the appropriate permissions. These permissions may take several weeks to secure and may require input from the cultural resources consultant or Eversource Real Estate and/or Legal Departments.

Prior to alteration, proper documentation of the wall should be obtained and provided to Eversource Environmental Licensing and Permitting. At a minimum, this effort should include recording the following:

- Wall dimensions (total length, width, average height)
- Any existing breaches
- Wall location and general orientation on project maps

Photographs (including a scale, if possible) should also be taken of the entire wall clearly showing all sides, with increased attention on any areas of the wall that will be modified (e.g., expanded breaches) or will need to be rebuilt. The removal of dense vegetation along the stone wall prior to photography is highly recommended.

Once permissions to alter a stone wall and appropriate documentation have been secured, the following BMPs should be followed during alteration and rebuilding:

- While it is preferred that alterations be conducted by hand following traditional dry stone construction methods, construction machinery may be used when appropriate to the level of effort required and taking care not to unreasonably scratch or mar the stones or to begin excavating into soils underneath the wall.
- Any removed stones should be stockpiled nearby, outside any identified sensitive environmental areas such as wetlands or rare species habitat.
- When rebuilding, the wall should be reconstructed in the same location as the original and should match the original wall as closely as possible; if present, it is preferred that weathered/moss-covered surfaces are exposed.
- When alterations/rebuilding is complete, additional photographs from all sides should be taken and provided to Eversource Environmental Licensing and

Permitting.

3.5.2 Unanticipated Discoveries

During construction activities, most notably ground disturbing activities such as excavation, trenching, or grading, it is possible to discover previously unknown archaeological resources. Any specific procedures outlined in project-specific documents such as Post-Review Discoveries or Unanticipated Discoveries Plans should be followed. If such documents do not exist and a contractor encounters an unanticipated discovery, the contractor shall immediately notify the Eversource Construction Representative/Supervisor, secure the site, and not restart work in the area of the discovery until after the Eversource Senior Cultural Resources Program Administrator has granted clearance.

3.6 Human Remains

In the event human remains are encountered, the contractor must immediately stop work and notify the Eversource Construction Representative/Supervisor, secure the site, and ensure that the remains are treated with the utmost dignity and respect. The remains should be covered and left undisturbed along with any associated artifacts. No photography of the remains is allowed and work will not resume in the area of the discovery until after the Eversource Senior Cultural Resources Program Administrator has granted clearance. In addition to these preliminary guidelines, all relevant state laws and guidelines, including, but not limited to, the Massachusetts Unmarked Burial Law (M.G.L. Chapter 38, Section 6) and the Connecticut Human Burials Law (Conn. Gen. State. Sec 10-388) must be adhered to.

3.7 Vernal Pools

Construction within and across wetlands and in proximity to vernal pools should be limited to the extent practicable to avoid working in the periods between April 1st and June 1st. This will allow for obligate vernal pool species to emigrate to the breeding areas, deposit egg masses, and allow for hatching and development of juveniles. Silt fence should be installed at the limits of the construction to prevent individual reptiles and amphibians from entering the workspace, but in a manner that does not impede movement to and from pools from adjacent forested uplands. Consider installing syncopated silt fencing.

Protection Measures

When performing construction activities in proximity to vernal pools, a number of protection measures should be implemented.

Vegetation Removal

- Maintain existing scrub-shrub vegetation (consistent with ROW vegetation management requirements) within 25 feet of vernal pools, except in areas where access roads and work pads must be installed.
- Minimize removal of low growing (scrub-shrub) vegetation surrounding vernal pools by utilizing construction matting where access is needed. If vegetation must be cut adjacent to vernal pools, the cut vegetation (slash) should be left in place to serve as recruitment for leaf litter and coarse woody debris.

Erosion and Sedimentation Control

- Where the potential for sediment intrusion and runoff into a vernal pool exists, sedimentation and erosion controls shall be installed.
- Promptly remove erosion and sedimentation control devices upon final revegetation and stabilization of the ROW.

Access Roads

- Use construction mats, corduroy roads, or clean materials (i.e., clean riprap, gravel, stone or equivalent and rock fords) in locations where existing on-ROW access roads must be improved and are adjacent to vernal pools.
- Man-made depressions along existing on-ROW access roads provide low-quality vernal pool breeding habitat (due to an insufficient hydroperiod). Access roads must be graded and/or improved to accommodate project construction vehicles which may eliminate these depressions and the associated potential for amphibian breeding habitat. Perform improvements to on-ROW access roads outside of the breeding and migration seasons of vernal pool species to avoid direct impacts to amphibians that may breed in the man-made depressions along existing on-ROW access roads.

Scheduling and Site-Specific Considerations

- To the extent practicable (and in consideration of circuit outages and other construction timing constraints), schedule access road and work pad installation in and around vernal pool habitats to minimize interference with amphibian breeding and migration seasons.
- For project activities that must occur adjacent to vernal pools during amphibian migration periods, implement measures on a site-specific basis to facilitate unencumbered amphibian access to and from vernal pools. Consider the site-specific conditions including the type of construction activity that will occur in proximity to a vernal pool, the amphibian species known to occur in the vernal pool, and seasonal conditions. Identify appropriate mitigation measures. Options to be evaluated to allow amphibian access to vernal pools may include, but not be limited to: syncopated silt fencing in the immediate vicinity of vernal pools; elevated construction matting; and aligning erosion and sedimentation controls to avoid bifurcating vernal pool habitat.

3.7.1 Certified Vernal Pools (MA)

Encroachment upon Certified Vernal Pools (CVP) in Massachusetts should be avoided to the maximum extent practicable. CVPs are considered Outstanding Resource Waters (ORWs) in Massachusetts and are regulated under the 401 Water Quality Certification program. Consult with Eversource Environmental Licensing and Permitting.

3.8 Access Roads

Existing construction access roads are unpaved roadways that work crews use to access a site within a ROW. These access roads were generally either permitted previously or

constructed prior to the promulgation of regulations and are previously authorized under past general permits.

3.8.1 New Access Roads

New access roads are generally associated with new or large-scale projects that have separate permitting requirements. Construction of new access roads will be based on plans that are reviewed and approved by applicable federal, state, and local agencies. If a new access road is needed and not associated with a large project, notify Eversource Environmental Licensing and Permitting to make a decision on best access routes and identification of the necessary permits and approvals required to construct the new road. **Permit requirements must be followed**.

3.8.2 Existing Access Roads

The travel surface width of access roads in upland areas is not to exceed 16 feet. This does not include side slopes. Maintenance of existing access roads includes mowing of vegetation, grading, placement/replacement of stone, and the installation/maintenance of erosion control features (e.g., water bars, swales, sedimentation basins).

When access roads are in wetlands, measures should be taken to avoid disturbance to wetlands, waterways, and other sensitive environmental areas. If avoidance is not practicable, then measures should be taken to minimize the extent of disturbance. Alternate access routes should always be considered. Below is a list of methods that should be considered where disturbance is necessary:

- Minimize the width of typical access roads through wetlands. If an existing access road is evident in the wetland based on the presence of previously imported road-building materials (e.g., crushed stone), the existing width of the access road must be maintained. If unable to ascertain the original width of the access, then do not make the road wider than 16 feet (including side slopes).
- To the extent practicable, use low-impact vehicles and/or vehicles with low ground pressure when driving through wetlands.
- Coordinate the timing of work to minimize impacts during the regulatory low-flow period under normal conditions, when water/ground is frozen, after the spring songbird nesting season, and outside of the anticipated amphibian migration window (mid- February to mid-June). The ACOE defines the low-flow periods for streams as follows:
    - Connecticut streams—July 1 through September 30
    - Massachusetts non-tidal streams—July 1 through February 28
    - Massachusetts tidal streams—November 16 to February 15
- Use construction mats in wetlands to minimize soil disturbance and rutting when work needs to occur during non-frozen ground conditions.
- If practicable, conduct work manually if warranted (decision to be made by the Eversource Project Team).

Existing access roads are characterized by a clear dominance of imported fill material to a depth of at least three inches. When determining the presence and extent of an existing access road, soil probes shall be advanced as necessary to establish the boundary between fill and native soil. In some cases, hydrophytic vegetation may have become established or ponding may occur within the limits of imported fill. In these cases, the clear and

consistent presence of fill along a distinguished route is considered a previously authorized fill. Where the existing access road is not evident, Eversource Environmental Licensing and Permitting must be consulted to make a determination whether stone can be placed in the wetland. If stone is not evident, through soil cores, hand digging or other methods, construction mats must be used. If permanent access is warranted through the wetland, the new access road will need to have a permitting review and will likely require permits.

The access road in the wetland should not exceed 16 feet in width (unless there is evidence that the road was originally wider than 16 feet).

Over time, existing access roads require maintenance and repair. Travel by construction equipment and general traffic to reach a particular portion of the ROW must be via the designated access road and route. Changes in the location of the access road or the use of alternate roads must be reviewed and approved by the Eversource Project Team prior to their construction or use. Access road routes were selected to prevent degradation of the utility corridor, and must be constructed, used, and maintained in accordance with this BMP Manual, as well as federal, state, and local requirements, and other project plans.

In some situations, it may be necessary to construct redundant access roads, this practice should be avoided to the extent practicable. Some appropriate reasons for suggesting alternate routes are:

- Poor site conditions along preferred route because of weather or season.
- Property rights constraints, or property owner's preference.
- Equipment requirements.
- Unanticipated off-site access limitations along existing roads.

Unanticipated access opportunities (e.g., ice, snow, other developments) which may avoid environmental disturbance and/or reduce cost.

General Design: New and Existing Access Roads

Construction access roads that require new grading and/or filling or are to be heavily used require the creation of a stable, load-bearing surface resistant to erosion. If the existing soil and subsoil are not well drained, it may be necessary to import an aggregate road base (i.e., gravel borrow) such as that meeting the requirements of aggregate found in the:

- *Commonwealth of Massachusetts Department of Public Works Standard Specifications for Highways and Bridges*, Section 400
- Connecticut *Standard Specifications for Roads, Bridges and Incidental Construction*, Section M1.02

When the construction access road follows the same route as the permanent design road, establishing the grades and subgrade for the permanent roadway early in the construction sequence is recommended.

The travel surface of construction access roads shall typically not exceed 16 feet in width except for passing points, where necessary. Subgrading shall not extend beyond the space required for the finished road and normal side slopes.

Where practicable, construction access roads should conform to the contours of the land,

avoiding grades steeper than 10 percent and creating side slopes no steeper than a ratio of 2:1. If the side slopes are steeper than 2:1, then use of engineered slope stabilization methods may be necessary. Consider the volume and type of construction traffic as well as the extent that natural ground must be altered to accommodate the traffic. If no grading is required and traffic is sporadic (i.e., access roads used to maintain utility lines) the measures used may be limited to water bars, or some top dressing with gravel or stone in areas where the vegetation over soft soil is destroyed by traffic.

During wet weather, these roadways can generate significant quantities of sediment if not constructed with adequate stormwater management and erosion control measures. During active construction or maintenance activities, inspection of the construction access road and associated erosion and sedimentation measures should be conducted by the person(s) designated at the pre-construction meeting, should occur regularly while the activity is occurring, and repairs to controls should be made in a timely matter. Repairs may include re-grading and/or top dressing the traveled surface with additional aggregate to eliminate ruts, as well as those repairs required by each erosion and sedimentation measure used. When the roadway is no longer needed on a regular basis, the access road should be reviewed to ensure that the road is left in a condition that prevents future erosion and sedimentation (e.g., installation of water bars, gravel). In some cases, permit conditions may require that the access road be removed and that the disturbed area be restored (e.g., seeded and mulched) in accordance with applicable permits as required to match the pre-construction conditions.

Erosion and Sedimentation Controls

Construction personnel are reminded to control erosion and flow conditions during access road construction or maintenance activities by utilizing the following erosion and sedimentation measures which are described and illustrated further in Appendix A:

- **Outlet protection**, a **level spreader**, a **trench breaker**, a **sediment trap or basin**, or a **stone check dam** may be used to de-energize concentrated flows from diversions and in temporary channels.
- **Geotextile silt fencing**, **compost filter berms**, **straw wattles** and **straw bale barriers** may be utilized to provide protection at the toe of fill slopes and discharges from water bars.
- Side slopes can be protected by installing **erosion control blankets** and **seeding** the area with a fast-growing native or annual grass mix.
- **Dust control** should be employed when construction access road conditions create airborne dust.
- **Geotextile fabric** shall be used beneath all new fill and construction entrances, where needed.

The use of hay and/or hay products is strictly prohibited.

The use of nylon and/or plastic netting is strictly prohibited.

3.8.3 Best Management Practices – New Access Roads

The following are BMPs that are applicable to new access roads in uplands and are described at the following tabs:

Construction Entrance Track Pad (see Figure A01 in Appendix A)

Stormwater Management BMPs (includes Water Bars [Figure A02], Drainage Swales [Figure A03], and Sedimentation Basins [Figures A38-A41] in Appendix A)

Construction Entrance Track Pad

Applications: Erosion and sedimentation control, roadway protection

Limitations:

- Maintenance is required if the pad becomes clogged with soil.
- Muddy conditions may warrant the use of a tire wash station.

Overview:

Where access roads or construction areas connect to paved roads, a stone track pad must be installed at the construction entrance to prevent construction machinery from tracking soil onto paved roadways. Materials appropriate to construction site soil conditions should be employed and/or replenished, as necessary.

Installation:

- Use 3- to 6-inch washed stone to install stone tracking pads at a minimum length of 50 feet and a minimum depth of 12 inches.
- On sites with clayey soils, underlay stone tracking pads with a geotextile liner to prevent the stone from sinking into the soil.

Maintenance:

- Periodically inspect the stone in the entrance track pad. If the pad becomes clogged with soil, remove and refresh and/or clean stone.

Additional Comments:

If muddy conditions warrant the use of a tire wash station, procedures should be established to ensure soils are not tracked off site.

Where appropriate and when safety and environmental conditions are considered, vehicle tires or tracks may be spun quickly ("burn out") on the track pad to further facilitate the removal of soil.

Water Bar

Applications: Erosion and sedimentation control

Limitations:

- Should never be used to direct a watercourse into another waterbody or to divert unfiltered runoff to a wetland.
- Can impede vehicular movement.
- Damage from vehicle traffic and stormwater flow may require water bars to be reinstalled/reworked at the beginning and end of each construction season.

Overview:

Water bars are linear features built diagonally across access roads or ROWs to redirect stormwater runoff away from the road surface at non-erosive intervals. In general, they consist of a trench dug at least 6 inches below grade followed by an earthen mound at least 6 inches above grade. Use water bars to prevent erosion on sloping roadways less than 100 feet wide. Water bars must be designed to be stable throughout their useful life and meet the criteria in the table below. The maximum capacity should be the peak runoff from a 10-year storm.

Installation:

- Set water bar direction to utilize stable outlets and do not allow upslope water bar runoff to converge with down slope water bars. Water bars should be directed into well vegetated upland areas, sediment basins, or other erosion and sedimentation controls (e.g., straw bales, silt fence) as needed.
- Construct the bar immediately after vegetation has been cleared on constant or slightly increasing grades, not exceeding 2%. Avoid reverse grades.
- Mark the location and width of the ridge and disk the entire length.
- Fill ridge to above the design height and compact with wheeled equipment to the design cross section.
- Construct sediment traps or outlet stabilization measures, as needed.
- After the area has been permanently stabilized, remove the ridge and channel to blend with the natural ground level.
- Seed and mulch diversions that are intended for use for more than 30 days.

Minimum Cross Section

Top Width (ft)	Height (ft)	Side Slopes
0	1.5	4:1
4	1.5	2:1

Maximum Recommended Spacing[1]	
Land Slope (%)	**Diversion Spacing (ft)**
< 5	125
5 to 10	100
10 to 20	75
20 to 30	50
> 35	25

[1] Recommendations for ROW widths less than 100 feet as per the Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas (MassDEP, March 1997).

Maintenance:

- Inspect each week and after rain events of 0.25 inches (MA) or 0.50 inches (CT) or greater, or more frequently per permit conditions or Eversource Environmental Licensing and Permitting. Repair damage caused by construction traffic or erosion.
- Remove accumulated sediment and debris from the trench and stabilize outlets.
- If necessary, repair ridge to a positive grade and cross section, and add gravel at crossing areas.
- Use routine inspections to determine if the original spacing is adequate or if additional water bars need to be constructed.

Drainage Swales

Applications: Convey stormwater away from work area and/or improve water quality and reduce peak runoff.

Limitations:

- Vegetated swales need to have adequately established vegetation before flow is diverted to them.
- Need to have adequate bottom stabilization to prevent scouring.

Overview:

Drainage swales usually consist of a ditch that is either vegetated or lined with riprap, erosion control blankets, or other materials. They are natural or constructed waterways/outlets that intercept, redirect, and convey stormwater away from the work area to a stable location and are used in areas where concentrated runoff would otherwise cause erosion/flooding. Swales can be used to reduce erosion in uplands and/or prior to discharge of stormwater flows to natural receiving waters (e.g., wetlands or streams). They also help to reduce surface flow velocity and turbidity.

Grass Lined Channels (Stabilized with vegetation)

- Use where vegetative lining will provide sufficient stability, slopes are less than 5%, and space is available for a wide cross section.

Installation:

- Remove trees, brush, and stumps.

- Excavate and shape channel to dimensions on plans. Overcut 0.2 ft for vegetative growth.
- Install temporary liner or riprap at inflows and stabilize outlets.
- Vegetate immediately after construction and divert water until grass establishes. Install matting if flow cannot be diverted.
- Install sod rather than seeding where slopes approach 5%.
- Spread topsoil to a minimum of 4 inches where soil conditions are unfavorable. Seeded channels should be mulched.

Vegetated Swales (Stabilized with dense vegetation)

- Use for water quality improvement and peak runoff reduction. Applicable for small drainage areas with relatively small amount of impervious cover. The grassed waterway is used to convey runoff at a non-erosive velocity. Dense vegetation can be established and a stable outlet constructed.

Installation:

- General design parameters are as follows: minimum capacity 10-year, 24-hour storm; design slopes to prevent erosion during the 2-year storm event; maximum side slopes 3:1; bottom width 2 to 8 feet.
- Vegetate with a native erosion control seed mix for use at moist sites and divert flow until established.

Riprap Lined Channels (Contains lining of riprap or stone)

- Use on sites where channel flow velocities exceed those acceptable for grass lined swales. Applicable where vegetative establishment is not possible or there are steep grades, wetness, highly erodible soils, seepage or prolonged base flow.

Installation:

- Remove trees, brush, and vegetation from channel area.
- Stabilize inlets and install outlet protection.
- Construct channel and install filter and lining as shown on plan.
- Use the maximum stone size for riprap plus thickness of filter.

Maintenance:

- Swales need to be routinely maintained to prevent brush/sediment buildup. Inspect swale regularly and after every rain event (0.25 inches (MA) or 0.50 inches (CT), or greater). Repair and/or re-seed rill or gully erosion. Remove accumulated sediments and brush before it reaches a depth of 6 inches.

Additional Comments:

- Depth and spacing of swales should be dependent on runoff conditions of the specific site.
- If required, install check dams constructed of riprap or other materials to slow flows along certain reaches of a swale.

- Remove temporary swales once construction is complete or areas are stabilized. If leaving swales in place will provide long-term benefits and be compatible with the ultimate use of the site, then they may remain in place.

Sedimentation Basins

Applications: Erosion and sedimentation control

Limitations:

- Traps and basins need to be adequately sized based on expected rain events and the contributing drainage area.

Overview:

Sediment traps and basins are used to filter and settle out suspended solids in stormwater runoff before water is released into a wetland or other unprotected and/or sensitive environmental area. A sediment trap is a temporary measure installed during construction to detain runoff, while a basin is a more permanent measure. Basins are also used where other erosion control measures are not adequate to prevent off-site sedimentation.

Sediment traps and basins should have three components: a forebay, a check dam, and a basin. Debris and some sediments begin to settle out of the water in the forebay. The stone or straw bale check dam filters more suspended solids as water flows through. The actual basin is a low-velocity pool where suspended solids settle out of the water column before the water is released at the outlet.

Based on the size of the project area, a qualified engineer may be required to calculate the appropriate size of the basin. State-specific guidance for basin sizing can be found in the following locations:

- Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas (Page 140); http://www.mass.gov/eea/docs/dep/water/esfull.pdf
- 2002 Connecticut Guidelines for Soil Erosion and Sediment Control (Section 5-11-1); http://www.ct.gov/dep/cwp/view.asp?A=2720&Q=325660.

Installation:

Drainage area of 5 acres or less:

- Install to direct stormwater runoff to the sedimentation trap or basin. Form basin by excavating a depression similar to a small pond or by placing an earthen embankment across an existing drainage swale or naturally low area.
- The ratio between the basin length and width should be greater than 3:1 (L:W). A ratio of 9:1 is recommended.
- Clear, grub, and strip all vegetation and root material from area of embankment and place embankment fill in lifts (<9”/lift, max). Compact fill and construct side slopes 2:1 or flatter. Excavate rectangular outlet section from compacted embankment.
- Filter fabric may be installed on bottom and sides of basin and covered by riprap.
- Extend outlet apron/spillway below toe of dam on level grade until stable conditions are reached (5 feet minimum). Cover inside face of stone outlet section with a 1-

foot layer of ½- to ¼-inch washed stone.

- Use permanent or temporary seeding to vegetate embankments, spillways, and disturbed areas downgradient of the basin.

Drainage area of 10 acres or less:

- Locate the basin in an easily accessible upland area, not a wetland area.
- Install the basin so that it intercepts the largest possible amount of runoff from the disturbed area.
- Divert sediment-laden water to the upper end of the sediment pool to improve trapping effectiveness.
- Basin should have a minimum volume based on ½-inch of storage for each acre of drainage area.
- Size basin to provide a minimum detention of 12 to 24 hours at the maximum runoff quantity expected for the duration of the basin's use.

Maintenance:

- Monitor the amount of sedimentation in the trap/basin. Install a stake with a marking at half the design depth. Remove sediment when it reaches this mark.
- Inspect after every rain event.
- Clean or replace the spillway gravel and re-seed/plant vegetation, as needed.
- Monitor embankment, spillway, and outlet for erosion. Repair erosion problems immediately.

Additional Comments:

Construction of sediment traps and/or basins should occur before primary construction on a project begins. They are often a critical stormwater management component for larger construction sites and/or those with poorly drained upland soils. If compatible with the post-construction site use, it may be appropriate to leave sediment basins in place indefinitely.

3.8.4 Construction in Wetlands

Access roads that are constructed in or across wetlands require the following considerations in addition to the considerations for access roads in uplands:

- Construction of new access roads in wetlands, whether temporary or permanent, that do not utilize construction mats (e.g., earthen and/or rock fill roads, corduroy roads) requires considerable project specific permitting and design. These types of projects should comply with project specific permits and plans, while only using this BMP manual as a general reference source. Permits often also require wetlands replication when permanent new access roads are constructed in wetlands.
- Avoid putting the construction access road in a wetland whenever practicable. Explore all feasible and prudent alternatives before determining that a wetland crossing is necessary. When avoidance is not practicable, consider crossings that will result in the least amount of disturbance. This may involve locating the construction access road so that it crosses the wetland at its narrowest width or uses areas previously disturbed for access or other purposes.

- Minimize the width of the temporary construction access road through the wetlands (generally no wider than 16 feet when using construction mats). It is preferable to have a passing point created before and after the wetland crossing, but internal passing points may be needed if the crossing is long or critical sight line restrictions exist.
- Construct access roads so that wildlife is able to pass under or go through the road. In areas where the road is only one construction mat thick, allow for passageways or "gaps" between construction mats. In locations where the access road is greater than one mat thick, install elevated construction mat road crossings or "bridges." Gaps and/or bridges are to be placed along the access road at intervals no less than 50 feet.
- Consider the soil conditions. Expect deep organic wetland soils to require geotextiles, construction mats, or other materials during use to keep imported road materials separated from wetland soils. In shallow organic or saturated soils, thick plywood sheets or AlturnaMATS® may be sufficient to support a stable travel surface for small, lightweight vehicles. In addition, in areas which are inundated or have deep organic wetland soils, it may be necessary to use more than one layer of construction mats.
- Prevent obstructions to surface and subsurface flow across and through the construction access road. Provide adequate drainage. This may require the use of crushed stone, a layer of log corduroy, construction mat bridges, or multiple cross culverts, particularly if the wetland does not contain a well-defined watercourse channel and/or the wetland crossing is long. If the wetland soils are susceptible to seasonal high groundwater tables or flooding, then give additional consideration for maintaining flows across and/or over the construction access road without causing erosion or siltation during such times.
- Plan in advance how the construction access road will be removed and the wetland restored. A road stabilization geotextile can facilitate the segregation of imported soils and crushed stone and/or log corduroy from the native wetland soils and make wetland restoration easier. However, after the end of an extensive project and a highly traveled crossing, stone removal from the wetland surface will still usually have to occur, even when placed in conjunction with geotextile.

In some cases, access roads may not need to be constructed in a wetland to gain access into or through a wetland if the work can be designed such that disturbances to the wetland are avoided or negligible. Options to be considered are presented below.

Equipment Selection and Usage:

- **Low ground pressure equipment -** Using equipment that reduces the pressure it exerts on the ground can minimize disturbance to sensitive areas. Employing the use of equipment with wide tires, rubberized tracks, and low ground pressure (<3 psi when loaded) can help minimize soil compaction.
- **Wide tires -** Increasing the width of tires will increase traveling surface area and therefore reduce the amount of ground compaction that the equipment will cause. Ultimately, this will reduce rutting, and allow for easier maneuvering of the vehicle. However, wide tires may be costly and will require a wider travel area.
- **Rubberized tracks -** Equipment with rubberized tracks spreads the weight of the vehicle over a much larger surface, reducing ground pressure and enabling the vehicle to move more freely through wet substrates. Each track can be between

1.5 and 3 feet wide, length depending on the width of the vehicle. This can greatly reduce rutting and allow the vehicle to move with less difficulty through wet substrates.

- **Lightweight equipment -** Disturbance in a wetland area can be lessened by reducing the size of equipment (e.g., ORVs, Gator™) used in sensitive environmental areas. This reduces the amount of pressure to the travel surface as well as the necessary width of access ways.

Timing of Work:

- **Work during frozen conditions**. Activities conducted once wetland areas are frozen can minimize rutting and other disturbance to the surrounding environment. Work during this time also generally reduces disturbance of aquatic and terrestrial wildlife movement by avoiding sensitive breeding and nesting seasons.
- **Work during the "low flow" period**. Conducting work during the low flow period can reduce disturbance to surface water and generally avoids spawning and breeding seasons of aquatic organisms. The ACOE defines the low-flow periods for streams as follows:
    - Connecticut streams—July 1 through September 30
    - Massachusetts non-tidal streams— July 1 through September 30
    - Massachusetts tidal streams—November 16 through February 15

Alternate Access:

- **Manual access** – Consider accessing work areas on foot through terrestrial areas and/or by boat through open water or ponded areas. Smaller projects (e.g., repairs to individual structures or parts of structures) do not categorically require the use of heavy machinery and should be accessed manually to the extent practicable.
- **Limit trips** – Multiple trips through a wetland have shown to increase the potential for damage and requirement for matting. Try to limit trip to one in and one out.

Use of overhead/aerial access (e.g., helicopters):

- Using overhead or aerial equipment can be expensive and is not always feasible, but it may be appropriate in some situations to get vehicles and other equipment to a site that may be otherwise very difficult to access. The use of overhead and/or aerial equipment may be beneficial for work in areas where large water bodies, deep crevices, or mountainous areas hinder ground access.

Erosion and Sedimentation Controls:

Construction personnel are reminded to control erosion and flow conditions during new access road construction by utilizing the following erosion and sedimentation measures which are described and illustrated further in Appendix A:

- **Straw wattles** [Figure A26 in Appendix A]**, geotextile silt fencing** [Figure A22 in Appendix A]**,** and **straw bale barriers** [Figure A21 in Appendix A] may be installed at the edges of earthen roads or construction mat roads to prevent erosion of soil into wetlands from the road fill or tracked soil on construction mats.
- In areas where silt fencing is required for more than one activity season, **syncopated silt fencing** [Figure A23 in Appendix A] may be installed to permit animal crossings.

- Side slopes of earthen roads can be protected by installing **erosion control blankets** [Figure A25 in Appendix A] and **seeding** [Figure A32 in Appendix A] the area with a fast-growing native or annual grass mix.
- **Dust control** should be employed as necessary when construction access road conditions create airborne dust when necessary. Refer to Section 3.16 of this BMP Manual.

Best Management Practices – Construction in Wetlands

The following are BMPs that are applicable to new access roads in wetlands and are described at the following tab:

Construction Mats (includes Elevated Construction Mats and AlturnaMATs®; see Figures A04 – A06 in Appendix A)

Permeable Road (see Figure A08 in Appendix A)

Dewatering (see Figures A39 – A41 in Appendix A)

Construction Mats (i.e., timber or swamp mats)

Applications: Wetland crossings, rut minimization

- Used for access where the ground surface is unstable due to shallow, standing water, saturated soils, or other substrates not suitable for heavy vehicles.

Limitations:

- Only for temporary use. Generally, mats should be removed upon construction completion.
- May float away in high water conditions.
- Need to be installed with heavy machinery.
- AlturnaMATs® limited to smaller vehicles and equipment.
- Equipment operators should remain cautious so as not to drive off or slip off the side of the mats.
- In winter, mats must be plowed and sanded or heated to prevent equipment from sliding off mats. Use of a deicing agent requires approval by Eversource Environmental Licensing and Permitting. Snow removal must be conducted in accordance with the Eversource Snow Removal BMP (refer to Section 3.15).

Installation:

- Place mats along the travel area without any gaps and so that each board is positioned perpendicular to the direction of traffic. Position mats so that they are offset far enough from the resource area so that ruts are not created when equipment enters and exits a sensitive area.
- Remove mats by "backing" out of the site and removing mats one at a time. Regrade soils to pre-existing contours while taking care not to compact soils.
- Clean mats after use to remove any invasive plant species seed stock. Cleaning methods may include, but are not limited to, shaking or dropping mats in a controlled manner with a piece of machinery to knock off attached soil and debris,

spraying with water or air, sweeping, or exposing the mats to high temperatures.

- Clean mats that were used in wetlands dominated by invasive species using brooms, shovels, and compressed air, if needed.

Additional Comments:

Construction mats installed in wetlands categorized as ORWs in Massachusetts must be underlain by non-woven geotextile, which can be placed directly on the ground surface beneath the first layer of matting or atop the first layer of matting if additional layers of mats are to be installed.

Lightweight, easy to maneuver alternatives to traditional mats are available. For example, AlturnaMATS® are half-inch thick polyethylene slip-resistant ground protection mats available in dimensions up to 4 feet by 8 feet and weigh between 21.5 and 86 pounds.

Mat anchoring may be required for matting installed in areas prone to flooding, such as stream crossings, shorelines of lakes and ponds, floodplains where known base flood elevations are 2 feet or greater above the ground surface, and tidal areas, and when mats will be in place in these areas for more than two weeks during hurricane season. The need for, and type of, anchoring should be coordinated with Eversource Environmental Licensing and Permitting. Examples of mat anchoring include:

- Linear ropes anchored using helical screws, manta ray anchors, or posts.
- Cable or report in chain pockets and run linearly.

Construction mat anchoring methods are illustrated in Figure A07 in Appendix A of this BMP Manual. Additional methods may be necessary depending on site and/or weather conditions.

Permeable Road (i.e., rock sandwich, French Mattress, or road with continuous cross-drainage)

Applications: Temporary wetland crossings, rut minimization

Limitations:

- Must be removed entirely at the end of construction unless project-specific permits have been obtained to allow for permanent wetland fill.
- Not appropriate for areas where concentrated, high volume and/or velocity water flow will intersect the road (i.e., stream crossings).
- Need to be installed with heavy machinery.
- Equipment operators should remain cautious so as not to drive or slip off the side of the road.

Overview:

Permeable roads are used for access in situations not suitable for heavy vehicle use often due to unstable ground surfaces with shallow standing water, saturated soils, or other unstable substrate. Installation of a permeable road can also help reduce the potential for frost action and pothole creation by preventing groundwater from wicking up into the road fill material.

Installation:

- Cover existing soil with a geotextile fabric prior to road construction. Excavation of existing soil is generally not recommended in order to minimize impacts to the resource area. Construct road on top of the soil surface, as shown on the typical on the next page. Drainage layer materials include 3- to 6-inch rock (12-inch minimum depth) or log corduroy (2-inch minimum diameter).
- Install the road so that it is offset far enough from the resource area so that ruts are not created when equipment enters and exits a sensitive area.
- Remove road by "backing" out of the site and removing road one section at a time. Regrade soils to pre-existing contours while taking care not to compact soils.

Maintenance:

- Regularly inspect and clean edges of cross-drainage layer along the sides of the road to prevent clogging by debris, leaf litter, sediment, etc.

3.8.5 Watercourse Crossings

There are a number of BMPs that can be used to minimize disturbance to streams. For each application, consider the site and project needs to select a method that is cost effective and will incur the fewest secondary disturbances. Additional erosion and sedimentation controls (e.g., straw bales) may be required in conjunction with the stream crossing BMPs to protect sensitive areas. The stream crossing methodology chosen will depend largely on the equipment required for a particular task, the existing environmental conditions, and the duration of the crossing. In constructing any stream crossing, care should be taken to limit disturbance to the extent practicable within 100 to 200 feet of the stream banks (the riparian area). The riparian area provides habitat to a number of species and provides protection and shading to the stream.

Erosion and Sedimentation Controls

Construction personnel are reminded to control erosion and flow conditions during new watercourse crossings by utilizing the following erosion and sedimentation measures which are described and illustrated further in Appendix A:

- **Straw wattles** [see Figure A26 in Appendix A]**, geotextile silt fencing** [see Figure A22 in Appendix A] and/or **straw bale barriers** [see Figure A21 in Appendix A] may be installed at the edges of earthen roads or construction mat roads to prevent erosion of soil into watercourses from the road fill or tracked soil on construction mats. These controls however should generally not be placed within a watercourse.
- Side slopes of earthen roads can be protected by installing **erosion control blankets** [see Figure A25 in Appendix A] and **seeding** [see Figure A32 in Appendix A] the area with a fast-growing native or annual grass mix.

Best Management Practices – Watercourse Crossings

The following are BMPs that are applicable to new access roads watercourse crossings and are described at the following tabs:

Stream Crossings without Bridges (includes limiting turbidity and stone crossing; see Figures A05, A06, and A12 in Appendix A)

Bridged Crossings (includes construction mat bridges and rail car frame bridges; see Appendix A)

Dewatering (see Figures A39 – A41 in Appendix A)

Stream Crossings Without Bridges: Limiting Turbidity

Applications: Stream crossing, turbidity control

Limitations:

- Limited to areas where stream banks and bottoms will not be significantly damaged by the crossing.

Overview/Use:

- In some situations, such as routine or emergency maintenance with small ORVs, pickup trucks or tracked equipment, it may be acceptable for equipment to simply travel (perpendicularly) through a stream.
- Crossings are generally considered acceptable in situations where there is an existing or historic access road, a stable rock or sand/gravel stream bottom, and/or the crossing is at a relatively narrow reach of the stream and any adjacent wetlands.
- Cross streams slowly to minimize in-stream turbidity.

Stream Crossings Without Bridges: Stone Crossings

Applications: Stream crossing, turbidity control

Limitations:

- Only use in small (less than 2 feet wide or braided) intermittent streams which do not appear on USGS topographic maps and have a downstream section with a gradient greater than 20%.
- Not suitable in areas where there could be a potential for fish passage.
- Stone size should be sufficient to allow for macroinvertebrate passage.
- Not preferred for new access road crossings; generally more suitable for existing access road crossings.
- Project-specific permitting may be required to allow for installation of stone within a stream bed. Consult with Eversource Environmental Licensing and Permitting prior to using this crossing method.

Overview/Use:

- Use to cross small streams with stable stream bottoms.
- Carefully place 6-inch to 8-inch clean angular stone within stream at crossing. Limit width of stone to that needed for widest vehicle/equipment to crossing the stream.
- Drive over stone slowly.
- Leave riprap in intermittent streams for future use. More damage will occur by removing stone.

Bridged Crossings: Construction Mats as Temporary Bridge

Applications: Watercourse crossings

Limitations:

- Installation requires machinery.
- May become unstable under high flows.

Overview/Use:

- Untreated wooden construction mats may be used as a temporary bridge over a stream to allow construction vehicles access to the work site. Construction mat bridging is suitable for crossing intermittent and perennial streams. Before constructing a stream crossing, confirm that the construction mats are capable of supporting the equipment to be used.
- Place small sections of matting on either side of the stream parallel to the flow of water at top of banks to act as supports. Then place mats perpendicular to the stream and resting on top of the initial construction mat supports.
- Install non-woven geotextile between the first and second layers of matting; install erosion control barriers (e.g., straw bales, straw wattles, silt socks) along edges of timber matting to minimize potential for soil to discharge to the stream.
- Use of non-woven geotextile fabric at ORW crossings (MA) is required.

Bridged Crossings: Rail Car Frame as Temporary Bridge

Applications: Watercourse crossings

Limitations:

- Requires heavy equipment for transport and installation.
- Expensive.
- Banks must be stable to support heavy loads.

Overview/Use:

- Used rail car frames can be used for crossing larger and deeply incised streams where construction mats are unsuitable.
- Place the rail car frame perpendicular to the stream flow and between opposing banks. Use timber frame footings, if necessary. Next, place construction matting
- Install non-woven geotextile between the first and second layers of matting; install erosion control barriers (e.g., straw bales, straw wattles, silt socks) along edges of timber matting to minimize potential for soil to discharge to the stream. Use of non-woven geotextile fabric at ORW crossings (MA) is required.

Culvert Installation / Repair / Replacement

Contact Eversource Environmental Licensing and Permitting prior to performing any culvert installations, repairs and/or replacements

Applications: Stream and wetland crossings

Limitations:

- Permitting and design are required for new culvert installation or expansion of existing culverts over streams and wetlands. Significant regulatory requirements must be followed. Permitting restrictions on time of year use.
- Installation may require in-stream work; dewatering and sedimentation concerns.
- Culverts are susceptible to washouts, sedimentation, erosion, and failure during heavy wet-weather events and flooding.
- Culverts require routine and long-term maintenance because they often become clogged with debris or other obstructions.

Overview:

Culverts are installed to maintain wetlands or streams at road crossings. Hydraulic calculations are required at all crossings to determine the area that will drain to the culvert.

General Design Guidelines:

- Size culverts to handle the maximum expected flow of the wetland or watercourse. It is preferable to have one large culvert rather than multiple culverts. Corrugated culverts are favored because they slow the water velocity. HDPE corrugated pipes are preferred to metal.
- Design culverts to withstand and accommodate high flows while maintaining existing low flows and not impeding on the movement of indigenous aquatic life. Culverts must be sized to accommodate flows from at least the 100-year storm and preferably 500-year storm.
- The maximum velocity at the culvert outlet should be consistent with the velocity of the natural channel. To mitigate higher velocities, use outlet protection measures, energy dissipation, and channel stabilization, if necessary.
- Refer to state specific stream crossing guidance documents for additional design requirements:
    - Connecticut: Stream Crossing Guidelines, CT DEEP, Inland Fisheries Division Habitat Conservation and Enhancement Program, February 26, 2008 (www.ct.gov/deep/lib/deep/fishing/restoration/streamcrossingguidelines.pdf)
    - Massachusetts: Massachusetts River and Stream Crossing Standards, River and Stream Continuity Partnership, March 1, 2006, Revised March 1, 2011 (https://www.nae.usace.army.mil/Portals/74/docs/regulatory/StreamRiverContinuity/MA_RiverStreamCrossingStandards.pdf)

Installation:

- Construction mats may be placed over culverts to provide structural protection from heavy loads.

- Backfill culverts with natural substrate matching the upstream and downstream streambed substrate, even when fish passage is not a concern. Other aquatic organisms rely on natural streambed sediment to aid their movement.
- Strive to install culverts with minimal disruption to the watercourse and riparian buffer zone.
- Culvert length should be as short in length as practicable. Cut culverts to size if they are protruding into the natural streambed.

Maintenance:

- Remove debris and sediment from culverts to maintain an open channel for flow. A clogged culvert could result in flooding and washout.

Pole Fords

Applications: Stream Crossings

Limitations:

- Limited to streams with gently sloping adjacent land.

Overview/Use:

- Poled fords are used in remote locations where a stream crossing requires a functional BMP, but it is impractical to bring in larger materials. Sufficiently sized wood poles or saw logs of may be laid in the streambed parallel to the flow.
- Gently slope the road to and from the streambed at a maximum ratio of 1:5 (V:H). To limit disturbance to the riparian area, install engineering fabric and cover with an aggregate bed at the approach and exit.
- Use poles with a minimum length of ten feet.
- Remove poles immediately after use.

3.9 Slope Excavation

Engineering designs may be required for any changes in upland areas that could potentially direct or channel water across the face of slopes, particularly terrace escarpments or other highly erodible soils. No snow or soil piles, construction materials, or equipment should be stored in the immediate vicinity at the top of the terrace escarpment or other highly erodible soils.

3.10 Vegetation Removal and Preservation

Care should be taken to limit disturbance to the extent practicable when removing vegetation. Grubbing is not preferred as it results in considerable ground disturbance that could result in erosion and should be avoided to the extent feasible. Utilize grubbing only when all other methods cannot be used to prepare stable and safe work areas. If grubbing is necessary, the area must be seeded and mulched to protect it prior to the end of the workday. During mowing and trimming, woody debris greater than two (2) inches in diameter should not be placed in wetlands, and no woody debris should be placed in standing water. Permit conditions may mandate all woody debris to be removed from sensitive environmental areas. Mowing must be kept to a minimum, particularly at road crossings.

3.10.1 ROW Vegetation and Eastern Box Turtle (EBT) – MA only

Eastern box turtles (EBT) are often found near small streams and ponds and inhabit old fields, deciduous forests, and logged woodlands. Adults are completely terrestrial, while the young may be semiaquatic. EBTs hibernate on land by digging down in the soil between October and April. They have an extremely small home range and can usually be found in the same area year after year. EBT populations have been negatively impacted by the loss of suitable habitat. Some turtles may be killed directly by construction activities, but many more are lost when important habitat areas for shelter, feeding, hibernation, or nesting are destroyed. As remaining habitat is fragmented into smaller pieces, turtle populations can become small and isolated. Turtles are long-lived and the loss of even a single adult turtle can negatively impact the persistence of a local population. Therefore, vegetation removal in ROWs should be performed in a manner that minimizes impacts to turtle populations.

Cleared and Maintained ROW—EBTs have been found to use existing ROWs for foraging and nesting. Whenever feasible, perform maintenance mowing in identified habitat during inactive periods (November 1st to March 31st). Turtle BMPs are not required for work performed during the inactive period.

If mowing during the active turtle season (April 1st to October 31st) is required, turtle sweeps should be conducted by trained personnel prior to mowing activities; mow vegetation to no lower than seven (7) inches. Use Brontosaurus or Fecon mower heads to minimize the impact to identified habitat areas. Do not used Flail-type mowers during the active season. Additionally:

- **Avoid direct harm to turtles**. Visual inspections ("turtle sweeps") of the work area must be conducted by trained personnel prior to the commencement of work. If turtles are encountered, they should be removed from the work area and reported to NHESP.

Use extra care when using heavy machinery or traveling in vehicles through areas mapped as turtle habitat.

Any silt fencing used in these areas should be removed as soon as site stabilization has occurred; fencing can be a barrier to turtle movements. Alternatively, install silt fencing in accordance with the Syncopated Silt Fence detail (see Appendix A).

If required, excavation should be completed within one (1) day and/or open excavations should be backfilled daily to prevent turtles from becoming trapped.

Uncleared ROW—When project work requires vegetation removal in an uncleared ROW, cut and mow uncleared portions of EBT habitat during the active season (April 1st to November 1st). If clearing must be conducted during hibernation periods, pre-planning will involve conducting a turtle survey and the possible use of telemetry. Consult Eversource Environmental Licensing and Permitting before performing work because this activity may not be covered under the OMP and may require a permit.

3.10.2 ROW Vegetation and Other Protected Turtles

In addition to EBTs, some ROWs overlap with known habitat of other protected species of turtles. In Massachusetts, these species include Blanding's Turtle, Bog Turtle and Northern Red-bellied Cooter. If any work, including but not limited to vegetation

management, is scheduled to occur in the habitats of these turtles at any time of the year, **avoid wetland work**.

If unavoidable, operation and maintenance work in wetlands should be minimized to the greatest extent practicable. If work must occur in wetlands, the following guidelines apply:

- Any work should be reported to NHESP
- Work within wetlands mapped as habitat for the Bog Turtle or Northern Red-bellied Cooter must be reviewed on an individual basis by NHESP.

		Recommended Maintenance Activity if the Existing ROW is:	
Time Period	Turtle Status	Cleared and Maintained	Uncleared
April 1 to November 1	Active	*Perform only if required*—Mow vegetation no lower than seven (7) inches and use recommended mower heads	*Recommended*—Cut and mow uncleared areas
November 1 to April 1	Inactive	*Recommended*—Perform maintenance mowing	*Not recommended*—Requires turtle survey at minimum before removing vegetation

General Construction Recommendations –The following are general construction guidelines for protecting turtles:

- Install silt fencing around the work area prior to construction activity. Consider using syncopated silt fencing (see Figure A23 in Appendix A).
- Turtle training is required for all contractors. Apprise workers of the possible presence of turtles and provided a description of the species. Include a turtle sweep reminder on the Daily Tailboard.
- Conduct a turtle sweep after installing silt fencing and before conducting work.
- Perform daily turtle sweeps in work areas before performing any work.
- Carefully move any turtles that are discovered to an area immediately outside of the fenced area. Position turtle in the same direction that it was walking.
- Perform work with caution during early morning and evening hours. Take special care not to harm basking or foraging individuals.
- Remove silt fencing after work is completed and soils are stable so that reptile and amphibian movement between uplands and wetlands is not restricted.
- Return temporary cross-country access routes to pre-construction grade, seed if adequate root and seed stock are absent, and mulch. Do not seed pre-existing sandy soils that are within mapped rare turtle habitats unless directed by Eversource Environmental Licensing and Permitting in order to avoid altering nesting habitat.

3.10.3 Preservation of Existing Vegetation

Preserve the existing vegetation (i.e., groundcovers, vines, shrubs, trees) when practicable to improve soil stability and decrease the runoff volume and velocity. Identify and protect specified trees for erosion and sediment control benefits and/or aesthetic purposes. Consider saving trees that provide shading or screening benefits, particularly in residential areas. Preserve existing vegetation by reducing the width of a cleared ROW at stream crossings.

3.10.4 Invasive Plant Species

Invasive plant species are non-native species that invade natural communities and develop self-sustaining populations. The start of many infestations is often tied to a disturbance, and once established, the invasive species spread into undisturbed landscapes. They out-compete native species, disrupting ecological processes, and cause a loss of economic value or output. **It is illegal to transport, to introduce, and/or propagate state-listed invasive species**. Cleaning, draining and drying equipment between sites is mandated for aquatic invasives, and recommended for terrestrial equipment. Power washing of equipment and gear between sites is recommended, where feasible. At a minimum, visual inspection and hand removal of any plants, seeds, propagules, insects, mud, etc. is encouraged to maintain compliance with state laws and rules.

The linear nature of utility maintenance activities in vegetated corridors entails that a range of vegetative communities may be encountered by equipment, vehicles and personnel during the course of a single maintenance project or when mobilizing from one project site to another. It is especially important to follow best management practices when mobilizing equipment, vehicles and personnel from an area infested with invasive species to an un-infested area.

3.10.4.1 Project Planning – Invasive Plant Species

Prior to starting utility maintenance work, the project area should be evaluated to determine:

- Do invasive plant species exist in the project area?
- Do project activities have the potential to contact invasive plants or disturb soils in a manner that could potentially spread live plant parts or viable seeds?
- If invasive species are not present, or if it is not possible or not feasible to identify invasive plant species within the project area, follow best management practices to minimize the disturbance and spread of soil and/or plant matter.

3.10.4.2 Species Identification

It is imperative that workers who will be working or operating equipment in areas that may contain invasive plant species be trained in the identification and modes of dispersal of common, highly-prolific aquatic and terrestrial invasive plant species commonly found along road sides and in utility ROWs. See tables below for identification of the common invasive plants in Connecticut and Massachusetts.

Invasive Species in Massachusetts[1]

Botanical Name	Common name
Aegopodium podagraria	Bishop's goutweed; bishop's weed
Acer platanoides	Norway maple
Acer pseudoplatanus	Sycamore maple
Ailanthus altissima	Tree of heaven
Alliaria petiolata	Garlic mustard
Berberis thunbergii	Japanese barberry
Cabomba caroliniana	Carolina fanwort; fanwort
Celastrus orbiculatus	Oriental bittersweet; Asian or Asiatic bittersweet
Cynanchum louiseae	Black swallow-wort; Louise's swallow-wort
Cynanchum nigrum – see Cynanchum louiseae	Black swallow-wort; Louise's swallow-wort
Elaeagnus umbellata	Autumn olive
Euonymus alatus	Winged euonymus; burning bush
Euphorbia esula	Leafy spurge; wolf's milk
Fallopia japonica - see Polygonum cuspidatum	Japanese knotweed; Japanese or Mexican bamboo
Ficaria verna - see Ranunculus ficaria	Lesser celandine; fig buttercup
Frangula alnus	European buckthorn; glossy buckthorn
Glaucium flavum	Sea or horned poppy; yellow hornpoppy
Hesperis matronalis	Dame's rocket
Iris pseudacorus	Yellow iris
Lepidium latifolium	Broad-leaved pepperweed; tall pepperweed
Lonicera japonica	Japanese honeysuckle
Lonicera morrowii	Morrow's honeysuckle
Lonicera x bella [morrowii x tatarica]	Bell's honeysuckle
Lysimachia nummularia	Creeping jenny; moneywort
Lythrum salicaria	Purple loosestrife
Myriophyllum heterophyllum	Variable water-milfoil; two-leaved water-milfoil
Myriophyllum spicatum	Eurasian or European water-milfoil; spike water-milfoil
Nasturtium amphibium - see Rorripa amphibia	Water yellowcress; great yellowcress
Nasturtium officinale - see Rorripa nasturtium-aquaticum	
Phalaris arundinacea	Reed canary-grass
Phragmites australis	Common reed

Invasive Species in Massachusetts[1]

Botanical Name	Common name
Polygonum cuspidatum	Japanese knotweed; Japanese or Mexican bamboo
Polygonum perfoliatum	Mile-a-minute vine or weed; Asiatic tearthumb
Potamogeton crispus	Crisped pondweed; curly pondweed
Ranunculus ficaria	Lesser celandine; fig buttercup
Reynoutria japonica – see Polygonum cuspidatum	Japanese knotweed; Japanese or Mexican bamboo
Rhamnus cathartica	Common buckthorn
Rhamnus frangula – see Frangula alnus	European buckthorn; glossy buckthorn
Robinia pseudoacacia	Black locust
Rorippa amphibia	Water yellowcress; great yellowcress
Rosa multiflora	Multiflora rose
Salix atrocinerea/Salix cinerea	Rusty Willow/Large Gray Willow complex
Sisymbrium amphibium - see Rorripa amphibia	Water yellowcress; great yellowcress
Trapa natans	Water-chestnut
Vincetoxicum nigrum – see Cynanchum nigrum	Black swallow-wort; Louise's swallow-wort

[1] Based on the Massachusetts Invasive Plants Advisory Group (MIPAG); Last Updated 6/2021

Invasive Species in Connecticut[1]

Botanical Name	Common name
Acer platanoides	Norway maple
Aegopodium podagraria	Goutweed/Bishops Weed
Ailanthus altissima	Tree of heaven
Alliaria petiolata	Garlic mustard
Ampelopsis brevipedunculata	Porcelainberry
Artemisia vulgaris	Mugwort
Berberis thunbergii	Japanese barberry
Berberis vulgaris	Common barberry
Cabomba caroliniana	Fanwort
Cardamine impatiens	Narrowleaf bittercress
Celastrus orbiculatus	Asiatic bittersweet
Centaurea stoebe	Spotted knapweed
Cynanchum louiseae	Black swallow-wort

Invasive Species in Connecticut[1]

Botanical Name	Common name
Cynanchum rossicum	Pale swallow-wort
Elaeagnus umbellata	Autumn olive
Euonymus alatus	Winged euonymus
Euphorbia esula	Leafy spurge
Frangula alnus	Glossy Buckthorn
Froelichia gracilis	Slender snake cotton
Hesperis matronalis	Dame's rocket
Hydrilla verticillata	Hydrilla
Iris pseudacorus	Yellow iris
Lepidium latifolium	Perennial pepperweed
Lonicera japonica	Japanese honeysuckle
Lonicera maackii	Amur honeysuckle
Lonicera morrowii	Morrow's honeysuckle
Lonicera x bella	Belle honeysuckle
Lythrum salicaria	Purple loosestrife
Microstegium vimineum	Japanese stiltgrass
Myosotis scorpioides	Forget-me-not
Myriophyllum heterophyllum	Variable-leaf watermilfoil
Myriophyllum spicatum	Eurasian watermilfoil
Phalaris arundinacea	Reed canary grass
Phragmites australis	Common reed
Polygonum caespitosum	Bristled knotweed
Polygonum perfoliatum	Mile-a-minute vine
Potamogeton crispus	Curly-leafed pondweed
Ranunculus ficaria	Fig buttercup
Rhamnus cathartica	Common buckthorn
Robinia pseudoacacia	Black locust
Rosa multiflora	Multiflora rose
Rubus phoenicolasius	Wineberry
Trapa natans	Water chestnut
Tussilago farfara	Coltsfoot

[1] Based on the Connecticut Invasive Plants Council in accordance with Connecticut General Statutes §22a-381a through §22a-381d. The list was most recently re-printed in October 2018.

Avoidance and Minimization

- If possible, avoid or minimize contact with invasive species by physically avoiding locations with invasive plant infestations.
- In locations where invasive infestations exist, design the project to minimize contact with invasive species by choosing access routes and staging areas that are outside areas of infestation.
- Sequence work to the extent possible such that work using clean equipment and materials proceeds in un-infested areas prior to moving into infested areas and not vice versa.
- If it is unknown whether invasive species exist, design the project to limit travel across vegetated areas to the extent possible.
- When possible, time work under conditions that minimize the risk of spread, (frozen ground, snow cover, absence of seeds or propagules).

Vegetation Management

- Control of invasive plants by chemical means should be performed by a licensed applicator in accordance with the requirements of the CT DEEP Pesticide Management Program, the Massachusetts Pesticide Control Act (MPCA; M.G.L. Chapter 132B) and 333 CMR 2.00, ROW Vegetation Management regulations (333 CMR 11.00), and the MAWPA.
- Mechanical mowing of vegetation should adhere to principals of avoidance and minimization. Where possible avoid mowing invasive plants, especially plants that have the ability to sprout from stem and root fragments. For other invasive species, mowing should occur prior to seed set if possible.
- If woody vegetation is removed from a project site, transport it in compliance with invasive pest or disease quarantine zones established by the United States Department of Agriculture (USDA), the Connecticut Agricultural Experiment Station, MA DCR, and MA DAR.
- Any restoration seed mixes used should be free of any species identified as invasive by the Connecticut Invasive Plants Council in accordance with Connecticut General Statutes §22a-381a through §22a-381d (in Connecticut) or the Massachusetts Invasive Plants Advisory Group (in Massachusetts).

Soil Disturbance and Management

- Where possible, avoid soil disturbance as it may increase the chances of colonization by invasive seeds or propagules.
- Stabilize disturbed soils as soon as possible by seeding and/or using mulch, straw or gravel that is free of invasive plant material.
- Where possible, when excavating soils, top layers of soil containing plant material and roots should be segregated from sub soils and left on site.
- Cover soil and other material containing invasive plant material during transport.
- Do not transport fill and material containing invasive plant material onto a project site.
- If fill and materials containing invasive species must be transported off site, do not reuse, stockpile or dispose of these materials in such a manner that could promote

the spread of invasive plants.

Decontamination Procedures

- When utility maintenance activities require work in areas infested with invasive species, implement decontamination procedures per NHDOT's Best Management Practices for Roadside Invasive Plants manual.
- In order to minimize the spread of invasive plant seeds and material:
    - Clean vehicles, equipment, materials, gear, footwear or clothing of all visible soil and plant material on site in the infested area, or as near as practical to the infested area, prior to leaving the project site.
    - Do not decontaminate equipment next to streams or water bodies that could potentially transport seeds or propagules.
    - Decontaminate equipment and materials that may be contaminated by aquatic plant materials adjacent to the surface water they were exposed to prior to use in another surface water body.
    - Do not transport water withdrawn from a surface water body and discharge it to another water body.

Methods of Cleaning

- Use a brush, broom or hand tools to manually clean.
- Clean debris off equipment such as construction matting by shaking or dropping mats in a controlled manner to dislodge attached soil and debris.
- Compressed air.
- Containment must be in compliance with wastewater discharge regulations when using low-or high-pressure wash stations.

3.11 Work Pads

3.11.1 De-Energized and Energized

Applications: Work in wetlands

- Reconnaissance of each work pad area in or adjacent to wetlands should be performed to determine if the construction mat work pad areas could be located outside of wetland resource areas. Wetland disturbances should be avoided or minimized where practicable. Coordinate work pad locations and/or configurations with Eversource Environmental Licensing and Permitting.

Limitations:

- Requires heavy machinery for installation.
- Significant amount of time required for installation and removal.
- Pads for live line work require a considerably larger footprint.
- Several layers of matting may be needed in deep, construction areas.
- Animals may be injured or killed when attempting to cross work pads.

- May not be suitable in deep/open water wetlands.
- Must be underlain with non-woven geotextile if within an ORW (MA only).

How to Use:

- Work at structures may require placement of construction mats to provide safe and stable work pad areas for employees and contractors.
- Live line work, which is work that is done while the line is energized, requires a much larger work pad area. Efforts should be avoid or minimize impacts to wetlands to the extent practicable.
- Sizes of work pads vary based on the type of work being proposed.
- Work pad areas may extend into wetlands where structures that require maintenance either fall within or are in proximity to wetlands. In these cases, untreated wooden construction mats shall be used to limit disturbance.
- Install silt fencing around work pads in identified amphibian and reptile priority habitat and where matting is greater than one mat thick. The exclusionary silt fencing will deter animals from moving across work pads and reduce the likelihood of being crushed by heavy equipment.
- Following construction activities all mats at each work pad and vehicle access locations must be removed.
- Remove mats by "backing" out of the site and removing mats one at a time. Regrade soils to pre-existing contours while taking care not to compact soils, if necessary.
- In areas with invasive species, plant material should be removed from mats following removal from the infested area to prevent the spread of invasive species. Refer to the tables in this section for additional details regarding invasive plant species.

3.11.1.1 Best Management Practices – Work Pads

De-energized work requires smaller work pad areas, while live line work (i.e., work that is done while the line is energized) requires a much larger work pad areas.

De-energized construction mat work pads (see Figure A14 Appendix A)

3.12 Structure-Related Work

3.12.1 Wetland

Structure-related activities that may occur in wetlands include structure replacement/ installation (including casing installation), guy wire anchor installation, counterpoise installation, and pole butt removal. Access to these areas and completion of the activities can cause disturbance to wetland vegetation and soils. Therefore, structure-related activities in wetlands should entail use of adequately sized work pads and proper dewatering methods if/as needed. Inspection of the construction access and associated dewatering measures should occur daily during construction to ensure that controls are in working order and repairs to damaged/deteriorating controls are made in a timely matter. Repairs may include re-grading the traveled surface to eliminate ruts as well as those repairs required by each erosion and sedimentation measure used.

Structure Replacement / Installation

Replacement structures will often be replaced within a few feet of the original structure to maintain the required distances and line sags between other existing structures. Therefore, options for relocating proposed replacement structures are limited. Pole replacement will also require placement of construction mats in wetlands to provide a safe work pad for the required structure replacement activities. Usually, there are no alternatives that allow for this work to be conducted from nearby upland areas or to install the replacement structures in upland areas. Each structure replacement area should be assessed to determine the required footprint needed for construction mat work pads. Typical installation is as follows:

- At each pole location, remove wetland topsoil with an excavator and stockpile. Segregate wetland soils as necessary.
- If a borehole is drilled, collect and dispose of drilling spoils in an upland area.
- A galvanized steel casing is then driven into place at least 12 inches below the ground surface. The new pole is installed within the casing with a crane. The casing is then backfilled with crushed rock and compacted.
- Stockpiled wetland topsoil is placed above the casing to the ground surface. No net fill in wetlands occur, as the original poles are removed.
- Following installation of the new structures, the old structures are removed. Each pole is cut with a chainsaw and allowed to fall to the ground, which in wetland areas is protected by construction mats. If the pole is to be bucked into sections, conduct sawing activities in uplands when feasible. Pole butts will remain in place; if removing the pole butt will cause more damage than if left in place.
- Remove the pole and all appurtenant accessories (e.g., cross-arms, insulators) and properly dispose off-site. Remove each pole butt by pulling with an excavator positioned on a construction mat. If it is apparent that pole removal will compromise the integrity of the new pole installation, or that removal will result in additional disturbance to wetland areas, cut off the old pole at least 12 inches below ground level and backfill to match adjacent grades.

Guy Wire Anchor Installation

Guy wire anchors supporting the structures may also require replacing. There are two types of anchors: 1) helical and 2) plate type. Helical anchors are preferred over plate anchor because the installation of the helical anchor results in less disturbance to the wetland.

- Load test the existing anchor to determine whether it will support the pole structure. Consult with Eversource Engineering to determine load testing requirements. In the event the existing anchor cannot be re-used, remove it and install a new anchor.
- Screw in place a special triple helix ("screw type") anchor with an anchor installation rig operated from the matting area. Add rod sections as needed until proper holding capacity of the anchor is achieved. Consult with Eversource Engineering to determine anchor installation requirements.
    - Helical anchors are turned into the ground with only the rods protruding. Disturbance to the wetland from the helical anchor is minimal.

- Plate anchors are used in wetlands when proper holding cannot be achieved with screw anchors. To install a plate anchor, a pit is excavated to a sufficient depth and if necessary, a concrete footing would be installed several feet below surface grade. Consult with Eversource Engineering to determine plate anchor installation requirements.
    - When excavating to install plate anchors, segregate the top 12 inches of wetland topsoil from the underlying material. When the plate anchor has been set, backfill the excavation with underlying material. Utilize segregated wetland topsoil to restore pre-construction grades.

Counterpoise Installation/Grounding

To install grounding equipment in wetlands, use hand digging or minimally invasive methods to dig around the structure and restore soil to previous grades. In some cases, grounding rods can be driven directly into the ground with hand tools. Where work is occurring in the vicinity of wetland areas, sedimentation and erosion controls will be used to limit disturbance to wetlands.

Underground Facility Repair/Replacement

Underground facilities such as cables and conduits may be present beneath wetland areas. In the event underground facilities require repair, BMPs are required for both access and construction. Construction mats are used for access where warranted, and sedimentation and erosion controls are used to isolate the work area. During excavation activities, excavate wetland topsoil and stockpile separately from subsurface soils. Dewatering is often required during excavation and repair activities.

An alternative to repairing a subsurface line by excavation is to install a new line via trenching or horizontal directional drilling (HDD). The decision to use one of these alternatives is made on a case by case basis. Consult with Eversource Environmental Licensing and Permitting to determine if any permits will be needed.

Pole Butt Removal

When transmission poles are decommissioned or otherwise taken out of service, in most cases the entire pole shall be removed. Treated wood pole butts shall be removed completely from the ground and properly disposed at an off-site location. Locations where the removal of pole butts may cause significant disturbance to wetlands or other sensitive environmental areas will be considered for exception to this practice on a site-by-site basis. The Transmission Line Construction and Maintenance Manager, in consultation with Eversource Environmental Licensing and Permitting, will be responsible for determining if a pole butt can be removed if located in a sensitive environmental area.

All pole butt holes must be backfilled and compacted (every 3 feet) with appropriate fill material. Existing material on-site can be reused if it does not include materials that can rot (e.g., vegetation) and cause settling.

Disposal

Treated and non-treated wood products owned by the Transmission Group shall be stored in an area(s) designated by the Transmission Line Construction/Contract Field Services Supervisor until collected by an approved disposal vendor.

Concrete Wash Outs

Concrete wash outs shall be used for the management of concrete waste. Concrete and concrete wash out water shall not be deposited or discharged directly on the ground, in sensitive environmental areas, or in catch basins or other drainage structures. Where possible, concrete wash outs shall be located away from sensitive environmental areas, including buffer zones. Consult with Eversource Environmental Licensing and Permitting to determine concrete wash out locations prior to their use. Following the completion of concrete pouring operations, the wash outs shall be properly disposed of off-site with other construction debris.

3.13 Underground Cable and Gas Piping-Related Work

Gas piping-related activities will typically occur within roadways or along roadway shoulders. There may be some instances where wetland permitting is required when wetlands are located adjacent to or in the vicinity of roadways. However, when work is performed within the roadway/shoulder, permitting is typically not required. Verify permitting requirements with Eversource Environmental Licensing and Permitting. In all cases, BMPs should be followed to ensure environmental compliance.

Typical examples of underground cable and conduits include:

High-Pressure, Fluid-Filled Pipe-Type Cable: A high-pressure, fluid-filled (**HPFF**) pipe-type of underground transmission line, consists of a steel pipe that contains three high-voltage conductors. The fluid also transfers heat away from the conductors. The fluid is usually static and removes heat by conduction.

XLPE Cable (cross-linked polyethylene): Hydronic tubing that is manufactured from polyethylene plastic with a three-dimensional molecular bond that is created within the structure of the plastic. The cross-linked polyethylene (XLPE) underground transmission line is often called solid dielectic cable. The solid dielectric material replaces the pressurized liquid or gas of the pipe-type cables. XLPE cable has become the national standard for underground electric transmission lines less than 200 kV.

Roadways and Shoulders

When working in roadways, particularly in residential areas, the following activities should be performed in addition to standard construction BMPs:

- Repave disturbed paved areas and return to original elevations on the same day that construction is performed.
- Restore all non-paved areas to pre-existing (or improved) conditions. Replace any sod or other plantings in kind or with an acceptable alternative.
- Employ dust control as necessary to minimize airborne dust.
- Streets should be swept daily or as necessary to remove dirt and debris from resulting from construction from the roadway surface. Dirt and debris swept from the roadway surface should be collected and properly disposed of as construction waste. Under no circumstances should dirt and debris be swept off of the roadway surface to the road shoulder or deposited in any catch basins.
- Discharge trench dewatering volumes to an appropriate dewatering structure setup on adjacent undeveloped, unimproved uplands away from wetlands (refer to Appendix A). Consult with Eversource Environmental Licensing and Permitting staff

to determine appropriate locations for placement of dewatering structures.

- Trench dewatering may also be discharged to areas of open trench to allow for infiltration.
- For minor volumes or short-term duration dewatering needs, trench dewatering may be pumped to frac tanks for transport off-site and discharge to an appropriate dewatering structure located at a contractor yard or similar location.
- Trench dewatering may only be discharged to stormwater catch basins after all necessary federal, state and local permits have been obtained to do so (this typically requires design and implementation of an effective treatment system to remove all potential contaminants, such as suspended solids or other chemical contaminants). Consult with Eversource Environmental Licensing and Permitting if discharge to catch basins is required.

Under certain circumstances, gas piping must be installed beneath existing culverts within roadways. Take care to ensure that any saturated material excavated from the trench be properly stored and disposed as to not cause sedimentation issues. Implement dewatering methodologies, as required.

There may be cases where a drainage ditch or swale must be crossed to gain construction access from paved roads onto ROWs along the roadway shoulder. Install construction mats, mat bridges, or temporary culverts, as necessary, to facilitate access. Culverts should be for temporary use, sized for peak flow, and removed after construction is complete. Consult with Eversource Environmental Licensing and Permitting prior to installation.

Bridges and Culverts

Attachment of gas piping to bridges or culverts is the environmentally preferable method for crossing a wetland or watercourse. Consult with the appropriate people (engineers, the Department of Transportation (DOT), etc.) to determine if attachment to a bridge or culvert is a technically feasible option at the desired crossing location. Eversource Environmental Licensing and Permitting should also evaluate the impacts to FEMA flood storage quantities and potential Coast Guard permitting requirements. Ensure that proper erosion and sedimentation controls are in place on either side of the bridge or culvert throughout construction.

Rivers and Streams

There are two primary approaches for crossing a river or stream with a gas pipeline: direct bury (open trenching) and trenchless methods (e.g., HDD, standard bore/pipe jacking).

Direct bury methods involve erecting a coffer dam to isolate the work area and redirecting water flow using gravity or pumping to move water from one side of the work area to the other. Direct bury methods have larger direct environmental impacts than trenchless methods. Typical coffer dam examples are included in Figures A42 and A43 in Appendix A.

Trenchless methods use specialized equipment to install piping beneath a waterbody (or a major roadway, railroad, etc.). The most common method used for gas piping is HDD which uses remote controlled, steerable drilling equipment to install pipe along a long arc alignment. The drilling process can be divided into three steps: pilot, reaming, and pull-in. The first step is to drill a pilot bore-hole. Next, a larger diameter fly cutter is used to

enlarge the opening. A specialized bentonite slurry drilling fluid is injected into the bore-hole to stabilize the surrounding soil and to lubricate and cool the drill bit. For the final step, a barrel reamer is used to further enlarge the bore-hole and to pull the pipe into place.

A notable environmental concern with HDD is called "frac-out." This occurs when drilling fluid breaks through the soil surface and into the waterbody. Regulatory agencies may require a "frac-out plan" which details preventative controls and response measures should frac-out occur. A typical frac out plan is included in Appendix D; however, HDD contractors should be required to provide a detailed frac-out plan specific to the project and their practices. These plans may be subject to environmental regulatory agency review. Consult with Eversource Environmental Licensing and Permitting for permit requirements.

3.14 Construction Material along the ROW

Once a site is prepared by clearing and/or installing erosion and sediment controls, materials may be stored along the ROW prior to the start of construction. Such materials may include the following: piping, poles, cross-arms, cable, insulators, stone, and other engineered backfill materials. In general, the stockpiling of stone and other unconsolidated material on construction mats should be avoided. If it is determined necessary due to access and work pad constraints, the material should be placed on a geotextile fabric and be properly contained with a sedimentation barrier such as straw wattle or bales. No construction materials should be placed in wetlands or other sensitive resource areas.

3.15 Winter Construction

3.15.1 Snow Management

Snow should not be stockpiled or disposed in any waterbody or near water supply sources. These include wetlands, rivers/streams, the ocean, reservoirs, ponds, stormwater catch basins, wellhead protection area, in high or medium yield aquifer, or within 200 feet of a private well. In addition to water quality impacts and flooding, snow disposed in surface water can cause navigational hazards when it freezes into ice blocks. Maintain a minimum buffer of 25 feet between any snow disposal area and the high water mark of any surface water. A silt fence or equivalent barrier should be installed between the snow storage area and the high water mark of rivers, streams, ponds, or the ocean. Consult with Eversource Environmental Licensing and Permitting regarding any specific state and local snow management requirements.

Avoid disposing of snow on top of storm drain catch basins or in storm water drainage swales or ditches. Snow combined with sand and debris may block a storm drainage system and cause localized flooding. A high volume of sand, sediment, and litter released from melting snow also may be quickly transported through the system into surface water and could also result in fines or a violation.

All debris in a snow storage area should be cleared from the site and properly disposed of no later than May 15 of each year. Care shall be taken not to plow road materials away when removing snow.

3.15.2 De-Icing

Where permitted, calcium chloride is the preferred de-icing agent when applied according to manufacturer's guidelines in upland areas. Sand should be used on construction mats through wetland areas. Consult with Eversource Environmental Licensing and Permitting on de-icing agents when working in a facility or substation near resource areas. Many municipalities have specific de-icing agent requirements for work within 100 feet of wetlands and other sensitive environmental areas.

3.15.3 Snow and Ice Management on Construction Mats

Promptly and properly remove snow from construction mats to avoid ice formation. Remove snow from construction mats before applying sand to avoid forming ice. A round street sweeping brush mounted on the front of a truck may be an effective way to remove snow from construction mats. Propane heaters may also be suitable solutions for snow removal and/or de-icing of construction mats. Sand should be collected from the construction mats and disposed of in an upland area prior to removing construction mats from wetlands. Once construction mats are removed, wetlands shall be inspected for sand buildup that may have fallen through construction mats. Sand deposited in wetlands or other sensitive environmental areas shall be completely removed by the contractor. Consult with Eversource Environmental Licensing and Permitting prior to commencing work in wetlands or other sensitive environmental areas.

3.16 Dust Control

Dust control measures are used to reduce surface and air movement of dust from exposed soil surfaces during land disturbance, demolition, and construction activities. These practices reduce the amount of dust in the air and decrease the potential for accidents, respiratory problems, and airborne sedimentation. Construction activities should be scheduled appropriately to minimize the amount of site surface exposed at one time in order to reduce the amount of areas requiring dust control. Use dust control measures on disturbed soil surfaces and exposed soil surfaces, especially during hot or dry weather periods and in areas with excessively well-drained soils. Repetitive treatments should be used as needed, or required by permits, and until the surface is permanently stabilized.

Type	Description / Use
Vegetative Cover	• Most effective and practical method. • Use in disturbed areas not subject to traffic. • Follow seeding requirements as directed by local guidelines or permit requirements.
Stone	• Cover soil surface with crushed stone/coarse gravel.
Water/Sprinkling	• Sprinkle exposed soils until wet (Water trucks may be used depending on size of the site). • Do not excessively wet the soil as this causes run-off and also wastes water.

Barriers	• Board fences, wind fences, and sediment fences control air currents and blowing soil. • Wind barriers protect soil downgradient for a distance of ten times the barrier height. • Perennial grasses and stands of existing trees also serve as wind barriers, stressing the importance of planning work phasing properly and minimizing the amount of exposed soil.
Plastic Covering	• Cover soil piles with sheets of plastic/tarp to minimize dust.
Calcium Chloride	• Loose, dry granules of calcium chloride may be applied with a mechanical spreader. • Apply at a rate that keeps the surface moist but not high enough to cause water pollution or plant damage. This method should be done under consultation with an expert in order to maintain this balance and to determine if the site is applicable.

3.16.1 Soil Stockpile Management

Some projects may involve excavation and stockpiling of soil. Stockpiles should be located outside sensitive areas to the extent practicable and managed to prevent erosion and sedimentation of adjacent areas. Typical measures include the installation of protective measures (e.g., siltation fence and/or straw bales) around the perimeter of the stockpile. The stockpile must be seeded if left in place for more than 30 days. No snow or soil piles, construction materials, or equipment should be stored in the immediate vicinity at the top of a terrace escarpment slope.

3.16.2 Stockpiles on Construction Mats

When soil (or gravel) stockpiles must be staged on construction mat work pads in wetlands, stockpiles should be placed atop areas of matting underlain with non-woven geotextile (either directly atop the mats or between layers of matting) to minimize the potential for material to filter through gaps in matting and deposit in wetlands. Use of construction mat stringers as physical barriers at the edge of the work pad should also be considered. These barriers are recommended to minimize the potential for stockpiled material to get pushed off the work pad into wetlands. Consult with Eversource Environmental Licensing and Permitting for site-specific guidance.

3.16.3 Regulated Soils Management

When polluted/contaminated soil is encountered, it must be handled in accordance with the appropriate regulatory requirements. In addition to the measures discussed above, contaminated soils should be stockpiled on and covered by polyethylene sheeting. Sheeting used to cover the stockpile should be weighted down to prevent the wind migration of contaminated dust.

For soil stockpiles in substations, contact Eversource Environmental Licensing and Permitting. If soil/water must be stored and/or disposed, comply with existing soil and groundwater management guidelines. Coordinate with the Environmental Affairs Department (EAD) to ensure appropriate procedures are followed.

3.16.4 Best Management Practices – Soil Stockpile Management

The following BMP is applicable to soil stockpile management and is described at:

Soil Stockpile Management (see Figure A19 in Appendix A)

3.17 Anti-Idling Laws

Connecticut and Massachusetts have promulgated anti-idling laws for the purpose of improving air quality by reducing unnecessary air pollution from idling vehicles.

State	Idling Time Limit (in minutes)
Connecticut	3
Massachusetts	5

Details of these laws and the statutory exceptions to the limits noted above are presented in the following sections.

3.17.1 Connecticut

The Regulations of Connecticut State Agencies (RCSA) section 22a-174-18(b)(3) states: a mobile source shall not operate for more than three (3) consecutive minutes when such mobile source is not in motion except if the vehicle is operating for one of the conditions exempted in the regulation.

These exemptions for mobile sources not in motion include:

- When a mobile source is forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control.
- When it is necessary to operate defrosting, heating or cooling equipment to ensure the safety or health of the driver or passengers.
- When it is necessary to operate auxiliary equipment that is located in or on the mobile source to accomplish the intended use of the mobile source.
- To bring the mobile source to the manufacturer's recommended operating temperature.
- When the outdoor temperature is below 20 degrees Fahrenheit.
- When the mobile source is undergoing maintenance that requires such mobile source be operated for more than three (3) consecutive minutes.
- When a mobile source is in queue to be inspected by U.S. military personnel prior to gaining access to a U.S. military installation.

3.17.2 Massachusetts

The Massachusetts Anti-Idling Law (M.G.L. Chapter 90, Section 16A and its implementing regulations set forth at 310 CMR 7.11 applies to all vehicles and limits unnecessary engine idling of stopped vehicles to five (5) minutes.

This law shall not apply to:

- Vehicles being serviced, provided that operation of the engine is essential to the proper repair thereof.

- Vehicles engaged in the delivery or acceptance of goods, wares, or merchandise for which engine assisted power is necessary and substitute alternate means cannot be made available.
- Vehicles engaged in an operation for which the engine power is necessary for an associate power need other than movement, and substitute alternate power means cannot be made available provided that such operation does not cause or contribute to a condition of air pollution.

SECTION 4

Section 4
Inspection and Maintenance

A pre-construction meeting will be held to discuss how often and who is responsible for monitoring erosion and sediment controls to document their condition and recommend maintenance or other corrective actions, as necessary. All BMPs will be inspected at least once per week during active construction and until disturbed areas have stabilized following post-construction site restoration. Construction sites will be inspected after major storm events (rainfall events greater than 0.25 inches (MA) or 0.50 inches (CT)), or as directed by Eversource Environmental Licensing and Permitting.

4.1 During Construction

Construction sites, construction access roads, and the associated erosion and sediment controls should be inspected by the person(s) designated at the pre-construction meeting, as required by permit conditions. Any damage observed must be repaired in a timely manner, at least within 48 hours of observation. Repairs may include re-grading and/or top dressing the surface with additional aggregate to eliminate ruts as well as those repairs required by each erosion and sediment measure used.

All inspections will be documented in a written report submitted to Eversource Environmental Licensing and Permitting and saved to the project folder. Copies will be distributed to the relevant contractors if/as directed by Eversource Environmental Licensing and Permitting.

4.1.1 Maintenance of Erosion and Sedimentation Controls

Spare erosion and sedimentation control materials such as straw wattles, straw bales and silt fencing should be kept on site or be readily available so they may be replaced if they become non-functional due to deterioration or damaged during a storm, extreme water or wind, or other unexpected events.

4.1.2 Rapid Wetland Response Restoration

In the event of unintended discharges of sediment into wetlands, Eversource Environmental Licensing and Permitting will direct the contractor(s) to quickly control, contain and remove sediment using non- or marginally invasive methods. Responding quickly to unintended discharges minimizes the difficulty and cost of restoration if the sediment is left in place for an extended period of time. Eversource Environmental Licensing and Permitting will direct sediment removal activities at the time of discharge and will notify the appropriate regulators of the discharge and the recommended corrective actions.

4.1.3 Vehicle Storage and Refueling

All storage and refueling of vehicles and other equipment must occur outside of and as far away as practical from sensitive environmental areas such as wetlands, unless specifically authorized by Eversource Environmental Licensing and Permitting and an alternate protocol is developed and approved internally.

The recommended minimum distance from wetlands for storage of fuel and refueling is 100 feet. Additionally, equipment should be checked regularly for evidence of leaks. Construction material storage should also be located at least 100 feet from wetlands.

Storage of larger, less mobile equipment such as drill rigs or large cranes, may be permitting within wetlands subject to prior approval from Eversource Environmental Licensing and Permitting. Secondary containment shall be in place at each piece of equipment during non-working hours.

Refueling of larger, less mobile equipment such as drill rigs or large cranes, may be allowed within wetlands only with prior approval from Eversource Environmental Licensing and Permitting and if specified precautions and protocols are followed. A proper location for refueling should be identified and designated before site work begins. At a minimum, if refueling must be conducted in wetlands, the contractor shall provide adequate secondary containment during refueling operations and shall maintain a spill kit on-site at all times.

4.1.4 Spills

Spill kits consist of emergency cleanup and spill containment materials that can be used in the event of a fuel or other chemical spill. Spill kits must be kept on site and accessible at all times in case of an emergency spill. Such kits should generally contain multiple absorbent socks and/or pillows and wipes and temporary disposal bags. Follow the applicable Eversource Contractor Work Rules.

4.1.5 Post-Construction

Post-construction inspections of restored areas will be conducted at regular intervals throughout the growing season, as required by any applicable permits, and/or after major storm events. Sites should be inspected for success or failure of revegetation, invasive species colonization, and erosion and sedimentation. In the event additional measures are required to achieve site restoration and stabilization, corrective actions shall be identified and implemented.

All information collected during inspections, regular maintenance, and repair procedures should be documented in project folders. In addition, photographic or diagrammatic logs may be kept to record certain events and for documentation of project progress and any noteworthy observations.

The construction work is not complete until all areas are restored.

SECTION 5

Section 5
Rehabilitation and Restoration

5.1 Restoration

All areas disturbed by construction, repair, and maintenance activities shall be substantially restored to pre-construction conditions. Please refer to Appendix A for photos and typical details for loaming, seeding, and mulching. Prompt restoration minimizes the extent and duration of soil exposure and protects disturbed areas from erosion due to stormwater runoff, ice, wind and gravity. Stabilization should be conducted as soon as practicable. Where appropriate, it is preferable to allow sensitive environmental areas, such as wetlands and rare species habitat to revegetate naturally.

Consult Eversource Environmental Licensing and Permitting for project-specific restoration requirements.

5.1.1 Seed Mixes

Several different seed mixes are available for upland and wetland restoration. State-specific comprehensive summaries of seed mixes for both temporary and permanent seeding of disturbed sites can be found within the following documents:

- Massachusetts: Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas, page 157: https://www.mass.gov/doc/complete-erosion-and-sedimentation-control-guidelines-a-guide-for-planners-designers-and/download
- Connecticut: 2002 Connecticut Guidelines for Soil and Erosion Sediment Control, page 5-3-8: https://portal.ct.gov/DEEP/Water/Soil-Erosion-and-Sediment-Control-Guidelines/Guidelines-for-Soil-Erosion-and-Sediment-Control

Upland Seed Mix: If significant grading or upland alteration has occurred, annual rye grass seed shall be placed for temporary stabilization following manufacturer's recommendations after re-grading activities.

Wetland Seed Mix: If significant grading or wetland alteration has occurred, a wetland seed mix shall be placed following manufacture's recommendations after re-grading activities.

5.1.2 Upland

The following restoration techniques apply to restoration projects in upland areas.

- Soil excavated during construction and not used as backfill must be evenly spread across disturbed areas to restore grades. Topsoil shall be stripped and separated to the extent practicable for re-use. Permanent soil protection shall be provided for all areas disturbed by construction activities. All areas will be seeded either by hydroseeding or broadcast seeding. Interim stabilization measures are required if areas cannot be seeded due to the time of year. Interim measures may include the application of mulch.
- Topsoil removed during construction activities will be replaced, seeded, and mulched.
- All areas that are broadcast seeded shall be treated with a layer of mulch, such as

straw, up to one (1) inch thick to enhance moisture retention, dissipate disturbance from precipitation, and detract birds foraging on broadcast seed.

- Rehabilitation of access routes and other areas must be performed as soon as practicable after construction is completed, including reestablishment of water bars or other BMPs to control erosion of the access road, and the removal and restoration of temporary wetland or waterway crossings.
    - Temporary breaks in construction activities may warrant seeding and mulching of disturbed areas as interim erosion control measures. Consult with Eversource Environmental Licensing and Permitting to determine project-specific requirements.
- Erosion control measures shall remain in place until soils are adequately stabilized, as confirmed by Eversource Environmental Licensing and Permitting. Once soils are stable, erosion controls – especially silt fence, which presents an obstacle to movement of small animals, shall be removed and properly disposed off-site. Stakes should be removed from straw bales and spread as mulch to remove barriers to wildlife movement.
- The use of hay and/or hay products is strictly prohibited to prevent the spread of invasive plant species seed stock.
- If a grading operation at a site is suspended for a period of more than twenty-nine (29) consecutive days, the disturbed area shall be stabilized by seeding, mulching, and/or other appropriate means within the first seven (7) days of the suspension of grading.
- Within seven (7) days after a final grade is established in any grading operation, the disturbed area shall be stabilized by seeding, loaming, and/or other appropriate means.

5.1.3 Wetland / Watercourses

Re-grading of Ruts: Upon removal of construction mats, or other BMPs, the wetland/watercourse should be inspected for rutting or disturbance from eroded upland soils. Any rutting should be re-graded to pre-existing contours and upland soils removed from wetland areas while taking care not to compact soils.

The following restoration techniques apply to restoration projects in wetlands:

Maintenance, Repair, and Emergency Projects (When No Permit is Required)

- Remove mats by "backing" out of the site and removing mats one at a time. Re-grade soils to pre-existing contours while taking care not to compact soils.
- Soils excavated from wetland areas shall be segregated and stockpiled separately (i.e., topsoil/muck apart from mineral subsoil) in a dry/upland area at least 100 feet from wetland boundaries unless other provisions have been made to facilitate restoration activities.
- Excavated wetland soils that have been stockpiled during underground utility installations within wetlands shall be replaced in the same order (i.e., mineral subsoil beneath organic topsoil/muck) to the extent practicable and restored to pre-disturbance grades.
    - Grading activities should include the elimination of ruts within the

area to be restored.

- If replacement of soil associated with temporary wetland or watercourse crossings for access roads is necessary, disturbed areas must be restored to pre-disturbance grades, either seeded and mulched, or allowed to revegetate from the natural seed bank.
- Disturbed wetland areas shall generally be allowed to revegetate from the natural seed bank. Measures to discourage the establishment or spread of plant species identified as non-native, invasive species by federal or state agencies shall be utilized. Consult with Eversource Environmental Licensing and Permitting to evaluate means and methods of wetland vegetate re-establishment.
- Any restoration plantings or seed mixes used in restoration shall consist of species native to the project area and, if feasible, from local nursery stock.
- Any stream banks and beds damaged shall be restored through use of 100 percent natural fiber geotextile erosion control blankets and/or coir logs. The use of erosion control products containing plastic and/or nylon is strictly prohibited.
- All seeded areas shall be treated with a layer of mulch (i.e., straw; the use of hay and/or hay products is strictly prohibited) up to one (1) inch thick to enhance moisture retention, dissipate disturbance from precipitation, and detract songbirds foraging on broadcast seed.

5.2 Private Property

5.2.1 Improved Areas

If access is over an off-ROW property, then it is the responsibility of a construction representative to determine if legal access rights are available to cross the property.

Access to and along the ROW over private property must be improved to the extent necessary to ensure suitable passage for construction equipment, provide erosion control, and maintain proper drainage. Upon completion of construction activities, altered yards, lawns, agricultural areas, and other improved areas must be restored to a condition equal to or better than before their use for the construction project.

5.2.2 Overall Work Site

Construction personnel should remove all work-related trailers, buildings, rubbish, waste soil, temporary structures, and unused materials upon satisfactory completion of work. All areas should be left clean, without any litter or equipment (e.g., wire, pole butts, anchors, insulators, cross-arms, cardboard, coffee cups, water bottles) and stabilized to match pre-construction conditions to the maximum extent practicable. Debris and spent equipment should be returned to the operating facility or contractor staging area for disposal or recycling as appropriate.

5.2.3 Material Storage/Staging and Parking Areas

Upon completion of all work, all material storage yards, staging areas, and parking areas shall be completely cleared of all waste and debris. Unless otherwise directed or unless other arrangements have been made with an off-ROW or off-property owner, material storage yards and staging areas shall be returned to the condition that existed prior to the installation of the material storage yard or staging area. Regardless of arrangements

made with a landowner, all areas shall be restored to their pre-construction condition or better. Any temporary structures erected by the contractor, including fences, shall be removed by the contractor and the area restored as near as possible to its original condition, including seeding and mulching as needed.

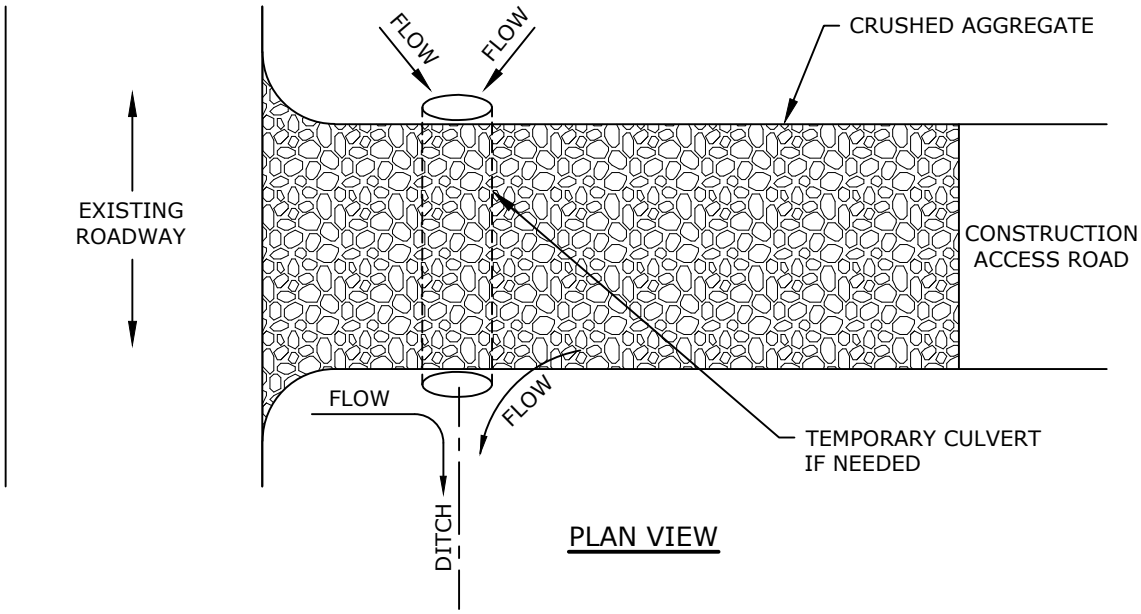
5.3 Work in Agricultural Lands

Transmission lines often cross agricultural lands. In some instances, this may affect ongoing agricultural activities in and around the ROWs. If a construction or maintenance project occurs within agricultural lands, Eversource will work closely with landowners, licensees and stakeholders to minimize agricultural impacts. Whenever practical, Eversource will make reasonable efforts to coordinate the schedule of construction-related activities around the growing and harvest seasons to minimize the impacts on agricultural operations. When this is not practical, Eversource will pursue reasonable measures to mitigate any impacts.

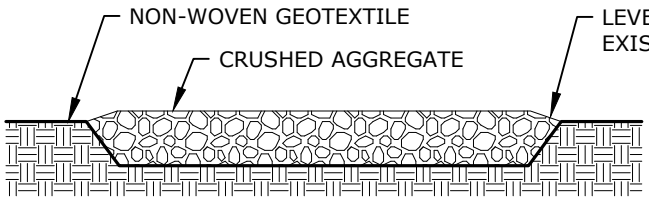
Eversource recognizes that disturbed soils, or soils compacted by heavy construction equipment, may affect the soil's ability to support certain agricultural activities. Eversource will take reasonable steps to avoid or minimize soil compaction and will restore soils that are compacted by construction equipment. Typical measures to avoid or minimize soil compaction include the use of construction mats for access to, and work pads at, structures within the project scope.

Eversource will also work with affected landowners to determine the appropriate method for restoring the soils and is open to discussing and implementing the landowners' alternative restoration suggestions. After the transmission improvement is complete, Eversource will remove all construction-related equipment and debris from the ROW.

APPENDIX A



PLAN VIEW



ELEVATION VIEW

NOTES:

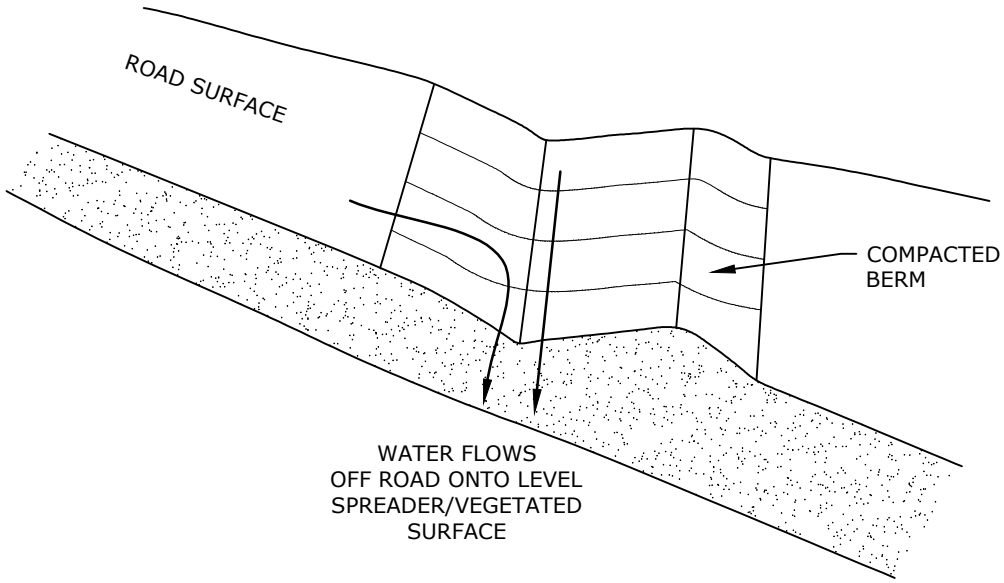
1. CRUSHED AGGREGATE TO CONSIST OF 3-INCH TO 6-INCH STONE.
2. AGGREGATE TO BE UNDERLAIN WITH NON-WOVEN GEOTEXTILE FABRIC.

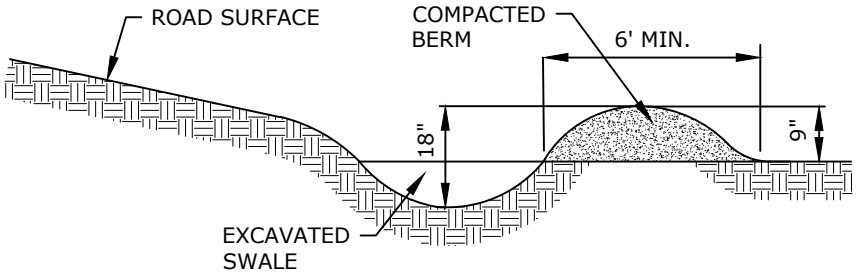
CONSTRUCTION ENTRANCE TRACK PAD

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A01

EVERSOURCE

NOTE:
FILL FOR BERMS SHALL BE A COMBINATION OF GRAVEL, SAND AND SILT TO ENSURE WATER TIGHTNESS AND STABILITY.



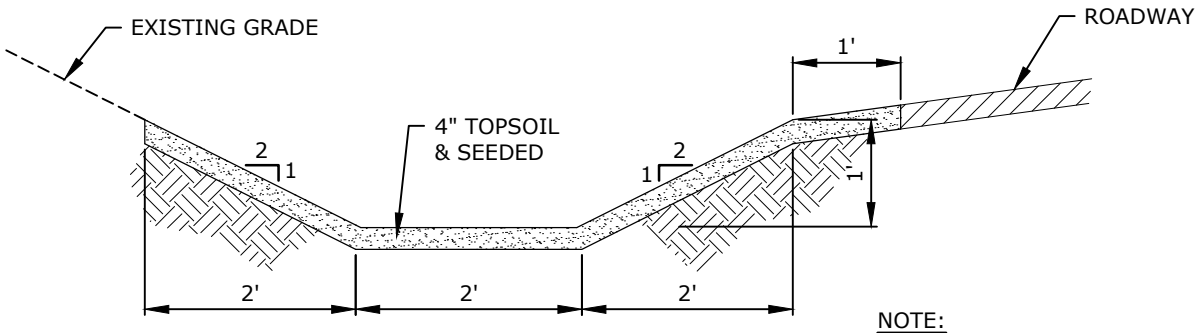


ELEVATION VIEW

WATER BARS

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A02

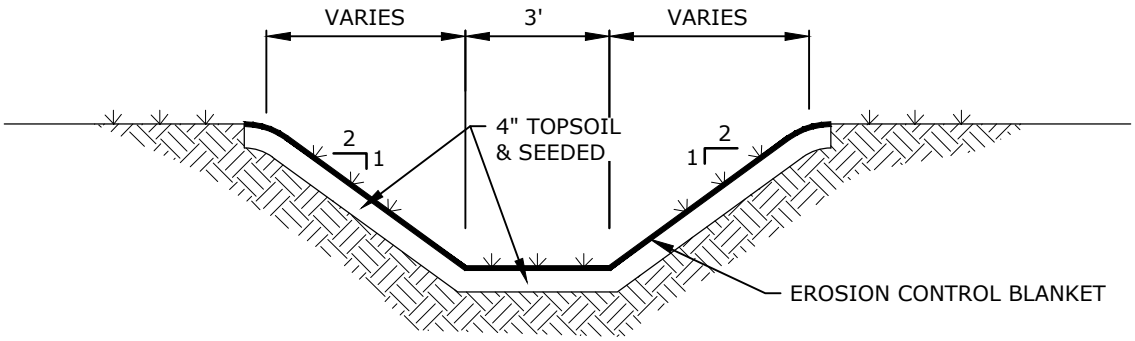
EVERSOURCE



DRAINAGE SWALE AT ROADWAY

NOTE:

1. USE OF PRODUCTS WITH PLASTIC AND/OR NYLON NETTING IS PROHIBITED.

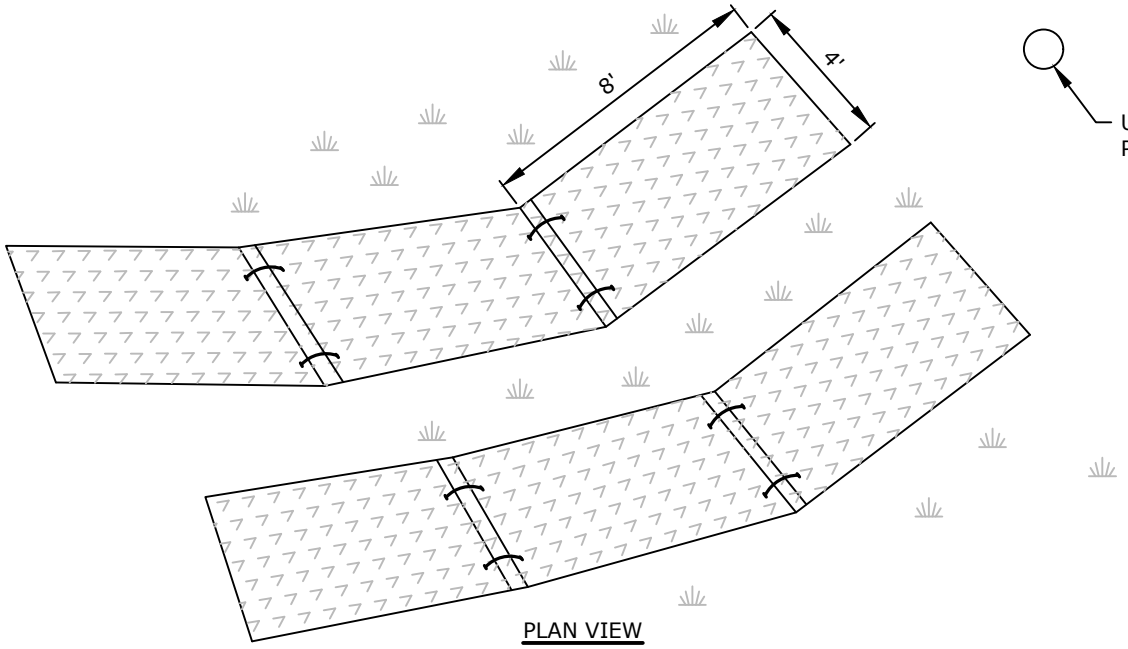


GRASS-LINED CHANNEL

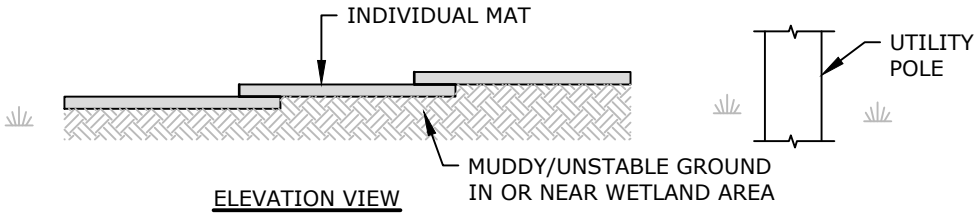
VEGETATED SWALES

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A03

EVERSOURCE



PLAN VIEW

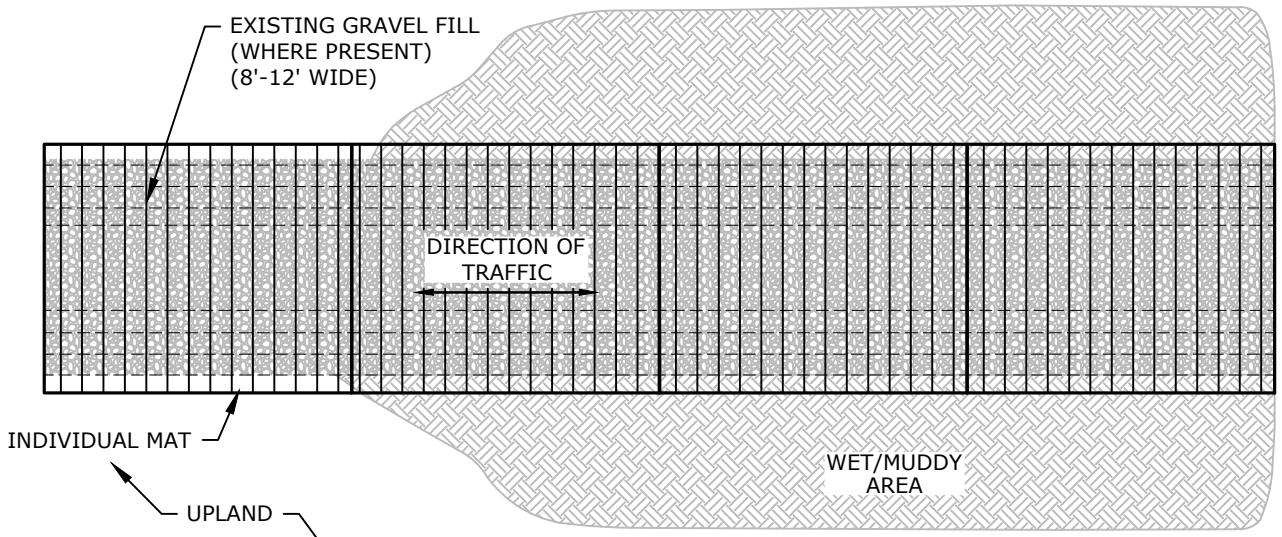


ELEVATION VIEW

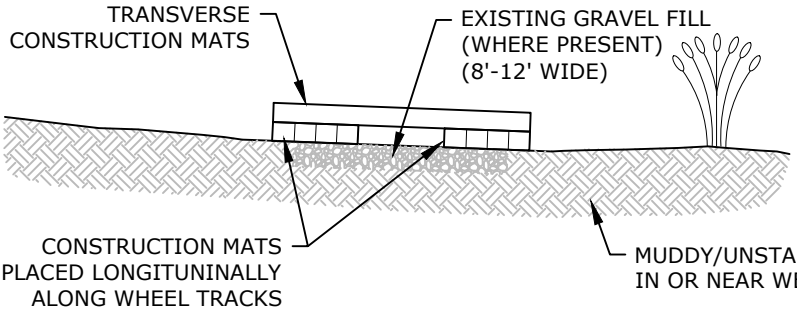
ALTURNAMAT®

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A04

EVERSOURCE



PLAN VIEW



ELEVATION VIEW

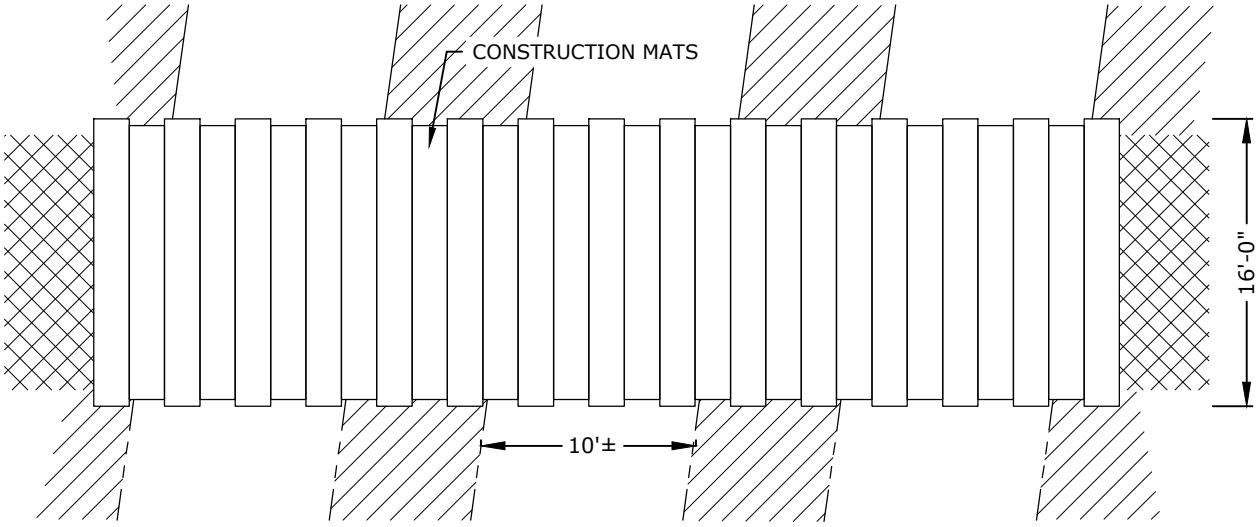
NOTES:

1. CONSTRUCTION MAT DIMENSIONS OF 12'x4'x8", 16'x4'x8" OR OTHER TO BE USED.

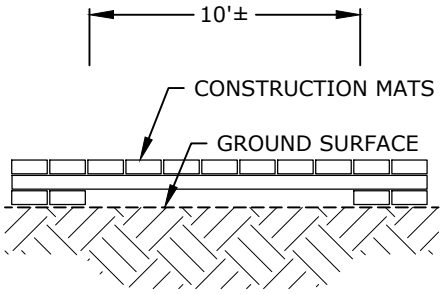
CONSTRUCTION MAT
(WETLAND CROSSING)

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A05

EVERSOURCE



PLAN VIEW



ELEVATION VIEW

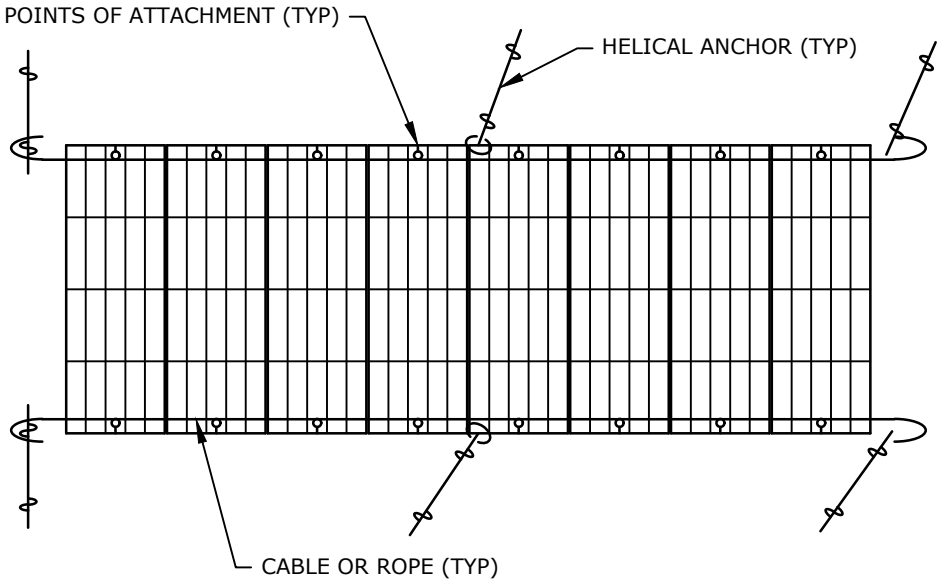
NOTES

1. CONSTRUCTION MATS SHOULD BE PLACED CLOSELY TOGETHER SO THERE ARE NO GAPS BETWEEN EACH MAT SECTION.
2. CONSTRUCTION MAT DIMENSIONS OF 12'x4'x8", 16'x4'x8" OR OTHER TO BE USED.
3. AIR BRIDGING MAY ALSO BE USED TO AVOID IMPACTS TO UNDERGROUND UTILITIES, STONE WALLS, RARE PLANTS OR OTHER SENSITIVE FEATURES. CONSULT WITH EVERSOURCE ENVIRONMENTAL.
4. ADDITIONAL MEASURES MAY BE REQUIRED.

CONSTRUCTION MAT
(AIR BRIDGE)

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A06

EVERSOURCE



PLAN VIEW

NOTES:

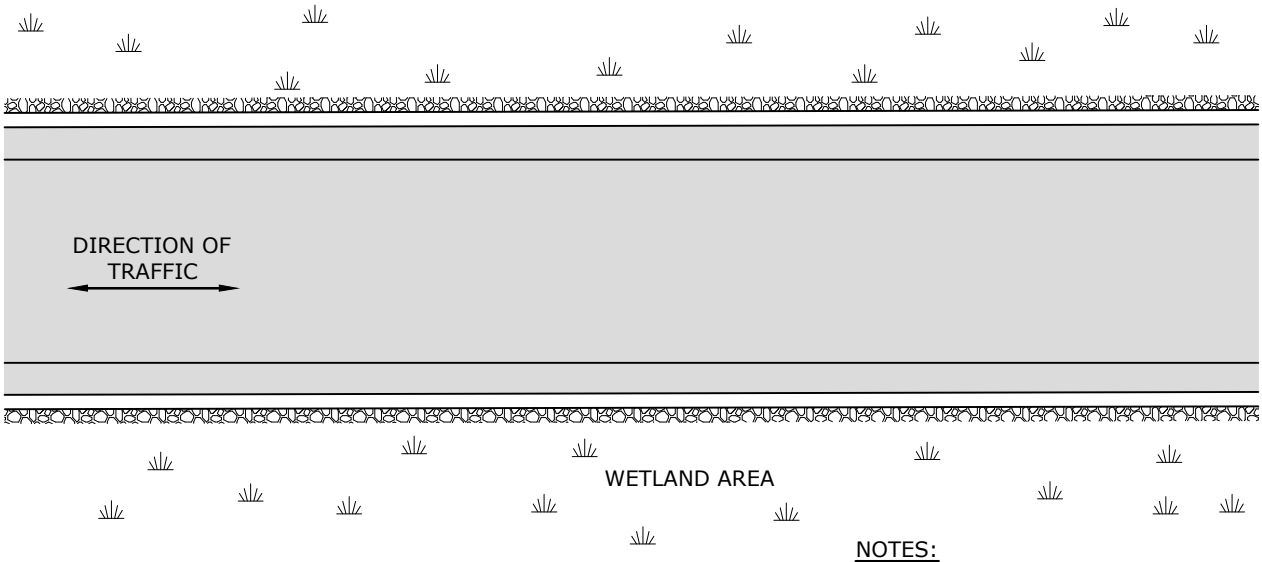
1. TYPICAL HELICAL ANCHOR AND CABLE CONFIGURATION FOR MAT CONTAINMENT IN FLOODPLAINS/LAND SUBJECT TO FLOODING.

2. TYPICAL POINT OF ATTACHMENT HEAVY STAPLES, EYEBOLTS OR OTHER SUITABLE HARDWARE TO SECURE ATTACHMENT OF MAT TO LINEAR CABLE. IF CHAIN POCKETS ARE PRESENT IN THE MATS CABLE OR ROPE CAN BE LOOPED THROUGH RODS.

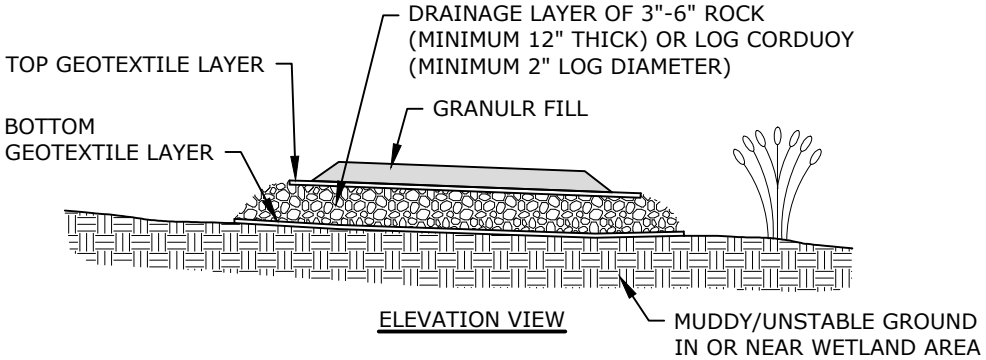
CONSTRUCTION MAT ANCHORING

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A07

EVERSOURCE



PLAN VIEW



ELEVATION VIEW

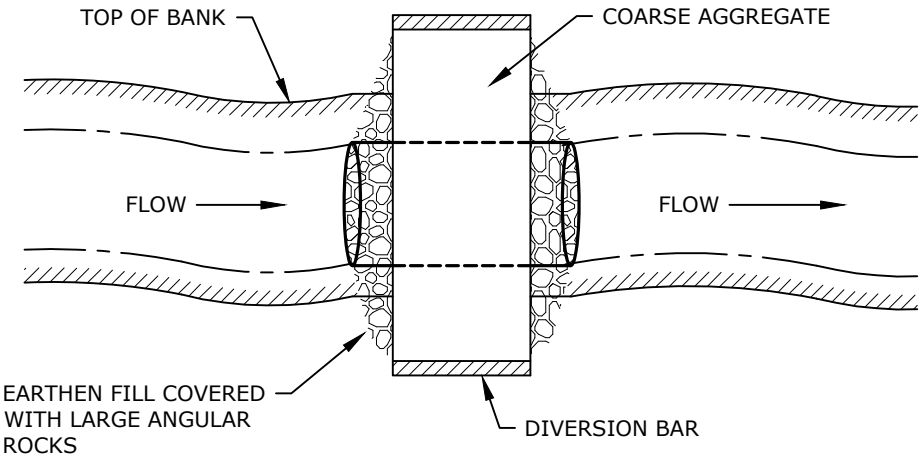
NOTES:

1. DRAINAGE LAYERS MAY BE USED AS AN ALTERNATIVE TO CULVERTS, OR IN COMBINATION WITH CULVERTS, TO PROVIDE ADEQUATE CROSS-DRAINAGE.
2. FILTER FABRIC "JOINTS" SHOULD OVERLAP AT LEAST 18" (WHERE ONE PIECE OF FILTER FABRIC ENDS AND A NEW PIECE OF FABRIC IS ADDED TO CONTINUE THE ROAD).
3. EROSION AND SEDIMENTATION CONTROLS MAY BE INSTALLED ADJACENT TO THE SIDES OF THE ROAD WHEN CONDITIONS WARRANT.

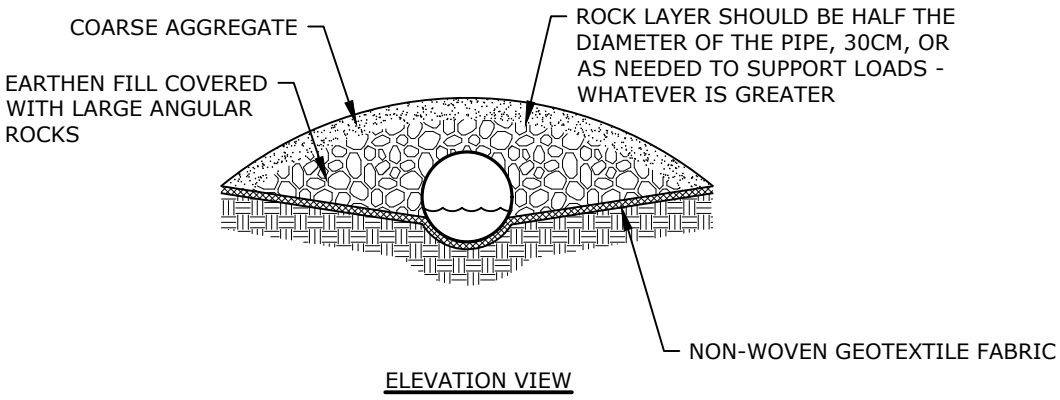
PERMEABLE ROAD

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A08

EVERSOURCE



PLAN VIEW



ELEVATION VIEW

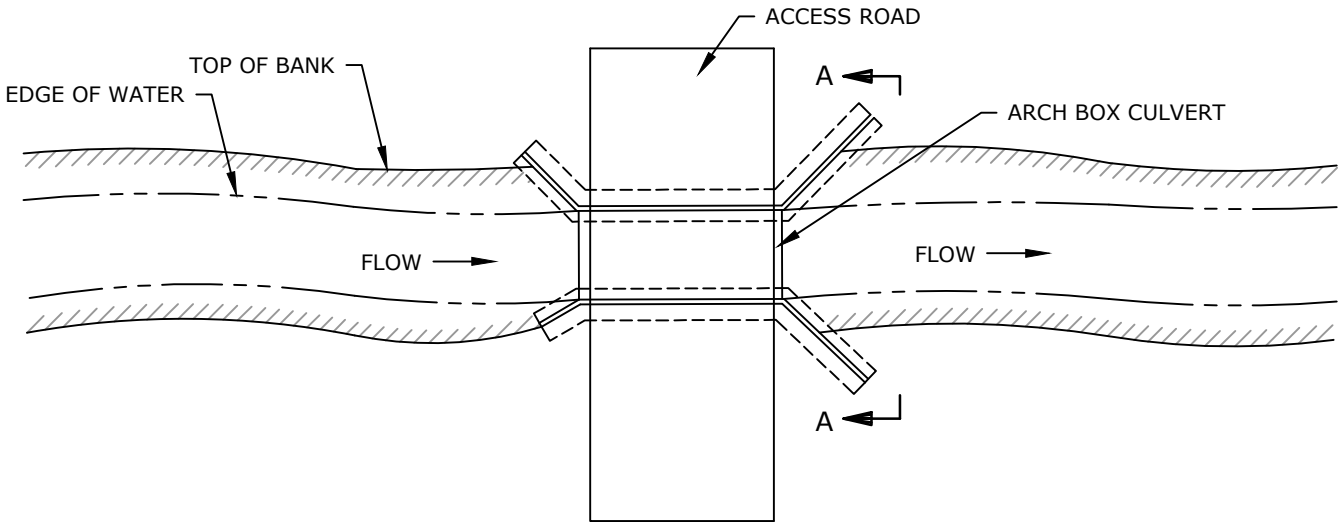
NOTES:

1. CAPACITY OF PIPES COMBINED SHOULD ACCOUNT FOR SIGNIFICANT STORM EVENTS.
2. INSTALLATION OF NEW CULVERTS MAY REQUIRE PERMITS. CONSULT WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING PRIOR TO CONSTRUCTION.

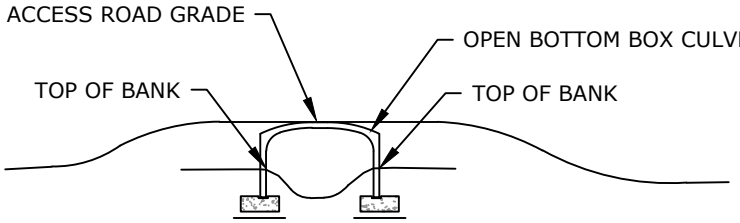
TEMPORARY CONSTRUCTION CULVERT

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A09

EVERSOURCE



PLAN VIEW



SECTION A-A

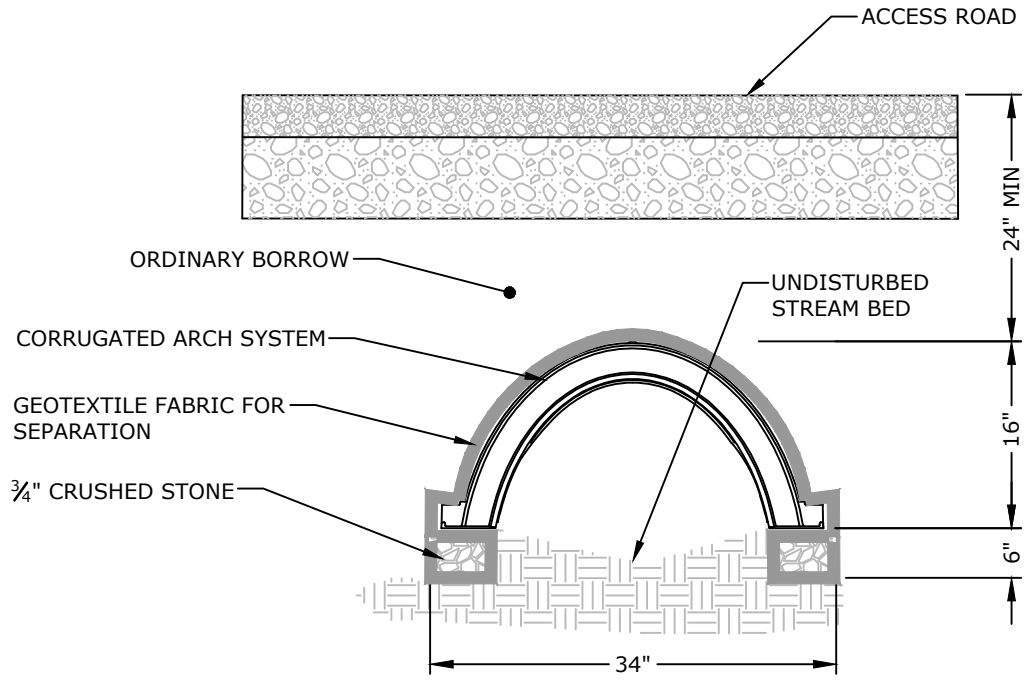
NOTE:

1. INSTALLATION OF NEW OR REPLACEMENT STREAM CROSSINGS, INCLUDING BOX CULVERTS, IS SUBJECT TO ENVIRONMENTAL PERMITTING. CONSULT WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING.

PERMANENT OPEN BOTTOM
BOX CULVERT

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A10

EVERSOURCE



NOTES:

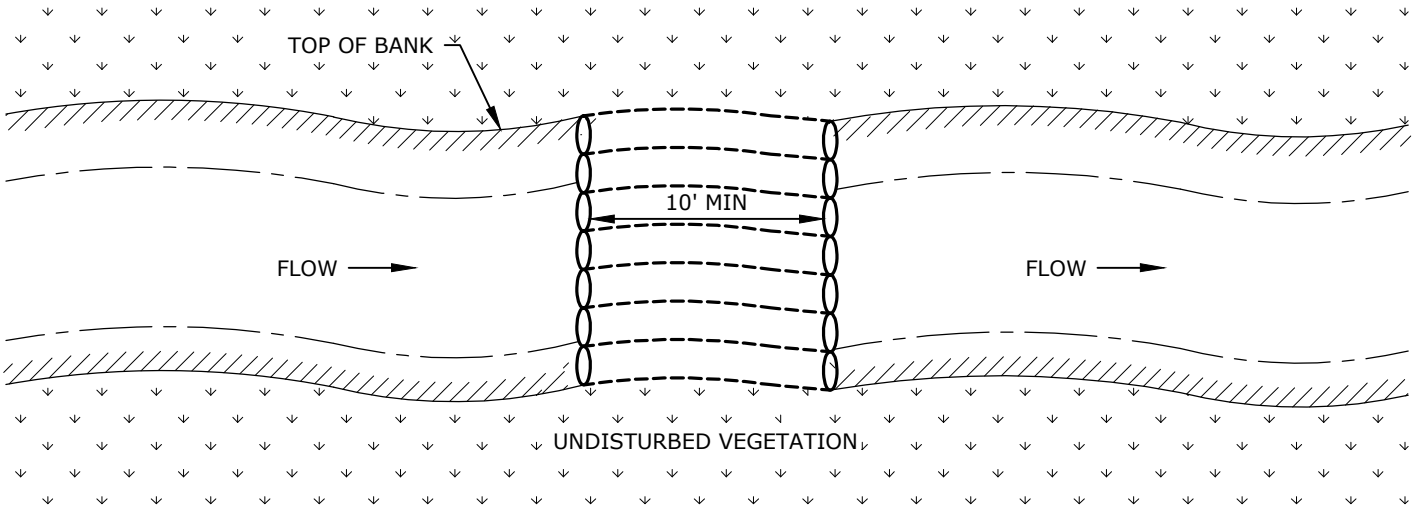
1. CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".

2. CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".

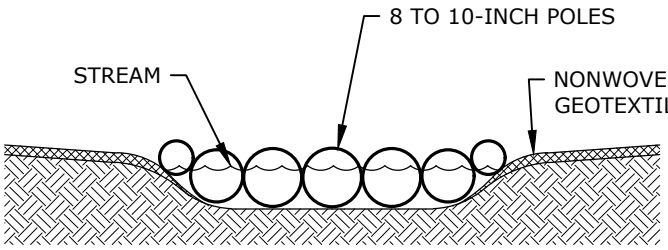
ARCH CULVERT

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A11

EVERSOURCE



PLAN VIEW



ELEVATION VIEW

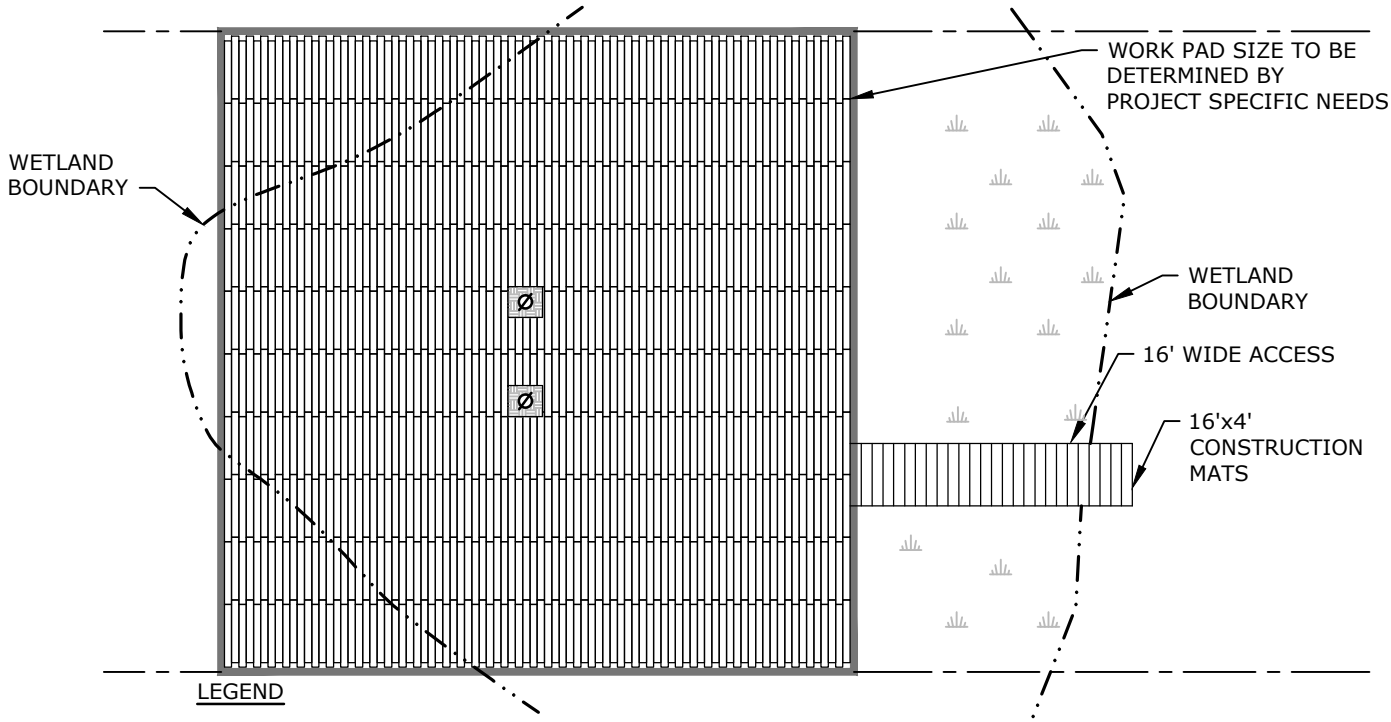
NOTES:

1. POLES AND NONWOVEN GEOTEXTILE MUST BE REMOVED IMMEDIATELY AFTER USE.
2. LENGTH OF POLES SHALL BE AT LEAST 10 FEET.
3. USE OF HARDWOODS PROHIBITED.
4. CONSULT WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING PRIOR TO INSTALLATION OF POLED FORDS.

POLE FORD

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A12

EVERSOURCE



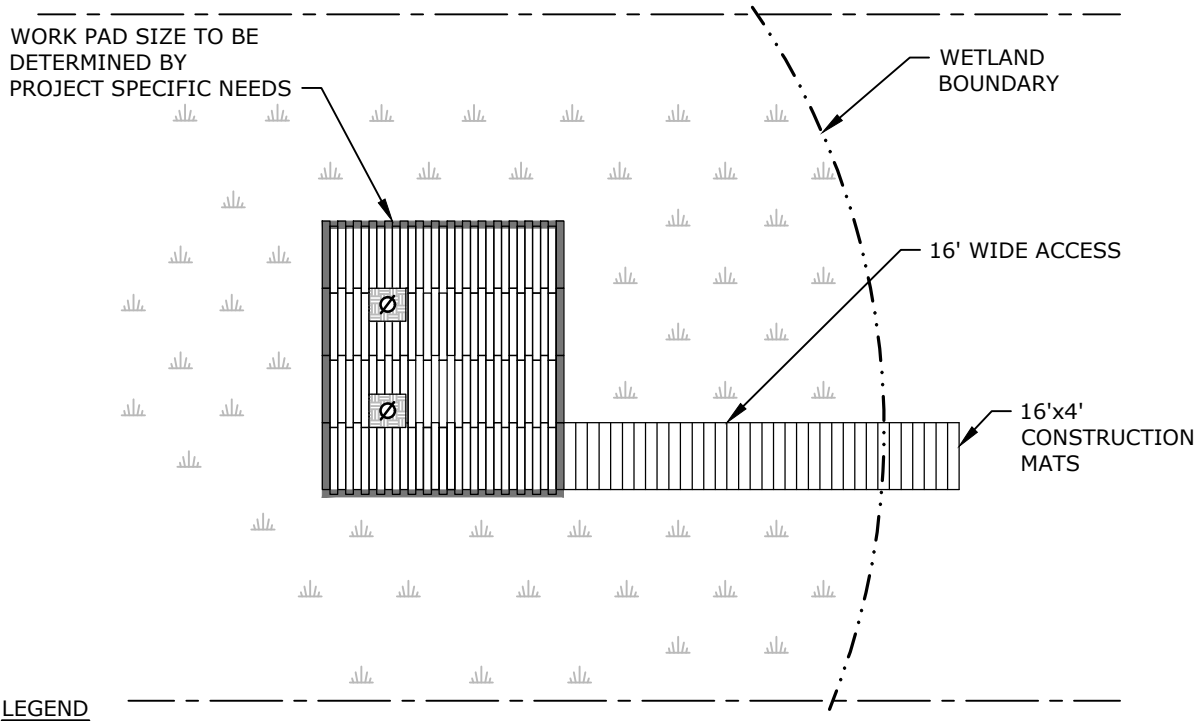
LEGEND

ø	REPLACEMENT POLE LOCATION
▭	CONSTRUCTION MAT - 16'x4'x 8" TYPICAL SIZE. 12'x4'x8" OR OTHER SIZE ACCEPTABLE.
▬	WORK SPACE REQUIREMENTS - LIVE LINE WORK (DETERMINED BASED ON PROJECT SPECIFIC NEEDS)
— – —	LIMIT OF RIGHT-OF-WAY
ılı	WETLAND AREA

CONSTRUCTION MAT LAYOUT
(LIVE LINE WORK)

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A13

EVERSOURCE



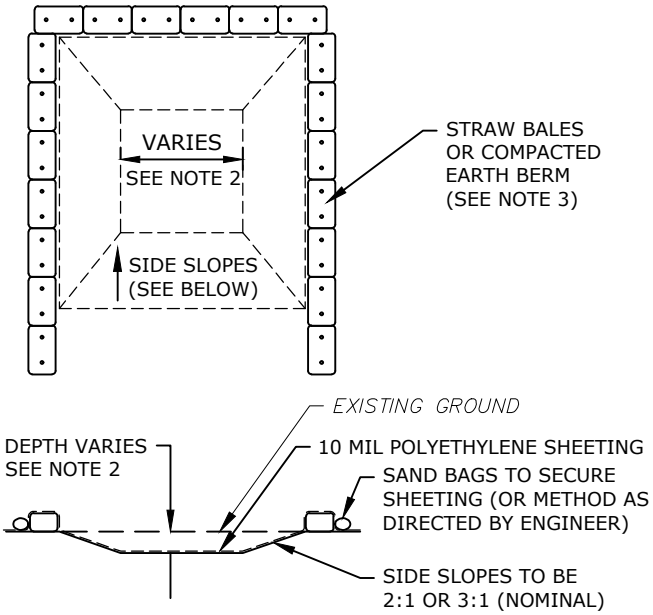
LEGEND

Ø	REPLACEMENT POLE LOCATION
▭	CONSTRUCTION MAT - 16'x4'x 8" TYPICAL SIZE. 12'x4'x8" OR OTHER SIZE ACCEPTABLE.
▬	WORK SPACE REQUIREMENTS - DE-ENERGIZED WORK (DETERMINED BASED ON PROJECT SPECIFIC NEEDS)
— – —	LIMIT OF RIGHT-OF-WAY
ılı	WETLAND AREA

CONSTRUCTION MAT LAYOUT
(DE-ENERGIZED LINE WORK)

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A14

EVERSOURCE



NOTES:

1. CONCRETE WASHOUT AREA(S) SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE. THE CONCRETE WASHOUT AREA SHALL BE ENTIRELY SELF-CONTAINED.

2. THE CONTRACTOR SHALL SUBMIT THE DESIGN, LOCATION AND SIZING OF THE CONCRETE WASHOUT AREA(S) WITH THE PROJECTS'S EROSION AND SEDIMENTATION CONTROL PLAN.

3. LOCATION: WASHOUT AREA(S) ARE TO BE LOCATED AT LEAST 50 FEET FROM ANY STREAM, WETLAND, STORM DRAINS, OR OTHER SENSITIVE RESOURCE. THE FLOOD CONTINGENCY PLAN MUST ADDRESS THE CONCRETE WASHOUT IF THE WASHOUT IS TO BE LOCATED WITHIN THE FLOODPLAIN.
   SIZE: THE WASHOUT MUST HAVE SUFFICIENT VOLUME TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS INCLUDING, BUT NOT LIMITED TO, OPERATIONS ASSOCIATED WITH GROUT AND MORTAR.

4. SURFACE DISCHARGE IS UNACCEPTABLE. THEREFORE, STRAW BALES OR OTHER CONTROL MEASURES, SHOULD BE USED AROUND THE PERIMETER OF THE CONCRETE WASHOUT AREA FOR CONTAINMENT.

5. SIGNS SHOULD BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE CONCRETE AREA(S) AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CONCRETE WASHOUT TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS. WASHOUT AREA(S) SHOULD BE FLAGGED WITH SAFETY FENCING OR OTHER APPROVED METHOD.

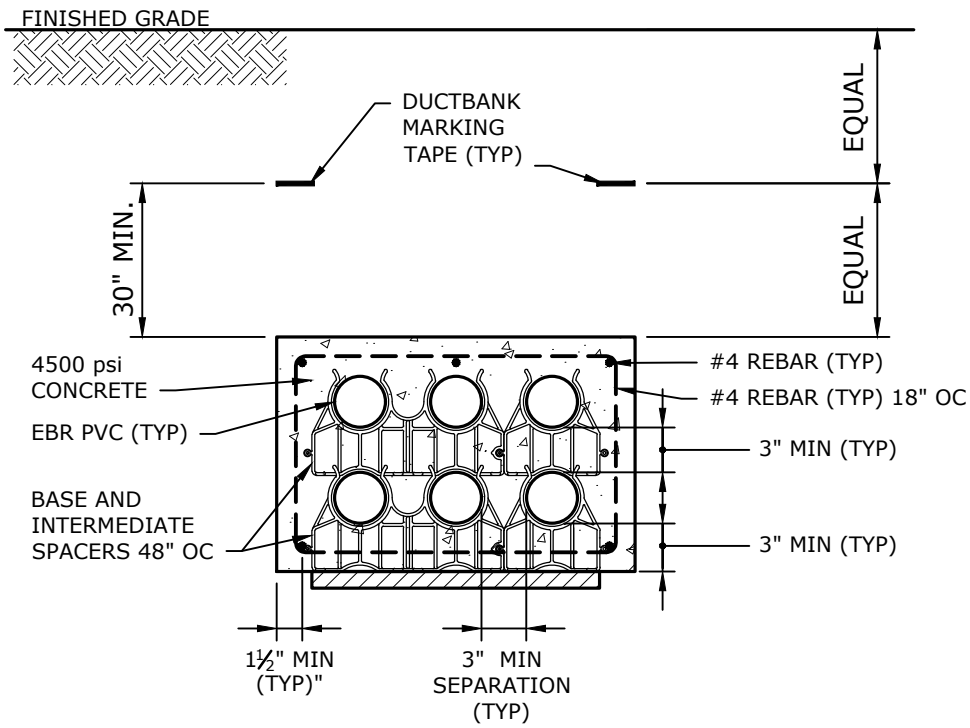
6. WASHOUT AREA(S) ARE TO BE INSPECTED AT LEAST ONCE A WEEK FOR STRUCTURAL INTEGRITY, ADEQUATE HOLDING CAPACITY AND CHECKED FOR LEAKS, TEARS OR OVERFLOWS. (AS REQUIRED BY THE CONSTRUCTION SITE ENVIRONMENTAL INSPECTION REPORT) WASHOUT AREA(S) SHOULD BE CHECKED AFTER HEAVY RAINS.

7. HARDENED CONCRETE WASTE SHOULD BE REMOVED AND DISPOSED OF WHEN THE WASTE HAS ACCUMULATED TO HALF OF THE CONCRETE WASHOUT'S HEIGHT. THE WASTE CAN BE STORED AT AN UPLAND LOCATION. ALL CONCRETE WASTE SHALL BE DISPOSED OF IN A MANNER CONSISTENT WITH ALL APPLICABLE LAWS, REGULATIONS, AND GUIDELINES.

CONCRETE WASH OUT

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A15

EVERSOURCE



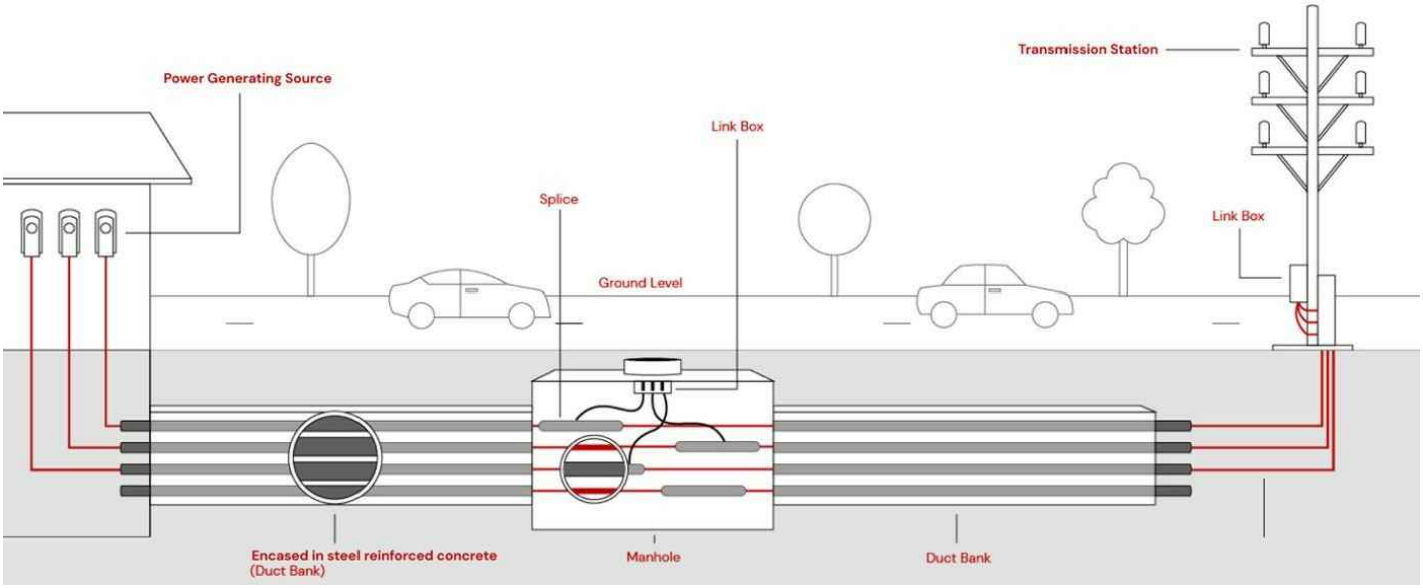
NOTES:

1. GEOTECH TEST, IN ACCORD WITH ASTM D608, THE BOTTOM OF EXCAVATION TO ACHIEVE 85% OF MAXIMUM DRY DENSITY, PRIOR TO CONCRETE PLACEMENT.

ROAD TRENCH
(DUCT BANK)

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A16

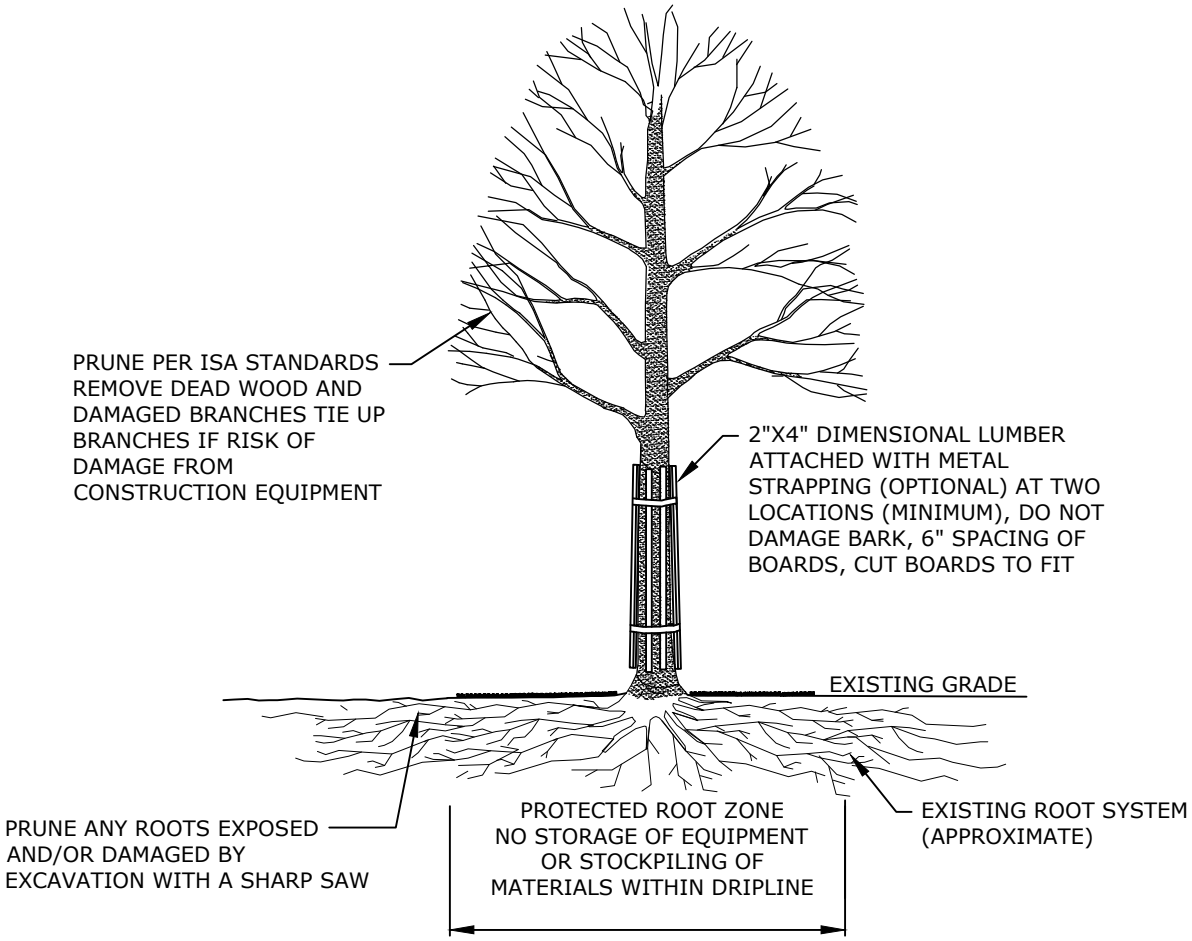
EVERSOURCE



ROAD TRENCH
(6-WAY DUCT BANK)

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A17

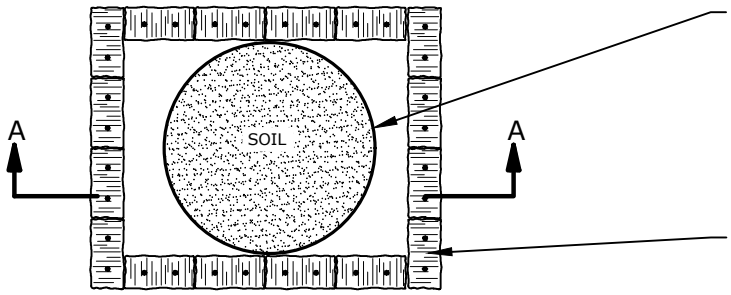
EVERSOURCE



TREE PROTECTION

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A18

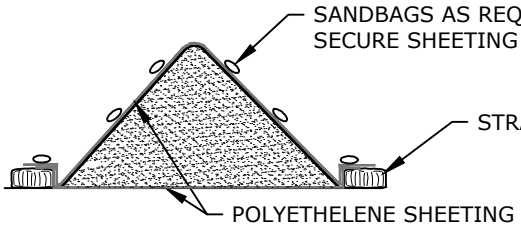
EVERSOURCE



CONTAMINATED SOILS MUST BE ON AND COVERED WITH POLYETHYLENE SHEETING TO LIMIT EROSION. SHEETING NOT REQUIRED FOR NON-CONTAMINATED SOILS IF SEDIMENTATION AND EROSION CONTROLS COMPLETELY ENCLOSE STOCKPILE.

STRAW BALES AND/OR SILT FENCE

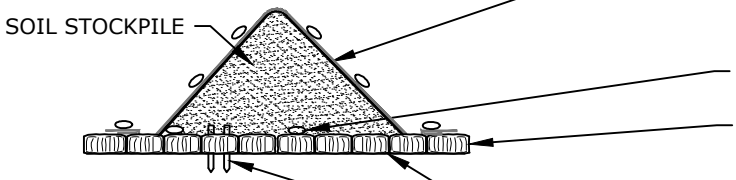
PLAN VIEW



SECTION A-A

NOTE:

1. SANDBAGS (OR SIMILAR) MAY BE USED TO SECURE POLYETHYLENE SHEETING ON TOP OF THE STOCKPILE.
2. STRAW PRODUCTS ONLY; THE USE OF HAY OR HAY PRODUCTS IS STRICTLY PROHIBITED.



ELEVATION VIEW

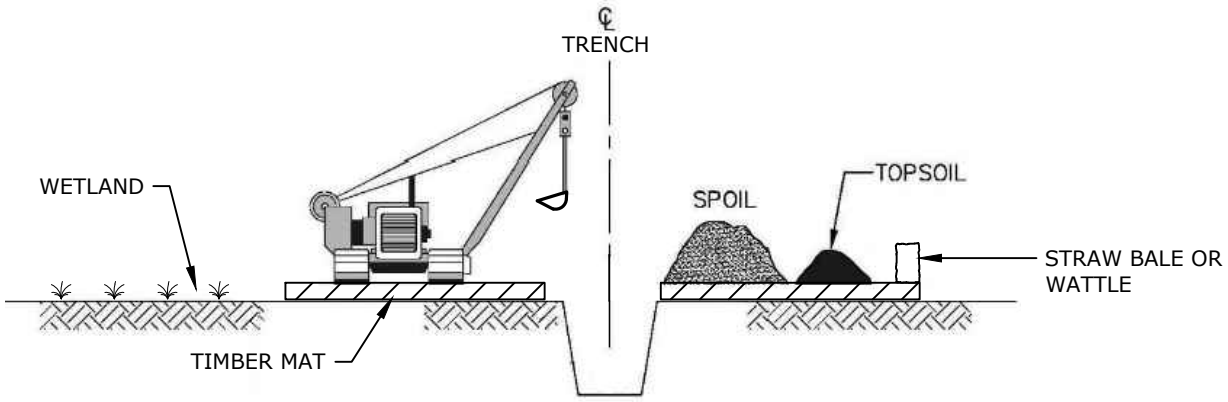
SOIL STOCKPILE MANAGEMENT

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A19

EVERSOURCE

NOTES:

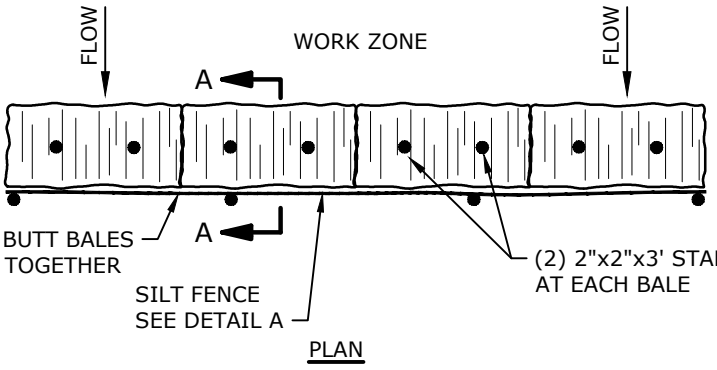
1. TOPSOIL SEGREGATION TO BE USED IN WETLANDS AND AGRICULTURAL LAND.
2. IF WORKING WITHIN WETLANDS, MATTING BENEATH STOCKPILES MUST BE LINED OR UNDERLAIN BY GEOTEXTILE FABRIC.
3. STOCKPILES SHOULD BE ENCLOSED BY STRAW BALES OR WATTLES.



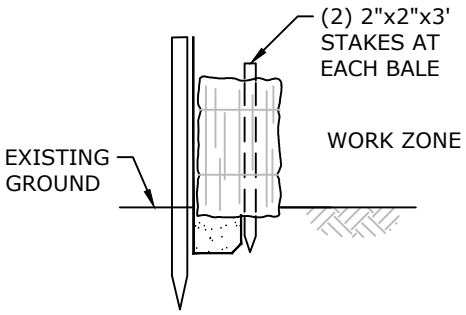
TOPSOIL SEGREGATION

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A20

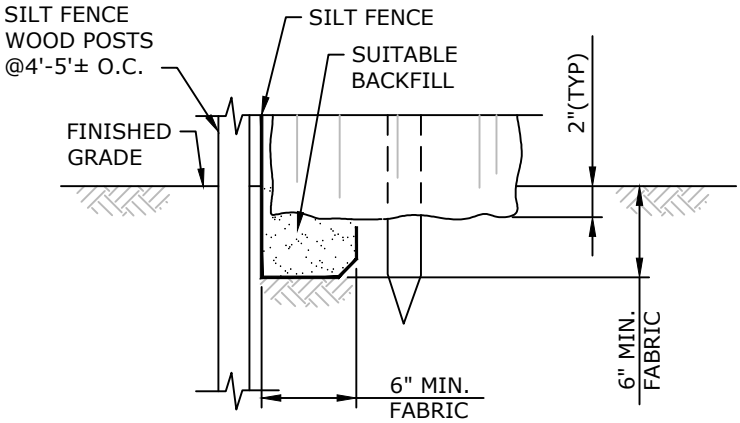
EVERSOURCE



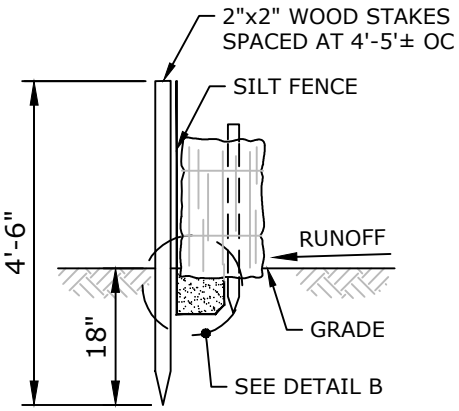
PLAN



SECTION A-A



DETAIL B



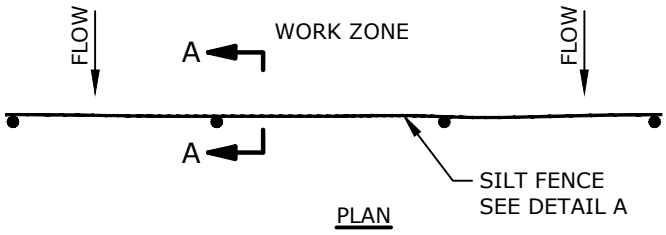
DETAIL A

NOTE:
USE OF HAY AND/OR PRODUCTS CONTAINING WEED SEED IS PROHIBITED.

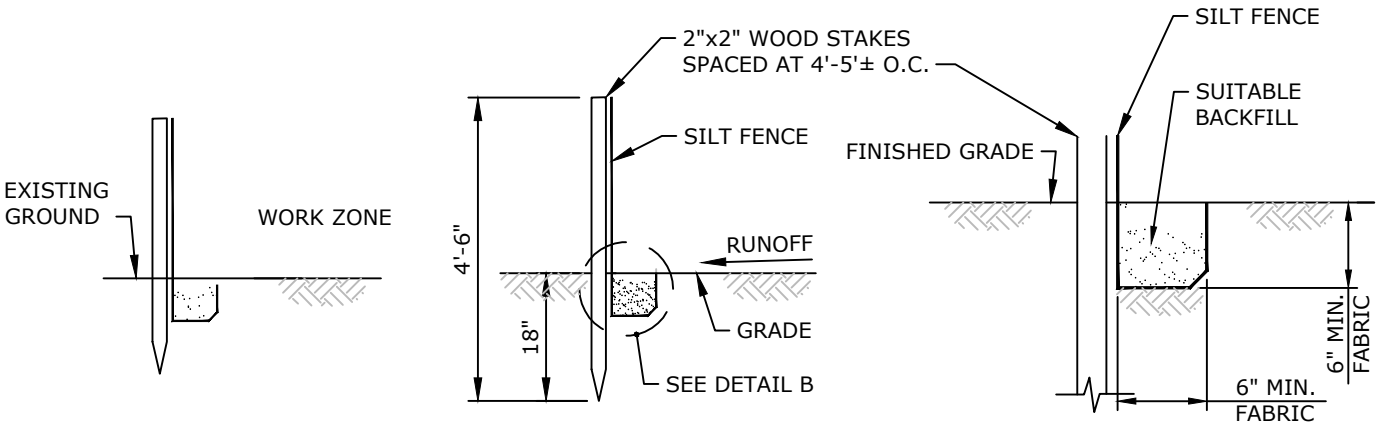
STRAW BALE BARRIER

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A21

EVERSOURCE



PLAN



SECTION A-A

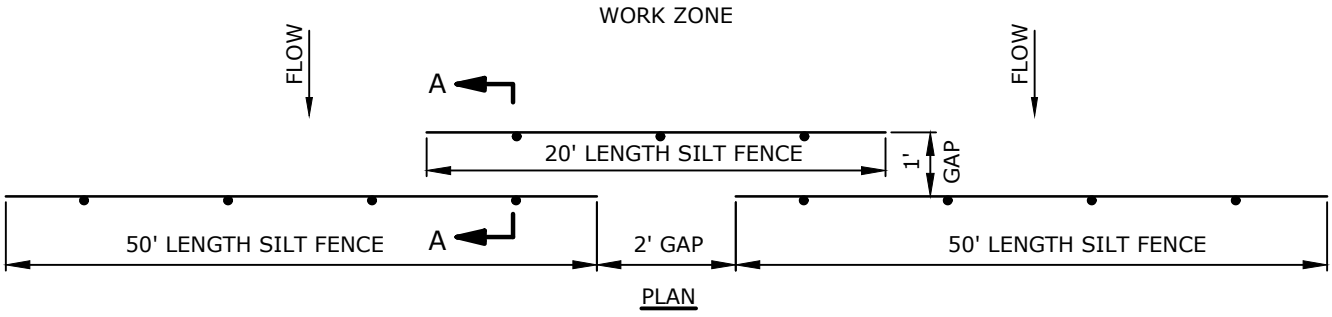
DETAIL A

DETAIL B

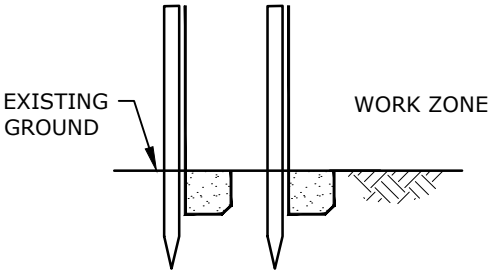
SILT FENCE

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A22

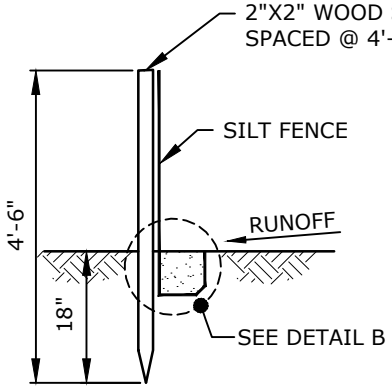
EVERSOURCE



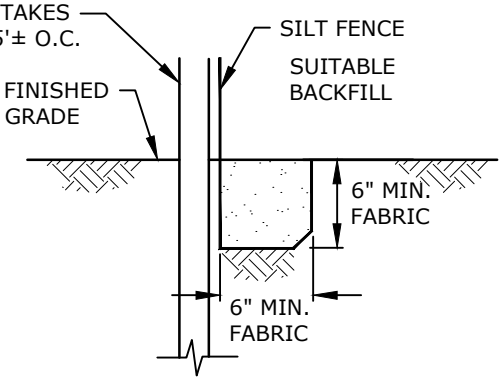
PLAN



SECTION A-A

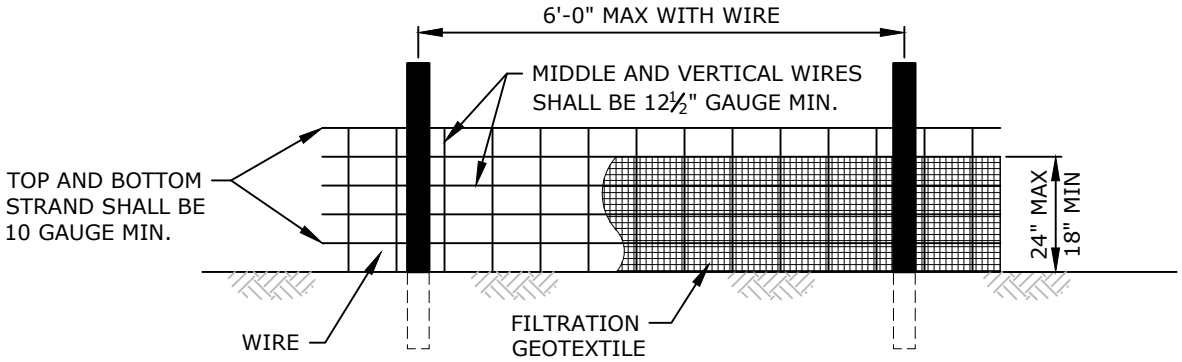


DETAIL A

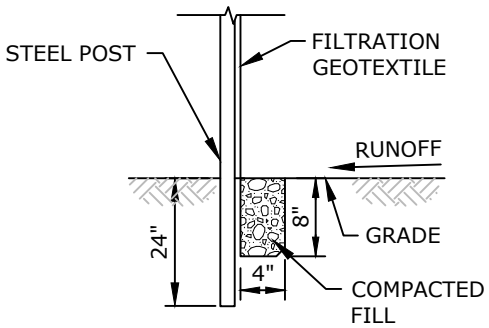


DETAIL B

SYNCOPATED SILT FENCE	
DATE: 12/2021	EVERSOURCE
SCALE: NO SCALE	
FIGURE: A23	



ELEVATION



SECTION

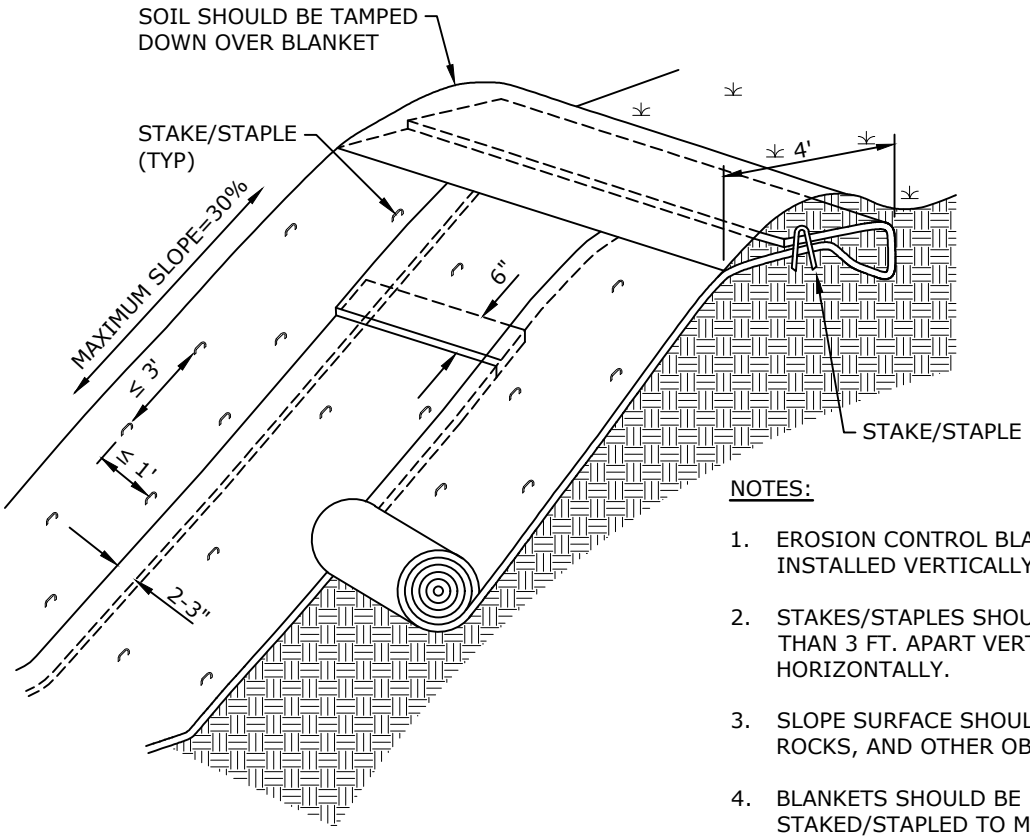
NOTES:

1. USE FILTRATION GEOTEXTILE A MINIMUM OF 36" IN WIDTH AND FASTEN ADEQUATELY TO THE POSTS AND WIRES AS DIRECTED.
2. USE A WIRE A MINIMUM OF 32" IN WIDTH AND WITH A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
3. PROVIDE 5'-0" STEEL POST OF THE SELF-FASTENER ANGLE STEEL TYPE.
4. FOR MECHANICAL SLICING METHOD INSTALLATION, GEOTEXTILE SHALL BE A MAXIMUM OF 18" ABOVE GROUND SURFACE.
5. EXTEND GEOTEXTILE AND WIRE INTO TRENCH.

REINFORCED SILT FENCE

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A24

EVERSOURCE



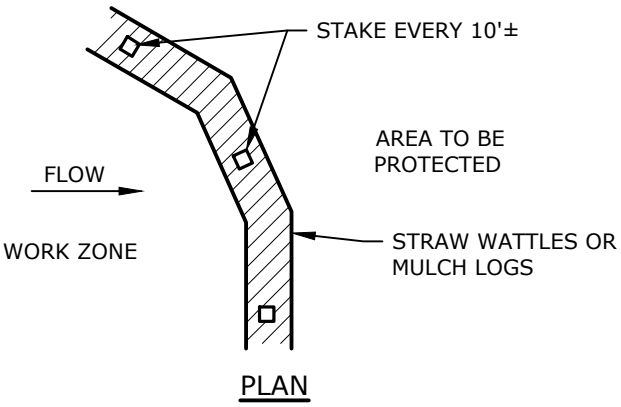
NOTES:

1. EROSION CONTROL BLANKET SHOULD BE INSTALLED VERTICALLY DOWNSLOPE.
2. STAKES/STAPLES SHOULD BE PLACED NO MORE THAN 3 FT. APART VERTICALLY, AND 1 FT. APART HORIZONTALLY.
3. SLOPE SURFACE SHOULD BE FREE OF STICKS, ROCKS, AND OTHER OBSTRUCTIONS.
4. BLANKETS SHOULD BE ROLLED OUT LOOSELY AND STAKED/STAPLED TO MAINTAIN DIRECT SOIL CONTACT. DO NOT STRETCH THE BLANKETS.
5. USE OF PRODUCTS WITH PLASTIC AND/OR NYLON NETTING IS PROHIBITED.

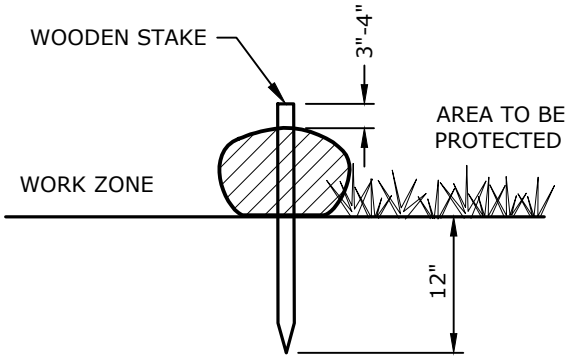
EROSION CONTROL BLANKETS

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A25

EVERSOURCE



PLAN



SECTION

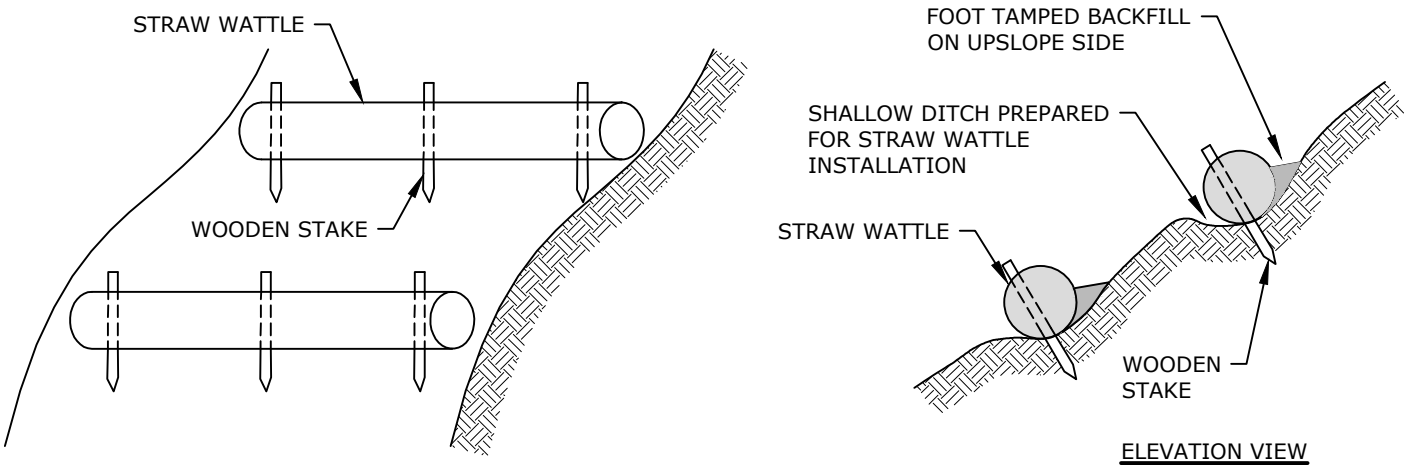
NOTE:

1. USE OF PRODUCTS WITH PLASTIC AND/OR NYLON NETTING IS PROHIBITED.

STRAW WATTLE/MULCH LOG

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A26

EVERSOURCE



NOTES:

1. USE OF PRODUCTS WITH PLASTIC AND/OR NYLON NETTING IS PROHIBITED.

2. VERTICAL SPACING FOR SLOPE INSTALLATIONS TO BE DETERMINED BY SITE CONDITIONS: SLOPE GRADIENT AND SOIL TYPE. CONFIRM SPACING PER MANUFACTURER'S SPECIFICATIONS. SEE BELOW FOR TYPICAL REQUIREMENTS. COORDINATE SPACING AND LOCATION WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING.

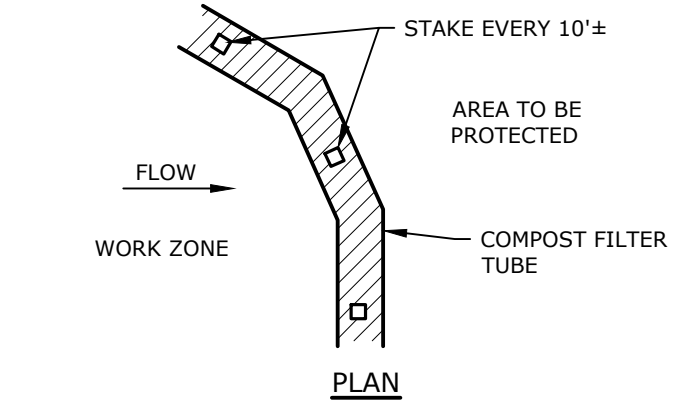
    - 1:1 SLOPES = 10 FEET APART
    - 2:1 SLOPES = 20 FEET APART
    - 3:1 SLOPES = 30 FEET APART

3. MINIMUM 12" DIAMETER WATTLES SHOULD BE USED FOR HIGHLY DISTURBED AREAS (E.G. HEAVILY USED ACCESS ROADS WITH ADJACENT WETLANDS). MINIMUM 8" DIAMETER WATTLES SHOULD BE USED FOR LESS DISTURBED SOILS.

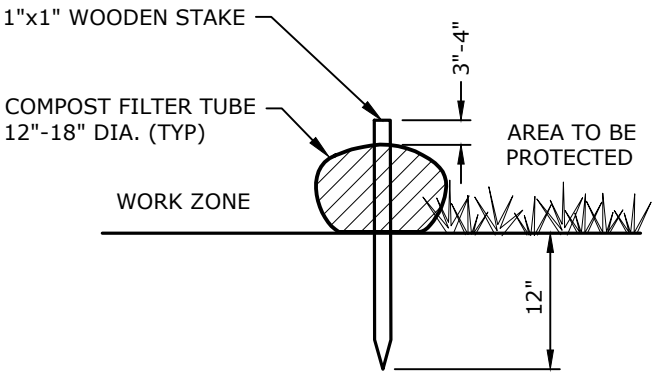
STRAW WATTLE
(ON SLOPE)

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A27

EVERSOURCE



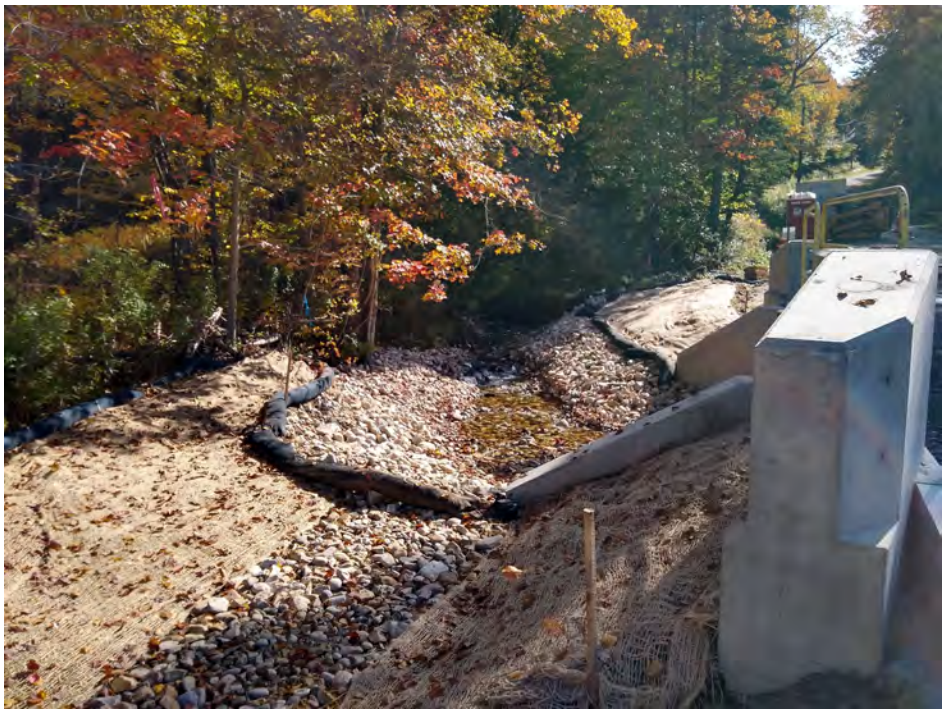
PLAN



SECTION

NOTES:

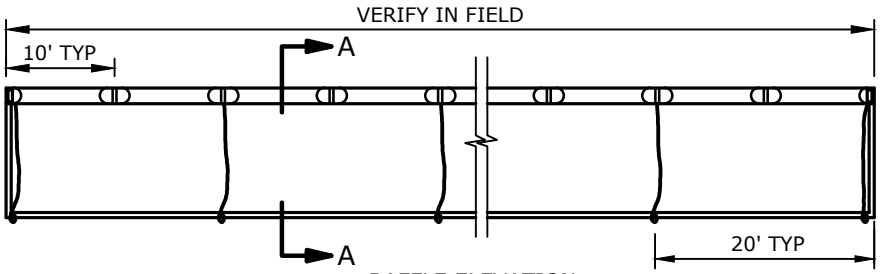
1. TUBES FOR COMPOST FILTERS SHALL BE JUTE MESH OR APPROVED BIODEGRADABLE MATERIAL.
2. TAMP TUBES IN PLACE TO ENSURE GOOD CONTACT WITH SOIL SURFACE.
3. PROVIDE 3' MINIMUM OVERLAP AT ENDS OF TUBES TO JOIN IN A CONTINUOUS BARRIER AND MINIMIZE UNIMPEDED FLOW.
4. COMPOST MATERIAL SHALL BE DISPERSED ON SITE WITHIN LIMITS OF WORK, AS DIRECTED.
5. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
6. DO NOT INSTALL IN PERENNIAL, EPHEMERAL, OR INTERMITTENT STREAMS.
7. CONFIGURE TUBES AROUND EXISTING SITE FEATURES TO MINIMIZE SITE DISTURBANCE AND MAXIMIZE CAPTURE AREA OF STORMWATER RUN-OFF.



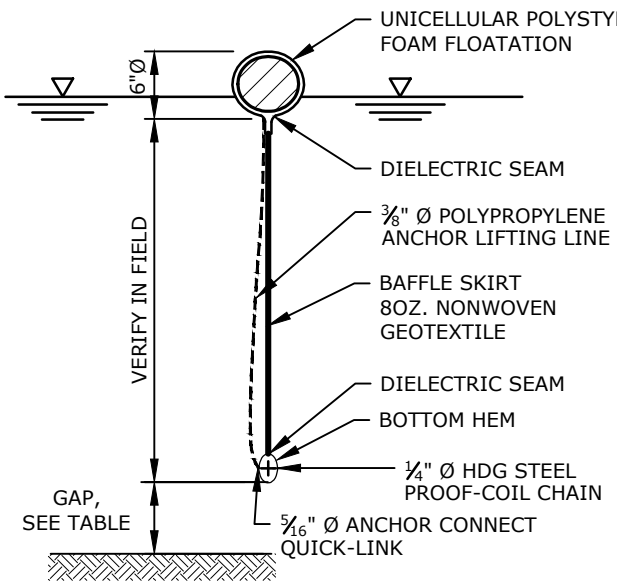
COMPOST FILTER TUBE

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A28

EVERSOURCE



BAFFLE ELEVATION



SECTION A-A

NOTES:

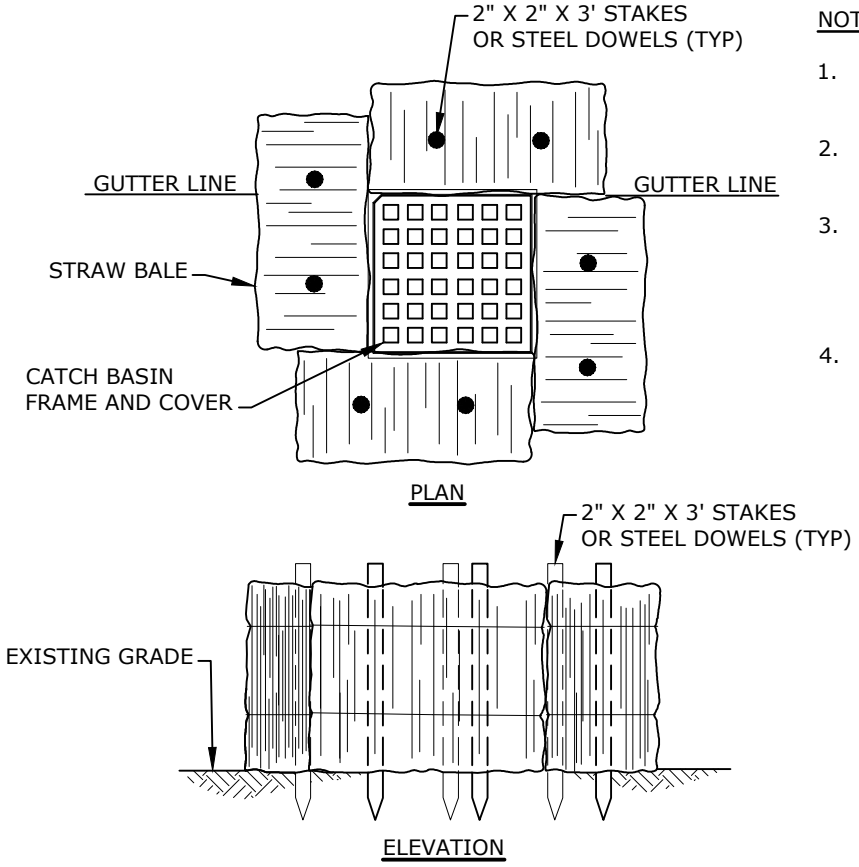
1. TURBIDITY CURTAIN BY ENVIRONETICS, INC. OR APPROVED EQUAL.
2. TURBIDITY CURTAIN SHALL NOT BE EXTENDED ACROSS CHANNEL FLOWS.
3. TURBIDITY CURTAIN MATERIAL SHALL BE ULTRAVIOLET LIGHT RESISTANT.

TYPE	DESCRIPTION	CONDITIONS	GAP (IN.)
I	FLATWATER	CALM AND PROTECTED	0
II	LIGHTWEIGHT	SEMI-PROTECTED AREA, CURRENTS UP TO 2 FT/S	12
III	MIDDLEWEIGHT	EXPOSED AREA, CURRENTS UP TO 5 FT/S	12
IV	HEAVYWEIGHT	EXPOSED TO WIND, CURRENT, AND TIDES	0

TURBIDITY CURTAIN

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A29

EVERSOURCE



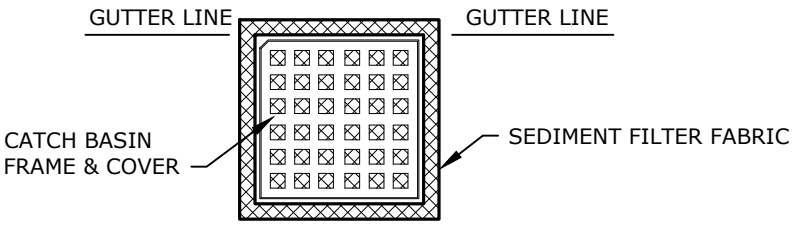
NOTES:

1. A MINIMUM OF TWO WOOD STAKES ARE REQUIRED PER STRAW BALE.
2. STEEL DOWELS MAY BE USED WHERE WOOD STAKES CANNOT BE DRIVEN INTO THE GROUND.
3. "SILT SACKS", "DANDY BAG II" OR OTHER SIMILAR SILT RETENTION DEVICES SHALL BE INSTALLED IN LIEU OF STRAW BALES FOR CATCH BASINS LOCATED IN EXISTING PAVED AREAS.
4. STRAW PRODUCTS ONLY; THE USE OF HAY OR HAY PRODUCTS IS STRICTLY PROHIBITED.

CATCH BASIN INLET PROTECTION
(STRAW BALES)

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A30

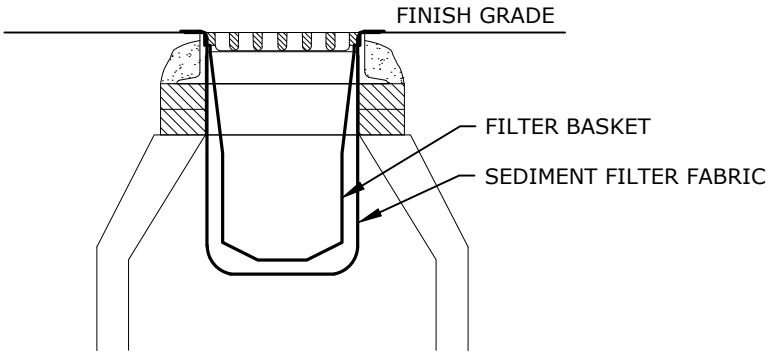
EVERSOURCE



PLAN VIEW

NOTES:

1. FILTER BASKET SHALL BE "SILT SAK" BY JENNIAN, MELROSE, MA; "DANDY BAG" BY DANDY PRODUCTS (1-800-591-2284); DRAIN PAC (91-800-272-2832); OR APPROVED EQUIVALENT SUBJECT TO CONSULTATION WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING.
2. FILTER BASKETS SHOULD BE USED IN COMBINATION WITH ANOTHER INLET PROTECTION MEASURE SUCH AS SEDIMENT FILTER FABRIC IF DRAINAGE AREA IS SMALL WITH SHALLOW FLOWS.



ELEVATION VIEW

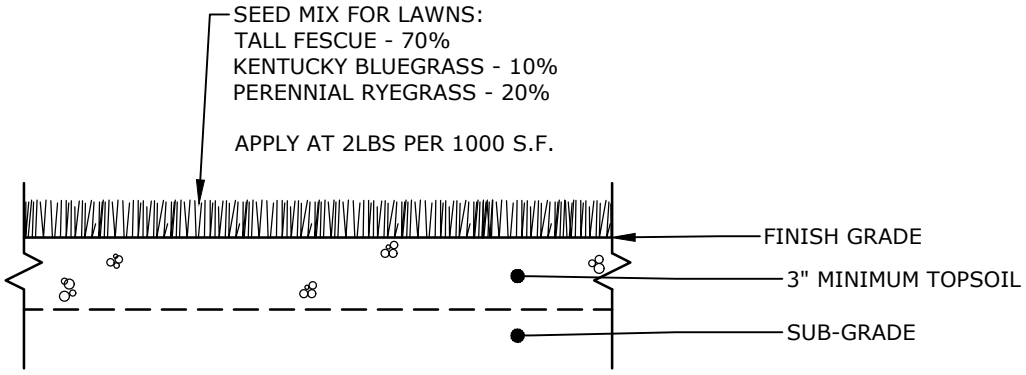
CATCH BASIN INLET PROTECTION
(SILT SACK)

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A31

EVERSOURCE

NOTE:

THE SEED MIX UTILIZED SHALL CONSIST OF QUICK GROWING, DROUGHT TOLERANT, NATIVE GRASSES, SUCH AS RYES. THE SEED MIX UTILIZED WITHIN THE BUFFER ZONE TO WETLAND RESOURCE AREAS MAY CONSIST OF QUICK GROWING, DROUGHT TOLERANT, NATIVE GRASSES BUT MUST CONTAIN AT LEAST 50% OF A NATIVE SEED MIX WITH HIGH HABITAT VALUE, SUCH AS ONES WHICH CONTAIN PERENNIAL SHRUBS, WILDFLOWERS. CONSULT WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING FOR PROJECT SPECIFIC REQUIREMENTS.



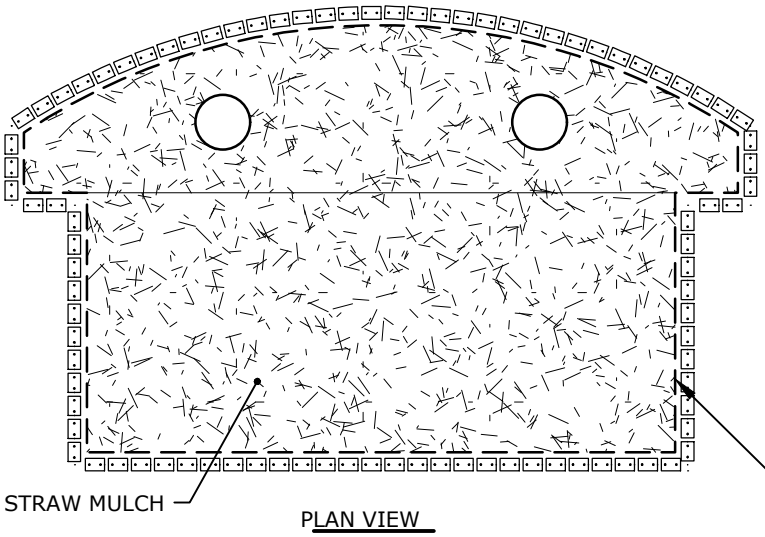
LOAM AND SEED

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A32

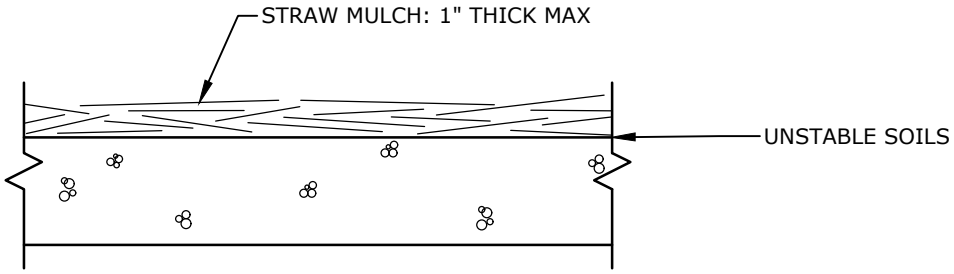
EVERSOURCE

NOTES:

1. STRAW PRODUCTS ONLY; THE USE OF HAY OR HAY PRODUCTS IS STRICTLY PROHIBITED.
2. MULCH APPLICATION SHALL NOT EXCEED 1" IN THICKNESS.
3. WOOD CHIPS MAY BE SUBSTITUTED FOR STRAW MULCH SUBJECT TO EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING APPROVAL.
4. CONSULT WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING FOR PROJECT SPECIFIC REQUIREMENTS.



PLAN VIEW

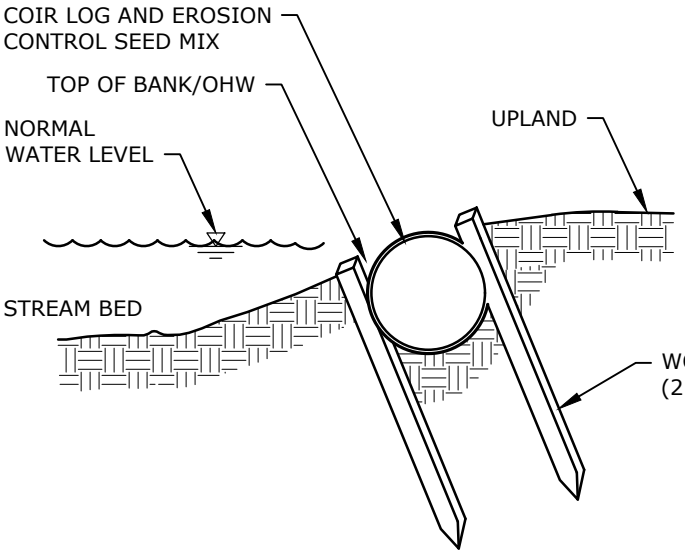


ELEVATION VIEW

STRAW MULCH

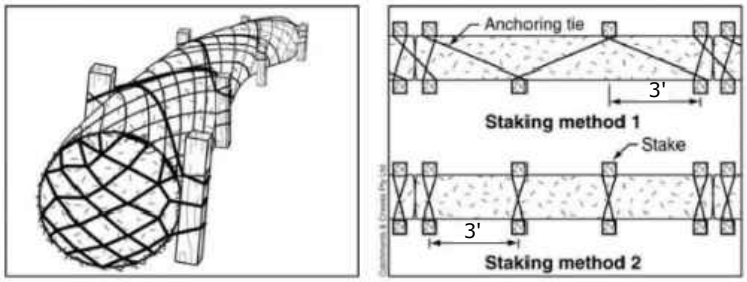
DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A33

EVERSOURCE



NOTES:

1. USE OF PRODUCTS WITH PLASTIC AND/OR NYLON NETTING IS PROHIBITED.
2. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
3. INSTALLATION MAY INCLUDE SEEDING AND/OR OTHER NATIVE PLANT INSTALLATION. CONSULT EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING.

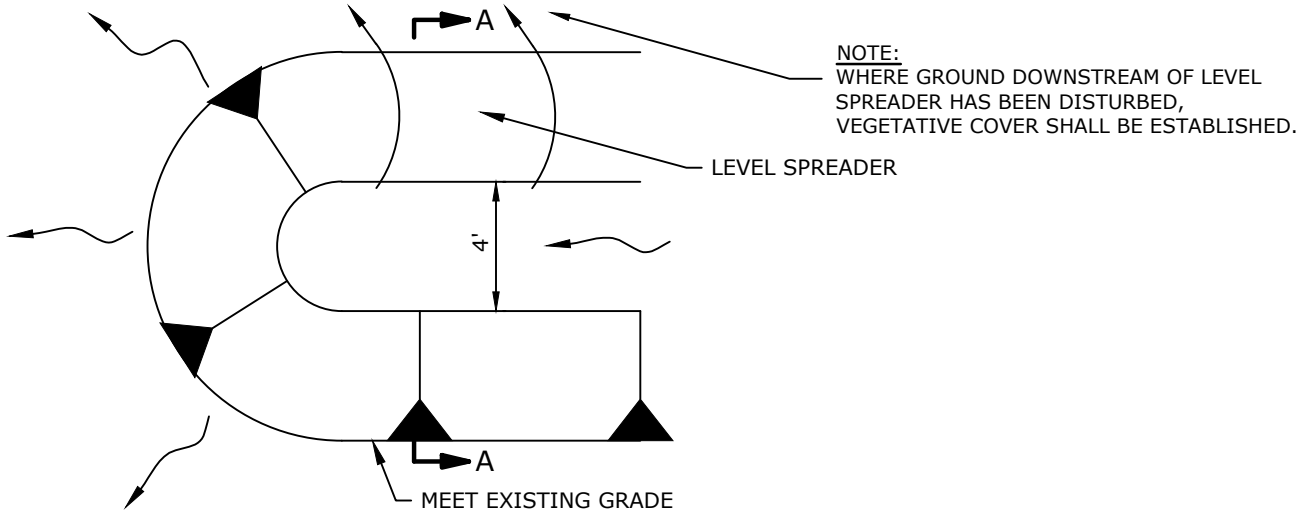


TYPICAL STAKING

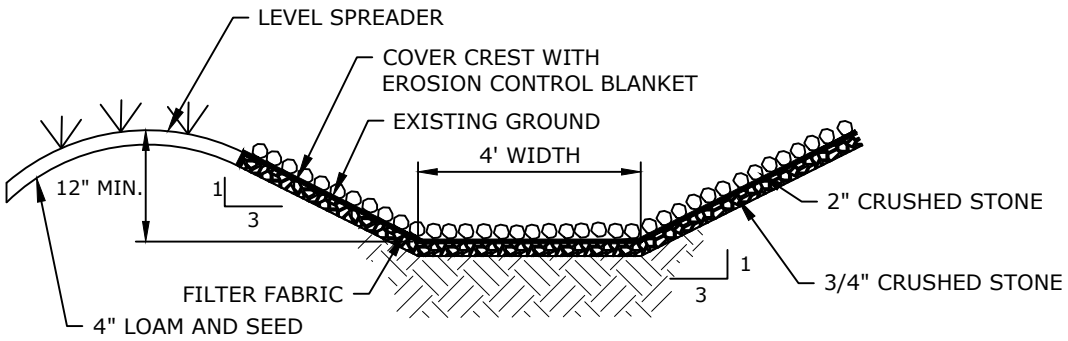
COIR LOG

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A34

EVERSOURCE



PLAN VIEW

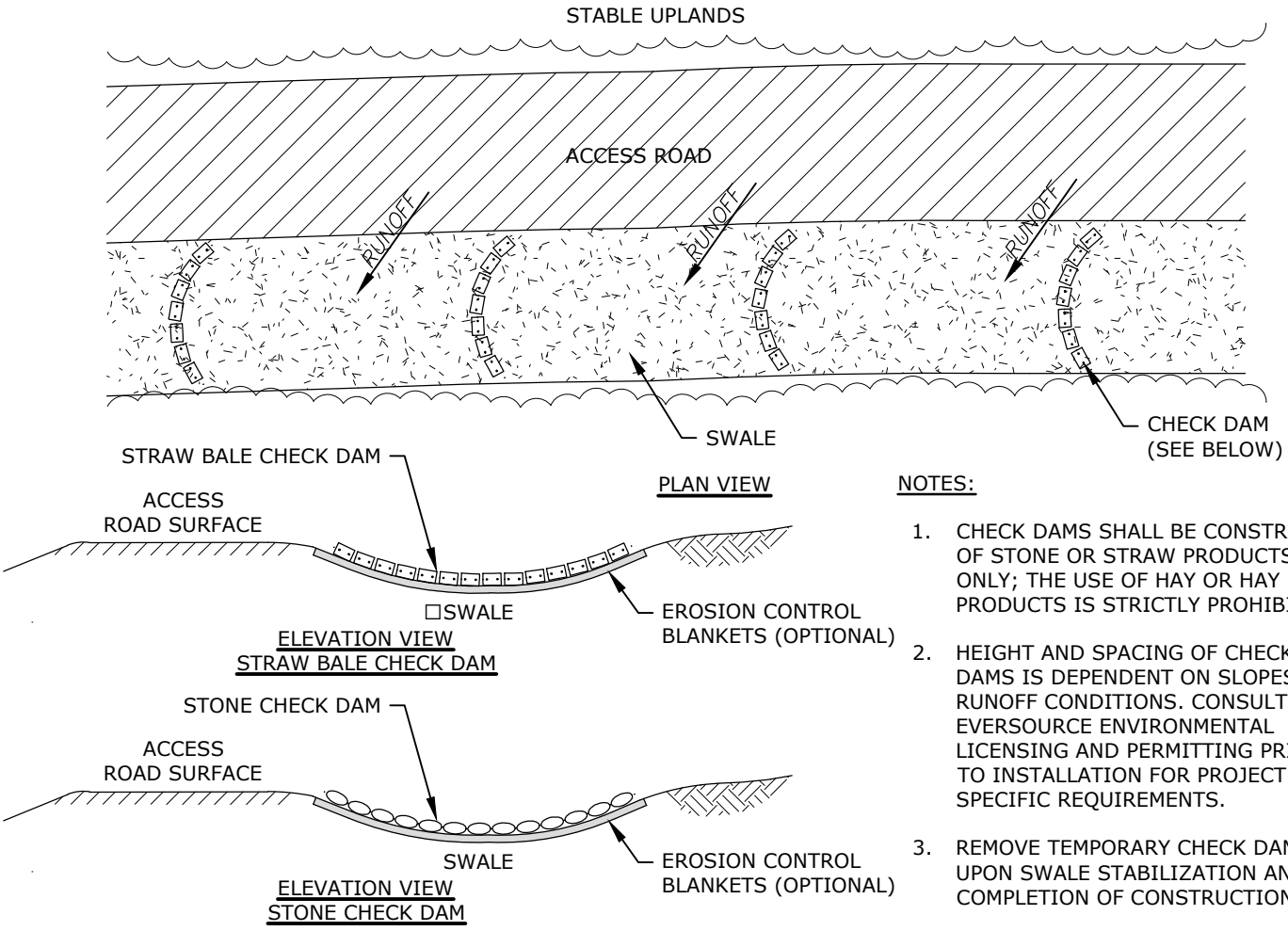


SECTION A-A

LEVEL SPREADER

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A35

EVERSOURCE



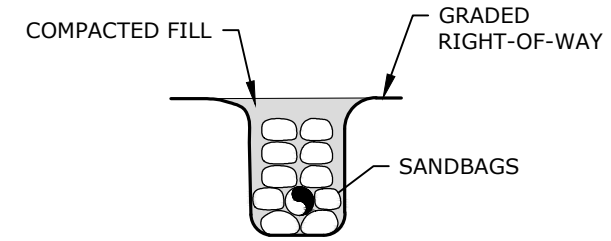
NOTES:

1. CHECK DAMS SHALL BE CONSTRUCTED OF STONE OR STRAW PRODUCTS ONLY; THE USE OF HAY OR HAY PRODUCTS IS STRICTLY PROHIBITED.
2. HEIGHT AND SPACING OF CHECK DAMS IS DEPENDENT ON SLOPES AND RUNOFF CONDITIONS. CONSULT WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING PRIOR TO INSTALLATION FOR PROJECT SPECIFIC REQUIREMENTS.
3. REMOVE TEMPORARY CHECK DAMS UPON SWALE STABILIZATION AND/OR COMPLETION OF CONSTRUCTION.

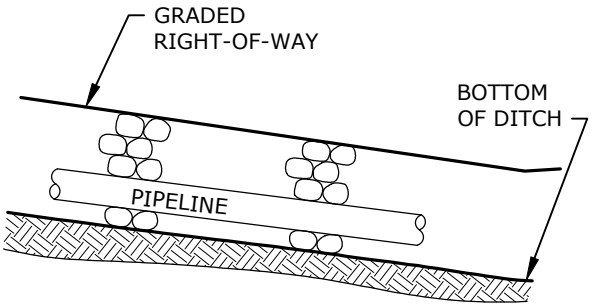
CHECK DAMS

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A36

EVERSOURCE

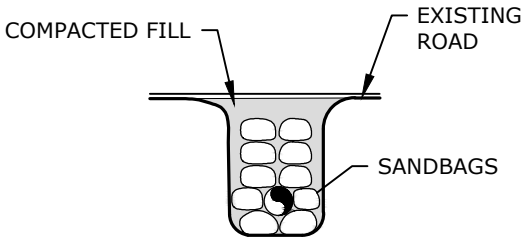


SECTION

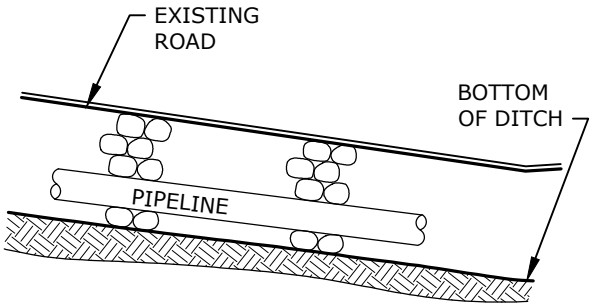


ELEVATION

CROSS-COUNTRY BURIED PIPELINE



SECTION



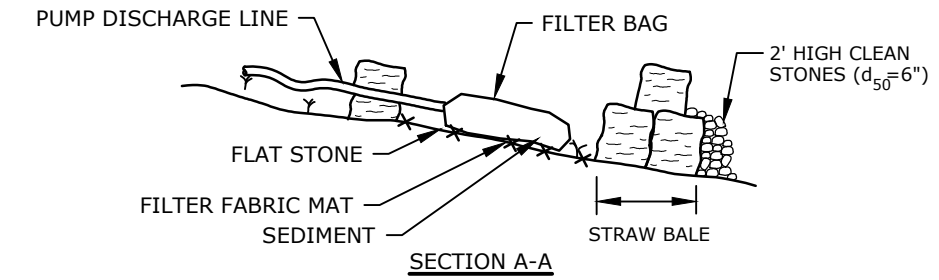
ELEVATION

IN-ROAD BURIED PIPELINE

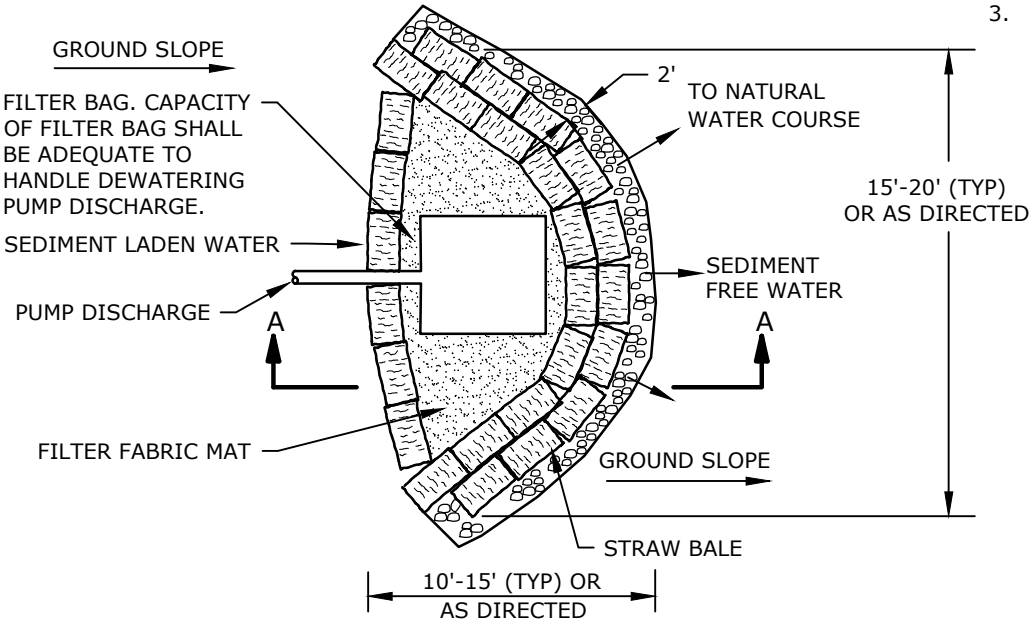
TRENCH BREAKER

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A37

EVERSOURCE



SECTION A-A



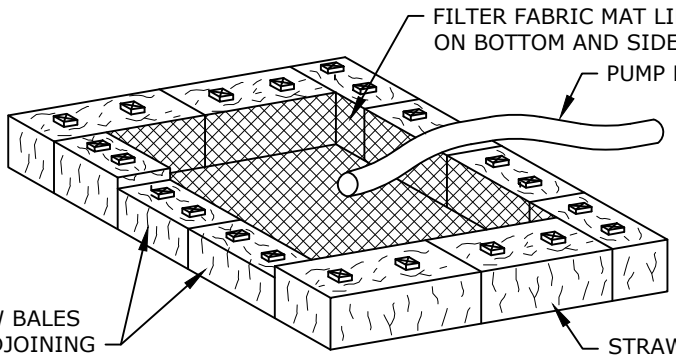
NOTES:

1. LOCATION OF SEDIMENT TRAP SUBJECT TO CONSULTATION WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING.
2. SEDIMENT TRAPS OR SETTLING BASINS SHALL BE USED FOR CONSTRUCTION DEWATERING.
3. DISCHARGE AWAY FROM WORK AREA/DEWATERING AREA.

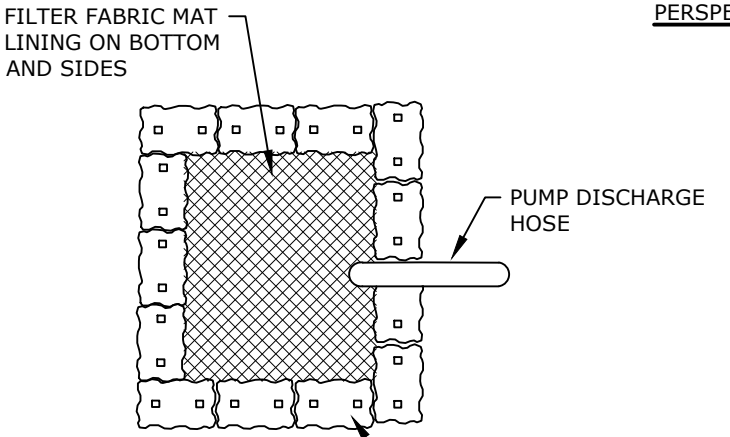
SEDIMENT TRAP

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A38

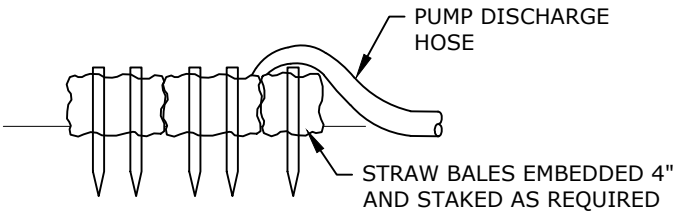
EVERSOURCE



PERSPECTIVE



PLAN VIEW



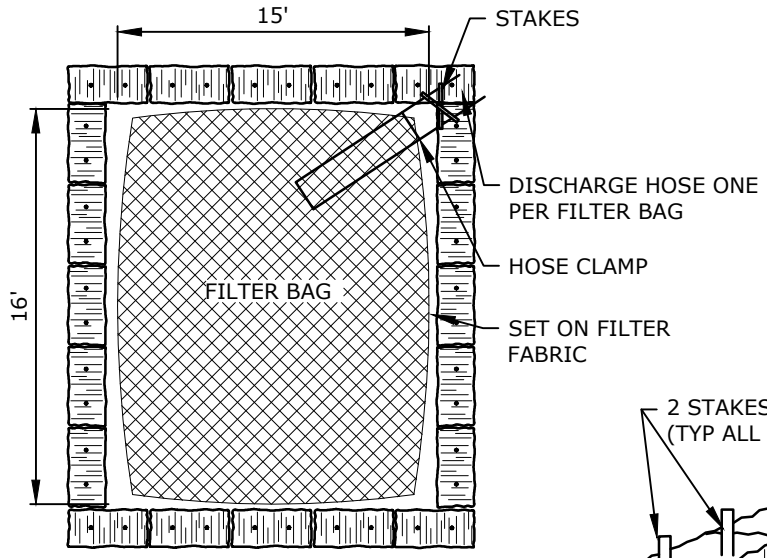
SECTION

NOTE:
PLACE DEWATERING/PUMPING SETTLING BASINS IN A WELL-VEGETATED AREA, OUTSIDE OF WETLANDS WHENEVER PRACTICABLE.

DEWATERING BASIN

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A39

EVERSOURCE

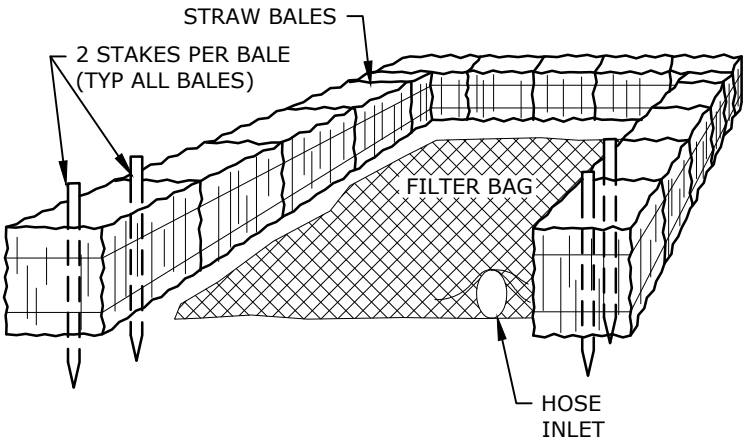


PLAN

SECTION

NOTE:

PLACE FILTER BASINS IN A WELL-VEGETATED AREA, OUTSIDE OF WETLANDS WHENEVER PRACTICABLE.

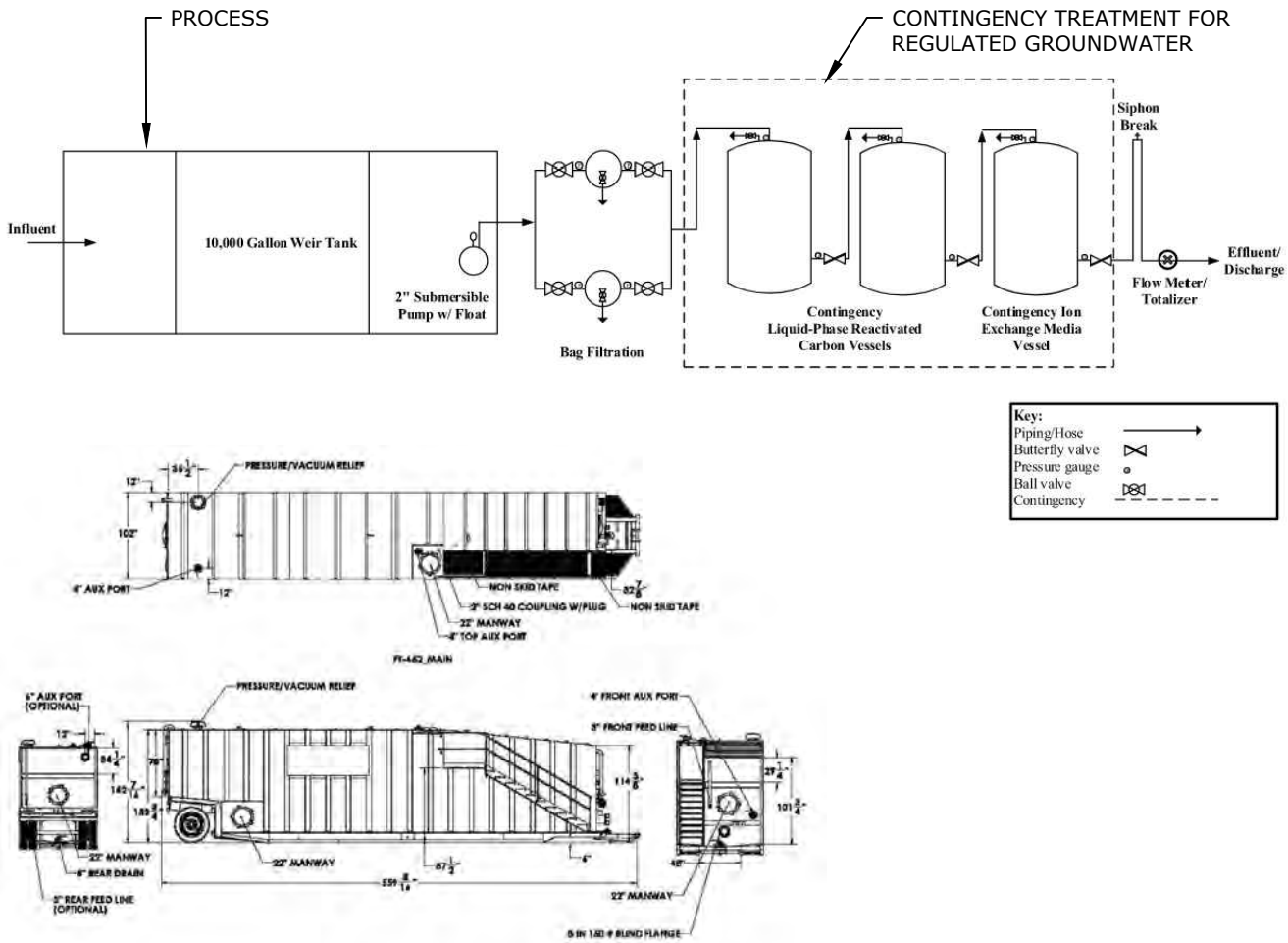


PERSPECTIVE

DEWATERING BASIN
(FILTER BAG)

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A40

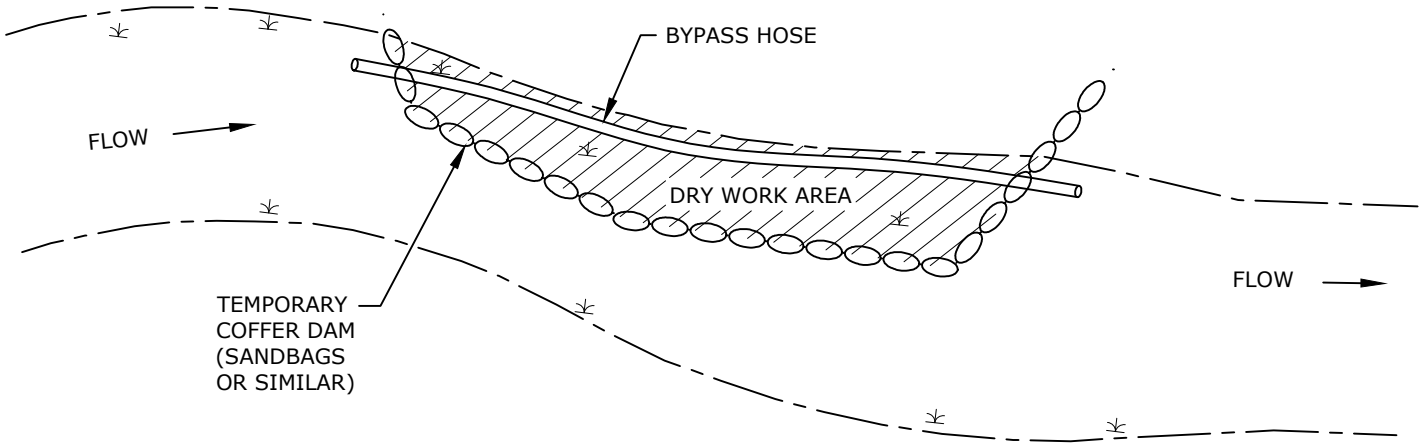
EVERSOURCE



DEWATERING BASIN
(FRAC TANK)

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A41

EVERSOURCE

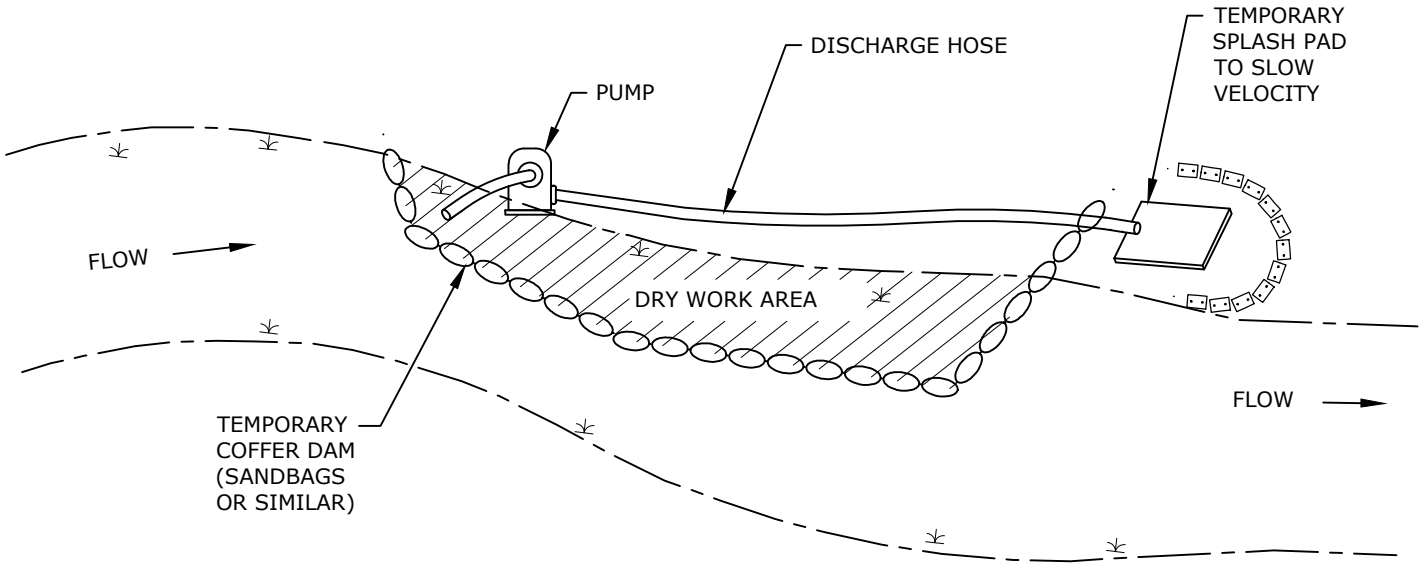


PLAN VIEW - GRAVITY COFFER DAM

COFFER DAM AND STREAM
FLOW BYPASS (GRAVITY)

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A42

EVERSOURCE



PLAN VIEW - PUMP COFFER DAM

COFFER DAM AND STREAM
FLOW BYPASS (PUMPING)

DATE:	12/2021
SCALE:	NO SCALE
FIGURE:	A43

EVERSOURCE

APPENDIX B

Appendix B

Appendix B

B.1 Applicable Laws / Regulations

In Connecticut, there are no fewer than eight potentially pertinent regulatory programs associated with activities proposed in environmentally sensitive areas. The following list of laws and regulations are most likely to apply to electrical utility projects in the State.

- Connecticut Inland Wetlands and Watercourses Act (C.G.S. §§ 22a-36 through 22a-45a)
- Municipal inland wetland and zoning regulations
- Connecticut General Permit for Water Resource Construction Activities (C.G.S. §§ 22a-6, 22a-45a and 22a-378a)
- Connecticut Environmental Policy Act (C.G.S. §§ 22a-1a through 22a-1h)
- Connecticut Coastal Management Act (C.G.S. §§ 22a-359 through 22a-363; 22a-28 through 22a-35; 22a-90 through 22a-112; 33 U.S.C. § 1314)
- Connecticut Water Diversion Policy Act (C.G.S. §§ 22a-365 through 22a-379)
- Connecticut Endangered Species Act (C.G.S. §§ 26-303 through 26-315)
- Section 10 of the Rivers and Harbors Act of 1899 (C.G.S. §§ 22a-426; 33 U.S.C. § 403)
- Section 401 of the Clean Water Act (33 U.S.C. § 1251)
- Section 404 of the Clean Water Act (33 U.S.C. § 1344)

B.2 Geographic Areas Subject to Jurisdiction

The following areas are subject to regulatory jurisdiction by at least one of the regulatory programs discussed in this section: It is important to note that more than one jurisdictional resource type may be present at any given location.

- Inland wetlands, watercourses (rivers, streams, lakes, ponds), and floodplains
- Areas subject to municipal wetlands bylaws or ordinances (these vary by town)
- Coastal Resource Areas (beaches, dunes, bluffs, escarpments, coastal hazard areas, coastal waters, nearshore waters, offshore waters, estuarine embayments, developed shorefront, intertidal flats, islands, rocky shorefronts, shellfish concentration areas, shorelands, and tidal wetlands)
- Navigable waters
- Essential Fish Habitat (EFH)
- Rare species habitat as mapped by the Connecticut Natural Diversity Database (NDDB)
- Historic/cultural Resources including archaeological resources and above-ground historic resources

B.3 Applicable Regulatory Agencies

Activities subject to jurisdiction under the above-referenced programs will generally be subject to review by one or more regulatory agencies (refer to list below). Most stream and wetland crossings will require notification or consultation with municipal Inland Wetland and Watercourses Agencies, and may require permitting with the U.S. Army Corps of Engineers (ACOE) and Connecticut Department of Energy & Environmental Protection (CT DEEP) under Sections 404 and 401 of the Clean Water Act. Coordination with CT DEEP may also be required for projects located within areas mapped by the Connecticut Natural Diversity Database.

- Municipal Conservation Commissions
- Connecticut Department of Energy & Environmental Protection (CT DEEP) Land and Water Resources Division (LWRD)
- CT DEEP Wildlife Division
- CT DEEP Office of Environmental Review
- United States Army Corps of Engineers (ACOE) New England District
- CT State Historic Preservation Office (CT SHPO)

The State of Connecticut and the Federal Government define wetlands differently. According to the Inland Wetlands and Watercourses Act, inland wetlands are defined as "land, including submerged land, not regulated pursuant to Sections 22a-28 through 22a-35 of the Connecticut General Statutes, as amended, which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soil Survey, as it may be amended from time to time by the United States Department of Agriculture Natural Resource Conservation Service. Such areas may include filled, graded, or excavated sites which possess an aquic (saturated) soil moisture regime as defined by the National Cooperative Soil Survey." State wetland identification is based solely on the presence of these soil types.

"Watercourses" means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon this state or any portion thereof. Intermittent watercourses shall be delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (A) Evidence of scour or deposits of recent alluvium or detritus, (B) the presence of standing or flowing water for a duration longer than a particular storm incident, and (C) the presence of hydrophytic vegetation.

The Federal Government defines wetlands as "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Federal wetland identification is based on a three-parameter approach, where a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrology is used to make a wetland determination.

B.4 Maintenance, Repair, or Emergency Projects

Most regulatory programs contain provisions that allow normal maintenance of existing structures and/or response to emergency situations that require immediate attention.

Prior to commencement of new construction, all jurisdictional wetland areas within the work corridor should be delineated by a qualified wetland and soil scientist. The specialist shall delineate areas in accordance with the General Statutes of Connecticut (revised January 1, 2007) as set forth at Title 22a Chapter 440 "Inland Wetlands and Watercourses Act", the U.S. Army Corps of Engineers 1987 Wetland Delineation Manual, and any local inland wetland regulations, ordinances or bylaws that may exist. Refer to each set of regulations regarding applicable wetland definitions. Wetland areas shall be clearly demarcated using appropriate flagging tape or similar means. It is important to note that certain jurisdictional wetland areas in Connecticut can actually occur in uplands, such as floodplains. In addition, Upland Review Areas generally apply to work activities and vary in each community. This makes consultation with a wetland specialist particularly important.

B.4.1 Maintain, Repair and/or Replace

Exemptions or considerations for maintenance, repair, and/or replacement of existing electrical utility structures exist in some environmental regulations, but not all. The exemptions are limited to work related to existing and lawfully located structures where no change in the original structure or footprint is proposed. It is not for the selected contractor of a particular project to make a determination as to whether an activity is exempt. This determination will be made prior to work by the Eversource project manager, in consultation with Eversource environmental staff.

These exemptions/considerations are afforded at:

- CT Inland Wetlands & Watercourses Act (RCSA § 22a-39-4)
- CT General Permit (Section 3)
- CT Coastal Management Act (RCSA § 22a-363b)
- CT GP [33 CFR 323.4(a)(2)]
- CT Water Diversion Policy Act (RCSA § 22a-377(b)1)

B.4.2 Emergency Projects

Emergency provisions are generally afforded to activities that need to abate conditions that pose a threat to public health or safety. These provisions generally do not allow work beyond what is necessary to abate the emergency condition and will generally require an after-the-fact permit. It is not for the selected contractor of a particular project to make a determination as to whether an activity is an emergency. This determination will be made prior to work by the Eversource project manager, in consultation with Eversource Environmental Licensing and Permitting.

It is important to note that invocation of an emergency provision does not release the project proponent from reporting requirements.

Emergency provisions are afforded at:

- CEPA (RCSA § 22a-1a-3)
- CT Coastal Management Act (RCSA § 22a-29)
- CT GP [33 CFR Part 323.4(a)(2)]

B.5 Municipal Permitting

Work within wetlands, watercourses and designated Upland Review Areas typically requires notification to municipal staff, (Department of Public Works and/or the Inland Wetland and Watercourse Agency staff). In October 1996 the Connecticut Department of Public Utility Control opened a docket (Docket Number 95-08-34) to conduct a generic investigation on the allocation of siting jurisdiction over utility plant facilities. This included an investigation as to whether local authorities (including local Inland Wetlands and Watercourses Agencies) have jurisdiction over public utility projects.

The investigation resulted in several orders which provide guidance on how public utility companies should coordinate with municipalities on the construction of new facilities, upgrades, significant maintenance activities, and routine maintenance activities.

- For the construction of new facilities, alterations to existing facilities (including upgrades) or significant maintenance involving substantial disturbance of soil, water or vegetation which would regularly fall under the review requirements of certain local authorities (ie. Planning and Zoning Authority; Inland Wetlands Commission; Public Works Department; Historic District Commission), the utility shall at least notify and consult with such local authority, or its designated agent or staff, toward the development of mutually agreeable schedules and procedures for the proposed activity.
- For routine maintenance activities or alterations to existing facilities (including upgrades) involving minor disturbance of soil, water or vegetation which would regularly fall under the review and approval requirements of certain local authorities, the utility shall make local authorities or their designated agent or staff aware of such ongoing activities.

B.6 CT Department of Energy & Environmental Protection

If the project requires formal permitting with the ACOE (Pre-Construction Notification (PCN) or Individual Permit), copies of the application should be forwarded to CT DEEP for review under Section 401 of the Clean Water Act. The CT DEEP requires that a GP Addendum form be completed and submitted along with the ACOE application. If the project qualifies for Self-Verification Notification (SVNF) under the ACOE GP, the project also is granted authorization (Water Quality Certification, WQC) with no formal application under Section 401 of the Clean Water Act, provided the project meets the additional WQC general conditions. The general conditions commonly applicable to utility projects include:

- Prohibiting dumping of any quantity of oil, chemicals, or other deleterious material on the ground;
- Immediately informing the CT DEEP Oil and Chemical Spill Response Division at (860) 424-3338 (24 hours) of any adverse impact or hazard to the environment including any discharge or spillage of oil or chemical liquids or solids;
- Separating staging areas at the site from the regulated areas by silt fences or stray/hay bales at all times;
- Prohibiting storage of any fuel and refueling of equipment within 25 feet from any wetland or watercourse;
- Following the document "Connecticut Guidelines for Soil and Erosion Control," inspecting employed controls at least once per week, after each rainfall, and at least daily during prolonged rainfall, and correcting any deficiencies within 48 hours of being found.

- Prohibiting the storage of any materials at the site which are buoyant, hazardous, flammable, explosive, soluble, expansive, radioactive, or which could in the event of a flood be injurious to human, animal or plant life, below the elevation of the
- 500 year flood. Any other material or equipment stored at the site below this elevation must be firmly anchored, restrained or enclosed to prevent flotation. The quantity of fuel for equipment at the site stored below such elevation shall not exceed the quantity of fuel that is expected to be used by such equipment in one day.
- Immediately informing CT DEEP at (860) 424-3019 and the ACOE at (617) 647-8674 of the occurrence of pollution or other environmental damage in violation of the WQC, and within 48 hours support a written report including information specified in the general conditions.

If the project falls within areas mapped by the Connecticut Natural Diversity Database, or is less than 0.50 miles upstream or downstream of a mapped area, a data request and possible coordination will be required with the Natural Diversity Database.

If a project is located within tidal, coastal or navigable waters of the state or in tidal wetlands, permitting may be required with the CT DEEP LWRD. For the routine maintenance of previously permitted structures or structures that were in place prior to June 24, 1939, no permitting is required. For significant maintenance of previously permitted structures or structures that were in place prior to June 24, 1939, a Certificate of Permission is required. For new projects a Structures, Dredging and Fill Permit and/or a Tidal Wetlands Permit may be required. The CT DEEP LWRD should be consulted prior to preparing permits to conduct a pre-application meeting and determine the appropriate permitting route.

B.7 U.S. Army Corps of Engineers

Work within wetlands and waters of the United States is subject to jurisdiction under Section 404 of the Clean Water Act, which is administered by the ACOE. Work within navigable waters is also administered by the ACOE under Section 10 of the Rivers and Harbors Act of 1899. The ACOE has issued Department of the Army General Permits for the State of Connecticut and Land Located within the Boundaries of an Indian Reservation (CT GPs) which establishes categories for projects based on their nature of impacts. The current permit was issued on December 15, 2021, and expires on December 15, 2026.

Applications are not required for Self-Verification (SV) projects, but submittal of a Self-Verification Notification Form (SVNF) before the work occurs and submittal of a Compliance Certification Form within one month after the work is completed is required. The SVNF and Compliance Certification Form entail self-certification by applicants that their project complies with the terms and conditions of SV under the CT GPs. Pre-Construction Notification (PCN) projects require the submittal of an application to the ACOE, followed by a screening of the application by the ACOE, the U.S. Fish and Wildlife Service (USFWS), U.S. Environmental Protection Agency (US EPA), National Marine Fisheries Service (NMFS) and CT DEEP, and consultation with the Connecticut Commission on Culture and Tourism and Tribal Historic Preservation Officers (THPOs). PCN projects may not proceed until written approval from the ACOE is received. Written approval is generally provided within 45 days of the multi-agency screening. After written approval is received, a Work-Start Notification Form must be submitted before the work occurs, and a Compliance Certification Form must be submitted within one month after the work is completed.

For work proposed within a FEMA floodway or floodplain, the ACOE recommends that the applicant apply for and receive a Flood Management Certification (if required), prior to applying to the ACOE. Additionally, applications for PCN inland projects that propose fill in ACOE jurisdiction must include an Invasive Species Control Plan (ISCP), unless otherwise directed by the ACOE.

An Individual Permit (IP) requires a formal permit application to be submitted to the ACOE. The application is reviewed in detail by both state and federal agencies, and a Public Notice is released for public comment. Projects which trigger an IP generally result in significant impacts to wetlands and/or watercourses.

Stream and wetland crossings are only subject to jurisdiction under the ACOE if there is **a discharge of dredge or fill material into wetlands or waters of the United States**. Equipment access through a stream or wetland with no structural BMP is not regulated by the ACOE if there is no discharge of dredge or fill material (note that equipment rutting as a result of not using an appropriate BMP can be considered a "discharge of dredge material"). Similarly, the use of a timber or rail car bridge that extends from bank to bank with no stream impacts is not regulated by the ACOE. Additionally, the use of timber mats and stone is considered "fill material" by the ACOE, and must be calculated to determine overall impacts. Temporary mats are not counted towards the 1-acre PCN threshold if they are adequately cleaned after previous use, removed immediately after completion of construction and disposed of at an upland site.

Maintenance, including emergency reconstruction of currently serviceable structures, is exempt from ACOE jurisdiction and does not require formal permitting. Maintenance does not include any modification that changes the character, scope, or size of the original fill design. Emergency reconstruction must occur within a reasonable period of time after damage occurs to qualify for this exemption.

Stream and wetland crossings that involve the discharge of dredge and fill material may be conducted under SV if the work complies with the general conditions and SV criteria of the CT GPs. The following are SV criteria that are commonly applicable to stream and wetland crossings in utility rights of way. See Section 1.8 for additional criteria for culvert crossings:

- The work results in less than 5,000 square feet of impacts to wetlands or Waters of the United States. Replacement of utility line projects with impacts solely within wetlands greater than 5,000 square feet may be eligible for SV Authorization after consultation with the ACOE about the specific project;
- Temporary fill, with the exceptions of swamp and timber mats, discharged to wetlands shall be placed on geotextile fabric laid on the pre-construction wetland grade. Unconfined temporary fill discharged into flowing water (rivers and streams) shall consist only of clean stone. All temporary fill shall be removed as soon as it is no longer needed, and disposed of at an appropriate upland site.
- Any unconfined in-stream work, including construction, installation or removal of sheet pile cofferdam structures, is conducted during the low-flow period between July 1 and September 30. However, installation of coffer dams, other than sheet pile cofferdams, is not restricted to the low-flow period and must be installed between July 1 and March 31 and must not encroach > 25% of the stream width measured from OHW during the prohibited work window;
- No work will occur in the main stem or tributary streams of the Connecticut River watershed that are being managed for Atlantic salmon (*Salmo salar*). (Work of this

nature requires screening for potential impacts to designated Essential Fish Habitat.);

- The work does not result in direct or secondary impacts to Special Wetlands, Threatened, Endangered or Special Concern Species, or Significant Natural Communities identified by the Connecticut Natural Diversity Database. Work within 750 feet of vernal pools shall be minimized;
- The project does not require an ACOE permit with associated construction activities within 100 feet of Special Wetlands;
- The project does not result in fill placed within a FEMA established floodway, unless the applicant has a State of Connecticut Flood Management Certification pursuant to Section 25-68d of the Connecticut General Statutes;
- The project does not result in fill placed within a FEMA established floodplain that would adversely affect the hydraulic characteristics of the floodplain;
- The project does not entail stormwater detention or retention in inland waters or wetlands;
- The project is not located in a segment of a National Wild and Scenic River System (includes rivers officially designated by Congress as active study status rivers for possible inclusion) or within 0.25 miles upstream or downstream of the main stem or tributaries to such a system;
- The project has no potential for an effect on a historic property which is listed or eligible for listing in the National Register of Historic Places;
- The project does not impinge upon the value of any National Wildlife Refuge, National Forest, or any other area administered by the U.S. Fish and Wildlife Service, U.S. Forest Service or National Park Service;
- Section 106 needs to be taken into account for all work that requires federal permitting – including SV;
- The project does not use slip lining, plastic pipes, or High Density Polyethylene Pipes (HDPP).
- Appropriate BMPs are employed in regard to heavy equipment in wetlands (General Condition 16) and sedimentation and erosion controls (General Condition 20).
- Disturbed inland wetland areas are restored in accordance with General Condition 18.

Stream and wetland crossings that involve the discharge of dredge and fill material may be conducted under PCN if the work complies with the general conditions and PCN criteria of the CT GPs. The following are PCN criteria that are commonly applicable to stream and wetland crossings in utility ROWs. See Section 1.8 for additional criteria for culvert crossings:

- The work results in less than one acre of impacts to wetlands or Waters of the United States;
- The project does not result in fill placed within a FEMA established floodplain that would adversely affect the hydraulic characteristics of the floodplain;
- The project does not entail stormwater detention or retention in inland waters or wetlands.
- Temporary fill, with the exceptions of swamp and timber mats, discharged to

wetlands shall be placed on geotextile fabric laid on the pre-construction wetland grade. Unconfined temporary fill discharged into flowing water (rivers and streams) shall consist only of clean stone. All temporary fill shall be removed as soon as it is no longer needed, and disposed of at an appropriate upland site.

- Appropriate BMPs are employed in regard to heavy equipment in wetlands (General Condition 16) and sedimentation and erosion controls (General Condition 20).
- Disturbed inland wetland areas are restored in accordance with General Condition 18.

Stream and wetland crossings that cannot meet SV or PCN criteria may require review under an IP. The ACOE should be consulted before assuming an IP will be required, as exceptions can be made under certain circumstances.

GP1. Aids to navigation & temporary recreational structures (Coastal only)
GP2. Repair or maintenance of existing currently serviceable, authorized or grandfathered structures/fills and removal of structures (Coastal and Inland)
GP3. Moorings *(Coastal only)*
GP4. Pile-supported structures & floats, including boat lifts/hoists & other miscellaneous structures & work *(Coastal only)*
GP5. Boat ramps and marine railways *(Coastal and Inland)*
GP6. Utilities including lines, outfall and intake structures and appurtenant structures (Coastal and Inland)
GP7. Dredging, transport & disposal of dredged material, beach nourishment & rock removal and rock relocation *(Coastal only)*
GP8. Discharges of dredged or fill material incidental to the construction of bridges *(Coastal only)*
GP9. New shoreline and bank stabilization projects and Living Shorelines *(Coastal and Inland)*
GP10. Aquatic habitat restoration, establishment and enhancement activities *(Coastal and Inland)*
GP11. Fish and wildlife harvesting activities *(Coastal and Inland)*
GP12. Oil spill and hazardous material response operations *(Coastal and Inland)*
GP13. Cleanup of hazardous and toxic waste and removal of contaminated soil *(Coastal and Inland)*
GP14. Scientific measurement and monitoring devices *(Coastal and Inland)*
GP15. Survey and exploratory survey activities *(Coastal and Inland)*
GP16. Aquaculture & Mariculture Activities *(Coastal only)*
GP17. New and expansion of recreational, residential, institutional, and commercial developments *(Inland only)*
GP18. Wetland crossings for linear transportation projects (Inland only)
GP19. Stream, river and brook crossings (not including wetland crossings) (Coastal and Inland)
GP20. Energy generation and renewable energy generation facilities and hydropower projects *(Coastal and Inland)*
GP21. Temporary fill not associated with a regulated General Permit activity *(Inland only)*

GP22. Modification and Improvement of Existing Minor drainage features and Mosquito Control *(Coastal only)*

GP23. Agricultural Activities *(Inland only*)

B.8 Culvert Installation

New culvert installation or existing culvert replacements will require notification or consultation with municipal staffers which might include the Department of Public Works and/or the inland wetlands officer, and may require permitting with the ACOE under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act of 1899, and the CT DEEP under Section 401 of the Clean Water Act. Coordination with CT DEEP may also be required for projects located within areas mapped by the Connecticut Natural Diversity Database. For work within tidal, coastal or navigable waters or in tidal wetlands, permitting will be required with the CT DEEP LWRD.

B.8.1 Municipal Permitting

See Section 1.5 for general local permitting guidance.

- For the installation of new culverts and the replacement of culverts that involve substantial disturbance of soil, water or vegetation which would regularly fall under the review and approval requirements of certain local authorities (i.e., Planning and Zoning Authority; Inland Wetlands Commission; Public Works Department; Historic District Commission), the utility shall at least notify and consult with such local authority, or its designated agent or staff, toward the development of mutually agreeable schedules and procedures for the proposed activity.
- For the replacement of culverts involving only minor disturbance of soil, water or vegetation which would regularly fall under the review and approval requirements of certain local authorities, the utility shall make local authorities or their designated agent or staff aware of such ongoing activities.

B.8.2 CT Department of Energy & Environmental Protection

If the project requires formal permitting with the ACOE, copies of the application should be forwarded to CT DEEP for review under Section 401 of the Clean Water Act. CT DEEP requires that a PGP Addendum form be completed and submitted along with the ACOE application.

If a culvert project falls within areas mapped by the Connecticut Natural Diversity Database or falls within 0.50 miles upstream or downstream of a mapped area, a data request and possible coordination will be required with the Natural Diversity Database.

If a culvert project is located within tidal, coastal or navigable waters of the state or in tidal wetlands, permitting will be required with the CT DEEP LWRD. For new projects a Structures, Dredging and Fill Permit and/or a Tidal Wetlands Permit will be required. For replacement structures which were previously permitted, or which were in place prior to June 24, 1939, a Certificate of Permission may only be required, which entails a shorter permitting process.

B.8.3 U.S. Army Corps of Engineers

See Section 1.7 for general ACOE permitting requirements. Open bottom arches, bridge spans or embedded culverts are preferred over traditional culverts and are required for SV projects. However, where site constraints make these approaches impractical, the ACOE should be consulted.

New bridge or open-bottom structure crossings may be conducted under SV or PCN if the following criteria are met in addition to meeting any applicable general criteria listed in section 1.7 of this manual:

- The work spans at least 1.2 times the watercourse bank full width;

- The structure has an openness ratio equal to or greater than 0.25 meters;
- The structure allows for continuous flow of the 50-year frequency storm flows.

New culvert installations may be conducted under SV if the work complies with the general conditions and SV criteria of the CT GPs. The following are SV criteria that are commonly applicable to new culvert installations in utility right of ways:

- Work is conducted in accordance with the design requirements listed in Section 3.1.3 of the BMP Manual; Plastic and High Density Polyethylene Pipes (HDPE) are not used;
- The work results in less than 5,000 square feet of impacts to wetlands or Waters of the United States;
- Any unconfined in-stream work, including construction, installation or removal of sheet pile coffer dam structures, is conducted during the low-flow period between July 1 and September 30, except in instances where a specific written exception has been issued by the Connecticut Department of Energy & Environmental Protection. However, installation of coffer dams, other than sheet pile coffer dams, is not restricted to the low-flow period;
- No open trench excavation is conducted within flowing waters. Work within flowing waters can be avoided by using temporary flume pipes, culverts, coffer dams, etc. to isolate work areas and maintain normal flows;
- The tributary watershed to the culvert does not exceed 1.0 square mile (640 acres);
- The culvert gradient (slope) is not steeper than the streambed gradient immediately upstream or downstream of the culvert;
- For a single box or pipe arch culvert crossing, the inverts are set not less than 12 inches below the streambed elevation;
- For a multiple box or pipe arch culvert crossing, the inverts of one of the boxes or pipe arch culverts are set not less than 12 inches below the elevation of the streambed;
- For a pipe culvert crossing, the inverts are set such that not less than 25% of the pipe diameter or 12 inches, whichever is less, is set below the streambed elevation;
- The culvert is backfilled with natural substrate material matching upstream and downstream streambed substrate;
- The structure does not otherwise impede the passage of fish and other aquatic organisms;
- The structure allows for continuous flow of the 50-year frequency storm flows;
- The work does not result in direct or secondary impacts to Special Wetlands, Threatened, Endangered or Special Concern Species, or Significant Natural Communities identified by the Connecticut Natural Diversity Database. Work within 750 feet of vernal pools shall be minimized;
- The project does not require an ACOE permit with associated construction activities within 100 feet of Special Wetlands;
- The project does not result in fill placed within a FEMA established floodway, unless the applicant has a State of Connecticut Flood Management Certification pursuant to section 25-68d of the Connecticut General Statutes;

- The project does not result in fill placed within a FEMA established floodplain that would adversely affect the hydraulic characteristics of the floodplain;
- The project does not entail stormwater detention or retention in inland waters or wetlands;
- The project is not located in a segment of a National Wild and Scenic River System (includes rivers officially designated by Congress as active study status rivers for possible inclusion) or within 0.25 miles upstream or downstream of the main stem or tributaries to such a system;
- The project has no potential for an effect on a historic property which is listed or eligible for listing in the National Register of Historic Places;
- The project does not impinge upon the value of any National Wildlife Refuge, National Forest, or any other area administered by the U.S. Fish and Wildlife Service, U.S. Forest Service or National Park Service.
- Appropriate BMPs are employed with regard to sedimentation and erosion controls (General Condition 20).

New culvert installations may be conducted under PCN if the work complies with the general conditions and PCN criteria of the GP. The following are PCN criteria that are commonly applicable to new culvert installations in utility right of ways:

- Work is conducted in accordance with the design requirements listed in Section 3.1.3 of the BMP Manual;
- The work results in less than one acre of impacts to wetlands or Waters of the United States;
- The project does not result in fill placed within a FEMA established floodplain that would adversely affect the hydraulic characteristics of the floodplain;
- There is no practicable alternative location for the crossing that would have less environmental impacts;
- The use of a bridge or open-bottom structure is determined to be not practicable;
- For a single box or pipe arch culvert crossing, the inverts are set not less than 12 inches below the streambed elevation;
- For a multiple box or pipe arch culvert crossing, the inverts of one of the boxes or pipe arch culverts are set not less than 12 inches below the elevation of the streambed;
- For a pipe culvert crossing, the inverts are set such that not less than the pipe diameter or 12 inches, whichever is less, is set below the streambed elevation;
- The culvert is backfilled with natural substrate material matching upstream and downstream streambed substrate;
- The culvert has an openness ratio equal to or greater than 0.25 meters;
- The structure does not result in a change in the normal water surface elevation of the upstream waters or wetlands;
- The structure allows for continuous flow of the 50-year frequency storm flows;
- Appropriate BMPs are employed with regard to sedimentation and erosion controls (General Condition 20).

New culvert installations that cannot meet SV or PCN criteria may require review under an IP. The ACOE should be consulted before assuming an IP will be required, as exceptions can be made under certain circumstances.

In-kind replacement of culverts using the same materials is exempt from Section 404 of the Clean Water Act, and does not require permitting with the ACOE. The ACOE, however, should be consulted before assuming an activity is exempt from their jurisdiction. Consult with Eversource Environmental Licensing and Permitting.

Bridge or open-bottom structure replacements may be conducted under SV if the conditions for a new bridge or open-bottom structure replacement have been met. In addition, bridge or open-bottom structure replacements should not result in a change in the normal surface elevation of the upstream waters or wetland, and the replacement structure should have a riparian bank on one or both sides for wildlife passage. Culvert replacements may be conducted under SV if the conditions for new culvert installation are met.

Bridge or open-bottom structure replacements may be conducted under PCN if the conditions for a new bridge or open-bottom structure replacement have been met. Culvert replacements may be conducted under PCN if the following conditions are met:

- The work results in 5,000 square feet to less than one acre of impacts to wetlands or Waters of the United States;
- The use of a bridge or open-bottom structure is determined to be not practicable;
- For a single box or pipe arch culvert crossing, the inverts are set not less than 12 inches below the streambed elevation;
- For a multiple box or pipe arch culvert crossing, the inverts of one of the boxes or pipe arch culverts are set not less than 12 inches below the elevation of the streambed;
- For a pipe culvert crossing, the inverts are set such that not less than the pipe diameter or 12 inches, whichever is less, is set below the streambed elevation;
- The culvert is backfilled with natural substrate material matching upstream and downstream streambed substrate;
- The culvert has an openness ratio equal to or greater than 0.25 meters;
- The structure does not result in a change in the normal water surface elevation of the upstream waters or wetlands;
- The structure allows for continuous flow of the 50-year frequency storm flows;
- Appropriate BMPs are employed with regard to sedimentation and erosion controls (General Condition 20).

APPENDIX C

Appendix C

Appendix C – Massachusetts Environmental Regulations

C.1 Applicable Laws/Regulations

In Massachusetts, there are no fewer than nine potentially pertinent regulatory programs associated with activities proposed in environmentally sensitive areas. The following list of laws and regulations are most likely to apply to electrical utility projects in the Commonwealth.

- Massachusetts Wetlands Protection Act (M.G.L. 131 § 40) (MA WPA)
- Municipal wetland bylaws/ordinances (varies by municipality)
- Massachusetts Endangered Species Act (M.G.L. 131A) (MESA)
- "Chapter 91" Public Waterfront Act (M.G.L. c. 91 §§ 1 through 63)
- Massachusetts Environmental Policy Act (M.G.L. c. 30 §§ 61 through 62H) (MEPA)
- Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 403)
- Section 401 of the Clean Water Act (33 U.S.C. § 1251; 314 CMR 9.00)
    - Administrative Consent Order (ACO)
- Section 404 of the Clean Water Act (33 U.S.C. § 1344)
- Massachusetts Watershed Protection Act (M.G.L. 92A §1/2) (MA WsPA)

C.2 Geographic Areas Subject to Jurisdiction

The following areas are subject to regulatory jurisdiction by at least one of the regulatory programs discussed in this section: It is important to note that more than one jurisdictional resource area type may be present at any given location.

- Massachusetts Wetlands Protection Act Resource Areas:
    - (Coastal) Land Under the Ocean; Designated Port Areas; Coastal Beaches; Coastal Dunes; Barrier Beaches; Coastal Banks; Rocky Intertidal Shores; Salt Marshes; Land Under Salt Ponds; Land Containing Shellfish; Banks of or Land Under the Ocean, Ponds, Streams, Rivers, Lakes or Creeks that Underlie Anadromous/Catadromous ("Fish Run"); Land Subject to Coastal Storm Flowage
    - (Inland). Bank; Bordering Vegetated Wetland; Land Under Water Bodies and Waterways; Land Subject to Flooding; 200-foot Riverfront Area; and the 100-foot Buffer Zone to Bank and BVW
- Areas subject to municipal wetlands bylaws or ordinances (note: varies by community)
- Estimated and/or Priority Habitat of State-listed Rare Species
- Outstanding Resource Waters (ORWs; include Certified Vernal Pools, public surface water drinking supplies, tributaries to drinking water supplies and vegetated wetlands adjacent thereto)
- Essential Fish Habitat (EFH)
- Areas of Critical Environmental Concern (ACECs)
- Great Ponds

- Navigable waterways
- Wild and Scenic Rivers
- Quabbin Reservoir, Ware River and Wachusett Reservoir watersheds

C.2.1 Endangered Species

The Massachusetts Natural Heritage and Endangered Species Program (NHESP), a department of the Massachusetts Division of Fisheries and Wildlife (MassWidlife) maintains the current list of rare and endangered species and species of special concern in Massachusetts. Publicly available data only allows for identification of designated Priority Habitats of Rare Species and Estimated Habitats of Rare Wildlife, not specific species information. Priority and Estimated Habitat locations are available online via the Massachusetts Geographic Information System (MassGIS) viewer.

Species specific information is provided for planned linear transmission maintenance activities which are reviewed by NHESP as part of Eversource's annual Operation and Maintenance (O&M) Plan. Projects/ activities which are not covered in the O&M Plan must file an independent request for information or initiate coordination with NHESP through Eversource Environmental Licensing and Permitting.

Applicable regulations and agency are listed below:

- Massachusetts Endangered Species Act: 321 CMR 10.00 – Division of Fisheries and Wildlife – NHESP

C.2.2 Vernal Pools

NHESP maintains a database of certified and potential vernal pools in Massachusetts. These data are available on the NHESP website and MassGIS. Certified Vernal Pools (CVP) are considered Outstanding Resource Waters (ORWs).

The current version of the Department of the Army General Permits for the Commonwealth of Massachusetts (MA GPs), effective date April 16, 2018 (expiration date: April 5, 2023) includes General Conditions for protection of vernal pools, regardless of whether or not the vernal pool is certified by NHESP, and including the vernal pool depression, the vernal pool envelope (area within 100 feet of the vernal pool depression's edge), and the critical terrestrial habitat (area within 100-750 feet of the vernal pool depression's edge). Temporary impacts associated with construction mats in previously disturbed areas of existing utility projects rights-of-way are exempt from GP requirements regarding work in the vernal pool envelope or critical terrestrial habitat, provided that a Vegetation Management Plan (VMP) exists that avoids, minimizes and mitigates impacts to aquatic resources. Applicable regulations and agencies for Certified Vernal Pools (CVPs) are listed below:

- Wetlands Protection Act: 310 CMR 10.00 – Municipal Conservation Commissions (and MassDEP)
- 401 Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Material Disposal in Waters of the U.S. within the Commonwealth: 314 CMR 9.00 – MassDEP
- Department of the Army General Permits for the Commonwealth of Massachusetts – ACOE

C.2.3 Essential Fish Habitat and Wild & Scenic River Designation

Essential Fish Habitat (EFH) is a habitat essential for spawning, breeding, feeding, or growth to maturity of federally managed species. This website provides more information: https://www.fisheries.noaa.gov/region/new-england-mid-atlantic#habitat. Consultation

with the ACO is recommended to confirm the location of Essential Fish Habitat with respect to a proposed project.

Massachusetts has approximately 8,229 miles of river, of which 147.1 miles are designated as wild & scenic, as summarized below:

- Nashua River (Main Stem from the confluence of the North and South Rivers in Lancaster, and extending north to the MA-NH border; some geographic exclusions)
- Squannacook River (from headwaters in Ash Swamp/Townsend, extending downstream to the confluence with the Nashua River in Shirley/Ayer; some geographic exclusions)
- Nissitissit River (from headwaters in Brookline (NH) to confluence with the Nashua River in Pepperell)
- Sudbury River (14.9-mile segment from Danforth Street Bridge/Framingham downstream to the Route 2 Bridge/Concord; 1.7-mile segment
- Assabet River
- Concord River
- Westfield River (Main Stem, East Branch, Middle Branch, West Branch, and named tributaries
- Taunton River (main stem from headwaters at the confluence of the Town and Matfield Rivers (Bridgewater) downstream 40 miles to confluence with the Quequechan River at the Route 195 Bridge (Fall River)

Currently, there are no river segments under study in Massachusetts for National Wild and Scenic designation (https://www.rivers.gov/study.php).

Wild and Scenic designations should be verified via the National Wild and Scenic Rivers System website (https://www.rivers.gov/massachusetts.php) during project planning and permitting. The ACOE reviews projects for impacts to both EFH and National Wild and Scenic Rivers.

- Department of the Army General Permits for the Commonwealth of Massachusetts – ACOE

C.2.4 Cold-water Fishery Resources

The Massachusetts Division of Fisheries and Wildlife (MassWildlife) maintains a list of waters that are known to have cold-water fishery resources (CFRs) which are waters in which the mean of the maximum daily temperature over a seven day period generally does not exceed 68°F (20°C) and, when other ecological factors are favorable (such as habitat), are capable of supporting a year round population of cold-water stenothermal aquatic life. CFRs are not currently regulated in and of themselves in Massachusetts. However, MassDEP is particularly concerned with water quality impacts to CFRs due to erosion and sedimentation as a result of construction projects.

C.2.5 Outstanding Resource Waters

Outstanding Resource Waters (ORWs) include Certified Vernal Pools (CVPs), surface drinking water supplies, tributaries to surface drinking water supplies and vegetated wetlands adjacent thereto.

CVPs are designated by NHESP and locations are available through MassGIS. Locations of surface drinking water supplies and other ORWs, typically identified as Zone A, are also available through MassGIS. The applicable regulations and agency are listed below:

- 401 Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Material Disposal in Waters of the U.S. within the Commonwealth: 314 CMR 9.00 – MassDEP

C.2.6 Historic/Cultural Resources

The Massachusetts Historical Commission (MHC) is the State Historical Preservation Office (SHPO) and, along with the Board of Underwater Archaeological Resources (BUAR), are the state agencies responsible for protecting the Commonwealth's historic and cultural resources. Additional stakeholders for cultural resources include the Massachusetts Commission on Indian Affairs, Native American tribes with interests in the state, and local historical commissions.

C.3 Applicable Regulatory Agencies

Activities subject to jurisdiction under the above-referenced programs will generally be subject to review by one or more regulatory agencies (refer to list below). New stream and wetland crossings not related to maintenance will require permitting with municipal Conservation Commissions, and may require permitting with the U.S. Army Corps of Engineers (ACOE) and Massachusetts Department of Environmental Protection (MassDEP) under Sections 404 and 401 of the Clean Water Act. Any non-maintenance work within Land Under Water will require permitting with the MassDEP Division of Wetlands and Waterways. Coordination with NHESP may also be required for projects located within areas mapped as Priority and/or Estimated Habitat for state-listed rare species. For work within navigable waters, consultation may be required with the Massachusetts Office of Coastal Zone Management (MA CZM).

- Municipal Conservation Commissions
- Massachusetts Department of Environmental Protection (MassDEP) Division of Wetlands and Waterways
- Massachusetts Division of Fisheries and Wildlife: Natural Heritage and Endangered Species Program (NHESP)
- Massachusetts Executive Office of Energy and Environmental Affairs (EEA)
- United States Army Corps of Engineers (ACOE) New England District
- Massachusetts Office of Coastal Zone Management (MA CZM)
- Massachusetts Division of Conservation and Recreation (MA DCR)

C.4 Maintenance, Repair, or Emergency Projects

Most regulatory programs contain provisions that allow normal maintenance of existing structures and/or response to emergency situations that require immediate attention.

C.4.1 Maintain, Repair and/or Replace

Exemptions or considerations for maintenance, repair, and/or replacement of existing electrical utility structures exist in some environmental regulations, but not all. The exemptions are limited to work related to existing and lawfully located structures where

no change in the original structure or footprint is proposed. It is not for the selected contractor of a particular project to make a determination as to whether an activity is exempt. This determination will be made prior to the commencement of work by the Eversource project manager in consultation with Eversource Environmental Licensing and Permitting.

These exemptions/considerations are afforded at:

- MAWPA (M.G.L Chapter 131, § 40, paragraph 1)
- MAWPA regulations for Riverfront Area (310 CMR 10.58(6))
- MEPA regulations (301 CMR 11.01(2)(b)(3))
- 33 CFR Part 323.4(a)(2)
- MESA (M.G.L. Chapter 131A, § 3; 321 CMR 10.14(5-7) and (12)
- MAWPA (350 CMR 11.05(11) and (12))
- National Pollutant Discharge Elimination System (NPDES), Construction General Permit (as modified effective February 16, 2012)

Certain operation and maintenance activities that will directly impact Waters of the United States through the discharge of fill (e.g., construction mats) are subject to Sections 401 and 404 of the Clean Water Act.

C.4.2 Emergency Projects

Emergency provisions are generally afforded to activities that need to abate conditions that pose a threat to public health or safety. These provisions generally do not allow work beyond what is necessary to abate the emergency condition and will generally require an after-the-fact permit. It is not for the selected contractor of a particular project to make a determination as to whether an activity is an emergency. This determination will be made prior to work by the Eversource project manager, in consultation with Eversource environmental staff.

It is important to note that invocation of an emergency provision does not release the project proponent from reporting requirements.

Emergency provisions are afforded at:

- MAWPA regulations (310 CMR 10.06)
- MEPA (301 CMR 11.00)
- MA 401 WQC (314 CMR 9.12)
- Chapter 91 (310 CMR 9.20)
- MESA (321 CMR 10.15)

C.5 Municipal Permitting

Work within wetlands, watercourses and Buffer Zones typically requires permitting with municipal Conservation Commissions. Work that entails "maintaining, repairing or replacing, but not substantially changing or enlarging, an existing and lawfully located structure or facility used in the service of the public and used to provide electric service" is exempt under the Massachusetts Wetlands Protection Act (MAWPA) per MGL Chapter 131 Section 40. However, individual municipalities may establish their own wetlands bylaws under Home Rule authority which could require permitting for operation and maintenance activities. The following table lists communities in which Eversource operates and maintains infrastructure and which have a wetland bylaw. Appropriate municipal

permitting or notification should be completed in these towns as required prior to conducting operation and maintenance activities. Bylaws may be revised, or new bylaws enacted, at any time. Consult with Eversource Environmental Licensing and Permitting prior to the commencement of work.

TABLE C-1
Eversource Energy Communities with Municipal Wetland Bylaws[1]

Community	Date of Bylaw	Utility Maintenance Exemption	Notification Required
Acton	7/8/2003	Yes	No
Amherst	2/12/2014	Yes	Yes
Andover	5/11/1999	Yes	Yes
Aquinnah	6/23/2020	Yes	Yes
Arlington	5/15/2000	No	Yes
Ashland	5/6/2009	Yes	Yes
Attleboro	12/12/2007	No	No
Auburn	5/1/2012	Yes	Yes
Avon	5/7/2019	Yes	Yes
Barnstable	11/7/1987/rev. 7/7/2003	Yes	Yes
Bedford	1987/rev. 2016	Yes	Yes
Belchertown	6/7/2020	Yes	Yes
Bellingham	12/2015	No	Yes
Berlin	2/15/2021	Yes	Yes
Bolton	5/7/2012	Yes	No
Boston	12/11/2019	Yes	Yes
Bourne	10/26/2009	No	Yes
Brewster	1/1/2013	Yes	Yes
Bridgewater	11/13/1990	Yes	Yes
Brookline	5/28/2013	Yes	Yes
Burlington	5/2021	Yes	Yes
Canton	5/10/2017	Yes	Yes
Carlisle	2002	Yes	No
Carver	1998	Yes	Yes
Chatham	5/10/2004	Yes	Yes
Chicopee	4/3/2002	Yes	Yes
Chilmark	10/12/1993	No	Yes
Dartmouth	1990/rev. 8/25/2015	Yes	Yes
Dedham	11/182013	Yes	Yes
Deerfield	11/6/1989	Yes	Yes
Dennis	5/5/1989	Yes	Yes
Dover	5/2/1994	Yes	Yes
Duxbury		Yes	No
East Longmeadow	10/1992	Yes	Yes
Eastham	1980/rev. 1999	Yes	Yes
Edgartown	1985/rev. 6/25/1991	No	Yes
Fairhaven	5/10/1988	Yes	No
Falmouth	4/2/1979/rev. 7/16/1993	Yes	Yes

TABLE C-1
Eversource Energy Communities with Municipal Wetland Bylaws[1]

Community	Date of Bylaw	Utility Maintenance Exemption	Notification Required
Framingham	4/26/2005	Yes	Yes
Grafton	5/11/1987	Yes	Yes
Greenfield	11/23/2001	Yes	No
Hadley	5/1/2008	No	Yes
Hampden	8/5/1992	Yes	Yes
Harwich	7/1/2003/rev. 11/25/2020	No	Yes
Holden	2011	Yes	Yes
Holliston	5/2021	Yes	Yes
Hopkinton	5/2/1995/rev. 5/7/2012	Yes	Yes
Holyoke	11/2005	Yes	Yes
Kingston	2004	No	Yes
Leicester	11/2015	Yes	Yes
Lenox[3]	12/18/1985	Yes	No
Lexington	5/3/1982	No	Yes
Lincoln	3/24/2007	No	Yes
Longmeadow	10/2000	Yes	No
Ludlow	5/1/2002	Yes	No
Marshfield	1988/rev. 4/23/2018	Yes	Yes
Mashpee	2/1/1988	Yes	Yes
Maynard	12/3/2005	Yes	Yes
Medfield	1926	Yes	No
Medway	7/2014	Yes	Yes
Milford	5/2010	Yes	No
Millis	5/13/1191	Yes	No
Millville	5/13/2013	Yes	Yes
Natick	4/27/2000	Yes	No
Needham	9/1/1988	Yes	Yes
New Bedford	2017	Yes	Yes
Norfolk	11/9/2010	Yes	Yes
Northampton	8/17/1989	Yes	Yes
Northborough	5/21/1990	Yes	Yes
Northbridge	5/6/2008	Yes	Yes
Oak Bluffs	4/1983	No	Yes
Orleans	5/5/1987	Yes	Yes
Palmer	8/12/2013	Yes	Yes
Pelham	5/2/1987	Yes	Yes
Pembroke	4/22/2008	Yes	No
Plymouth	4/5/1989	Yes	Yes
Plympton	5/16/2012	Yes	Yes
Provincetown	5/2019	Yes	Yes
Richmond	5/2015	Yes	Yes
Rochester	As of 12/2015	Yes	Yes

TABLE C-1
Eversource Energy Communities with Municipal Wetland Bylaws[1]

Community	Date of Bylaw	Utility Maintenance Exemption	Notification Required
Sandwich	5/4/1992	Yes	Yes
Sharon	As of 12/2015	Yes	No
Sherborn	2013	Yes	No
Shutesbury	5/2/1987	Yes	Yes
Southampton	9/21/2021	Yes	Yes
Southborough	4/10/1995	Yes	Yes
South Hadley	12/27/2005	No	Yes
Southwick	6/6/1989	Yes	Yes
Springfield	5/5/1993	Yes	Yes
Stoneham	4/2013	Yes	Yes
Stow	5/21/2003	No	Yes
Sudbury		Yes	Yes
Sunderland	4/27/1990	Yes	Yes
Sutton	5/11/2015	Yes	Yes
Tisbury	1/1/1983	Yes	No
Truro	9/30/2010	No	Yes
Upton	2009	Yes	Yes
Walpole	2002	Yes	Yes
Wareham	4/25/2016	Yes	Yes
Watertown	10/2010	Yes	Yes
Wayland	5/1/2002	Yes	No
Wellfleet	4/20/1986/rev. 10/6/2021	Yes	Yes
Wendell	3/10/1988	Yes	Yes
West Tisbury	6/3/2004	Yes	Yes
Westborough	10/20/2008	Yes	Yes
Westfield	5/20/2003	Yes	Yes
Westport[4]	4/11/1995	No	Yes
Westwood	1989	Yes	Yes
Wilbraham	5/27/1997	Yes	Yes
Winchester		No	Yes
Woburn	6/24/1987	Yes	Yes
Worcester	7/1/2007	Partial	Yes
Yarmouth	12/1/2016	No	Yes

[1] Information based on the Massachusetts Association of Conservation Commissions website as of 2019 and municipal websites.

[2] Refer to municipal bylaws prior to conducting work in the community.

[3] Berkshire Scenic Mountain Act, as adopted by the Town of Lenox and administered by the Lenox Conservation Commission.

[4] Town of Westport Soil Conservation Bylaw, as administered by the Westport Conservation Commission.

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C.6 MA Department of Environmental Protection

Review and approval under the Commonwealth's Water Quality Certification Regulations

is required for "*discharge of dredged or fill materials, dredging, and dredged material disposal activities in waters of the United States within the Commonwealth which require federal licenses or permits and which are subject to state water quality certification under 33 U.S.C. 1251, et seq. The federal agency issuing a permit initially determines the scope of geographic and activity jurisdiction*" (314 CMR 9.01(2)). An individual Water Quality Certification is required from the Massachusetts Department of Environmental Protection (MassDEP) for any activity identified at 314 CMR 9.04. In accordance with 314 9.04 (4) activities which are exempt from MGL Chapter 131 Section 40 but are subject to 33 U.S.C. 1251, *et seq*., and will result in any discharge of dredge or fill material to bordering vegetated wetlands or land under water require an individual 401 Water Quality Certification.

Eversource entered into an Administrative Consent Order (ACO) with MassDEP in 2017. This ACO serves as a general permit under the 401 Water Quality regulations (314 CMR 9.00) and establishes general conditions for routine operation and maintenance activities within existing ROWs.

C.7 U.S. Army Corps of Engineers

Work within wetlands and waters of the United States is subject to jurisdiction under Section 404 of the Clean Water Act, which is administered by the ACOE. The General Permits for the Commonwealth of Massachusetts (MA GPs) establish categories for projects based on their nature of impacts. The MA GPs were most recently issued on April 16, 2018, and expire on April 5, 2023.

Certain minor activities are eligible for Self-Verification (SV), which requires submittal of a Self-Verification Notification Form (SVNF) prior to the commencement of work. Activities eligible for Self-Verification are authorized under the MA GPs and may proceed without written verification from the ACOE as long as the SVNF has been submitted and the activity meets the terms and conditions of the applicable MA GPs.

Activities requiring Pre-Construction Notification (PCN) require the submittal of an application to the ACOE, followed by a screening of the application by the ACOE, the U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, National Marine Fisheries Service, MassDEP, and consultation with the Massachusetts Historical Commission, Tribal Historic Preservation Officers (THPOs) and the Massachusetts Board of Underwater Archaeological Resources (BUAR). PCN projects may not proceed until written verification from the ACOE is received.

An Individual Permit (IP) requires a formal permit application to be submitted to the ACOE. The application is reviewed in detail by both state and federal agencies, and a public notice is released for public comment. Projects which trigger an Individual Permit generally result in significant impacts to wetlands and/or watercourses outside the limits of the MA GPs.

Work within, or above, Navigable Waters is also administered by the ACOE under Section 10 of the Rivers and Harbors Act of 1899.

ACOE permitting does not apply to activities that fall under the maintenance exemption set forth at 33 CFR 323.4(a)(2) – Discharges Not Requiring Permits:

"Maintenance, including emergency reconstruction of recently damaged parts, of currently serviceable structures such as dikes, dams, levees, groins, riprap, breakwaters, causeways, bridge abutments or approaches, and transportation structures. Maintenance does not include any modification that changes the character, scope, or size of the original fill design. Emergency reconstruction must occur within a reasonable period of time after damage occurs in order to qualify for this exemption."

Maintenance projects that occurred prior to the ACOE jurisdiction over fill activities, or that were properly permitted, can proceed under the maintenance exemption noted above, provided that the same temporary fill areas are used. However, it is recommended that a formal determination be requested from the ACOE to confirm these activities are exempt. The repair, rehabilitation or replacement of a previously authorized, currently serviceable structure or fill (with some minor deviations in the structure's configuration or filled area) are regulated under MA GP1 and subject to SV or PCN.

Also, operation and maintenance related activities that do not meet the above exemption may qualify for SV. In that case, it is recommended that a copy of the SVNF be submitted to MassDEP.

The MA GPs are listed below. MA GPs specifically, and typically, applicable to utility projects are emphasized by bold italic font:

GP1. Repair, Replacement and Maintenance of Authorized Structures and Fills
GP2. Moorings
GP3. Pile-Supported Structures, Floats and Lifts
GP4. Aids to Navigation, and Temporary Recreational Structures
GP5. Dredging, Disposal of Dredged Material, Beach Nourishment, and Rock Removal and Relocation
GP6. Discharges of Dredged or Fill Material Incidental to the Construction of Bridges
GP7. Bank and Shoreline Stabilization
GP8. Residential, Commercial and Institutional Developments, and Recreational Facilities
GP9. Utility Line Activities
GP10. Linear Transportation Projects Including Stream Crossings
GP11. Mining Activities
GP12. Boat Ramps and Marine Railways
GP13. Land and Water-Based Renewable Energy Generation Facilities and Hydropower Projects
GP14. Temporary Construction, Access, and Dewatering
GP15. Reshaping Existing Drainage Ditches, New Ditches, and Mosquito Management
GP16. Response Operations for Oil and Hazardous Substances
GP17. Cleanup of Hazardous and Toxic Waste
GP18. Scientific Measurement Devices
GP19. Survey Activities
GP20. Agricultural Activities
GP21. Fish and Wildlife Harvesting and Attraction Devices and Activities
GP22. Habitat Restoration, Establishment and Enhancement Activities
GP23. Previously Authorized Activities

In general, the following cumulative thresholds apply for determining the level of ACOE permitting required:

Table C-2
MA GPs Permits Limits

Resources	SV Limits (SV Eligible)	PCN Limits (PCN Eligible)	IP Limits (IP Required)
Non-tidal waters of the US	0 to 5,000 sf	5,000 sf to 1 acre	>1 acre
Tidal waters of the US	Not eligible	All discharges ≤1/2 acre	>1/2 acre
SAS in tidal waters of the US excluding vegetated shallows	Not eligible	All discharges ≤1,000 sf	>1,000 sf

SAS in tidal waters of the US consisting of vegetated shallows only	Not eligible	All discharges ≤100 sf (compensatory mitigation is required	>100 sf

*Special Aquatic Sites (SAS) consist of wetlands, mud flats, vegetated shallows, sanctuaries and refuges, coral reefs, and riffle and pool complexes. These are defined at 40 CFR 230 Subpart E.

Stream and wetland crossings are only subject to jurisdiction under the ACOE if there is **a discharge of dredge or fill material into wetlands or waters of the United States**. Equipment access through a stream or wetland with no structural BMP is not regulated by the ACOE if there is no discharge of dredge or fill material (note that equipment rutting as a result of not using an appropriate BMP can be considered a "discharge of dredge material"). Similarly, the use of a timber or rail car bridge that extends from bank to bank with no stream impacts is not regulated by the ACOE. The use of timber mats, stone, and log corduroy is considered "fill material" by the ACOE under the MA GPs, and must be calculated to determine overall impacts.

Maintenance, including emergency reconstruction of currently serviceable structures, is exempt from ACOE jurisdiction and does not require formal permitting. Maintenance does not include any modification that changes the character, scope, or size of the original fill design. Emergency reconstruction must occur within a reasonable period of time after damage occurs to qualify for this exemption.

New culvert installation or existing culvert replacements may require permitting with local Conservation Commissions under the MAWPA, and may also require permitting with the ACOE under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act of 1899, and the MassDEP under Section 401 of the Clean Water Act.

Stream and wetland crossings (including culvert installations) that involve the discharge of dredge and fill material may be conducted under SV if the following criteria are met.

- The use of construction mats of any area can be used to conduct activities that were previously authorized, authorized under Self-Verification, or not subject to regulation. Other temporary or permanent fill and associated secondary impacts must meet the SV limits.
- Authorized construction mats must be removed immediately upon work completion, and the wetlands must be restored per the General Conditions.

The project has no potential for an effect on a historic property within the permit area or any known historic property that may occur outside the permit area.

- Any in-water work controls that encroach upon more than 25 percent of the stream width are limited to a Time of Year (TOY) restriction in consideration of spawning, breeding and migration to maintain upstream fish passage. Activities within streams proposed during the TOY restrictions are generally ineligible for SV authorization.
- The work does not result in direct or secondary impacts to Special Aquatic Sites.
- No work occurs in Navigable Waters (waters subject to the ebb and flow of the tide and, in Massachusetts, the non-tidal consist of the Merrimack River, Connecticut River, and Charles River to the Watertown Dam).
- Span streams or size culverts or pipe arches such that they are at least 1.2 times the bankfull width. Spans are strongly preferred as they avoid or minimize disruption to the streambed and avoid entire streambed reconstruction and maintenance inside the culvert or pipe arch, which may be difficult in smaller structures. Footings and abutments for spans and scour protection should be landward of 1.2 times bankfull width.
- Embed culverts or pipe arches below the grade of the streambed. This is not required when ledge/bedrock prevents embedment, in which case spans are required. The following depths are recommended to prevent streambed washout, and ensure compliance and long-term success:
    - ≥ 2 feet for box culverts and pipe arches, or
    - ≥ 2 feet and at least 25% for round pipe culverts.
- Match the culvert gradient (slope) with the stream channel profile.
- Construct crossings with a natural bottom substrate within the structure matching the characteristics of the substrate in the natural stream channel and the banks (mobility, slope, stability, confinement, grain and rock size) at the time of construction and over time as the structure has had the opportunity to pass substantial high flow events.
- Construct crossings with appropriate bed forms and streambed characteristics so that water depths and velocities are comparable to those found in the natural channel at a variety of flows at the time of construction and over time. In order to provide appropriate water depths and velocities at a variety of flows and especially low flows, it is usually necessary to reconstruct the streambed (sometimes including a low flow channel) or replicate or preserve the natural channel within the structure. Otherwise, the width of the structure needed to accommodate higher flows will create conditions that are too shallow at low flows. Flows could go subsurface within the structure if only large material is used without smaller material filling the voids.
- Openness, which is the is the cross-sectional area of a structure opening divided by its crossing length when measured in consistent units, is > 0.82 feet (0.25 meters).

Banks on each side of the stream inside the crossing matching the horizontal profile of the existing stream and banks outside the crossing are recommended. To prevent failure, all constructed banks should have a height to width ratio of no greater than 1:1.5 (vertical:horizontal) unless the stream is naturally incised. Tie these banks into the up and downstream banks and configure them to be stable during expected high flows.

- The project is not located within a vernal pool depression, or vernal pool envelope, and does not individually or cumulatively impact greater than 25% of the vernal pool critical terrestrial habitat. It is feasible for some temporary impacts associated with the use of construction mats in previously disturbed ROWs to occur within the vernal pool envelope or critical terrestrial habitat if a Vegetation Management Plan demonstrates avoidance, minimization and mitigation impacts to aquatic resources.
- Culvert extensions do not qualify for SV.
- Culvert projects using slip lining do not qualify for SV, either as new work or maintenance activities.
- No open trench excavation in flowing waters. No work in riffles and pools.
- The project does not entail stream relocation.
- Work is not conducted within riffles or pools.
- Normal flows within the stream boundary's confines must be maintained, i.e., temporary flume pipes, culverts, cofferdams, etc.
- Water diversions (i.e., bypass pumping or water withdrawals) may be used immediately up and downstream of the work footprint.
- The project is (a) not located in the designated main stem of, or within 0.25 miles up or downstream of the designated main stem of, or in tributaries within 0.25 miles of the designated main stem of a National Wild and Scenic River System; (b) not in "bordering or contiguous wetlands" that are adjacent to the designated main stem of a National Wild and Scenic River; or (c) does not have the potential to alter flows within a river within the National Wild and Scenic River System.
- The project is not located within areas containing USFWS or National Marine Fisheries Service (NMFS)-listed species or critical habitat. The project is not "likely to adversely affect" listed species or habitat per the federal Endangered Species Act (ESA) or result in a "take" of any federally-listed threatened or endangered species of fish or wildlife.
- The project does not impinge upon the value of any National Wildlife Refuge, National Forest, National Marine Sanctuary, or any other area administered by the U.S. Fish and Wildlife Service, U.S. Forest Service or National Park Service.
- The project is not located on ACOE properties and ACOE-controlled easements.
- The project does not propose temporary or permanent modification or use of a federal project beyond minor modifications required for normal operation and maintenance.
- The project minimizes use of heavy construction equipment, and, where required, either has low ground pressure (typically less than 3 psi) or it must be placed on construction mats.
- Construction mats must be placed in the wetland from the upland or from equipment positioned on swamp mats if working within a wetland.
- Temporary fill must be stabilized. Unconfined, authorized temporary fill must consist of clean material that minimizes impacts to water quality. Temporary fill placed during the growing season must be removed before the beginning of the next growing season. If temporary fill is placed during the non-growing season, it may remain throughout the following growing season but must be removed before the beginning of the next growing season.

- Appropriate erosion, sedimentation and turbidity controls are used and maintained during construction.
- Appropriate measures must be taken to minimize flooding to the maximum extent practicable.

Wetland and stream crossings may be authorized under PCN if the following criteria are met:

- The work results in less than one acre of impacts to inland, non-tidal, wetlands or waters of the United States.

Stream and wetland crossings that cannot meet SV or PCN criteria may require review under an IP. The ACOE should be consulted before assuming an IP will be required, as exceptions can be made under certain circumstances.

C.8 Temporary Stream Crossings

C.8.1 U.S. Army Corps of Engineers

See Section C.7 for general ACOE permitting requirements for stream crossings. To qualify for SV, temporary stream crossings (typically culverts) that are not spans must be designed in accordance with below.

1) Installed outside of the TOY restrictions and must be removed before the beginning of the TOY restriction of that same season. Temporary crossings that must remain into the TOY restriction will require PCN review.
2) Impacts to the streambed or banks require restoration to their original condition (see "Stream Simulation: An Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings," for stream simulation restoration methods). Use geotextile fabric or other appropriate bedding for stream beds and approaches where practicable to ensure restoration to the original grade. The requirements in GCs 17, 18 and 19 are particularly relevant.
3) Avoid excavating the stream or embedding crossings.
4) For Culverts:
    a. The water height should be no higher than the top of the culvert's inlet and the culvert is large enough to pass debris.
    b. Install energy dissipating devices downstream if necessary to prevent scour.
    c. The TOY restrictions in GC 18 and the restrictions in GC 17(f) are particularly relevant.
5) Removed upon the completion of work. Impacts to the streambed or banks requires restoration to their original condition using stream simulation methods.

In-kind repair, replacement and maintenance of currently serviceable, authorized fills are eligible for SV. However, the conditions of the original authorization apply, and minor deviations in fill design are allowed. In-kind repair and maintenance of culverts that includes an expansion or change in use requires PCN. Replacement of non-serviceable fills, including an expansion or change in use, also requires PCN. In-kind replacement using the same materials is exempt from Section 404 of the Clean Water Act, and does not require permitting with the ACOE. The ACOE, however, should be consulted before assuming an activity is exempt from their jurisdiction.

APPENDIX D

Horizontal directional drilling (HDD) for subsurface utility installations is considered to be the most effective and least environmentally damaging technique when compared to traditional mechanical dredging and trenching. This method ensures the placement of the pipeline at the target burial depth with no wetland or water body disturbance. HDD installation is the preferred method for crossing sensitive resources–the alternative is open cut trenching.

The HDD procedure uses bentonite slurry, a fine clay material as a drilling lubricant. Directional drilling has the small potential to release bentonite slurry into the surface environment through frac-outs. This term describes the situation caused when the drilling head and its accompanying inert clay lubricant slurry, hits a subterranean fractured substrate. When the pressurized lubricant slurry reaches the fracture it can follow the fracture up or otherwise force itself to the surface or into the water if drilling is occurring under a waterbody. If a "frac-out" occurs under these water features, the potential exists for the inert clay (a non-toxic bentonite-based substance) to be released into the water column. In large quantities, the release of drilling mud into a waterbody could affect fisheries or other aquatic organisms by settling and temporarily inundating the habitats used by these species. Properly monitoring the slurry pressures and amounts significantly decreases risk of significant quantities of drilling fluid being released into the environment.

Frac-out is most likely to occur near the bore entry and exit points where the drill head is shallow. Should a frac-out occur during HDD operations, the following measures will be taken.

- Temporarily suspend forward drilling progress.
- Monitor frac-out for 4 hours to determine if the drilling mud congeals. (Bentonite will usually harden, effectively sealing the frac-out location.)
- If drilling mud congeals, take no other action that would potentially suspend sediments in the water column.
- If drilling mud does not congeal, erect appropriate isolation/containment measures (i.e. turbidity curtains and/or underwater boom and curtain).
- If the fracture becomes excessively large, a spill response team would be called in to contain and clean up excess drilling mud in the water. Phone numbers of spill response teams in the area will be on site.
- Following containment, evaluate the current drilling profile (i.e. drill pressures, pump volume rates, drilling mud consistency) to identify means to prevent further frac-out events.
- If the fracture is mitigated and controlled, forward progress of the drilling may resume.

Attachment O

Soil & Groundwater Management Plan

Weston & Sampson

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EVERSOURCE ENERGY

January 2022

Soil & Groundwater Management Plan

Sudbury to Hudson Transmission

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1.0 INTRODUCTION

Weston & Sampson Engineers, Inc., (Weston & Sampson) has prepared this Soil and Groundwater Management Plan (SGMP), on behalf of Eversource Energy (Eversource), for the Sudbury-Hudson Transmission Reliability Project (the Project). The purpose of this Plan is to summarize the procedures for managing soil, groundwater, and miscellaneous excavated materials during the construction of a new underground electric transmission line from the Hudson Light and Power Department (HLPD) Substation in Hudson to Sudbury Substation in Sudbury, Massachusetts. Once the electric transmission line is installed by Eversource (Phase I of the Project), portions of the Project located on the Massachusetts Bay Transportation Authority (MBTA) Right of Way (ROW) will be further improved and utilized by the Department of Conservation and Recreation (DCR) as part of the Massachusetts Central Rail Trail (MCRT) which is termed Phase II of the Project. Weston & Sampson will be the acting License Site Professional (LSP) for this Project and will represent Eversource prior to and during construction.

This SGMP has been prepared based on available information and data collected as part of Project due diligence, planning, and permitting efforts. It should be noted that additional data will be collected as part of local permit requirements prior to construction. In addition, once a contractor has been selected, specific means and methods to be employed by the contractor may need to be incorporated into this document. As such, this SGMP should be considered a "living" document and may be updated as needed to reflect the latest Project information and data.

1.1 Project Overview

The Project will include installation of a new 115-kilovolt (kv) underground electric transmission line within an inactive MBTA ROW and public roadways in the communities of Hudson, Marlborough, Stow and Sudbury. The Project is a collaborative effort between Eversource and the Massachusetts DCR and will serve the dual purpose of increasing the regional transmission system's reliability as well as advance a state-wide multi-use trail network initiative. The Project Limits are shown in Figure 1 – Project Area Map. This SGMP is intended for use during the installation of the 115 kv transmission line (Phase I of the Project) only and is not intended for use by DCR during Phase II of the Project.

As shown in Figure 1, the Project is approximately 9 miles long, and is predominately located in Hudson and Sudbury, Massachusetts. In total, the portion of the Project in Hudson is approximately 4.7 miles in length which begins at the HLPD substation and continues along municipal roadways for approximately 1.4 miles to the intersection of Wilkins Street and the inactive MBTA ROW. From this intersection, the Project continues in Hudson approximately 3.3 miles along the existing inactive MBTA ROW to the Hudson/Sudbury municipal border. The Project in Sudbury is approximately 4.3 miles long and is located entirely within the MBTA ROW from the Hudson/Sudbury municipal border to the Sudbury Substation off Route 20. The Project extents in Stow and Marlborough are limited and are confined to the existing MBTA ROW.

The Project will involve excavating and handling soil and groundwater to construct the proposed electric transmission line, install 28 manholes, and complete associated infrastructure improvements along the former MBTA ROW. The proposed electrical transmission line trench will measure approximately five (5) feet wide and 5 feet deep. Manholes will be approximately eight (8) feet wide by 24 feet long by eight (8) feet deep and will be placed approximately every 1,500 to 1,800 linear feet along the Project. It is estimated that the transmission line construction will require managing an estimated 58,000 cubic yards

of excavated soil. Based on the anticipated depth of excavation, the Project will also require groundwater dewatering to complete construction. Procedures for appropriate soil and groundwater management during the Project are outlined in Sections 3.0 and 4.0.

1.2 Project Area Description

For the purposes of this SGMP, the Project is discussed in terms of work areas located in the public right-of-way (herein referred to as the "in-road" portion), and the remaining work areas in the inactive MBTA ROW (herein referred to as the "MBTA ROW" portion). These areas are shown in Figure 1 and described below.

1.2.1 In-Road Portion

The in-road portion of the Project includes portions of public roads, which have been roads since the early 1900s. The in-road portion of the Project begins at the HLDP substation, extends approximately 1.4 miles in Hudson and is bounded by cross streets Wilkins Street and Forest Avenue. As shown in Figure 1, the eastern extent of the in-road portion is characterized primarily by undeveloped or residential land use. The western extent includes mixed residential, undeveloped, commercial, and industrial/manufacturing uses.

1.2.2 MBTA Right-of-Way

The MBTA ROW portion of the Project includes a section of the former Central Massachusetts Railroad from the intersection of Wilkins Street in Hudson to the Sudbury Substation located off Route 20 in Sudbury. Historically used for railroad operations from at least 1881 until 1971, this portion of the Project consists of approximately 3.3 miles in Hudson and 4.3 miles in Sudbury. As shown in Figure 2, the ROW portion includes intersections with several public roads, including Chestnut Street/Marlboro Street, Main Street, Paramenter Street, and White Pond Road in Hudson and Dutton Road, Horse Pond Road, Union Avenue, Boston Post Road and Landham Road in Sudbury.

According to historical aerial photographs, the area surrounding the Project was historically associated with agricultural use or undeveloped until at least 1960; after which residential developments began to appear around the Project area. Industrial property development also occurred between 1965 and 1978 along the portion of the Project located in Sudbury. Since these developments, the general uses abutting the ROW have largely remained the same. Currently, the area surrounding the ROW includes residential areas, commercial developments, wooded areas, and roadways. The MBTA ROW itself is variable in width but is approximately 82 feet wide in most locations. Within the ROW, the former track and underlying ballast occupy a footprint that is approximately 11 feet wide. In most areas, walking paths of variable width also exist. Figure 2 depicts surrounding areas, the MBTA ROW property boundary, and the Project's limits of work.

1.3 Natural Resource Areas

According to available information from the Massachusetts Bureau of Geographic Information (MassGIS), the Project corridor intersects Estimated Habitat designated by the natural Heritage & Endangered Species Program, a Federal Emergency Management Agency (FEMA) 100-year flood plain, freshwater wetlands, Zone II Protection Areas, Protected Open Space, potentially productive aquifers, and medium yield non-potential drinking water source areas. Additionally, there are also potential and certified vernal pools within 500 feet of the Project.

Properties within Hudson and Sudbury are serviced by public water supply wells and a municipal sewer system. Within Hudson, there are four (4) public water supply wells within 1,000-feet of the Project Area. There no public water supply wells within 1,000 feet in Sudbury or Stow; however, a portion of the Project in Sudbury does coincide with a Zone II groundwater public water supply protection area for wells in Sudbury. Wetland resource areas jurisdictional limits within the Project limits are presented on Figure 3.

Because the Project will involve working in or proximate to various natural resource areas or their jurisdictional buffer zones established under the Massachusetts Wetlands Protection Act, Eversource submitted Notices of Intent (NOIs) with Conservation Commissions in the Towns of Hudson, Stow, and Sudbury. The Orders of Conditions (OOC) issued from each Commission specify special conditions for handling soil and groundwater during work within natural resource areas of their buffer zones. These conditions are further discussed in Sections 3.0 and 4.0. Copies of the OOCs are provided in Appendix. A.

1.4 Soil & Groundwater Management Scope of Work

The soil and groundwater management activities addressed by this SGMP will be performed under the control and responsibility of Eversource and its LSP during the civil earthwork for the underground transmission line installation and any associated ancillary civil construction such as bridge reconstruction and the construction of an underpass at Chestnut Street. Based on the Project's plans and specifications, work requiring the handling soil and potentially groundwater includes:

- Installation of manholes and duct banks
- Construction of bridge and culvert crossing (Bridge 130 and Chestnut Street underpass required for the MCRT).
- Installation of electrical and signal conduit for MCRT at road crossings
- Rail removal and grading construction platform and installation of stormwater management features, and
- Final grading

It is anticipated that excavation for new transmission lines will require excavating trenches generally five (5) feet wide to depths of five (5) feet below ground surface (ft bgs) and excavating for the installation of 28 manholes every 1,500 to 1,800 feet along the Project's alignment. Each manhole is approximately eight (8) feet wide by eight (8) feet high and 24 feet long. The manhole depth will vary by location, with the base measuring approximately 12 to 15 feet below the proposed final grade. Additional details are provided in the Project's plans and specifications.

1.5 Regulatory Requirements and Applicable Guidance

The soil and groundwater management requirements described in this plan have been developed based on Eversource's *Massachusetts Excess Soil and Groundwater Management Policy* (revised January 2020), the plans and specifications prepared for the Project, and relevant local, state, and federal regulations, policies, and guidance. The due diligence performed, and Project design elements are in accordance with the Massachusetts Department of Environmental Protection (MassDEP) *Best Management Practices for Controlling Exposure to Soil During the Development of Rail Trails (MassDEP Rail Trail policy).* The Massachusetts Contingency Plan (MCP) 310 CMR 40.0000 is also the basis for managing OHM encountered on the Project. As noted in this SGMP, additional local, state and federal

requirements may apply during construction of the Project, including MassDEP COMM-97 *Reuse and Disposal of Contaminated Soil at Massachusetts Landfills*.

As noted in Section 1.3, the Project intersects or is adjacent to various natural resource areas. As such, the Project is subject to natural resource/wetland permitting with MassDEP and local conservation commissions in Hudson, Stow, and Sudbury. The activities covered by this plan are subject to various approvals or OOCs imposed by these local and state bodies as well as associated wetland ordinances/bylaws and the MassDEP's Wetland Protection Act Regulations, 310 CMR 10.00. Where these requirements overlap with soil and groundwater management, they are addressed in Section 5.0.

2.0 BACKGROUND

As noted in Section 1.0, the MBTA ROW portion of the Project will be the foundation for a future rail trail completed and maintained by DCR. Given the future use is coupled with the linear nature of the Project and its location predominantly within a former railroad ROW, the MassDEP in their comments to the Environmental Notification Form (ENF) for the Project referenced the use of the *Best Management Practices for Controlling Exposure to Soil During the Development of Rail Trails* guidance document to mitigate potential exposures to OHM for the Project. The specific use of this guidance document was to identify areas of concerns, assess those areas of concern for residual concentration of OHM, and identify best management practices (BMPs) to mitigate potential OHM exposures to construction workers during and future trail users following the Project's completion. Use of the RTG was confirmed during a meeting with the MassDEP Bureau of Waste Site Cleanup staff in 2017.

As described in the RTG, due diligence was conducted between 2015 and 2017 to evaluate potential impacts from known and suspected OHM releases within the project and develop an overall soil and groundwater management strategy that would enable reusing excavated soil where appropriate. Due diligence included review of historic information/photographs, database review of federal, state and local government records, and site reconnaissance to evaluate visual and reasonable identifiable indications of OHM along the Project. Ultimately, the due diligence findings were used to classify segments of the Project as "Rural/Residential" or "Industrial Commercial" as described below:

Rural/Residential
These are stretches along a rail line that border historically residential, undeveloped, or rural properties. These areas are likely to have been affected only by the normal operation of the rail line, with a residual level of contamination. The BMPs outlined in the RTG document are considered appropriate for these locations. Absent evidence of a specific release, segments classified in this group do not require further assessment or sampling and analysis to characterize risk to public health or the environment.

Industrial/Commercial
These are rail trails segments that pass through industrial areas, even the predominantly rural trails of western and central Massachusetts. These stretches have a higher potential for contamination within the right-of-way that is unrelated to the historic railroad use. The BMPs outlined in the RTG document may not be sufficiently protective of public health and the environment at these locations. Further evaluation is needed to establish whether there are site-specific concerns indicating the need for further investigation, including soil testing. Absent a site-specific concern, the RTG indicates that the BMPs outlined in the guidance is appropriate for work in areas designated into this group.

Pursuant to the MassDEP RTG, segments of the Project designated as Industrial/Commercial were targeted, along with the in-road portion of the Project in Hudson, for pre-characterization sampling based on the location of potential sources of OHM, scope of the Project, and associated waste management constraints. Additional justification and clarification on pre-characterization rationale is outlined in the following Sections.

2.1 Environmental Database Review

An environmental database review was completed in 2017 to identify properties and/or known OHM release sites with the potential to impact the Project. The review was completed by VHB using the Environmental Risk Information Services (ERIS) computer database and MassDEP's Bureau of Waste Site Cleanup online data bases. An update was provided to Weston & Sampson by ERIS by in October 2020. A summary of the updated findings is presented below.

Federal Environmental Records			
Record Source	*Search Radii*	*Subject Property Listed*	*Number of Sites Within Search Distance*
National Priorities List (NPL) Sites	1.0 mile	No	0
Safety and Environmental Management System (SEMS) Sites	0.5 miles	No	7
Comprehensive Emergency Response, Compensation, and Liability Information System (CERCLIS) Sites	0.5 miles	No	6
CERCLIS No Further Action Planned (NFRAP) Sites	Property & Abutting	No	4
Resource Conservation and Recovery Act (RCRA) Corrective Action (CORRACTS) Sites	1.0 mile	No	0
RCRA Non-CORRACTS Treated, Stored, and Disposed of hazardous wastes (TSD) Sites	0.5 miles	No	1
RCRA Generators	0.25-miles	No	26
RCRA NonGen (No Longer Generating)	0.25 miles	No	28
Engineering/ Institutional Control Sites	Property & Abutting	No	0
Federal Emergency Release Notification System (ERNS)	Property	No	2
Federal Facility Index System (FINDS)	Property	No	10

State Environmental Records			
Record Source	*Search Radii*	*Subject Property Listed*	*Number of Sites Within Search Distance*
SHWS (MassDEP Disposal Sites)	1 mile	No	186
Solid Waste Disposal Sites	0.5 miles	No	3
Leaking Storage Tank Sites	0.5 miles	No	26
Registered Storage Tank Sites	0.25 miles	No	20
Activity Use Limitation Properties	0.5 miles	No	7
Brownfield Sites	0.5 miles	No	5

As shown above, the environmental database review identified various sites along the Project's alignment, including CERCLIS sites, RCRA generators, registered and leaking underground and or aboveground storage tank sites, and MassDEP Disposal Sites. Available information for these Disposal Sites was subsequently reviewed to assess each sites potential to impact the Project, and those sites considered to have potential to impact the Project are discussed below. The 2020 ERIS database report is provided in Appendix B.

2.1.1 Hudson – In-Road & MBTA ROW Portion

The environmental database review identified a total of 104 MassDEP Disposal Sites within a 1-mile radius of the Hudson portion of the Project. Among the 104 sites, a total of six (6) were determined to have the potential to impact the Project and were therefore further evaluated. These sites included one (1) located within the in-road Hudson portion and five (5) sites located in the MBTA ROW Hudson portion of the Project. The last known status of these sites is described below. The sites are listed in order from the Project start to the Hudson/Sudbury municipal border.

Release Tracking Number (RTN) 2-10202 | Figure 2 – Sheet 1

The property located at the western end of the Project with an address of 49 Forest Avenue is identified as Hudson Light and Power Department is listed in the Aboveground Storage Tank (AST), RCRA-Small Quantity Generator (SQG), FINDS, UST, HW GEN, SHWS, and Release databases associated with the property's use as an electrical substation. It should be noted that a second property owned by Hudson Light and Power is also listed in the ERIS report, however this property is located approximately 400 feet North of the Project area and is therefore not considered a concern. The property has two permits for ASTs that are currently active. The property is listed in the RCRA-SQG and RCRALQG databases for the generation of ignitable waste. One former 4,000-gasoline UST was removed from the property in October 1997. No additional information regarding the removal of the UST was obtained. The property is listed in the SHWS and Release databases for the release of 20 gallons of diesel fuel assigned Release Tracking Number (RTN) 2-10202. The release achieved as Class A-1 RAO in April 1994 indicating a Condition of No Significant Risk and contamination was removed to background conditions.

Based on current Site conditions, this Disposal Site is considered unlikely to impact environmental conditions within the Project area; however, we will be continuously evaluating if a potential exists from the current operations of the property as an electrical substation and associated USTs and ASTs during constriction.

RTN-2-20907| Figure 2 – Sheet 2

The property located on Chestnut Street is identified as Chestnut Street Well and is listed in Tier Classified Oil and/or Hazardous Material and Release databases. The property was assigned RTN 2-20907 in August 2016 after PFAS compounds were detected in the Town of Hudson Public Water Supply wells known as Chestnut Street Well #1, Chestnut Street Well #2, Chestnut Street Well #3, and Kane Well. The source of PFAS contamination is unknown, and as a result, MassDEP issued several Request for Information (RFIs) to industrial owners in proximity to PFAS-impacted wells to better identify current and historic use or storage of PFAS materials at these manufacturing facilities.

In July 2019, MassDEP received a PFAS Source Assessment Summary Report from Corporate Environmental Advisors (CEA). The report identified thirteen (13) production and manufacturing facilities within the study area who are potential sources of PFAS. As of January 2020, MassDEP is continuing to

sample monitoring wells surrounding the Hudson Water Supply Wells while waiting for remaining RFI replies.

Based on the conditions at this Disposal Site, there is a potential to impact environmental conditions within the Project area based on the location of the impacted wells and their proximity to the Project as well as the lack of available information regarding potential PFAS sources from industrial property use in the area. We will be continuously evaluating the potential for impacts associated with this RTN to encroach on the Project area as more information becomes available; however, no impacts have yet been identified.

RTN-2-20923

The property located on 308 Chestnut Street is identified as Chestnut Street PFAS is listed in the Release database. The property was assigned RTN 2-20923 in June 2019 following the detection of PFAS in the on-site private drinking water well. Subsequent investigations identified PFAS in several other private wells within 599 feet of the 308 Chestnut Street property; requiring MassDEP to provide bottled drinking water and install point of entry treatment (POET) systems. As of March 2020, MassDEP continues to monitor and sample these POET systems, with limited additional investigation performed to assess the nature and extent of the PFAS impacts. The source of PFAS contamination is currently unknown; however, the property is located approximately 4,300 feet to the south-southwest of Project.

Based the location of the impacted well and the proximity to the Project, this Disposal Site is considered unlikely to impact environmental conditions within the Project area. We will be continuously evaluating the potential for impacts associated with this RTN to encroach on the Project area.

RTN 2-68 & 2-16560 | Figure 2 – Sheet 3

The property located at 555 Main Street in Hudson identified as Arrow Automotive Industrial Incorporated was listed in the LAST, LUST, Spills, RCRA Non-Gen, and SHWS databases. The property was assigned RTN 2-68 in 1987 due to historical volatile organic compound (VOC) impacts from leaking storage containers. Subsequent assessment activities identified VOCs in groundwater across the property and downgradient of the property to the north and northwest. A Class C-1 RAO (i.e. Temporary Solution) was submitted in May 2000 and later revised in April 2001 to include revisions such as the abutting properties connection to municipal sewer.

According to available records, in the course of investigation RTN 2-68 additional VOC exceedances in groundwater were identified and assigned RTN 2-16560. This Disposal Site was linked to the primary RTN and all response actions are being conducted under the Temporary Solution for RTN 2-68. According to the most recent status report submitted in August, concentrations of VOCs appear to be decreasing, but remain above applicable regulatory standards.

Based on the regulatory status of the property, the proximity to the Project area, and the north – northwesterly flow of groundwater towards to the Project area, this Disposal Site has the potential to impact environmental conditions within the Project area.

RTN-2-275 | Figure 2 – Sheet 3

The property located at 560 Main Street is identified as M&M Drilling Kane Perkins was listed in the RCRA-Conditionally Exempt Small Quantity Generator (CESQG), RCRA Non – Gen, Spills, UST, Release and SHWS (i.e. MassDEP Disposal Site) databases. The property was assigned RTN 2-275 in

September 1987 for the discovery of approximately thirty (30) 55-gallon drums containing oil. Upon further assessment, it was determined that petroleum impacts from the 55-gallon drums was only limited to surficial soils up to 2 feet below ground surface (bgs). Petroleum-impacted soil was removed from the property during Release Abatement Measure (RAM) activities. The disposal site achieved a Class A-2 Release Action Outcome (RAO) in June 1995, which indicates that a Condition of No Significant Risk was achieved; however, contaminant concentrations were not reduced to background. Also, the disposal site boundaries appear to encroach upon the Project Area.

Based on residual contamination still being present and the proximity to the Project area, this Disposal Site has the potential to impact environmental conditions within the Project area.

566 Main Street | Figure 2 – Sheet 3
The property identified as Rich's Auto Parts Incorporated located at 566 Main Street situated directly north of the Project area is listed in the FINDs, ICIS, and RCRA Non-Gen databases. Although no documented releases are recorded for the property, the industrial operations conducted at the property have the potential to have resulted in undocumented releases of OHM. with the potential to impact environmental conditions within the Project area.

Based on industrial operations performed near the Project, this Disposal Site has the potential to impact environmental conditions within the Project area.

RTN-2-248 & RTN 2-20439| Figure 2 – Sheet 3
The property located at 51 Parmenter Road is identified as Boyd Coatings Research Co., Inc. and is listed in RCRA Small Quantity Generator (SQG), Tier Classified Oil and/or Hazardous Material and Release databases. The property was assigned RTN 2-248 in May 1987 and RTN 2-20439 in January 2018.

RTN 2-248 was assigned after detecting trichloroethylene (TCE), 1,2-dichloroethylene (DCE), ethylbenzene, and xylenes in water samples. In July 1987, the equivalent of a Phase I and Phase II report was submitted to DEP identifying an abandoned septic tank east of the building as the source of TCE contamination in the form of a one-time release. This resulted in further assessment in the form of periodic sampling which suggested the source of the contamination was no longer present as concentration continuously decreased over time. In 1994, the only VOC detected was toluene at concentration well below the Reportable Concentration which led to the property being classified as Tier IA (now retired) and achieving a Class B-1 RAO indicating no further action is warranted because a level of No Significant Risk exists.

In January 2018, MassDEP assigned a new RTN, 2-20439, to the property after sampling of the Town of Hudson's Cranberry Bog Supply Well identified perfluorakyl substances (PFAS). According to the Notice of Responsibility (NOR), the RTN was assigned to the property due to its proximity to the supply wells and because MassDEP believed that historic industrial operations at property involved PFAS. As such, a NOR was issued to the former owner/operator, Boyd Coatings, as well as the current owner (Dylan Limited Partnership) and operator (Precision Coating Co., Inc.). The NOR also indicated that the PFAS detection constituted a Condition of Substantial Release Migration (SRM), requiring Immediate Response Actions (IRA) under the MCP.

In response to the NOR, IRA activities were initiated to investigate the nature and extent of PFAS impacts. To date, the IRA-related investigation activities have identified PFAS compounds in soil at the property, groundwater wells at or near the property, stormwater runoff from the property, and in drinking water samples collected from the Cranberry Bog supply well and twenty-two (22) nearby private wells.

Based on the PFAS investigations conducted to date identifying PFAS-impacted groundwater in the area surrounding the property, including to the north and south of the MBTA ROW portion of the Project, this Disposal Site has the potential to impact environmental conditions within the Project area. We will be continuously evaluating the potential for impacts associated with this RTN to encroach on the Project area.

2.1.2 Stow – MBTA ROW Portion

The environmental database review identified a total of eight (8) MassDEP Disposal Sites within a 1-mile radius of the Project in Stow. Among the eight (8) sites, a total of four (4) sites were determined to have the potential to impact the Project. A summary of the sites last known status are listed below.

RTN 2-722 | Figure 2 – Sheet 4

The property identified as Fort Devens Training Annex in Stow was listed in the Superfund and SHWS databases. The property was assigned RTN 2-722 in January 1990 for the identification of 73 study areas and areas of concern (AOCs), which had evidence of contamination from a variety of sources. The Disposal Site identified as AOC 10 and P32 was identified as a location of a railroad pit and former UST area where residents in the area reportedly dumped waste automotive oil. The former USTs have been pumped out and filled with water and the property is included in an arsenic investigation. The Disposal Site is listed as Adequately Regulated due to the Disposal Site status as an EPA Superfund Site. The listing was removed from the Superfund National Priorities List (NPL) in 2002.

Based on its former status as a Superfund Site and the proximity to the Project area, this Disposal Site has the potential to impact environmental conditions within the Project area.

RTN-2-20337

The property located at 220 and 216 Barton Road is identified as Barton Road Neighborhood is a residential area listed in the MassDEP Disposal Site Release database. The property was assigned RTN 2-20337 in October 2017 after the Nashoba Board of Health informed MassDEP of the discovery of chlorinated solvents, including trichloroethene (TCE) and 1,4-dioxane, at concentrations above drinking water standards in three (3) private drinking water wells. Upon further assessment, it was determined that multiple surrounding properties were also affected, although the source of the contamination is unknown.

In response to detecting contaminants in the several private drinking water wells, MassDEP installed POET systems at several affected properties, which they continue to monitor to ensure the effective removal of TCE and other contaminants of concern. To date, limited additional investigation to evaluate the nature extent of contamination has been performed.

Based on the closest affected private drinking water well located approximately 3,600 feet north of the Project, this Disposal Site is considered unlikely to impact environmental conditions within the Project area.

RTN-2-21045

The property located at 664 Sudbury Road is a Massachusetts Department of Fire Services (DFS) Firefighting Academy and is a listed MassDEP Disposal Site that was assigned RTN 2-21045 in October 2019. The RTN was assigned after results from a September 2019 PFAS investigation by MassDEP identified a Condition of Substantial Release Migration (SRM) associated with PFAS detected in surface water at White Pond. Additional investigations subsequently detected elevated total PFAS concentrations in soil, groundwater, sediment, and surface water samples collected at the property.

In December 2019, GZA Geoenvironmental, Inc. prepared and submitted an initial Immediate Response Action (IRA) Plan, which include provisions for conducting additional investigations to assess the nature and extent of PFAS. Based on the investigations conducted to date, the source of PFAS-impacted areas on property is believed to be historic use of aqueous film-forming foams (AFFF) during historic fire training exercises and the introduction of PFAS-impacted water from the existing potable water supply system (White Pond). The main impacted media and migration pathway for PFAS compounds appears to be movement through the wetland area at the western end of property toward surface water bodies; although, groundwater on property is also impacted and generally flows from the northeast to southwest towards White Pond.

Based on the property's proximity to the Project area being approximately 4,600 feet to the north-northeast, this Disposal Site is considered unlikely to impact environmental conditions within the Project area.

RTN-2-21116

The property located at 501 Gleasondale Road is identified as Gleasondale Mill is listed in the MassDEP Disposal Site Release database. The property was assigned RTN 2-21116 in December 2019 after an investigation of PFAS detected in Hudson's Chestnut Street public water supply resulted the detection of PFAS in private supply well and additional monitoring wells on property. The source of PFAS in groundwater is unknown; however, based on previous groundwater sampling locations, a potential source area may be located on the southern portion of the property.

In August 2020, Stow Industrial LLC, current owner and operator of property, submitted an IRA plan to MassDEP addressing the presence of PFAS in groundwater and associated SRM condition. Conditional approval of IRA plan was granted in September 2020. IRA activities are currently ongoing, which include limited on-site soil and groundwater testing and off-site testing of several private water supply wells. According to MassDEP records, the IRA-related sampling has yet to be conducted.

Based on the property's proximity to the Project area being approximately 3,200 feet to the north, this Disposal Site is considered unlikely to impact environmental conditions within the Project area; however, conditions associated with the site will be continuously evaluated.

2.1.3 Sudbury – MBTA ROW Portion

The environmental database review identified a total of 59 MassDEP Disposal Sites within a 1-mile radius of the Project in Sudbury. Among the 59 sites, a total of five (5) were determined to have the potential to impact the Project. A summary of the sites last known status are listed below in order from the Hudson/Sudbury municipal border to the Sudbury Substation off Route 20.

RTN 3-24573| Figure 2 – Sheet 5

The property identified as Former Rod and Gun Club located at 33 Bulkley Road was listed in the CERCLIS, SEMS, Spills, and Release databases. The property was assigned RTN 3-24573 in January 2005 for the identification of lead in surficial soils associated with the property's former operation as a recreational shooting range. Impacted soils were removed and confirmatory soil sampling determined that all lead concentrations were below the applicable standards. A Class A-1 RAO was submitted in March 2005, which indicates that a Condition of No Significant Risk was achieved, and contamination has been reduced to background.

Based on the property's current regulatory status, this Disposal Site is considered unlikely to impact environmental conditions within the Project area.

RTNs 3-3037 & 3-27243 | Figure 2 – Sheet 7

The property located at 528 Boston Post Road was listed in the RCRA-TSD and SHWS databases for the property's use as a Raytheon facility. The property was assigned RTN 3-3037 in April 1990 due to the presence of chlorinated volatile organic compounds (cVOCs) such as Trichloroethene (TCE) in groundwater. In addition, a release of 35 gallons of No. 2 heating oil occurred at the property in 1987, which was also addressed under RTN 3-3037. It was determined that release conditions did not warrant inclusion in the MassDEP's Locations to be Investigated List for potential Disposal Sites in 1990 as all soil concentrations were below regulatory standards in effect at the time. RTN 3-3037 achieved regulatory closure with MassDEP in 1997 under the condition of Pending No Further Action.

Raytheon continued to monitor groundwater quality at the property until 2007 when the elevated concentrations of cVOCs in groundwater were reported to MassDEP and assigned RTN 3-27243. In November 2008, the Disposal Site achieved a Class C-1 RAO, which is a Temporary Solution consisting of periodic groundwater sampling to monitor for natural attenuation. The most recent Class C-1 RAO Status Report in March 2017 for the Site indicated that all groundwater concentrations were below the applicable standards.

Between November 2016 and August 2018, several RAM Plans were filed on behalf of private developers to manage contaminated materials during redevelopment of the former Raytheon industrial facility. According to latest Post-Temporary Solution Status report filed for RTN 3-27243 in November 2018, the RAM activities/site redevelopment have had little impact on overall site conditions. Isolated areas of elevated CVOC concentrations exceeding the GW-1 standards continue to persist at the site.

Based on the site's location, the northwesterly flow of groundwater towards the Project area, and the regulatory status of the property, this Disposal Site has the potential to impact environmental conditions within the Project area.

RTN 3-74 | Figure 2 – Sheet 7

The property located at 33 Union Avenue identified as Coatings Engineering was listed in the RCRA Non-Gen, RCRA-Small Quantity Generator (SQG), UST, Spills, and SHWS databases. A least 10 former USTs were located on the property there had been removed by June 1987. The property was assigned RTN 3-74 in February 1986 for the identification of elevated levels of cVOCs in groundwater at the Disposal Site due to the former manufacturing of coated wire products. Groundwater monitoring was conducted from 2002 until 2012 to evaluate cVOC concentrations under Remedy Operation Status (ROS). A Class C-2 RAO (i.e. Temporary Solution) was submitted in April 2014. According to the most

recent Status Report submitted for the Site in April 2017, elevated levels of cVOCs were detected above the Method 1 GW-1 Standard in a monitoring well identified as RIZ-1 located approximately 75 feet south of the Project area with the Disposal Site boundary extending into the southern portion of the Project. Depth to groundwater at the property ranges from approximately 1.26 to 6.13 ft bgs.

Based on the regulatory status of the property and the location of the Disposal Site within the Project area, this Disposal Site has the potential to impact environmental conditions within the Project area. .

RTN 3-2640 | Figure 2 – Sheet 7
The property located at 39 Union Avenue identified in Mullen Lumber was listed in the Release database and assigned RTN 3-2640 in 1990 for the identification of 1,1,2-trichloroethane and 1,2-dichloroethane within groundwater at the property. The Disposal Site boundary is directly along the boundary between 39 Union Avenue and the Project area and is therefore conservatively assumed that impacts extend into the Project area. Reports infer that impacts are a result of groundwater migration from RTN 3-74 discussed above but the site is not eligible for a Downgradient Property Status (DPS). A Class C-1 RAO (i.e. Temporary Solution) was submitted in August 1997. According to the Five-Year Periodic Review of the Temporary Solution submitted in December 2012, groundwater at the Disposal Site continues to exceed the applicable Method 1 GW-1 standards in wells located closest to the Project area. Depth to groundwater at the Disposal Site ranges from approximately 1.21 to 6.89 ft bgs.

Based on the regulatory status of the property, depth to impacted groundwater at this property and the close proximity to the Project area, this Disposal Site has the potential to impact environmental conditions within the Project area.

38-40 Station Road | Figure 2 – Sheet 7
The property identified as Mosher Auto Body located at 34 Station Road situated directly north of the Project area is listed in the FINDs databases for the property's use as an automotive repair shop. The property is also listed in the RCRA-CESQG database for the property's generation of ignitable waste and nonhalogenated solvents. The property has received several written informal violations regarding the generation of this waste.

Based on the history of violations and the close proximity of hazardous materials storage to the Project area, this Disposal Site has the potential to impact environmental conditions within the Project area.

RTN 3-15581 | Figure 2 – Sheet 7
The property identified as Mill Village located at the intersection of Concord Road and Boston Post Road in Sudbury, north of the Project area is listed as having achieved a Class B-1 RAO on September 29, 1997. Chlorinated solvents, specifically vinyl chloride, were identified on the property in exceedance of MCP thresholds in 1994 but not reported until 1997.

Based on current regulatory status, this Disposal Site is unlikely to impact environmental conditions within the Project area.

RTN 3-33240 | Figure 2 – Sheet 8
The property located at 209 Boston Post Road was listed in the LUST, Spills, UST, and Release databases. Four USTs were formerly located at the property and two USTs are currently in use. RTN 3-33240 was assigned in November 2015 for the identification of petroleum constituents in soil following

the removal of a UST. During assessment activities, over a foot of separate-phase petroleum product (gasoline) was identified in groundwater at the property. Following the completion of a Phase I Investigation Report and Phase II Comprehensive Site assessment the limits of the LNAPL were defined, impacted soil has been removed, and the Disposal Site was classified as a Tier II Disposal Site. The Phase III Feasibility Study and Remedial Action Plan report concluded and selected a down well skimmer remedial solution as the best available technology for LNAPL recovery. According to the RAM Completion Report submitted in June 2020, approximately 639 gallons of LNAPL have been collected from several monitoring wells installed on site, including wells located approximately 150 feet north of the Project. The remedial system was constructed and online by July 2020, and since its startup has recovered approximately 73 gallons of LNAPL as of October 2020, as stated in the latest Phase IV Status Report and Remedial Monitoring Report submitted in November 2020. Regulatory closure has not been achieved and periodic monitoring will continue to determine the effectiveness of the system to recover and control NAPL migration potential.

Based on the regulatory status of the Disposal Site and the proximity to the Project area, this Disposal Site has the potential to impact environmental conditions within the Project area.

RTN 3-27224 | Figure 2 – Sheet 8

The property identified as Sudbury Automotive located at the intersection of Route 20 and Landham Road is listed in the historical leaking underground storage tank (LUST), SHWS, and Spill databases for a release of gasoline from a former UST at the property. Approximately 50 to 100 gallons of gasoline impacted soil at the property due to an overfill. The Spill ID is N91-1290 and the spill has since achieved closure. A release identified under RTN 3-27224 occurred at the property in October 2007 and achieved closure under a Utility-Related Abatement Measure (URAM) in March 2008.

Based on the release impacts limited to soil and the location of the Disposal Site greater than 250 feet north to the Project area, this Disposal Site is considered unlikely to impact environmental conditions within the Project area. However, conditions associated with LUST closure are unknown and may present a risk to environmental conditions within the Project area, which was already identified as a concern under RTN 3-33240.

2.1.4 Environmental Database Review Summary

As described in the preceding sections, the environmental database review identified 15 sites with the potential to affect soil and groundwater conditions along the Project. The 2017 environmental database review results were subsequently used to inform site reconnaissance according to DEP's RTG of the MBTA ROW portion of the Project, which is described in Section 2.1.5. Results were also used to inform soil and groundwater pre-characterization, with locations preferentially selected near sites of potential concern. Soil and groundwater pre-characterization is described in Section 2.2.

2.2 Site Reconnaissance & ROW Classifications

Based on the findings above, a site reconnaissance was conducted by VHB in 2015 and 2017 to evaluate site conditions for the MBTA ROW portion of the Project for visual and/or reasonably identifiable indicators of OHM. The site reconnaissance identified the former rail line along the entire length with rail spurs noted in several locations. Urban fill material (i.e,. soil containing asphalt, bricks and debris) was also observed in addition to coal slag at the Geasondale Station.

2.2.1 *Railroad ROW History*

According to historical railroad plans, the former railroad was historically owned and operated by the Boston and Maine Railroad, and there were five former railroad stations adjacent or within the Project area.

Station	Town	Location	Years of Operation
Gleasondale	Hudson	Along Chestnut Street	1881 to 1965
Ordway		Along Parmenter Road	1902 to 1965
Wayside Inn	Sudbury	Along Dutton Road	1881 to ~1940
South Sudbury		97 Union Road	1881 to 1971
East Sudbury		Along Landham Road	1887 to 1971

As noted previously, the Central Massachusetts Railroad operated from at least 1881 until 1971. According to historic records, construction of the railroad line began in 1870 and was acquired by the Boston and Maine Railroad by 1887. Records also indicate there were historic train derailments within the Project Area in 1955 and 1978, and that the Wayside Inn Station in Sudbury was destroyed by a fire in 1940. These events may have contributed to the presence of oil and/or hazardous materials (OHM) in the ROW.

2.2.2 *ROW Classifications*

Pursuant to MassDEP RTG and findings of the 2017 environmental database review and site reconnaissance, the MBTA ROW portion of the Project was divided into Rural/Residential and Industrial/Commercial segments. Four (4) segments were established which are shown on Figure 2 and further discussed below:

- Segment 1 Rural/Residential - extends from the beginning of the MBTA ROW portion of the Project in Hudson at STA 100+00 to approximately STA 150+00, and is classified as Residential, Rural, or Undeveloped. According to historical information, only one railroad station was located within this segment. Based on review of available documents, there are no reported releases associated with this station; however, coal slag was identified at the former Gleasondale Station during site reconnaissance. As outlined in the RTG, due to the presence of potential contamination at the station location, additional assessment is recommended with isolated soil testing at this location. However, with exception of the Geasondale Station (STA 130+00 to 132+76), the remainder of the segment is considered likely to have been affected only by normal operations of the rail line, with a residual level of contamination. The BMPs outlined in the RTG are appropriate for the remaining portion of the segment due to the absence of any releases within this area.

- Segment 2 Industrial/Commercial - includes the portion of the MBTA ROW in Hudson, extending from STA 150+00 to STA 307+70, and is defined as an Industrial Corridor due to the industrial nature of the surrounding properties and the presence of four (4) nearby Disposal Sites with the potential to impact the Project are located within this segment (see Figure 2 – Sheets 2 and 3). Additionally, there are various industrial businesses that use hazardous materials in their day-to-day operations, including a concrete plant, plastic manufacturer, an automotive repair facility, that abut the Project. Therefore, this stretch is considered to have a higher potential for contamination beyond what is expected for normal rail line use. According to historical information, only one railroad station is located within this segment, and based on visual

observations and a review of available documents, there is no known releases or evidence of contamination associated with the Ordway Station.

- **Segment 3 Rural/Residential** - begins at STA 307+70 in Hudson, passes through Stow and ends at approximately STA 569+61 in Sudbury. Segment is defined as Residential, Rural, and Undeveloped with exception of the Fort Devens Training Annex RTN 2-722 (STA 360+15 to 362+90). Based on the environmental database review, there are two Disposal Sites within this segment; neither of which is expected to impact the Project.

- **Segment 4 Industrial/Commercial** - runs from STA 569+61 to the Project end at STA 767+20.85. This segment of the Project area is defined as an Industrial Corridor due to the industrial nature of the surrounding properties and proximity of multiple Disposal Sites. As depicted on Figure 2 – Sheets 7 and 8, five of the Disposal Sites with the potential to impact the Project are located within this segment. According to historical information, the segment also contained two stations, identified as East Sudbury Station and South Sudbury Station; however, based on visual observations and a review of available documents, there is no evidence of contamination associated with these stations.

Note that the re-use of soil during Project construction will be limited by results of any characterization (i.e., testing) performed but also by the segment classification described above. Soil in the MBTA ROW portion of the Project may only be re-used within a similar segment classification (i.e., Industrial Commercial soils may only be re-used in an Industrial/Commercial segment and efforts should be made to re-use soil as close to the point of generation as possible. Although the MassDEP RTG does not specify a limitation for the reuse of soil within similarly classified segments (i.e. Industrial only within Industrial), Eversource and DCR have adopted this conservative soil management approach. Therefore, soils generated from construction activities will be managed separately depending on their classification, both within the ROW as well as at off-site laydown areas.

Right of Way Rail Trail Classifications			
Project Segments		Project Stationing (STA)*	
		Begin	End
Segment 1	Rural/Residential	100 + 00	130 + 00
	Industrial/Commercial	130 + 00	132 + 76
	Rural/Residential	132 + 76	150 + 00
Segment 2	Industrial/Commercial	150 + 00	307 + 70
Segment 3	Rural/Residential	307 + 70	360 + 35
	Industrial/Commercial	360 + 35	363 + 05
	Rural/Residential	363 + 05	569 + 61
Segment 4	Industrial/Commercial	569 + 61	767 + 21

*Stationing from Sudbury-Hudson Transmission Reliability Project Plans dated October 2020.

The 2015 and 2017 site reconnaissance resulted in the Project being divided into the segments as discussed above which directly influenced the location and frequency of samples to be taken during the re-characterization sampling program. For example, soil and groundwater samples were only taken in the in-road and "Industrial/Commercial" segments of the Project. Further details on the site pre-characterization sampling program are described in the following section.

2.3 Pre-Characterization Sampling Program

Based on the findings above, a soil and groundwater pre-characterization sampling program was completed in 2018 to assess the presence of OHM within the in-road and Industrial/Commercial segments of the MBTA ROW portions of the Project and to identify applicable BMPs for handling excavated soil and groundwater during future construction. The program was conducted concurrent with a geotechnical subsurface exploration and included advancing soil borings, installing monitoring wells, and soil and groundwater sampling and analysis. Areas targeted for investigation included sites of potential concern described in Section 2.1 and identified in the VHB ROW table in Appendix C, as well as the following:

- Segment 1 was classified as residential, rural, and undeveloped and therefore MassDEP RTG BMPs would apply and sampling would only be required at the Gleasondale Station due to evidence of contamination (coal slag) identified during Project reconnaissance.
- Segment 3 was characterized as residential, rural, and undeveloped; however, one disposal site of concern is located within this segment which is also the location of Mirror Lake Junction where historical collisions took place. As such, sampling was conducted at Mirror Lake Junction.
- The in-road portion

The soil boring and monitoring well locations are shown on Figure 2.

2.3.1 Subsurface Conditions

In 2018, geotechnical investigations were completed by Lahlaf Geotechnical Consulting, Inc. (LGCI), to gather subsurface information and provided recommendations regarding foundation design and construction along the Project. To assess subsurface conditions, LGCI oversaw a total of sixty-six (66) borings, with thirty-three (33) borings completed in Hudson and thirty-three (33) borings completed in Sudbury. According to the geotechnical explorations, subsurface conditions consisted of the following:

- Asphalt was encountered only in Hudson at depths ranging between 0.7 to 0.9 ft bgs.

- Surficial organic topsoil and subsoil, generally made up of silty sand with organic fines, roots, leaves, grass, and wood, encountered less than 1.5 feet thick in Hudson and 0.5 in Sudbury; however, the thickness ranged between 0.1 and 4 feet in Hudson and 0.1 and 2 feet in Sudbury,

- Fill, mostly poorly graded sand and some silty sand or well graded sand, encountered at ground surface and/or underneath the asphalt or surficial organic layers at various locations in Hudson and Sudbury. Fill depths extended up to 11 ft bgs; however, one location fill was encountered at the termination depth of 16 ft bgs. Note, fill along the abandoned MBTA railroad contained traces of organic fines, coal ash, coal, slag, roots, and wood,

- Buried Organic Soil and Swamp Deposits, generally made up of fibrous peat, organic fines, roots, and wood, encountered beneath the fill and extended to depths up to 10 to 11 ft bgs in Hudson and Sudbury. Note, in Hudson there were a few instances of buried organic soil depths extended up to 20 to 25 ft bgs and swamp deposits were only located in Sudbury,

- Sand, mostly well graded sand and silty sand with some poorly graded sand, encountered beneath the asphalt, surficial organic soil, fill, or buried organic soil and extended to boring termination depths at all locations with few exceptions in Hudson and Sudbury

- Bedrock, hard, slightly weathered, slightly fractured, fine-grained, gray with black mottles Granite, encountered in Sudbury at depths ranging between 6 to 18 ft bgs. Bedrock was not encountered in any of the borings completed in Hudson, however boulders were encountered at depths of 6 ft bgs

In addition, to characterizing soil conditions as part of their investigation, LCGI also evaluated groundwater levels during drilling. According to LCGI observations, groundwater was encountered at every soil boring location with few exceptions. Where encountered, groundwater was observed to be between 4 and 15 ft bgs along the MBTA portion of the Project and 5 to 10 ft bgs along the in-road portion of the Project. Using these depths and the corresponding soil information from the soil borings, LCGI estimated groundwater infiltration flow rates between 1,000 to 4,000 gallons per day for the proposed vault excavation and 10 to 40 gallons per day per foot of transmission line trench.

Further details regarding soil conditions along the Project are provided with the LCGI investigation report provided in Appendix D.

2.3.2 Soil Sampling & Analysis

Soil samples to assess the presence of OHM within the Project area, herein referred to as environmental borings/samples, were collected from select soil borings completed in Hudson and Sudbury to support Project design. These environmental borings were advanced by hollow stem auger or tripod methods, and four discrete samples were collected from each location using two-foot split spoons. Samples were then logged for their physical characteristics (i.e., grain size, moisture content, etc.) and evaluated for visual and olfactory contamination. Samples were also screened for volatile organic compounds (VOCs) using a photoionization detector (PID). The PID screening resulted in <3 parts per million volume (ppmV) at most sample locations except for seven (7) locations in Hudson that resulted in a range of 19 – 80 ppmV. The environmental soil boring logs and corresponding PID results are provided in Appendix E.

In addition to assessing potential impacts through field screening, samples were collected from each environmental boring (i.e., a boring used to evaluate for the presence of contaminants vs. geotechnical properties) and submitted for laboratory analysis to evaluate potential contamination and identify preliminary disposal categories for excavated soil. In general, samples to pre-characterize excavated soils were collected at a frequency of 1 sample per 500 cubic yards of expected soil to be handled. Sample depths were selected to coincide with proposed depths of construction, generally 12 ft. bgs for proposed manholes and 7 ft bgs along the proposed duct bank. A summary of sample depths by location is provided in Appendix C.

Samples for disposal characterization included one discrete sample based on field screening results from each boring for laboratory analysis of VOCs by EPA Method 8260. A vertical composite from the anticipated depth of construction was also collected for analysis of the remaining disposal characterization parameters. The disposal characterization laboratory analysis was conducted by Con-Test Analytical Laboratories according to MassDEP's Policy# COMM-97-001. Laboratory analyses included the following:

- Total Petroleum Hydrocarbons (TPH), Method SW-846 8100 Modified
- VOCs, EPA Method SW-846 8260C
- Semi-volatile organic compounds (sVOCs), EPA Method SW-846 8270D
- RCRA-8 Metals by Method SW-846 6010D and 7471B
- Polychlorinated biphenyls (PCBs), Method SW-846 8082A
- Herbicides, Method SW-846 8151A
- Organochlorine Pesticides, Method SW-846 8081B
- Reactive Sulfide & Reactive Cyanide, Method SW-846 9014/ 9030A
- Ignitability, SW-846 1030
- Conductivity, SM21-22 2510B Modified
- Corrosivity (pH), Method SW-846 9045C

Laboratory data reports are provided in Appendix F. Assessment and remediation of hazardous waste sites in the state of Massachusetts are governed under the Massachusetts Contingency Plan (MCP, 310 CMR 40.0000) enacted under M.G.L. C. 21E. Therefore, to determine potential regulatory obligations resulting from pre-characterization sampling, results of soil analysis compared to the MCP Reportable Concentrations for Soil Category 1 (RCS-1), which is applicable due to the presence of residences within 500 feet of the Project.

2.3.2.1 Hudson In-Road Results

Between June 2018 and August 2018, twenty (20) soil samples from select soil borings were collected for laboratory analysis. The sample locations are shown in Figure 2, Sheet 1. The laboratory results are summarized in Table 1.

Soil samples from the in-road portion of the Project contained various metals, pesticide, semi-volatile organic compounds (SVOCs) and petroleum hydrocarbon concentrations. Where detected, the concentrations were below their respective MCP RCS-1 standards, except for the concentration of hexachlorobenzene at MP-5 and benzo(a)pyrene at MP-2, MP-5 and MP-21.

2.3.2.2 Hudson Rail ROW Results

Between May 2018 and June 2018, thirty-two (32) soil samples from select soil borings were collected for laboratory analysis. The sample locations are shown in Figure 2, Sheets 2 through 4. Sampling results are summarized in Table 2. As shown, soil samples from the MBTA ROW portion of the Project in Hudson contained various metals and TPH concentrations. Where detected, the concentrations were all below their MCP RCS-1 standards.

2.3.2.3 Sudbury MBTA ROW Results

Between October and November 2018, twenty-nine (29) soil samples from select soil borings and one test pit sample (MP40) were collected for laboratory analysis. The sample locations are shown in Figure 2, Sheets 4 through 8. The laboratory results are summarized in Table 3.

Soil sampling results from the Sudbury ROW identified various metals, petroleum hydrocarbons, and SVOCs concentrations. Where detected concentrations were below their respective MCP RCS-1 standards, except for the following:

- Arsenic concentrations at MP34 (21 mg/kg) and SB36 (21 mg/kg) exceeded the MCP RCS-1 standard of 20 mg/kg.
- Two polycyclic aromatic hydrocarbons (PAHs) concentrations, benzo(a)pyrene at MP-33 and phenanthrene at MP34, were equal to their respective MCP RCS-1 standards.
- The TPH concentration at SB42 equaled the MCP RCS-1 standard of 1,000 mg/kg.

The detection of these contaminants at concentrations equal or exceeding their respective MCP RCS-1 standards were subsequently considered to be exempt from notification according to the MCP. The exception from notification was based on the following:

- Arsenic is a commonly detected contaminant of concern within railroad ROWs, having been used historically in various lead-arsenate pesticides as well as frequently detected in coal and coal ash. As such, the detection of arsenic is considered exempt from notification according to the MCP 310, CMR 40.0317(8), which states OHM releases result from the application of pesticides in a manner consistent with the labelling, and 310 CMR 40.0317(9), covering OHM related to coal and coal ash.

- PAHs are commonly detected contaminants in ROW and other areas of historic railroad operations. Although detected at concentrations equal to their respective MCP RCS-1 standards, they were considered except according to 310 CMR 0317 because the source of the PAHs was attributed to coal and coal ash. Additionally, these concentrations are consistent with background levels for soil containing coal or coal ash as listed in MassDEP's 2002 technical update Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil.

- TPH is a screening level analysis that is typically used where there is no known release of specific petroleum hydrocarbons. Based on the location of SB42 at the intersection of two public roadways associated Station Road and Boston Post Road, the observed concentrations of TPH in the soil sample can likely be attributed to the normal operations of motor vehicles. Vehicle emissions typically contain low levels of petroleum constituents as well as PAHs. Due to the low levels of TPH at the MCP RC and the low detections of other PAHs such as benzo(a)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, and pyrene, the concentration of TPH in the soil sample associated SB42 is likely attributable to emissions from the exhaust of an engine and is considered exempt from reporting under 310 CMR 40.0317(8)(b). In addition, petroleum residues that are incidental to the normal operation of motor vehicles meet the definition of Anthropogenic Background conditions in accordance with 310 CMR 40.0006.

2.3.3 Groundwater Sampling & Analysis

To characterize groundwater within the Project area, select soil borings were completed as groundwater monitoring wells. As mentioned previously, well locations were installed to sample groundwater in areas that were considered to have the potential to impact the Project based on the environmental database review and site reconnaissance conducted. The wells were constructed using 1- or 2-inch polyvinyl chloride (PVC) riser and a minimum 10-feet of slotted screen set. Groundwater monitoring well locations are shown in Figure 2. Monitoring well construction logs are provided in Appendix E.

Following installation, each newly installed well was developed by purging several well volumes (20 to 30 gallons) using a submersible pump. After allowing the wells to equilibrate, samples were collected using the Environmental Protection Agency (EPA) low flow sampling technique, using a peristaltic pump

and lab grade silicon tubing attached to disposable polyethylene tubing set to the midpoint of the saturated screen, to minimize turbidity. There samples were field preserved and submitted to ConTest for analysis of:

- VOCs, by EPA Method 8260
- Polychlorinated Biphenyls (PCBs), by EPA Method 8082
- RCRA-8 Metals by SW-846 Method 6020/7476, and
- TPH by EPA Method 8100M.

Groundwater sampling results are summarized in Tables 4 and 5. Laboratory data reports are provided in Appendix F.

2.3.3.1 Hudson In-Road & MBTA ROW

Three environmental soil boring locations (SB-5, SB-21 and SB-24) in Hudson were completed as groundwater monitoring wells as shown in Figure 2 – Sheets 2 and 4. On August 3, 2018, groundwater sampling from wells were collected, at which time groundwater was present at depths from 7.65 feet at SB/MW-24 to 15.32 feet in SB/MW-5. As shown in Table 4, no groundwater impacts were identified in any of the three samples. Groundwater analytical results were below the most stringent Reportable Concentrations, category GW-1 (RCGW-1) standards.

2.3.3.2 Sudbury ROW

Three soil boring locations (SB-33, SB-35, and SB-42) in Sudbury were completed as monitoring wells as shown in Figure 2 – Sheets 6 and 7. Groundwater sampling of these wells was completed by VHB on December 5, 2018. Depth to groundwater during the sampling ranged from 1.25 feet at SB/MW-35 to 3.31 at SB/MW-33. As shown in Table 5, the groundwater sampling identified no impacts within this portion of the Project area. Groundwater analytical results were below the most stringent RCGW-1 standards.

In conclusion, the 2018 soil and groundwater pre-characterization sampling program and geotechnical subsurface exploration, as discussed above, assessed the presence of OHM within the in-road and Industrial/Commercial segments of the MBTA ROW portions of the Project. The results from these activities were used to identify applicable BMPs for managing excavated soil and groundwater. Further details on the management of soil and groundwater encountered along the Project are described in the following sections.

3.0 SOIL MANAGEMENT

Excavated soil will be managed according to the requirements of Eversource's *Massachusetts Excess Soil and Groundwater Management Policy* (January 2020), the plans and specifications for the Project, DEP's RTG, and applicable local, state and federal regulations, policies and approvals, including the special conditions identified in Orders of Conditions issued by the Towns of Hudson, Sudbury and Stow. In general, geotechnically suitable excavated soil shall be reused to greatest extent feasible within the Project's limits of work to reduce surplus soil requiring off-site transportation and disposal. A summary of the estimated surplus and potential soil available for reuse is outlined in the table below.

Segment	Classification	Town	Excavation (cy)	Soil Reuse (cy)	Excess Soil (cy)
1	Residential/Rural	Hudson	7,980	410	7,570
	Industrial	Hudson	1,350	--	1,350
	Residential/Rural	Hudson	2,330	190	2,140
2	Industrial	Hudson	8,060	1,550	6,510
3	Residential/Rural	Hudson	4,380	2,580	1,800
	Industrial	S/H	260	260	--
	Residential/Rural	Sudbury	15,010	8,170	6,840
4	Industrial	Sudbury	10,040	6,640	3,400
In-Road	Industrial	Sudbury	8,470	--	8,470
SS	Industrial	Sudbury	330	--	330
		TOTAL	58,210	19,800	38,410

"In-Road" = In-road portion of the Project, from HLPD to MBTA ROW
"SS" = Sudbury Substation
"—" = Indicates no or minimal amounts anticipated | "cy" = cubic yards
Refer to Section 2.1.6 for MBTA ROW RTG Segment delineation and Project stationing.

The requirements for on- and off-site soil management re outlined in this Section.

3.1 On-Site Soil Reuse

The on-site reuse of excavated soil will be performed according to where the soil is excavated within the overall Project area. For work in the in-road areas, soil will be reused in the general locations it was excavated. Reuse within the MBTA ROW portion will be performed according to MassDEP's RTG and the segment classification discussed in Section 2.2.1. Additionally, Eversource has adopted the conservative approach that soil reuse from Rural/Residential and Industrial/Commercial segments will be kept separate since soil from Rural/Residential segments has not been characterized and intermixing of soil between different segments classifications is not allowed pursuant to Town approvals. Town approval also prohibit the reuse of excavated soil from the ROW across municipal boundaries to the greatest extent practicable.

As noted above, it is estimated that there will be up to approximately 19,800 cubic yards of excavated soil available for on-site reuse during the Project. Based on the soil pre-characterization sampling results, this SGMP has established appropriate BMPs to minimize or eliminate exposure to contaminated soil by construction workers, site visitors, and the adjacent community as well as to mitigate the track out/migration of contaminated materials, where present, outside the Project's limits of work. The RTG BMPs will include:

- Preparation of site-specific health and safety plan covering the potential hazardous associated with working with contaminated soil likely to be encountered during the Project.
- Implementing dust control measures, such as wet misting, during excavation and grading operations to prevent fugitive dust emissions.
- Covering loads of soil during transport within the Project Area and during transport between off-site laydown areas.
- Securing active work areas and temporary soil stockpile areas to prevent exposure to potentially contaminated soils.
- Providing appropriate erosion and sedimentation controls and stabilization of exposed areas to prevent/control stormwater runoff.
- Limit temporary stockpiles within active work areas and provide temporary soil stockpile locations that are adequately protected/safe-guarded. Stockpiles to be placed on and covered with polyethylene sheeting and provided with erosion and sedimentation controls.

Additionally, an independent environmental monitor will conduct inspections of Project work areas and off-site laydown and stockpile areas to assess BMP effectiveness and identify additional controls, where needed.

3.2 Off-Site Soil Management

3.2.1 Eversource Soil Types

It is estimated that the Project may result in generating up to approximately 38,400 cubic yards of surplus excavated soil. Surplus soil unable to be reused within the Project area will be transported off-site for appropriate reuse, recycling, treatment or disposal. The transport and off-site management of surplus soil will be performed according to applicable local, state and federal regulations and polices and Eversource's *Massachusetts Excess Soil Management Policy* and MassDEP's COMM-97 policy and Similar Soils Provisions Guidance (WSC-13-500). To evaluate management options, soil within the Project Area will be classified according to the following Eversource soil management categories:

Type A Soil: Reuse at Sand and Gravel facility: Soils which do not contain oil or hazardous material (OHM) or contain OHM below levels consistent with "natural" soil per MassDEP's Similar Soils Provision Guidance (WSC-13-500) are not considered Remediation Waste; this includes soil that exhibits concentrations of TPH less than or equal to 25 parts per million (ppm). These "natural" soils may be reused at specific beneficial reuse locations on a case-by-case basis under the discretion of Eversource and may be reused at an active sand and gravel processing facility that holds a Site Assignment Authorization with approval from the LSP-of-Record. Facilities that are reclaiming former sand and gravel pits must have a MassDEP approved ACO in place in accordance with MassDEP Interim Policy COMM-15-01: Re-Use of Soil for Large Reclamation Projects Policy.

Type B-1 Soil: <RCS-1 Beneficial Reuse: Soil containing OHM concentrations below MCP RCS-1 criteria can be used as fill material at off-site industrial/commercial locations provided that pre-existing OHM concentrations at the fill location are equal to or higher than those that exist in the construction generated soil and are not located within the Utility Related Abatement Measure (URAM). Facilities must have a MassDEP approved Administrative Consent Order (ACO) in place in accordance with MassDEP Interim Policy COMM-15-01.

Type B-2 Soil: <RCS-2 Beneficial Reuse: Soil containing OHM concentrations below MCP RCS-2 criteria can be used as fill material at off-site industrial/commercial locations provided that pre-existing OHM concentrations at the fill location are equal to or higher than those that exist in the construction generated soil and are not located within the URAM. Facilities must have a MassDEP approved ACO in place in accordance with MassDEP Interim Policy COMM-15-01.

Type C-1 Soil: Massachusetts Unlined Landfills: Soil that contains OHM concentrations above MCP RCS-1 levels but below the criteria for Massachusetts Unlined landfills per MassDEP Policy COMM-97-001.

Type C-2 Soil: Massachusetts Lined Landfills: Soil that contains OHM concentrations above MCP RCS-1 levels and Massachusetts Unlined landfills but below the criteria for Massachusetts Lined landfills per MassDEP Policy COMM-97-001.

Type D-1 Soil: Asphalt Batch Facility: Soil that contains OHM concentrations above MCP RCS-1 levels and above the criteria for Massachusetts unlined and lined landfills per MassDEP Policy COMM-97-001 but meets acceptance criteria for a permitted asphalt batch facility can be recycled at such facilities.

Type D-2 Soil: Thermal Desorption Facility: Soil that contains OHM concentrations above MCP RCS-1 levels and above the criteria for Massachusetts unlined and lined landfills per MassDEP Policy COMM-97-001 but meets acceptance criteria for a permitted thermal desorption facility can be recycled at such facilities.

Type D-3 Soil: Non-Hazardous Waste Out of State RCRA Subtitle D Landfill Facility Daily Cover: Soil that contains OHM concentrations above MCP RCS-1 levels and above the criteria for Massachusetts unlined and lined landfills per MassDEP Policy COMM-97-001 but meets acceptance criteria for a permitted non-hazardous waste out of state Subtitle D landfill facility for use as daily cover.

Type D-4 Soil: Non-Hazardous Waste Out of State RCRA Subtitle D Landfill Facility Disposal: Soil that contains OHM concentrations above MCP RCS-1 levels and above the criteria for Massachusetts unlined and lined landfills per MassDEP Policy COMM-97-001 but meets acceptance criteria for a permitted non-hazardous waste out of state Subtitle D landfill facility can be disposed at such facilities.

Type E-1 Soil: U.S. EPA Hazardous Waste RCRA Subtitle B Treatment Facility or RCRA Subtitle C Landfill Facility: Soil containing OHM concentrations that exceed reuse levels for Massachusetts landfills, asphalt batch and/or thermal desorption facilities and exceed federal TCLP limits or otherwise meets the definition of hazardous waste. Meets acceptance criteria for a permitted hazardous waste out of state RCRA Subtitle B treatment facility of RCRA Subtitle C landfill facility.

Type E-2 Soil: U.S. EPA Hazardous Waste PCB TSCA Landfill: Soils that either contain PCB concentrations greater than 50 PPM or are TSCA regulated and being managed under a Performance Based Cleanup can be disposed at approved TSCA facilities in accordance with 40 CFR 761.

Type E-3 Soil: Soil Stabilization to treat TCLP metals: Soil stabilization treatment of soil containing OHM concentrations that exceed federal TCLP limits for metals, to render soils non-hazardous prior to generation.

As noted above, it is estimated that the Project will require managing up to 38,410 cubic yards (approximately 65,200 tons) of surplus soil. The pre-characterization sampling program results described in Section 2.0 indicate management of these materials will generally be as either Type A, Type B-1 or Type C-1. The soil meeting these classifications along the Project area are color-coded as shown in Figure 2 and summarized below.

Pre-Characterization Soil Management Summary					
Town	Figure 2 Sheet No.	Soil Type Grouping Locations	Project Stationing		Soil Category
			Begin	End	
Hudson	1	Project Start to MP-1	00+00	--	B-1
		MP-1 to MP-3	--	--	C-1
		MP-3 to SB-1	--	--	B-1
		SB-1 to MP-6	--	--	C-1
		MP-6 to SB-2	--	--	B-1
		SB-2 to MP-10	--	--	A
		MP-10 to MP-14	--	--	B-1
	2	MP-14 to MP-15	100+00	129+00	B-1
		MP-15 to SB/MW-5	129+00	131+50	A
		SB/MW-5 to SB-14	131+50	152+05	B-1
		SB-14 to SB-15	152+05	156+52	A
		SB-15 to SB-44	156+52	161+87	B-1
	2 - 3	SB-44 to SB-45	161+87	180+40	A
	3	SB-45 to MP-22	180+40	186+50	C-1
		MP-22 to SB-16	186+50	211+43	A
		SB-16 to SB-43	211+43	303+85	B-1
	2 - 3	SB-43 to SB/MW-24	303+85	360+93	A
Sudbury	3 - 6	SB/MW-24 to MP-27	360+93	572+00	B-1
	6	MP-27 SB/MW-33	572+00	576+76	A
	6 - 7	SB/MW-33 to MP-28	576+76	579+96	B-1
	6 -7	MP-28 to MP-29	576+96	587+00	C-1
	7	MP-29 to SB-34	587+00	591+83	A
		SB-34 to MP-32	591+83	603/700+00	B-1
		MP-32 to SB-40	603/700+00	714+90	C-1
	7 - 8	SB-40 to Project End	714+90	767+20.85	B-1

According to Eversource's guidelines for excess soil management and the Project's excess soil management specifications, the following table outlines the anticipated types of facilities to be utilized and the required sampling frequencies to facilitate acceptance for surplus soil generated from the Project.

Soil Type	Expected Surplus Tonnage (% of total)	Destination Facility	Typical Sampling Frequency (per ton)
Type A	15	Reuse at Sand & Gravel Facility	800
Type B-1	76	<RCS-1 or 2 ACO Soil Reclamation Site	800
Type C-1	9	Unlined In-State Landfill	800

The Project contractor will be responsible for selecting appropriate destination facilities based on the pre-characterization soil sampling results and any supplemental testing performed by contractor during the Project. According to the Project's specifications, it is the contractor's responsibility to perform additional sampling, where required, to obtain approval from off-site facilities. The Contractor shall transport surplus soil off-site under a Massachusetts Material Shipping Record (MSR), Bill of Lading (BOL) or uniform hazardous waste manifest. Draft shipping documentation shall be prepared by the Contractor and submitted to Eversource and LSP for review a minimum 14 days prior to soil shipment. Eversource will sign all documentation as generator. Where required, Weston & Sampson will sign/stamp MSRs and BOLs as the LSP-of-Record/Qualified Environmental Professional. Final shipping documentation, once approved by the facility will be provided to the Sudbury Conservation Commission.

3.3 Soil Handling Procedures

Soil management will be overseen by Eversource and Weston & Sampson as the Licensed Site Professional (LSP) of Record for the Project. As noted above, inspections by a Project EM will be made during the Project to monitor the Contractor's soil handling operations and BMPs. Weston & Sampson will also conduct regular (weekly) inspections to verify that soil handling conforms with the Project's plans and specifications and this SGMP. General soil excavation and handling requirements are described below. Additional handling procedures are also outlined in Eversource's Excess Soil Management Specification 22153 included with the contract documents.

3.3.1 Excavation

Excavation of soil shall be handled in a manner that minimizes the spread and loss of contaminated materials, prevents cross-contamination of soil types/classifications, and segregates construction debris from excavated contaminated materials. Excavation activities should implement measures to divert and/or prevent surface water from directly entering open excavation areas. Following excavation, excess soil must be transported directly to the approved temporary controlled stockpile area for stockpiling prior to on-site reuse or transported directly off-site for reuse/recycling/disposal. No soils shall be removed from the Project area without prior approval from Eversource.

Excavated soils shall be handled according to their pre-characterization Eversource soil category and their RTG segment designation. Soils may be reclassified by the LSP and/or Eversource during excavation based on field screening, visual and olfactory observations, and the results of additional laboratory testing performed by the Contractor or LSP. Additionally, the LSP may evaluate excavation areas for the presence of debris to assess if such material can be designated as uncontaminated general demolition material. Excavation areas will also be inspected if unforeseen contaminated materials are encountered. The management of debris and unknown contaminated materials will be according to the Project specifications and Sections 5.0 and 6.0 of this SGMP.

3.3.2 Dust Controls

Soil excavation shall be performed in a manner that limits generating fugitive dust. Dust control measures and airborne particulate matter monitoring will be implemented to prevent unacceptable levels of dust resulting from handling operations associated with contaminated materials. Dust controls utilized by the contractor shall include wet misting during excavation activities or soil stockpiling activities, covering inactive soil stockpiles with polyethylene tarps, and covering each load of materials transported within and outside the Project area. Additionally, the Contractor is responsible for sweeping/cleanup of any materials tracked onto local streets. Lastly, any water used for dust suppression cannot be pumped or obtained from resource areas The dust suppression methods shall be subject to approval from LSP. If alternate dust suppression methods are proposed by the contractor, the Sudbury Conservation Commission will be notified prior to implementation.

3.3.3 Stockpiling & Temporary Storage

Following excavation, excess soil must be transported directly to the approved temporary controlled stockpile area for stockpiling prior to on-site reuse or transported directly off-site for reuse/recycling/disposal. The Contractor may be permitted to temporarily stockpile excavated materials upon approval by Eversource and the LSP. Soil stockpiles within the Project area will be limited in size and duration (no longer than one week) with appropriate runoff and erosion controls (silt fence and/or straw bales) installed around its perimeter. Sediment controls must be inspected regularly and repaired or replaced, as needed. Stockpiles of contaminated soils must be placed on and covered with a minimum of 6 mil polyethylene sheeting and at the end of each day secure the covering to prevent the stockpile from becoming uncovered due to winds. Excavated contaminated materials shall not be placed directly on the ground.

3.3.4 Transportation & Disposal

The Contractor is responsible for facilitating acceptance and transporting surplus excavated materials off-site for appropriate reuse, recycling or disposal. As noted above, no soil shall be removed from the Project area without prior approval from Eversource. The transport of soil classified as Type B-1 and Type C-1 will also require a signed/stamped Massachusetts BOL, MSR, and/or opinion letter from the LSP. During transportation, the Contractor is responsible for employing all measures necessary to prevent debris and/or soil from being spilled from trucks or tracked out onto local streets. Transportation shall also be performed according to any municipal traffic management plans required.

Following receipt of the surplus soil by off-site receiving facilities, the Contractor shall provide copies of fully executed manifests, MSRs and/or BOLs to Eversource and the LSP along with copies of certified weight slips for each load received. Information shall be provided to Eversource and LSP within 20 days of the last shipment.

4.0 GROUNDWATER MANAGEMENT

Observations during the Project's pre-characterization sampling program indicate depth to groundwater within the Project area generally ranges between 1 to 4 ft bgs in Sudbury and 7.5 to 15 ft bgs in Hudson. Based on these depths and the anticipated excavation depths for the Project, groundwater dewatering is likely to be required during construction. Given that previous groundwater sampling did not identify any locations where contaminant concentrations exceeded applicable standards, it is anticipated that only uncontaminated groundwater management will be necessary.

4.1 Groundwater Management Procedures

As described in Section 2.2.1, in 2018 LGCI performed geotechnical subsurface explorations across the Project in 2018. Based on soil observations and the perceived depth to groundwater encountered during their investigation, LGCI estimated groundwater infiltrations between 1,000 to 4,000 gallons per day for proposed vault excavations and 10 to 40 gallons per day per foot of transmission line trench could be expected.

The LCGI investigations indicate groundwater dewatering will be required to complete construction. Where dewatering is necessary, it shall be managed in accordance with the Project specifications, Section 22151 – Construction Dewatering, and all applicable local, state and federal regulations, polices and approvals, including the special conditions stipulated by OOCs issued by the Towns of Hudson, Sudbury and Stow. The Contractor shall note handling groundwater dewatering may vary by locations based on location of work and nearby resource areas. In general, groundwater shall be discharged in the vicinity of where it was generated and not within any wetland or 100-feet of a RFA. Additional dewatering handling requirements are discussed in Section 5.0.

4.1.1 General Requirements

Given the extent of dewatering that is likely to be necessary during the Project, efficient handling and discharge of dewatering effluent will be critical to completing construction and comply with the OCC issued from the local conservation commissions having jurisdiction over the work. Options for handling groundwater include the following based on work area conditions, infiltrations rates, and locations of any nearby natural resource areas:

- Infiltration by overland flow of the groundwater discharge to a vegetated upland area within the limit of work.
- Filtration of dewatering effluent using a filter bag surrounded by straw wattles or similar method before entering a dedicate catch basin or drain.
- On-site recharge through an adjacent section of trench within the limit of work.

Irrespective of the Contractor's chosen method, the Contractor is required to implement methods of controlling groundwater, seepage, precipitation, surface water runoff, and construction-generated water both inside and outside the excavation. The Contractor is responsible to furnish, install, operate, maintain, and remove a temporary construction dewatering systems/equipment to handle the expected flows. According to the Project specifications, the Contractor's dewatering system shall be capable of handling varying flow rates up to 50,000 gallons per day for every 100 linear feet of trench and manhole based on conditions encountered during construction. It is also the Contractor's responsibility to sufficiently dewater excavated soil to prevent transporting soil containing free liquids from the Project.

4.1.2 System Operation

The Contractor shall operate dewatering systems as necessary to lower and maintain groundwater water table and hydrostatic pressures below subgrade of trench and manholes to allow construction to proceed in a reasonably dry condition and maintain safe working conditions. Groundwater seepage, precipitation, surface water runoff and other construction-generated water shall be controlled until excavation and backfilling activities are complete. It is also the Contractor's responsibility to provide adequate collection, pumping, storage, sedimentation controls and, if necessary, treatment to comply with all local, state and federal regulations affecting the work. Eversource, the Sudbury Conservation Commission, and LSP shall be notified a minimum 7 days prior to dewatering discharge. Additional requirements outlined by the OOCs for the Project are summarized in Section 5.2.

4.1.3 On-site Recharge Requirements

The Contractor may discharge/recharge construction-related water on-site provide that the on-site discharge/recharge does not result in on-site surface runoff or damage to on-site construction and on-site discharge does not spread contamination or increase existing levels of contamination in other portions of the site or adjacent sites. On-site discharge must be performed according to the requirements of the MCP, Town/Conservation Commission requirements, and all other local, state and federal regulations. The Contractor is responsible for providing equipment and incidentals necessary for adequate flow and sedimentation control for on-site discharge of construction-related water. Additional groundwater management requirements are outlined in the Project Specifications.

5.0 REGULATORY REQUIREMENTS

The excavation and handling of soil and groundwater in some areas of the Project will be subject regulation under the MCP for handling contaminated materials as well as the special conditions stipulated by the Orders of Conditions issued by Town of Hudson, Sudbury and Stow for work in natural resource areas along the Project route. These requirements are discussed below.

5.1 Utility-Related Abatement Measure

The pre-characterization sampling program identified two locations within the Hudson in-road portion of the Project where contaminant concentrations exceeded their applicable MCP RCS-1 standards. Based on the exceedances, soil and groundwater management activities during work in these areas will be conducted under a Utility-Related Abatement Measure (URAM) prepared according to the MCP, 310 CMR 40.0460. The URAM will be filed by Eversource and Weston & Sampson prior to construction in these areas. The limits of the URAM areas based on the pre-characterization data performed to date are shown on Figure 2, Sheets 1 and 3.

5.2 Order of Conditions

The Orders of Conditions issued by the Towns of Hudson, Sudbury and Stow will affect portions of the earthwork conducted during the Project. In addition to complying with the requirements of this SGMP, work must be performed according to the OOC from each town. The OOC include various special conditions with the potential to impact environmental protection, earthwork and dewatering activities are outlined below. Where applicable, wetland jurisdictional areas are shown in Figure 3.

Order of Conditions – Special Conditions	
HUDSON	<u>EARTHWORK CONDITIONS</u> • All Time-Of-Year (TOY) construction restrictions and sweeps required by the Natural Heritage and Endangered Species Program shall be followed. TOY restrictions include no work within 450 feet of vernal pools between March 1 and June 1. • The Project EM shall be always on site that work is being performed in jurisdictional wetland areas. • If on-site excavation or other work reveals any soil contamination in reportable concentrations or quantities, the Conservation Commission shall be notified and shall be copied on all related correspondence. • If it is necessary to clean construction equipment while on site, it must be cleaned outside of the 100-foot Buffer Zone, Riverfront Area, or any other Resource Areas. <u>DEWATERING CONDITIONS</u> • If dewatering is necessary, water will not be discharge directly into any waterbodies, BVW, or inner 100-feet of RFA. • Conservations Commission shall be notified in advance if dewatering required within jurisdictional areas and shall inspect work site before dewatering commences if such inspection can occur within 24 hours of notification.

	• If any remedial activities or changes to the work plans are required due to the potential presence of PFAS in the Zone II wellhead area or other jurisdictional areas; the Conservation Commission shall be notified.
SUDBURY	<u>EARTHWORK CONDITIONS</u> • All stumping, grubbing, and grading shall be conducted after erosion controls have been installed and shall not adversely affect woody vegetation, or disturb soils, outside the permitted erosion control barriers. • Laydown areas shall be located predominantly outside resource areas subject to the Commission's jurisdiction. If any construction laydown area is proposed outside of the currently proposed work limits and in an area subject to the Commission's jurisdiction, an erosion control plan shall be submitted in advance to the Commission's representative for review and approval. • In any part of the Project work limits within 200 feet of a road crossing where the MBTA ROW crosses a Zone II for the Sudbury Water District supply wells, if a clay layer is encountered in the excavation for the transmission line and the excavation will extend below the bottom of the clay layer, the clay shall be stockpiled and reused to backfill and line the excavation before the transmission line duct bank is placed in that location. • Stockpiling of materials within the ROW shall be limited in size and duration (one-week maximum) and shall be located as far from sensitive areas as possible. Soil stockpiles shall be covered with tarp or plastic sheet and surrounded by erosion controls. Excess soil not reused within the Project site shall be stockpiled outside the ROW and wetland jurisdiction. Weekly reports prepared by the Project EM throughout construction will identify the locations of active stockpiles and will confirm that the appropriate erosion control measures are being implemented. • At least two weeks prior to the start of Phase I, the Applicant shall provide a construction schedule detailing construction activities and sequencing. This shall be amended as necessary throughout construction. Weekly reports shall be submitted to the Commission that details work completed each week and anticipated work for the coming week, including identifying when work is located in areas of potential elevated levels of soil and groundwater contamination. These reports shall include anticipated dewatering activities so that oversight can be provided by the Commission or its Agent, if found necessary, and include the location of active stockpiles with confirmation that appropriate erosion control measures are being implemented. • No equipment cleaning or refueling may occur within a wetland or upland resource area, with the exception of the crane. For cranes positioned within wetland jurisdiction for more than one day, the Applicant shall provide secondary containment to contain any leaks that may emanate from equipment. • Other than the grading of minor amounts of soil within the immediate vicinity of the Hudson/Sudbury town boundary, no soil excavated from Hudson may be used in Sudbury. The Sudbury Conservation Commission shall be copied if the Hudson Conservation Commission is notified of any remedial activities or changes to the work plans required due to the potential presence of PFAS in jurisdictional areas in Hudson. • The Applicant shall ensure that any reuse of on-site soils shall not result in the degradation of soil or groundwater in the area.

	• Loam borrow brought to the site to stabilize the work area after completing Phase I shall be sourced appropriately. Use of impacted soils (from contamination or invasive seed) shall be prohibited. DEWATERING CONDITIONS • If dewatering is required, the Project EM shall be notified of all dewatering activities and be on-site during dewatering in sensitive locations, i.e., whenever excavation is proposed within 50 feet of a wetland, or when extensive dewatering will be needed. • All dewatering shall include appropriate physical measures to filter sediment from water pumped from excavations, slow down velocity of discharge to eliminate potential for erosion and promote infiltration back to the local groundwater table. • Dewatering activities shall be located as far as possible from wetland resource areas and shall be prohibited from discharging to Bordering Vegetated Wetlands, Isolated Vegetated Wetlands, Land Under Water Bodies and Waterways, or within the inner Riverfront Area. Dewatering may only occur in other upland resource areas provided adequate control measures are implemented and locations are identified by the contractor and review and approved by the Commission and/or its agent prior to implementation.
STOW	EARTHWORK CONDITIONS • No filling or excavating of land beyond the limits or above the grades on the submitted plans is authorized. • All stockpiles shall be within the limit of work. • The erosion controls shall serve as a limit of work and no activity, including stockpiling or storage of material, is permitted beyond the sediment controls. • If dust controls beyond water spraying is required, the Conservation Commission shall be notified. • All trenches shall be backfilled or secured at the completion of each workday. • All imported soils shall be clean and reasonably tree of invasive species. No soil contaminated with Japanese knotweed and/or knotweed rhizomes may be reused in Stow. The Environmental Monitor shall identify and document any areas contaminated with Japanese knotweed within 500 of the eastern and western Town of Stow line prior to commencing construction. DEWATERING CONDITIONS • If dewatering is necessary, the Conservation Commission shall be notified in advance and must approve this work in the field prior to commencing dewatering. • No direct discharge to a waterbody is permitted. • No overland discharge of water is allowed within 100 feet of vegetated wetlands.

	• Concrete wash-out water shall not be discarded within the 100' buffer or within 100' of any drainage system that may discharge to wetlands or outside of the limit of work.

Restricted areas for dewatering are shown in Figure 3. Additional conditions affecting the other portions of the work are included with the OOCs in Appendix A.

6.0 MANAGEMENT OF OTHER EXCAVATED MATERIALS

Based on historic review of the Project Area, site reconnaissance, and the completed subsurface investigations, Project work may require excavating and handling of additional materials, such as the former rail line and railroad ties within the MBTA ROW portion of the Project. Types of materials to may be encountered and corresponding management requirements are outlined below.

6.1 Construction & Demolition Debris

Construction and demolition debris, such as plastic, metal, wood debris and glass, may be encountered during some soil excavation work. If encountered, these materials shall be segregated to maximum extent feasible for separate off-site transportation and recycling at an appropriate facility permitted to receive such materials.

6.2 Railroad Ties and Ballast

Work within the MBTA ROW portion of the Project is anticipated to encounter rail lines and ties associated with the former train service in this area. These materials shall be segregated during soil excavation for separate handling and disposal. Excavated rail ties shall be transported off-site for appropriate recycling or disposal according to MassDEP solid waste regulations, 310 CMR 16.00 and 310 CMR 19.00 and all other applicable local, state and federal regulations.

If ballast is encountered, it should be visually evaluated for the presence of OHM such as staining or sheening. If ballast is visually impacted, this material should be segregated for off-Site disposal consistent with section 22153 of the Project specification. If unimpacted, the contractor should re-use ballast whenever practicable or export with excess soil, as required.

6.3 Asphalt, Brick & Concrete

Asphalt, brick and concrete (ABC) that is encountered during the Project shall be segregated from excavated soil to maximum extent feasible for separate handling/disposal. ABC materials shall be managed/recycled according to MassDEP's solid waste regulations, 310 CMR 16.00 and 310 CMR 19.00. The crushing/downsizing of ABC materials to facilitate their loading, transport and acceptance by off-site recycling facilities is the Contractor's responsibility.

7.0 MANAGEMENT OF UNEXPECTED SOIL OR GROUNDWATER CONDITIONS

The Contractor shall immediately notify Eversource, the Sudbury Conservation Commission, and the LSP if suspected contaminated materials are encountered during the Project. Suspected contaminated material characteristics include: significant petroleum and/or chemical odors, an oily sheen or the presence of non-aqueous phase liquid (NAPL), and/or materials that exhibit significant staining or are comingled with suspect building debris (i.e., floor tile, insulation, etc.) or asbestos containing cement pipe.

Before continuing to handle any suspect contaminated materials, the Contractor will be provided guidance on how to manage, characterize, temporarily store, and recycle/dispose of any such materials. At a minimum, the Contractor will segregate suspect contaminated materials from other materials, as required by Eversource and the LSP. Stockpiles of contaminated materials will be placed and covered by 6-mil polyethylene sheeting, while groundwater/NAPL will containerized in drums or frac tank. Additionally, best management practices (BMPs) for erosion and sedimentation control of soil stockpiles (e.g., straw wattles, silt socks, etc.) will also be employed to prevent silt-laden runoff. These BMPs and stockpile covers shall be maintained until the materials are removed from the Site.

In the event suspect contaminated materials are encountered, it may be necessary for the Contractor to stop work and assist Eversource/LSP with collecting samples to evaluate the nature of potential soil and groundwater impacts and to characterize materials for appropriate off-site transportation and disposal. Work in suspected contaminated areas shall not resume until receipt of the sampling data unless approved by Eversource and the LSP. Based on the data, the Contractor shall transport suspected contaminated materials off-site for appropriate disposal. No materials shall be transported from the area without approval by Eversource and LSP as well as the Contractor's receipt of a signed/stamped BOL, MSR or hazardous waste manifest, as appropriate.

8.0 ORGANIZATION & RESPONSIBILITIES

Managing soil and groundwater will involve coordination between Eversource, Weston & Sampson as LSP-of-Record, and the Construction Contractor. This Section outlines the roles and responsibilities as well as lines of communication between these parties. Contact information for Eversource and Weston & Sampson are provided below.

Eversource Project Contact:

Mr. Dean Bebis
Environmental Specialist – Soil & Groundwater Management
Eversource Energy
247 Station Drive, SE270
Westwood, Massachusetts 02090
508-654-0492 | Dean.bebis@eversource.com

Weston & Sampson Project Contact:

Mr. Paul McKinlay, PG, LSP
Senior Project Manger
51 Walkers Brook Drive, Suite 100
Reading, Massachusetts 01867
617-5714521 | Mckinlayp@wseinc.com

8.1 Construction Contractor

The selected contractor will be responsible for managing surplus soil and groundwater as outlined in Section 22153 – Excess Soil Management and Section 22151 – Construction Dewatering of the Project's specifications. Work will include:

- Provide an off-site laydown area, as needed, for the temporary storage of excavated soil and groundwater prior to reuse within the Project Area or off-site reuse, recycling, treatment or disposal. Storage area locations and materials are subject to approval by Eversource and LSP and shall coordinate with relevant sections of the Project plans and specifications. Note that the local OOCs included in Appendix A include specific provisions and restrictions for permitted stockpile locations and procedures.
- Submit for approval by Eversource /LSP all required submittals outlined by Section 22153 and Section 22151 (Appendix G), including a list of proposed soil reuse, recycling, and/or disposal facilities for each category of surplus soil identified. For each category, a primary and secondary facility shall be identified.
- Comply with all applicable permits and approvals for the work including OOCs included as Appendix A.
- Submit all required disposal paperwork to coordinate acceptance of surplus soil and groundwater by approved off-site facilities.
- Excavate, stockpile, load, transport and dispose/reuse of surplus soil and groundwater off-site at approved facilities.
- Excavate, segregate, stockpile, load, transport and dispose/reuse of miscellaneous excavated materials at approved facilities.
- Provide weekly soil management reports for review and approval by Eversource and the LSP. A copy of these weekly reports will be provided to the Sudbury Conservation Commission.

8.2 Eversource

Eversource shall be responsible for the following soil and groundwater management activities:

- Review and approve the Contractor's selected primary and secondary off-site reuse, recycling, treatment and disposal facilities.
- Review and approve the Contractor's temporary staging/laydown area location.
- Sign appropriate disposal documentation, including MSRs, BOLs, and waste profile forms, to facilitate acceptance and the transportation off-site of excavated materials, excess soil and groundwater to approved facilities. Licensed Site Professional.

8.3 Licensed Site Professional

The LSP shall be responsible for the following soil and groundwater management activities:

- Review the pre-characterization sampling results to develop appropriate soil classifications according to categories outlined in as well as relevant MassDEP policies (COMM-97-001, COMM-15-01) and approved off-site reuse, recycling, treatment or disposal facility acceptance requirements.
- Preparation and updating (as necessary) this SGMP.
- Responding to and establishing requirements for handling, segregating and stockpiling of unanticipated contamination discovered during the Project.
- Conduct supplemental soil and groundwater sampling and analysis as needed to support acceptance of surplus excavated soil and groundwater by approved off-site facilities.
- Review and approval of the Contractor's proposed transportation companies and off-site reuse, recycling, treatment and disposal facilities for surplus excavated materials, soil and groundwater.
- Review and approval of the Contractor's proposed staging locations.
- Preparing MSRs and BOLs along with all applicable waste profile questionnaires or control forms for the Contractor's use in obtaining acceptance for surplus excavated materials, soil and/or groundwater by approved off-site facilities.
- Preparing Utility-Related Abatement Measure (URAM) notifications along with associated status and completion reports where required to handling contaminated materials during the Project.
- Prepare any required Release Notification Forms (RNFs) to address unforeseen contaminated materials requiring notification to MassDEP under the MCP.

9.0 REFERENCES

The information presented in this report was prepared based on the following reports and information.

1. *Geotechnical Report, Proposed Transmission Power Line Borings, Hudson, Massachusetts*, prepared by Lahlaf Geotechnical Consulting, Inc. (August 2018).

2. *Geotechnical Report, Proposed Transmission Power Line Borings, Sudbury, Massachusetts*, prepared by Lahlaf Geotechnical Consulting, Inc. (December 2018).

3. *Summary of Hazardous Materials Assessment, Proposed Transmission Line Project, Sudbury to Hudson, Massachusetts*, prepared by Vanasse Hangen Brustlin, Inc. (September 2017)

4. *MBTA ROW Subsurface Assessment Activities, Proposed Transmission Line Project, Hudson, Massachusetts*, prepared by Vanasse Hangen Brustlin, Inc. (August 2018)

5. *Summary of Hazardous Materials Assessment, Proposed Transmission Line Project, Hudson, Massachusetts*, prepared by Vanasse Hangen Brustlin, Inc. (October 2017).

6. *Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project, Summary of Soil and Groundwater Analytical Results and Subsurface Media Management*, prepared by Vanasse Hangen Brustlin, Inc. (May 2020).

7. *Massachusetts Contingency Plan, 310 CMR 40.0000 et. seq.*

8. *Massachusetts Excess Soil and Groundwater Management Policy,* prepared by Eversouce Energy (January 2020 revised).

9. *MassDEP Policy - Best Management Practices for Controlling Exposure to Soil during Development of Rail Trails.*

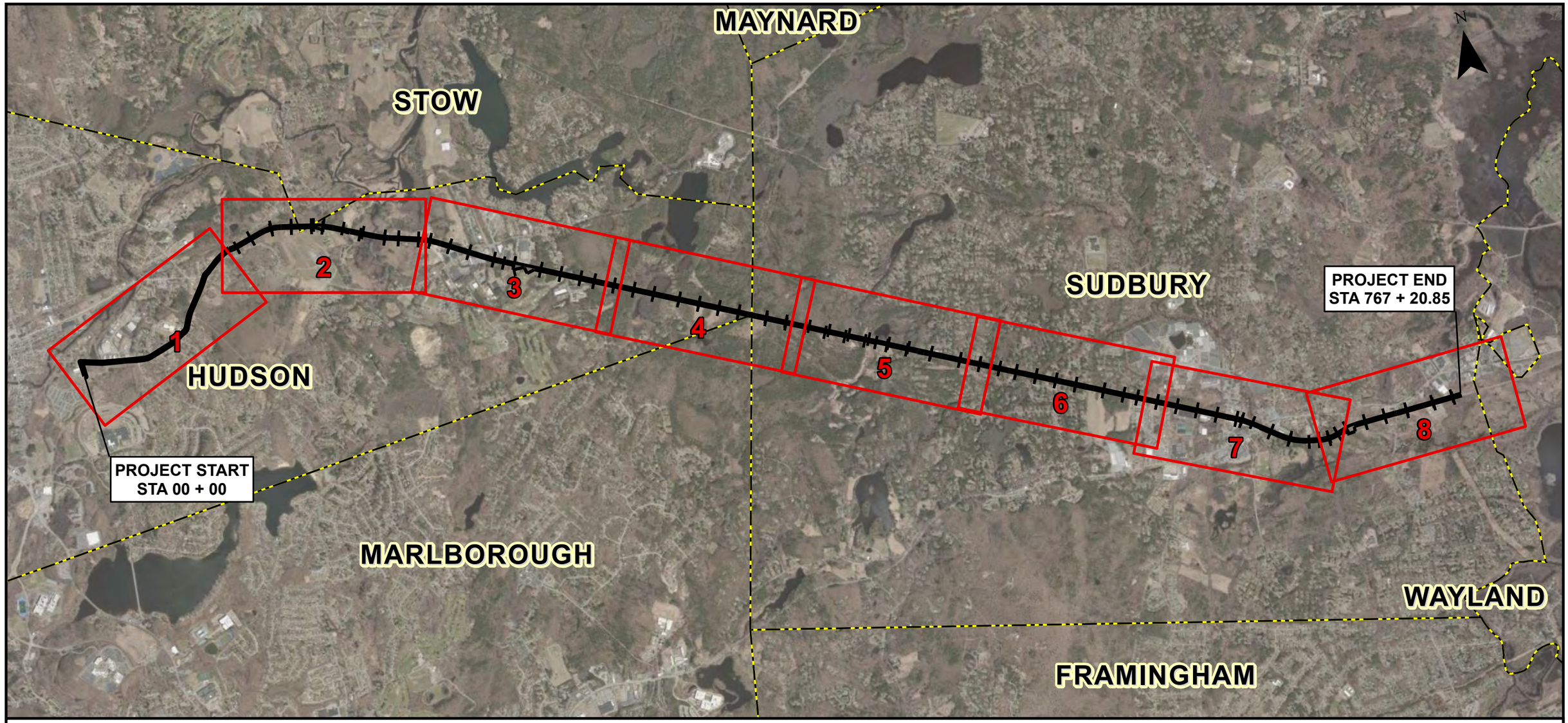
10. *MassDep Policy (COMM-15-01) – Interim Policy on Re-Use of Soil for Large Reclamation Projects,* (August 2015).

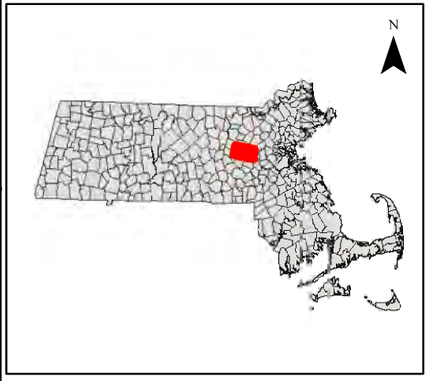
11. *MassDEP Policy (WSC-13-500) – Similar Soils Provision Guidance* (September 2014).

12. *MassDEP Policy (COMM-97-001) – Reused and Disposal of Contaminated Soil at Massachusetts Landfills,* (August 1997).

13. *Database Report: Underground Transmission Line Middlesex County, Sudbury/Hudson* prepared by Environmental Risk Information Services for Weston & Sampson Engineers, Inc. (October 2020).

FIGURES





Legend

Project Area

In-Road

MBTA ROW

Town Boundary

Figure 2 | Sheet Numbers

1 0.5 0 1

Scale in Miles

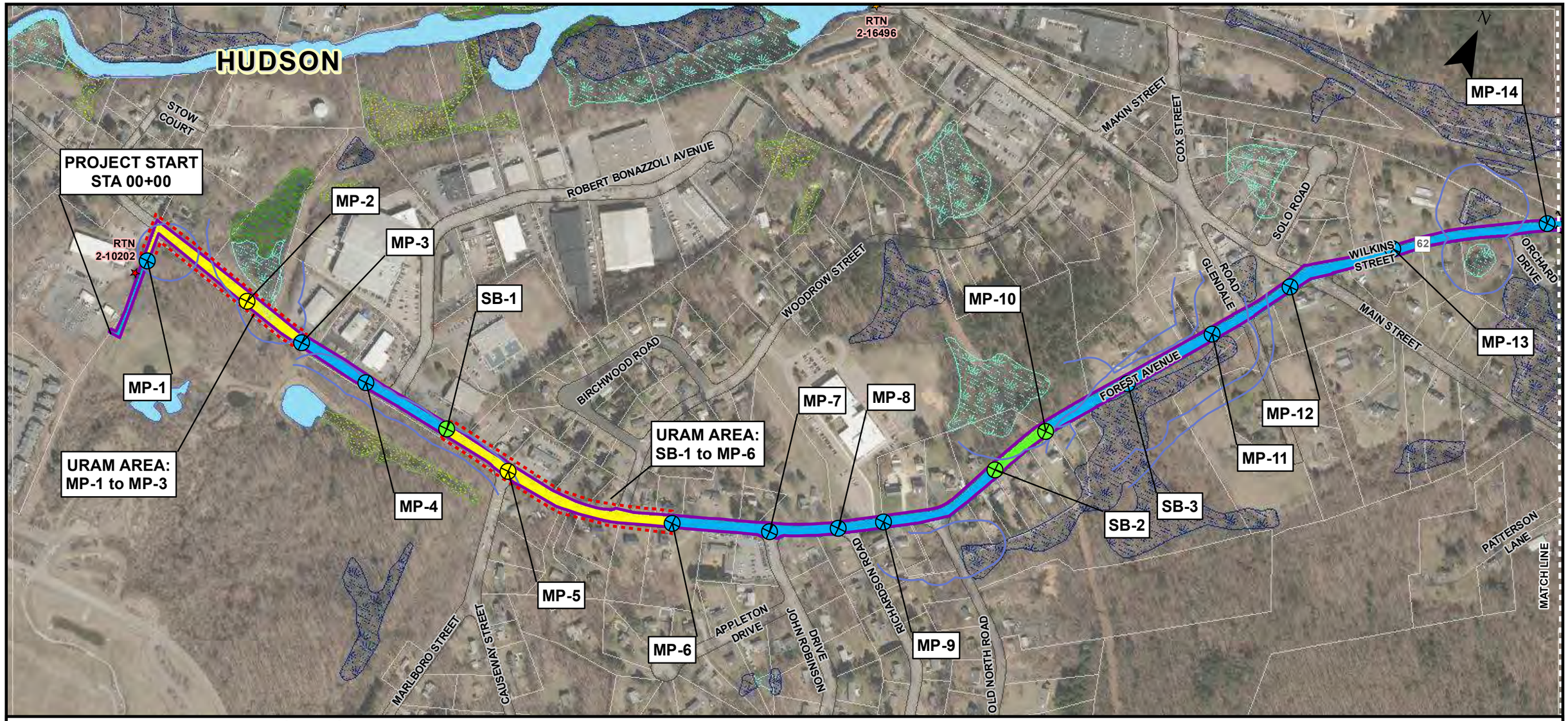
FIGURE 1 | Sheet 1 of 1

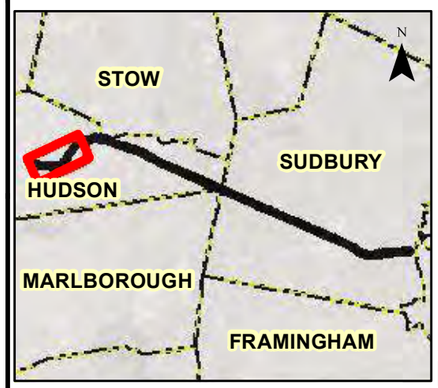
SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

PROJECT MAP

FEBRUARY 2020 SCALE: NOTED

Weston & Sampson





Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

Town Information
- Parcels
- Roads
- Boundary

Wetland Areas
- Bog
- Deep Marsh
- Shallow Marsh / Meadow
- Open Water
- Shrub Swamp
- Wooded Swamp

STA Callout
- Centerline
- 50ft Interval
- 500ft Interval

Soil Type
- Type A Soils
- Type B-1 Soils
- Type C-1 Soils

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM Area

Former Railroad Stations

BufferZones

Type A Soil: Reuse at Sand and Gravel facility: Soils which do not contain oil or hazardous material (OHM) or contain OHM below levels consistent with "natural" soil per MassDEP's Similar Soils Provision Guidance (WSC-13-500) are not considered Remediation Waste; this includes soil that exhibits concentrations of TPH less than or equal to 25 parts per million (ppm). These "natural" soils may be reused at specific beneficial reuse locations on a case by case basis under the discretion of Eversource and may be reused at an active sand and gravel processing facility that holds a Site Assignment Authorization with approval from the LSP-of-Record.

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Type C-1 Soil: Massachusetts Unlined Landfills: Soil that contains OHM concentrations above MCP RCS-1 levels but below the criteria for Massachusetts Unlined landfills per MassDEP Policy COMM-97-001.

500 250 0 500

Scale In Feet

FIGURE 2 | Sheet 1 of 8

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

SOIL & GROUNDWATER MANAGEMENT PLAN

OCTOBER 2020 SCALE: NOTED

Weston & Sampson

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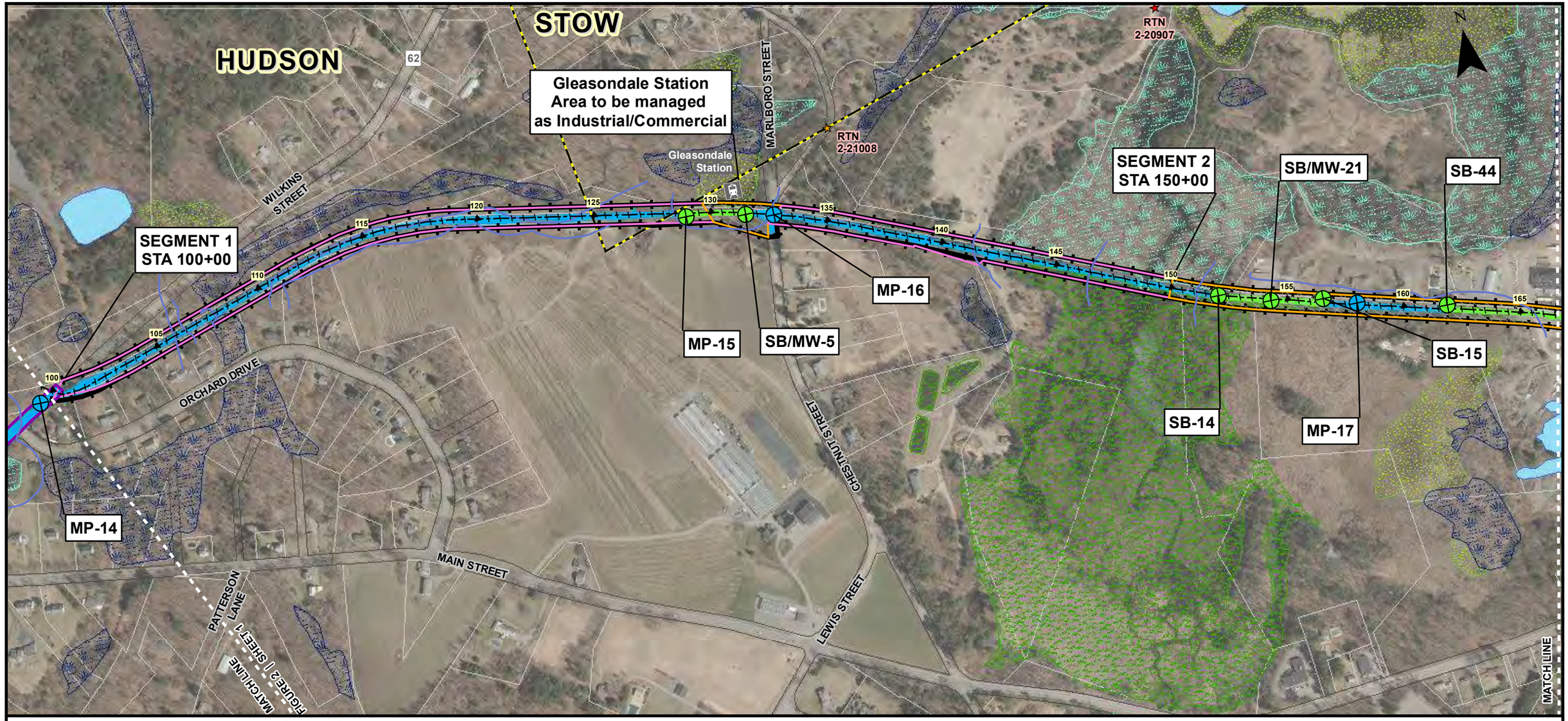

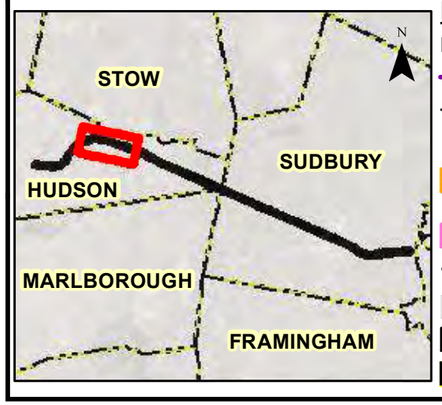

Legend

Project Area
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MCP Disposal Sites
- Sites of Concern
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URAM Area

Former Railroad Stations

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500 250 0 500

Scale In Feet

FIGURE 2 | Sheet 2 of 8

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

SOIL & GROUNDWATER MANAGEMENT PLAN

OCTOBER 2020 SCALE: NOTED

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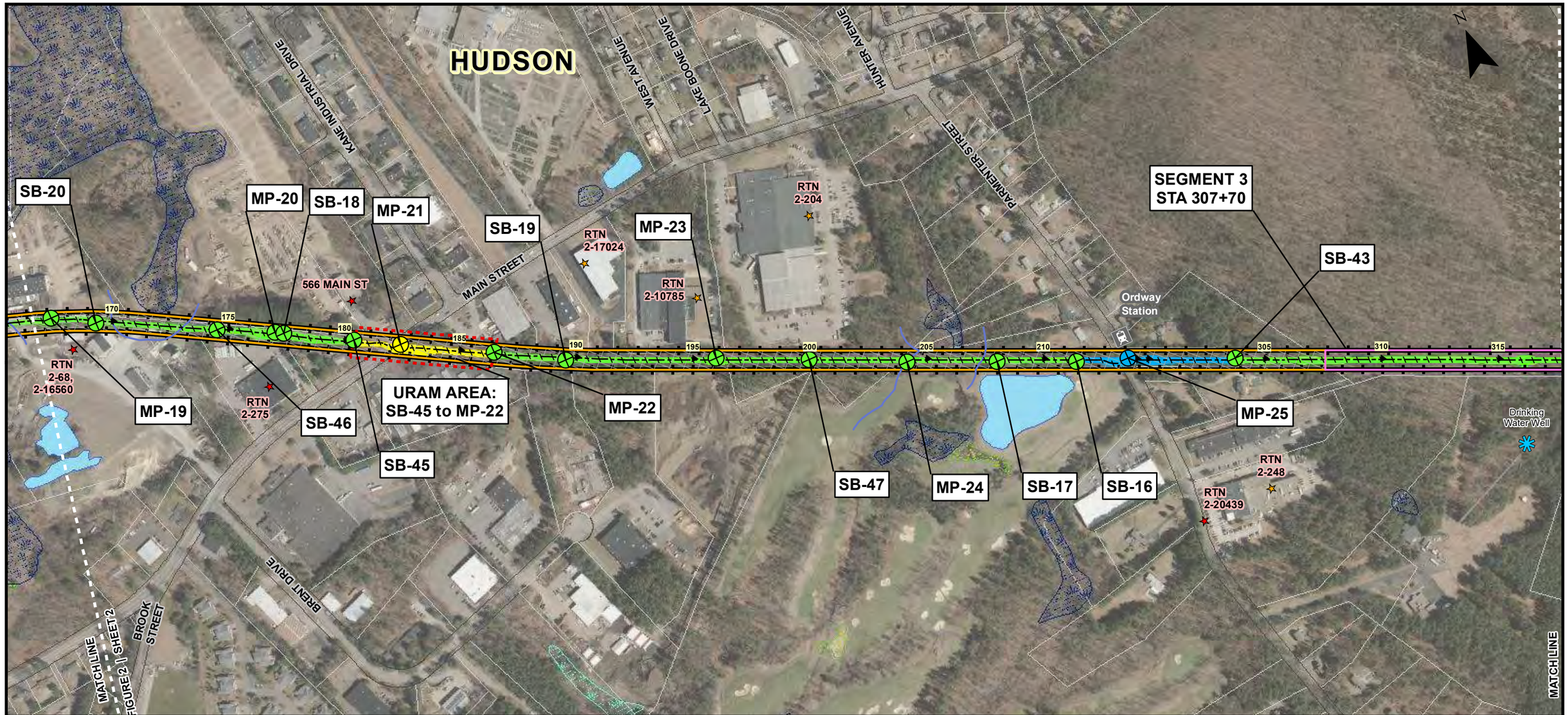

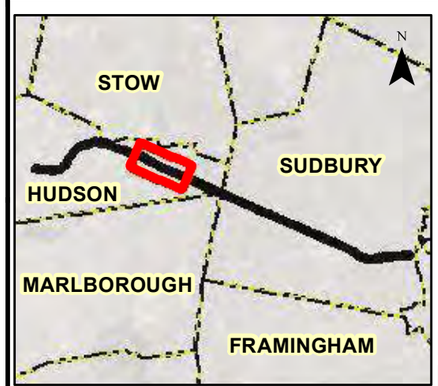

Legend

Project Area
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MBTA Segments
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Soil Type
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MCP Disposal Sites
- Sites of Concern
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URAM Area

Former Railroad Stations

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500 250 0 500

Scale In Feet

FIGURE 2 | Sheet 3 of 8

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

SOIL & GROUNDWATER MANAGEMENT PLAN

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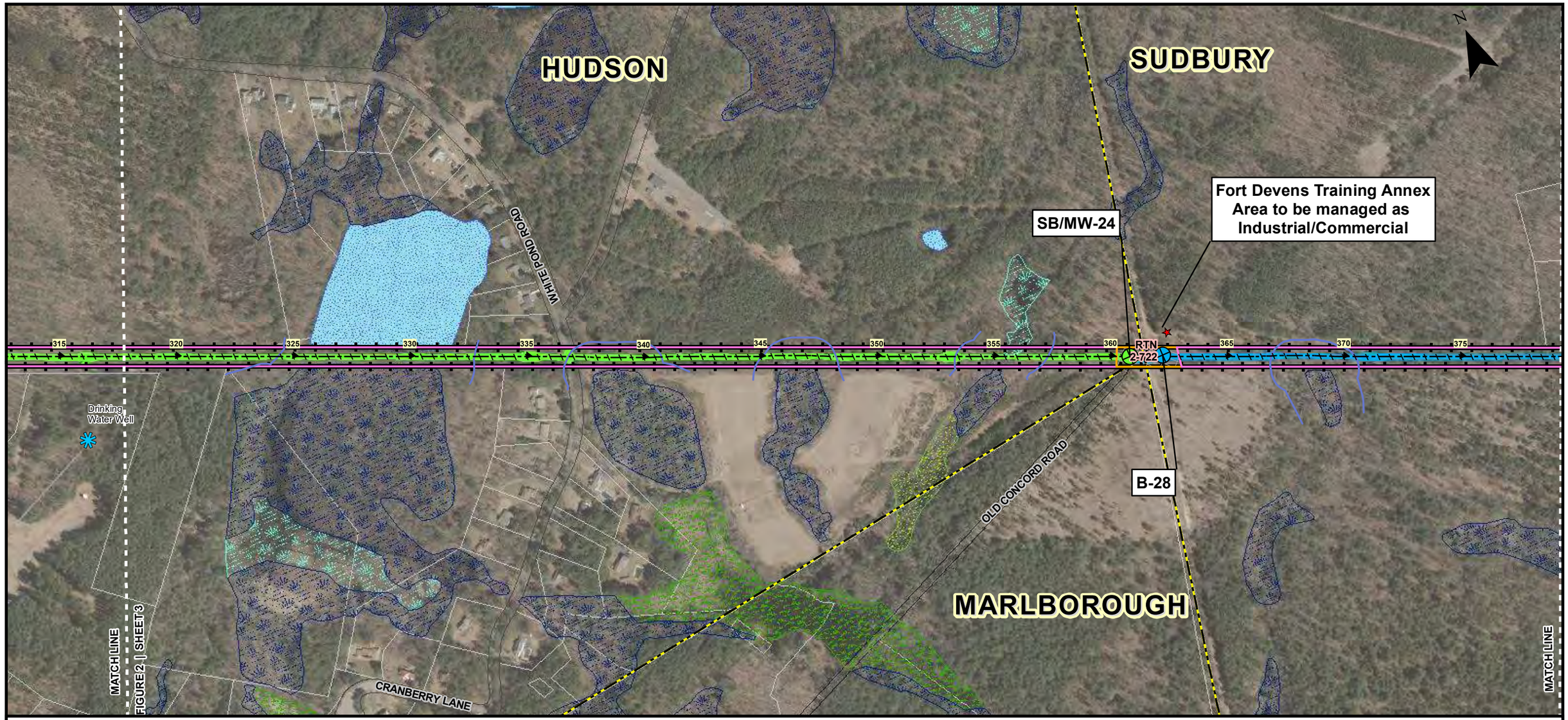

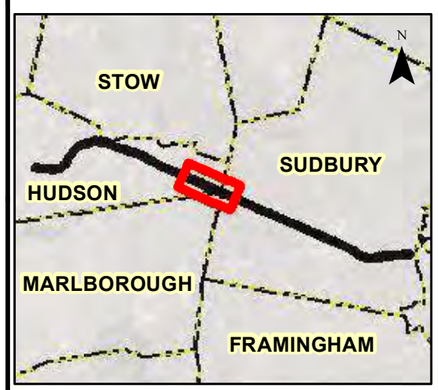

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STA Callout
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Soil Type
- Type A Soils
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MCP Disposal Sites
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URAM Area

Former Railroad Stations

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500 250 0 500

Scale In Feet

FIGURE 2 | Sheet 4 of 8

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

SOIL & GROUNDWATER MANAGEMENT PLAN

OCTOBER 2020 SCALE: NOTED

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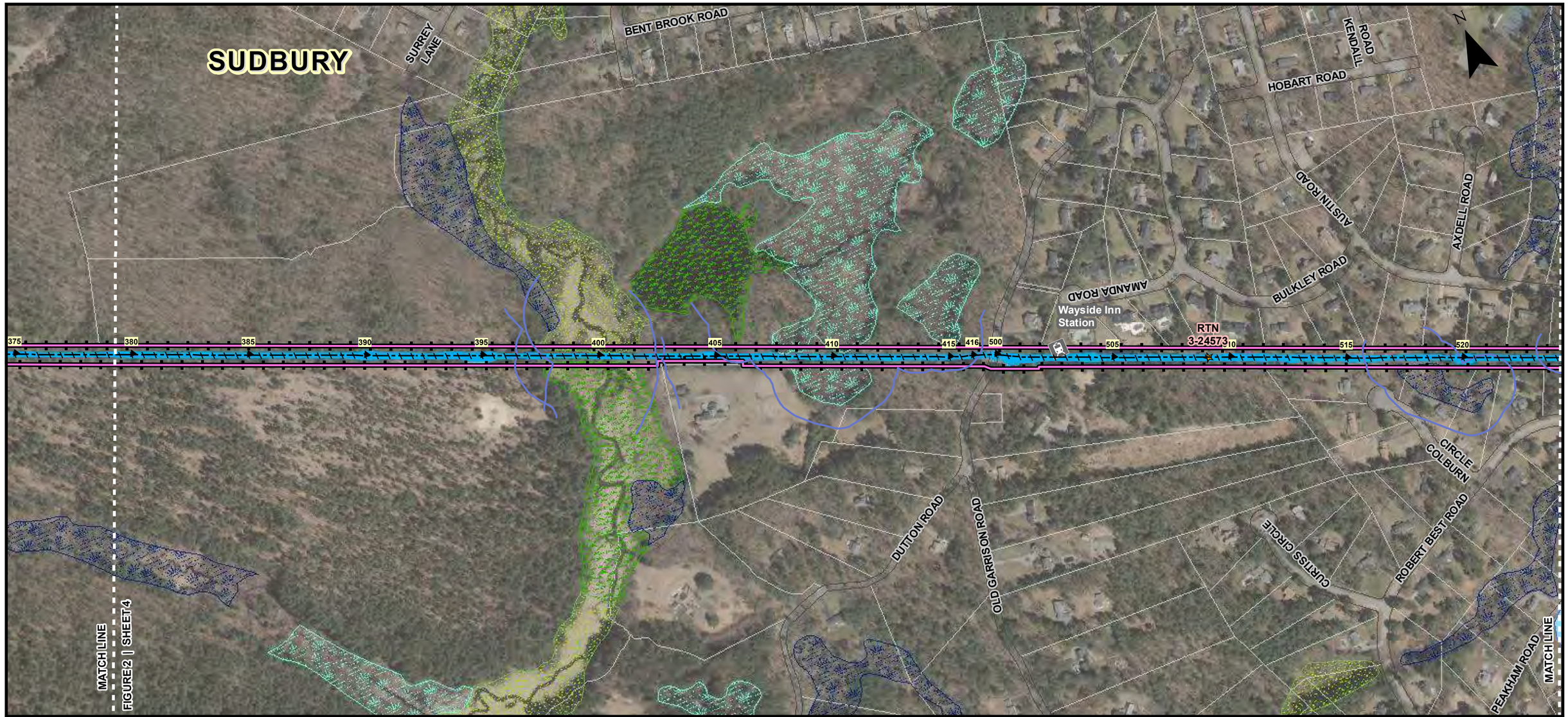

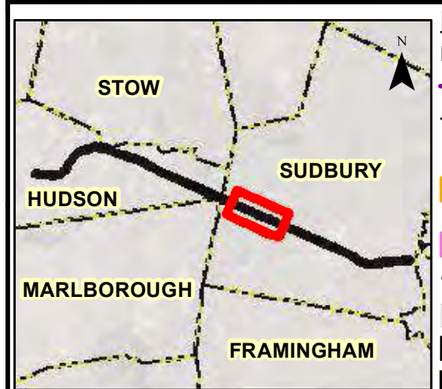

Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

Town Information
- Parcels
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Wetland Areas
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- Wooded Swamp

STA Callout
- Centerline
- 50ft Interval
- 500ft Interval

Soil Type
- Type A Soils
- Type B-1 Soils
- Type C-1 Soils

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM Area

Former Railroad Stations

BufferZones

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500 250 0 500

Scale In Feet

FIGURE 2 | Sheet 5 of 8

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

SOIL & GROUNDWATER MANAGEMENT PLAN

OCTOBER 2020 SCALE: NOTED

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SUDBURY

SEGMENT 4
STA 569+61

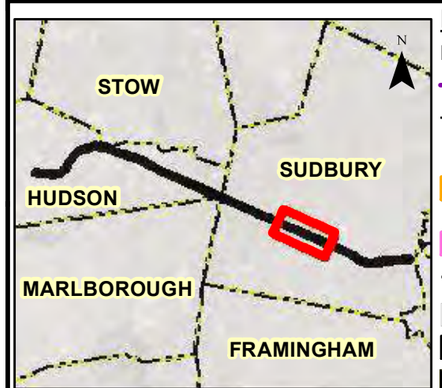
SB/MW-33

MP-28

MP-27

AXDELL ROAD
AUSTIN ROAD
PEAKHAM ROAD
FOX RUN
NEWTON ROAD
TREE MARKED ROAD
WHISPERING PINE ROAD
EVERGREEN ROAD
TALL PINE DRIVE
BRIDLE PATH
TRAILSIDE CIRCLE
STONEBROOK ROAD
JARMAN ROAD
CIRCLE COLBURN
ROBERT BEST ROAD
ROLLING LANE
OLD MEADOW ROAD
HORSE POND ROAD
COOLIDGE LANE
MATCH LINE
FIGURE 2 | SHEET 5
HAMMOND CIRCLE
BENT ROAD
ROBBINS ROAD
ELLIOT ROAD
STONE ROAD
HICKORY ROAD
RTN 3-35104

520 525 530 535 540 545 550 555 560 565 570 575 580



Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

Town Information
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Wetland Areas
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- Open Water
- Shrub Swamp
- Wooded Swamp

STA Callout
- Centerline
- 50ft Interval
- 500ft Interval

Soil Type
- Type A Soils
- Type B-1 Soils
- Type C-1 Soils

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM Area

Former Railroad Stations

BufferZones

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500 250 0 500
Scale In Feet

FIGURE 2 | Sheet 6 of 8

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

SOIL & GROUNDWATER MANAGEMENT PLAN

OCTOBER 2020 SCALE: NOTED

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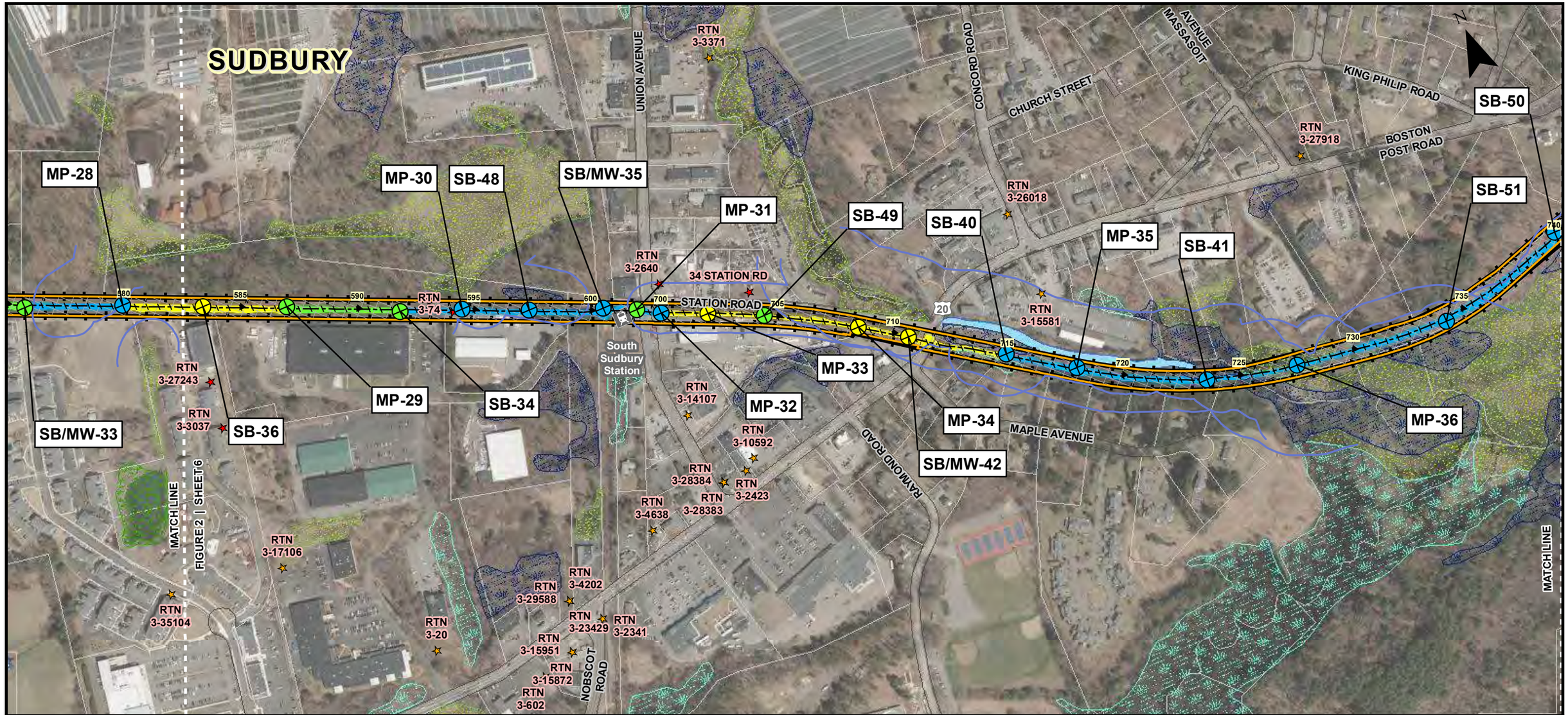

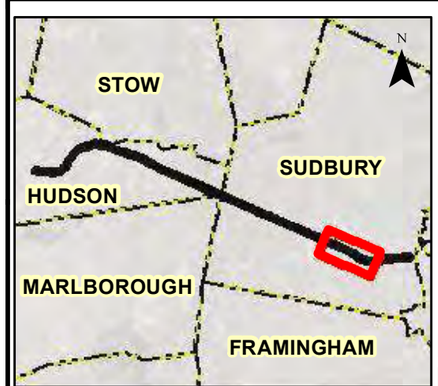

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Soil Type
- Type A Soils
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MCP Disposal Sites
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URAM Area

Former Railroad Stations

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Type A Soil: Reuse at Sand and Gravel facility: Soils which do not contain oil or hazardous material (OHM) or contain OHM below levels consistent with "natural" soil per MassDEP's Similar Soils Provision Guidance (WSC-13-500) are not considered Remediation Waste; this includes soil that exhibits concentrations of TPH less than or equal to 25 parts per million (ppm). These "natural" soils may be reused at specific beneficial reuse locations on a case by case basis under the discretion of Eversource and may be reused at an active sand and gravel processing facility that holds a Site Assignment Authorization with approval from the LSP-of-Record.

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Type C-1 Soil: Massachusetts Unlined Landfills: Soil that contains OHM concentrations above MCP RCS-1 levels but below the criteria for Massachusetts Unlined landfills per MassDEP Policy COMM-97-001.

500 250 0 500

Scale In Feet

FIGURE 2 | Sheet 7 of 8

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

SOIL & GROUNDWATER MANAGEMENT PLAN

OCTOBER 2020 SCALE: NOTED

Weston & Sampson

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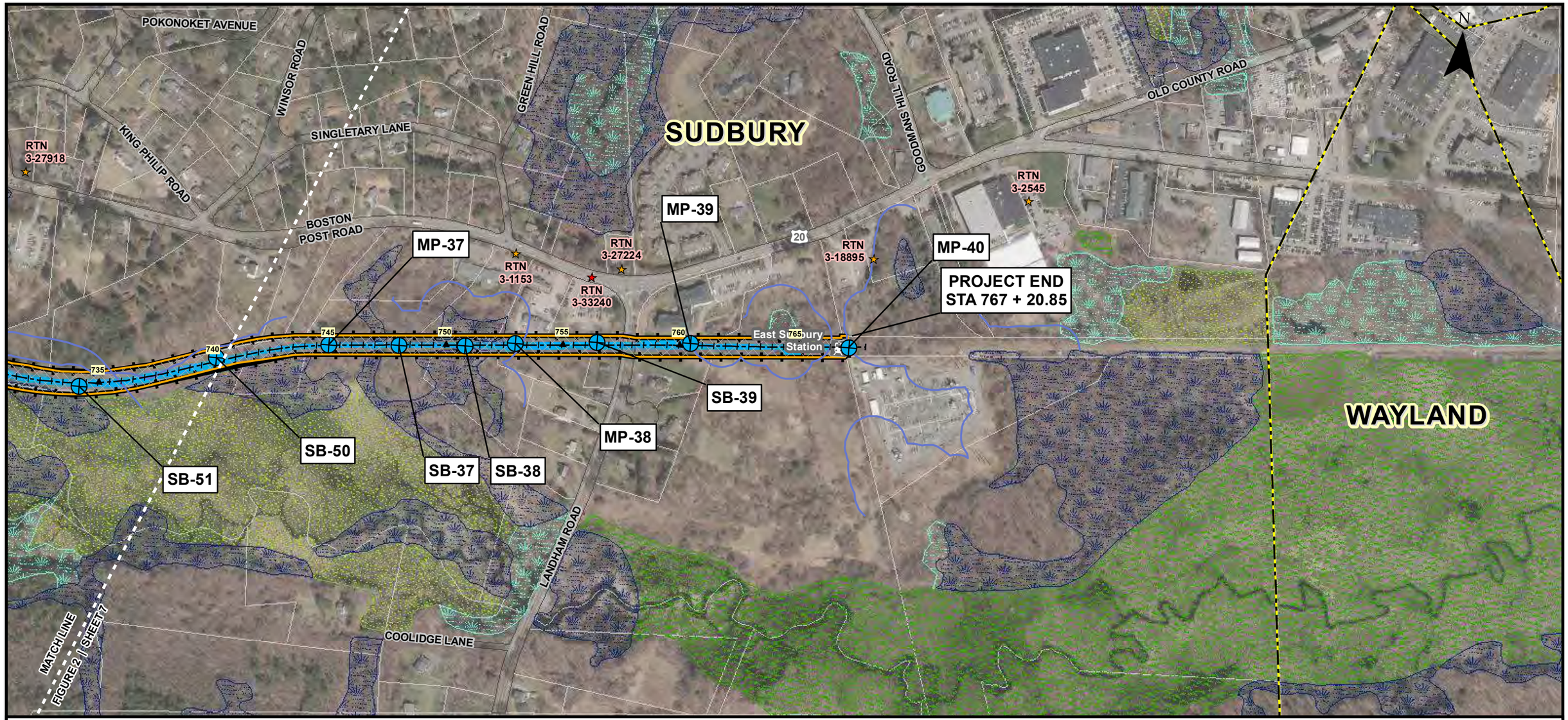

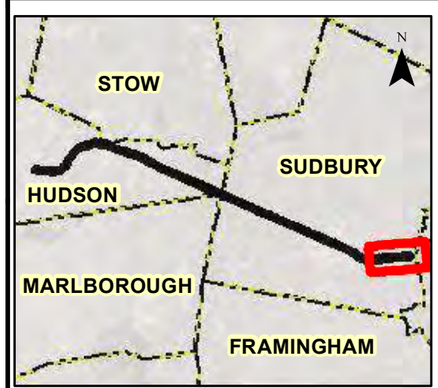

Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

Town Information
- Parcels
- Roads
- Boundary

Wetland Areas
- Bog
- Deep Marsh
- Shallow Marsh / Meadow
- Open Water
- Shrub Swamp
- Wooded Swamp

STA Callout
- Centerline
- 50ft Interval
- 500ft Interval

Soil Type
- Type A Soils
- Type B-1 Soils
- Type C-1 Soils

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM Area

Former Railroad Stations

BufferZones

Type A Soil: Reuse at Sand and Gravel facility: Soils which do not contain oil or hazardous material (OHM) or contain OHM below levels consistent with "natural" soil per MassDEP's Similar Soils Provision Guidance (WSC-13-500) are not considered Remediation Waste; this includes soil that exhibits concentrations of TPH less than or equal to 25 parts per million (ppm). These "natural" soils may be reused at specific beneficial reuse locations on a case by case basis under the discretion of Eversource and may be reused at an active sand and gravel processing facility that holds a Site Assignment Authorization with approval from the LSP-of-Record.

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500 250 0 500

Scale In Feet

FIGURE 2 | Sheet 8 of 8

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

SOIL & GROUNDWATER MANAGEMENT PLAN

OCTOBER 2020 SCALE: NOTED

Weston & Sampson

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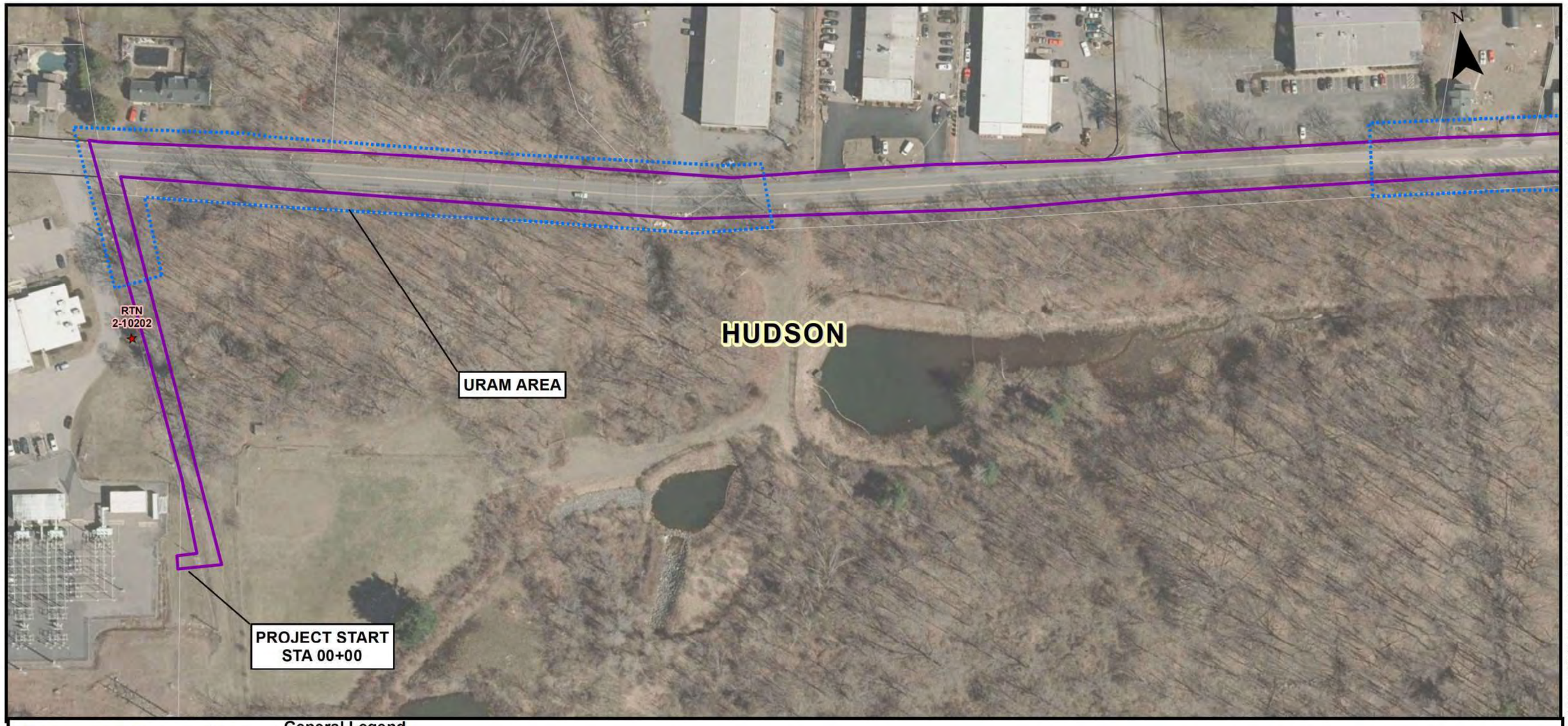

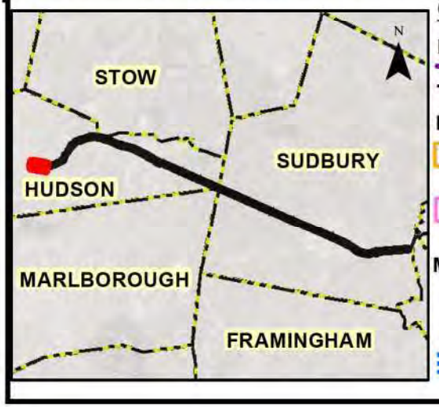

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 1 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

Weston & Sampson

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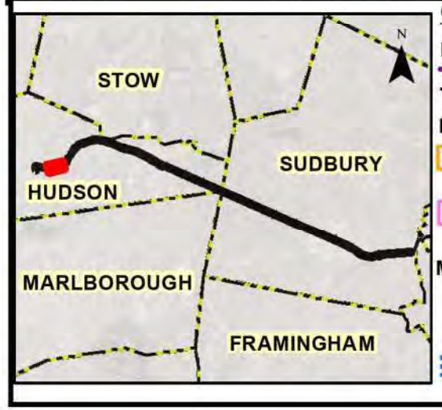

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 2 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

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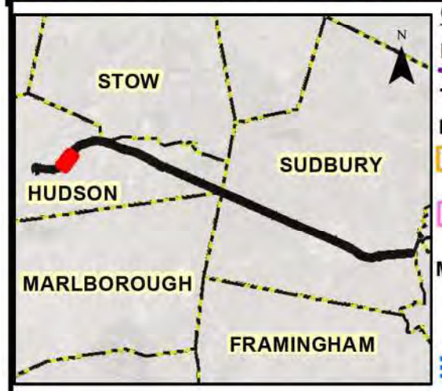

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 3 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

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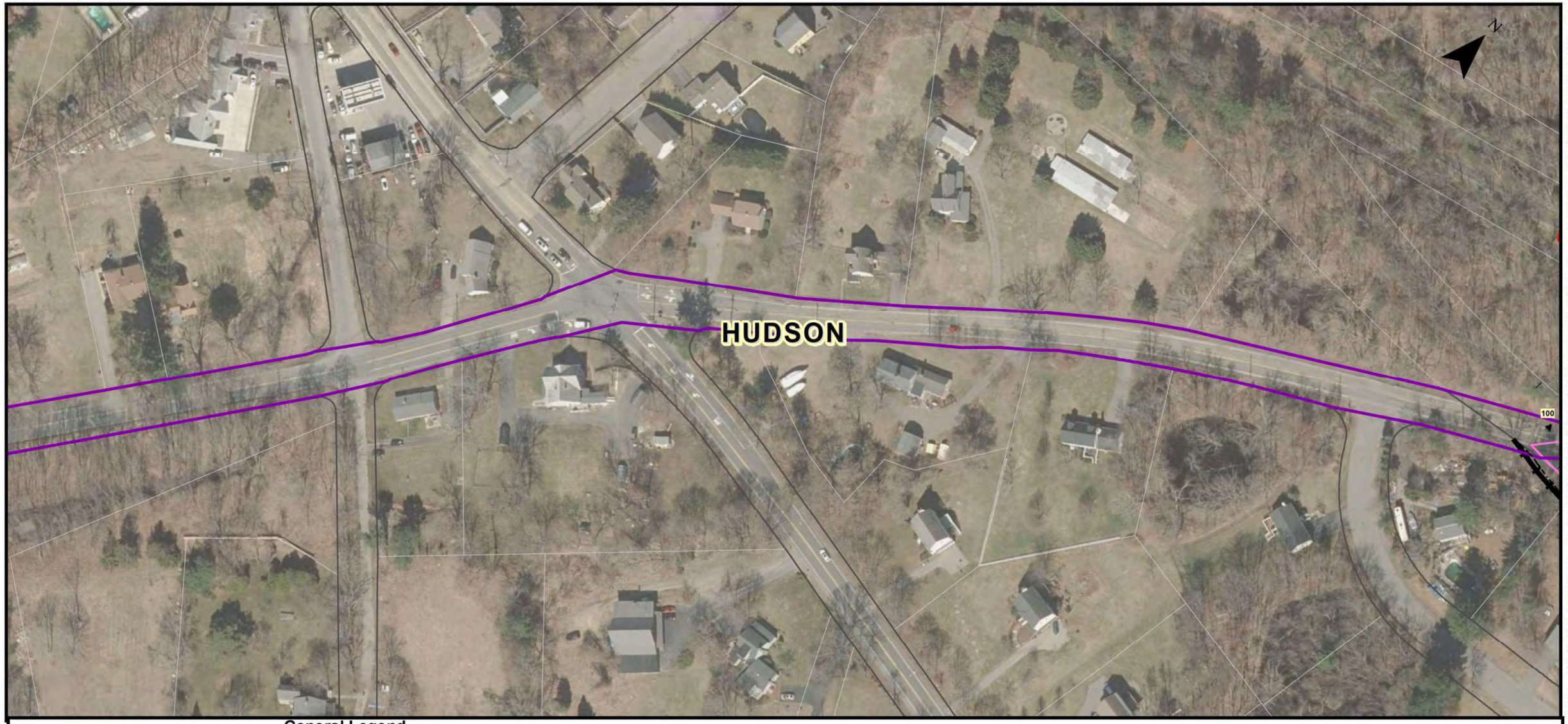

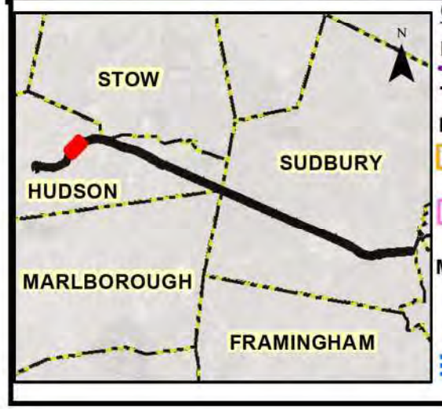

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 4 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

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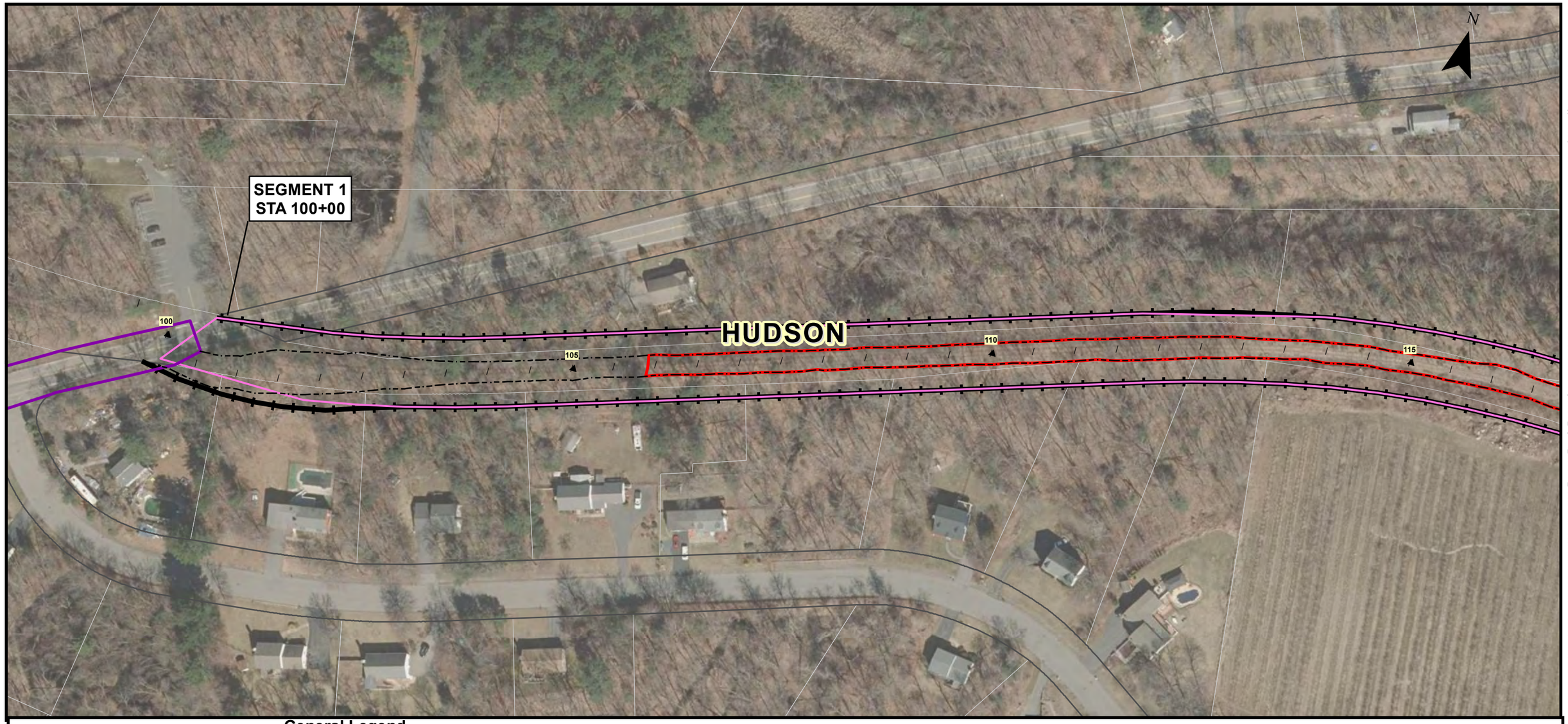

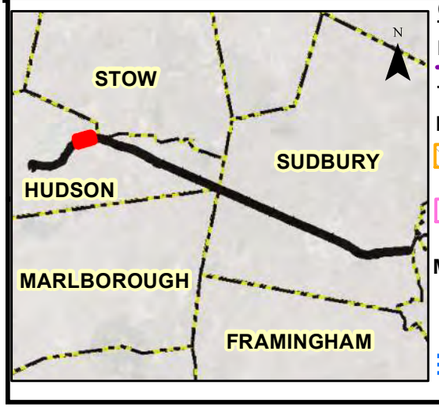

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 5 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

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STOW

Gleasondale Station
Area to be managed
as Industrial/Commercial

Gleasondale
Station

HUDSON

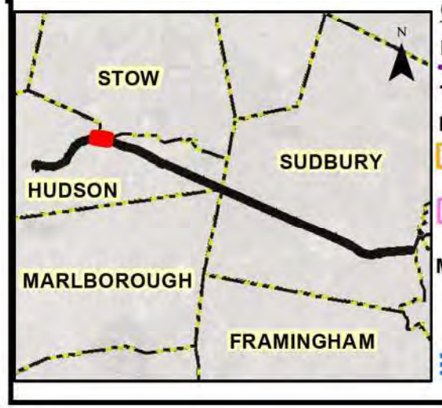
115

120

125

130

N



General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 6 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

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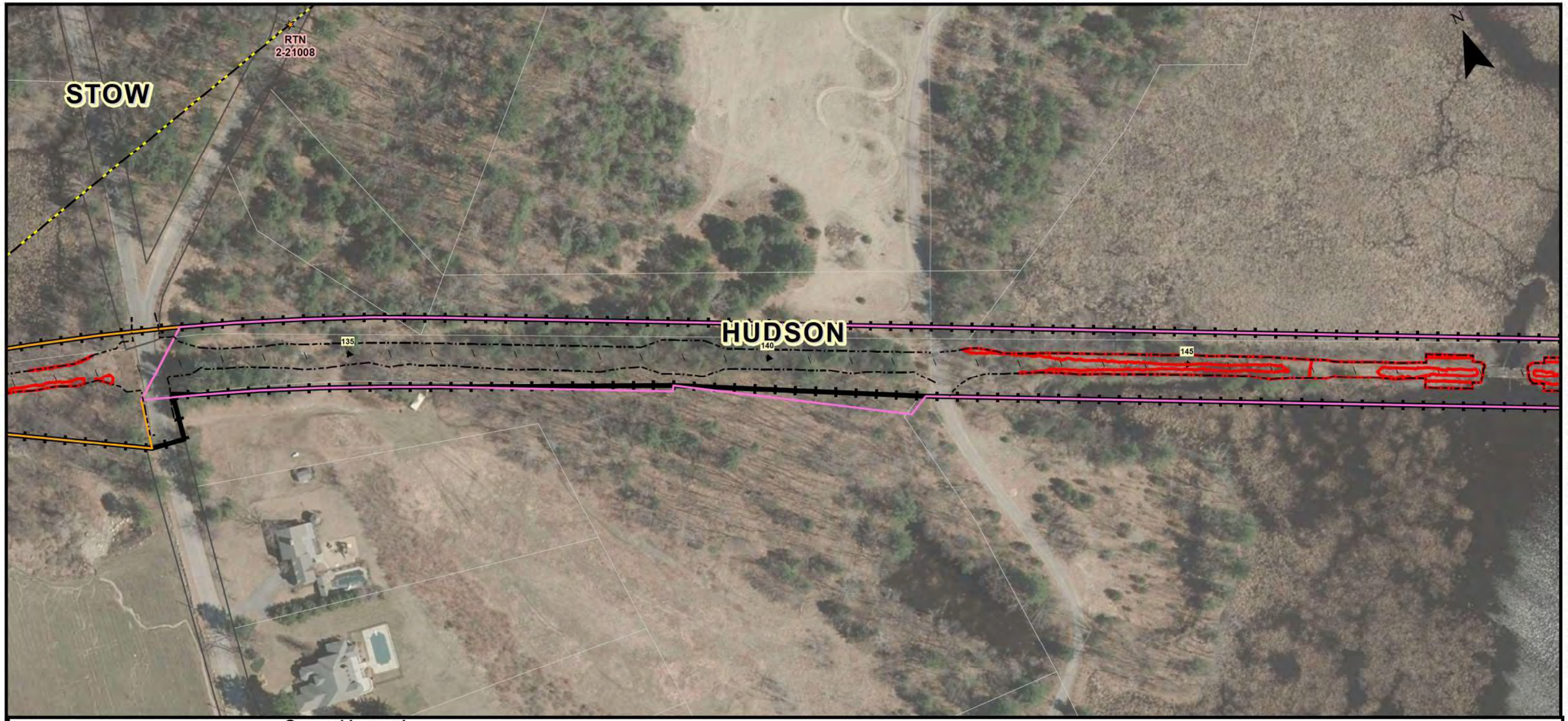

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 7 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

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General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 8 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

Weston & Sampson

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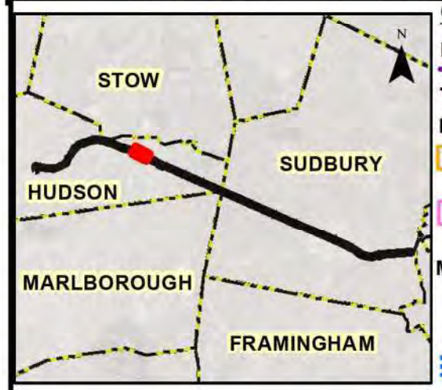

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0

Scale In Feet

FIGURE 3 | Sheet 9 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

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RTN 2-17024

RTN 2-10785

566 MAIN ST

HUDSON

185

190

195

URAM AREA

N

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

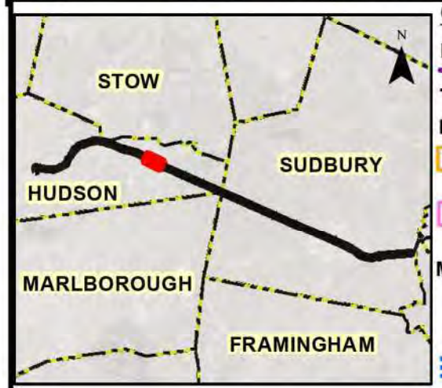
URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction



200 100 0

Scale In Feet

FIGURE 3 | Sheet 10 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

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General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 11 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

Weston & Sampson

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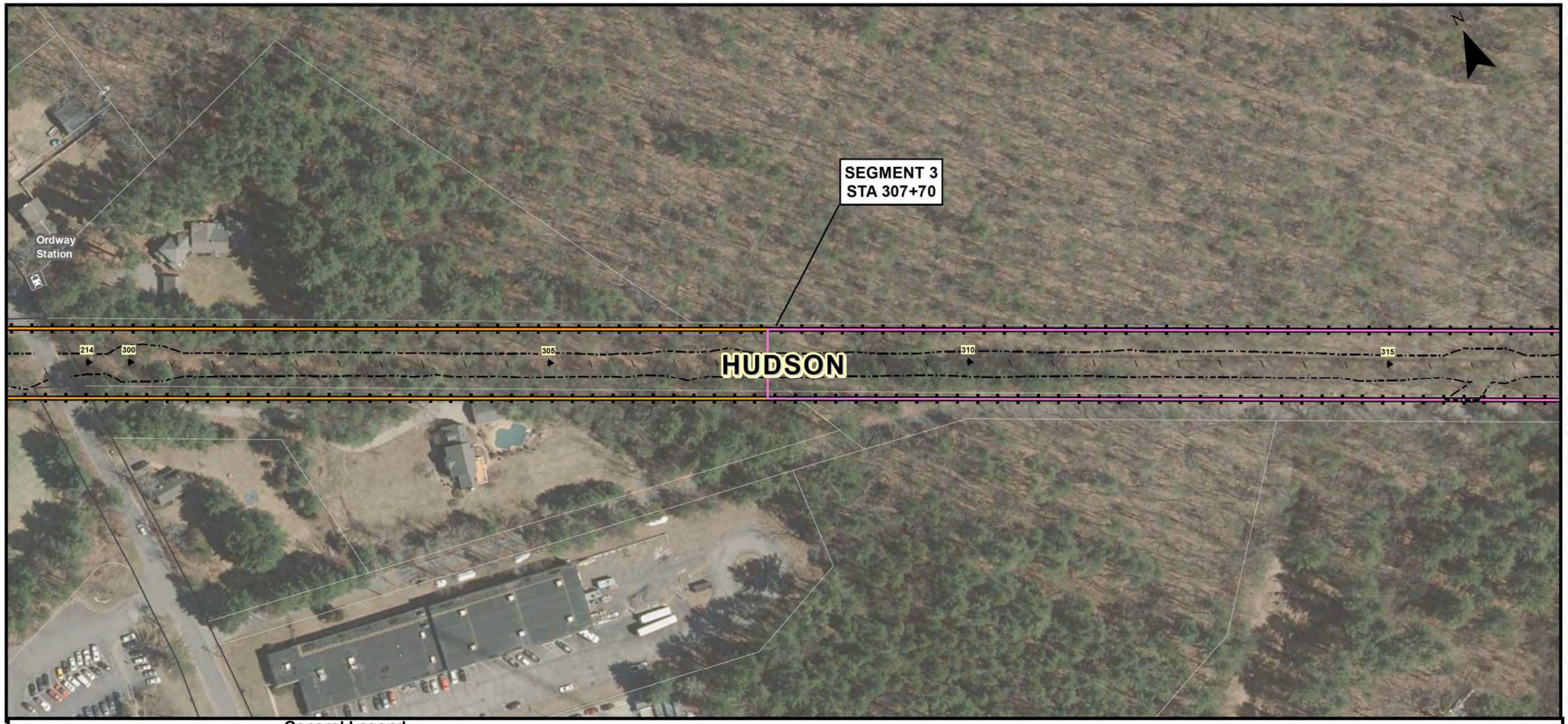

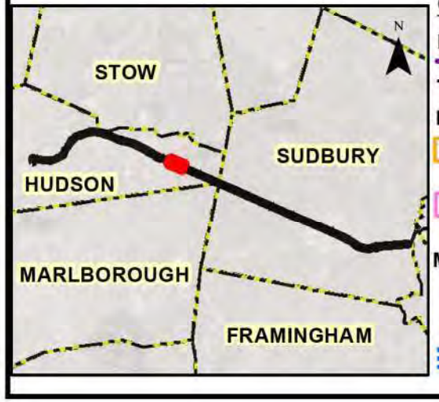

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 12 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

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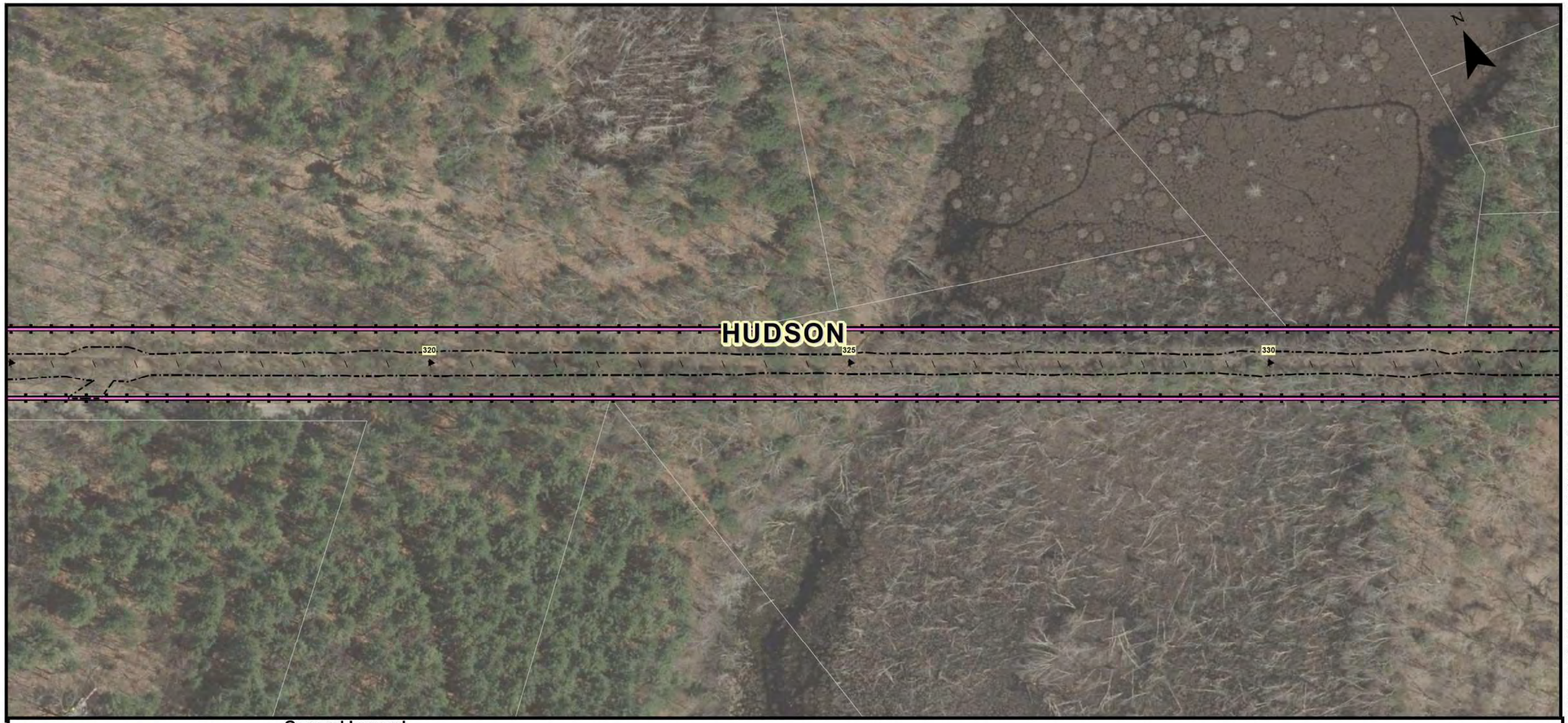

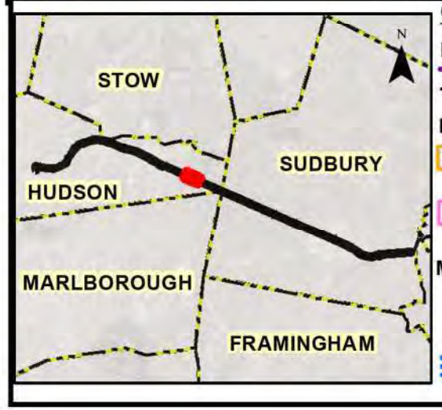

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 13 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

Weston & Sampson

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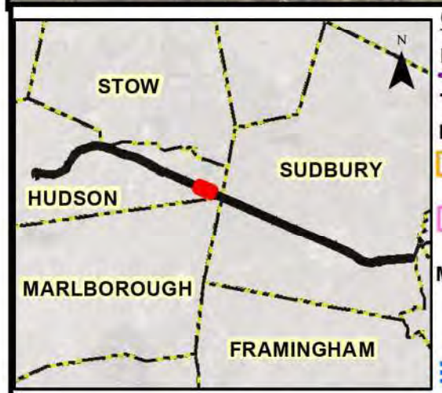


General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0

Scale In Feet

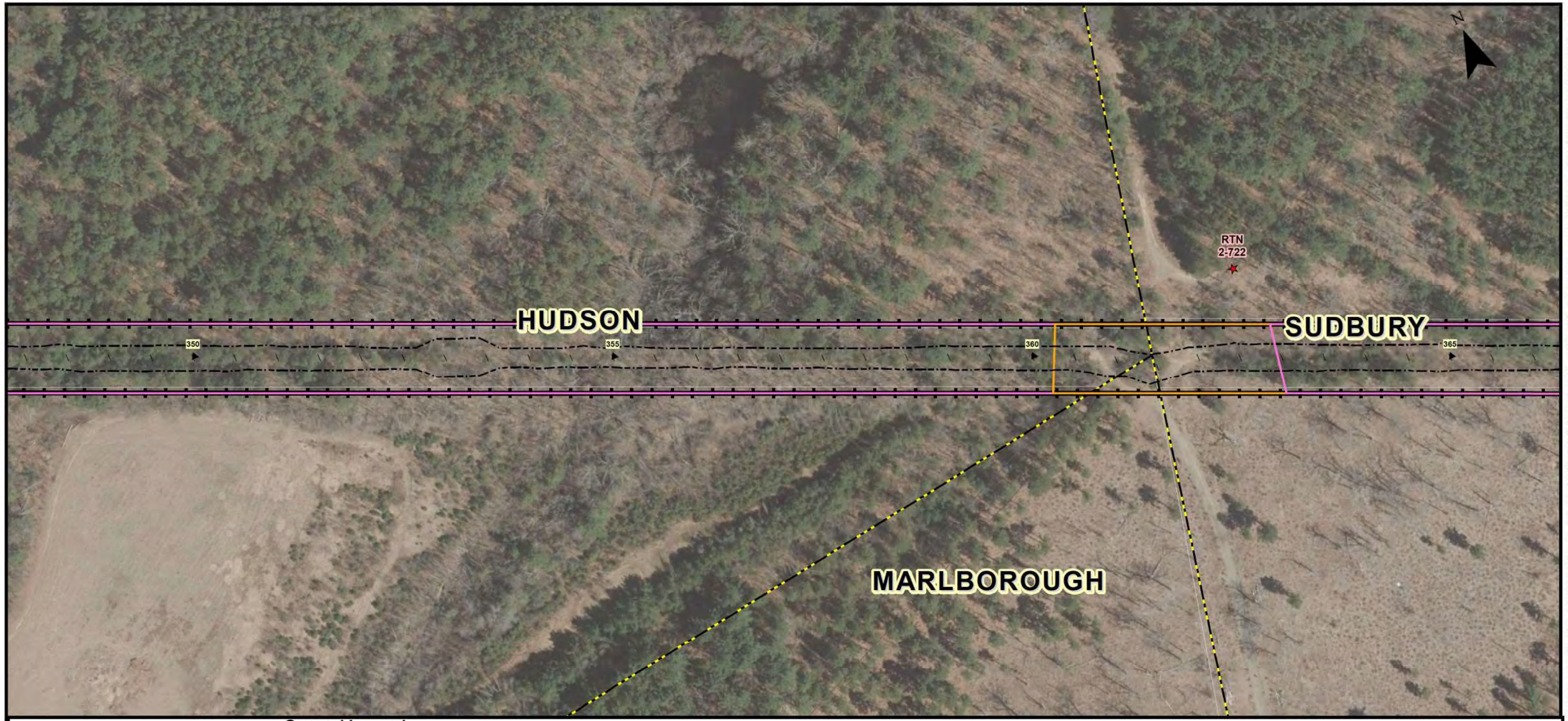
FIGURE 3 | Sheet 14 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

Weston & Sampson



General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0

Scale In Feet

FIGURE 3 | Sheet 15 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

Weston & Sampson

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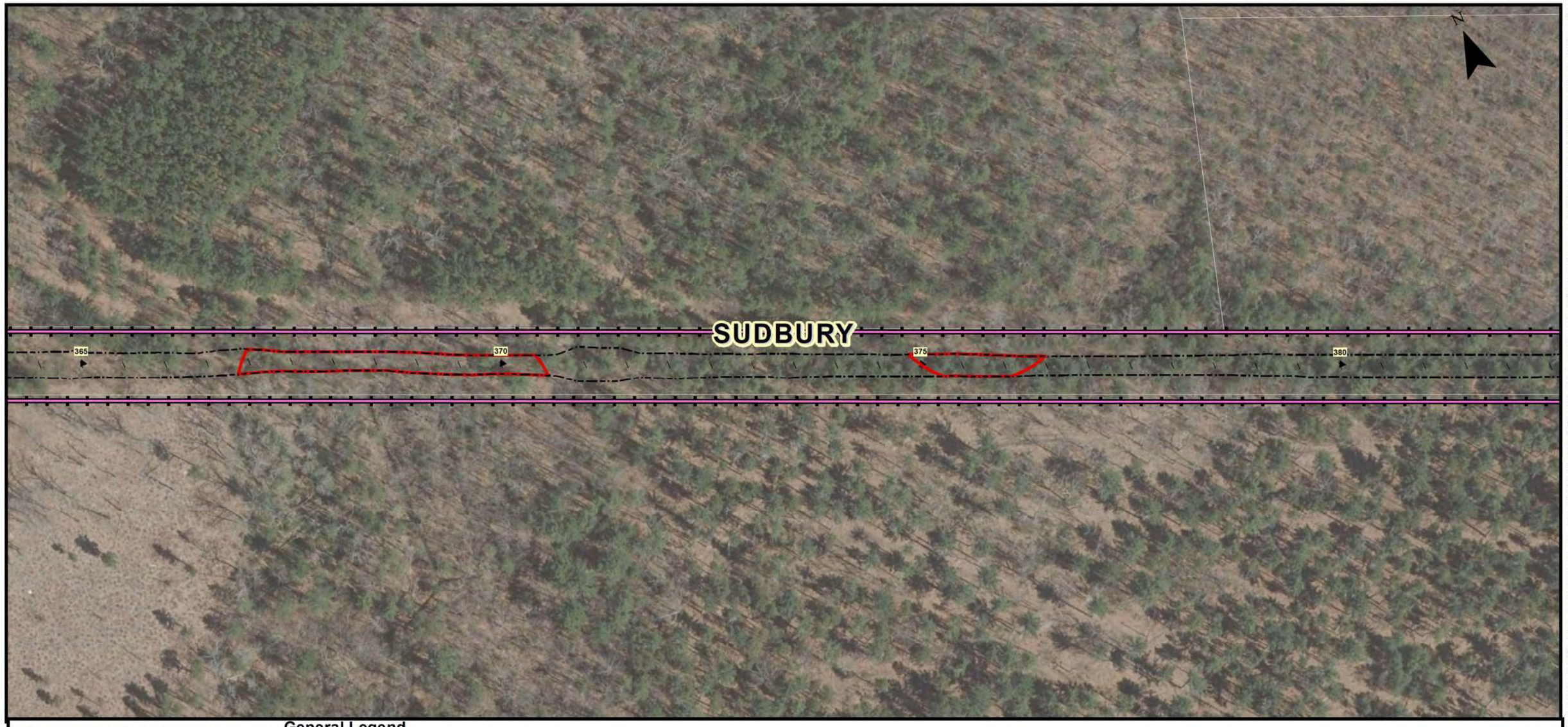

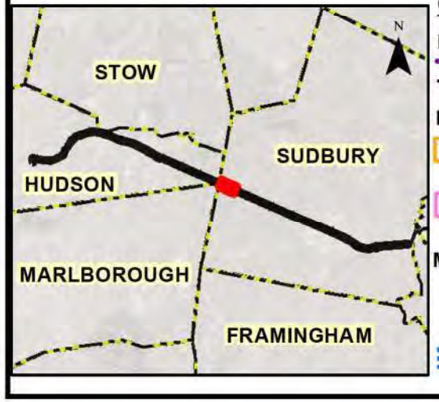

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 16 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

Weston & Sampson

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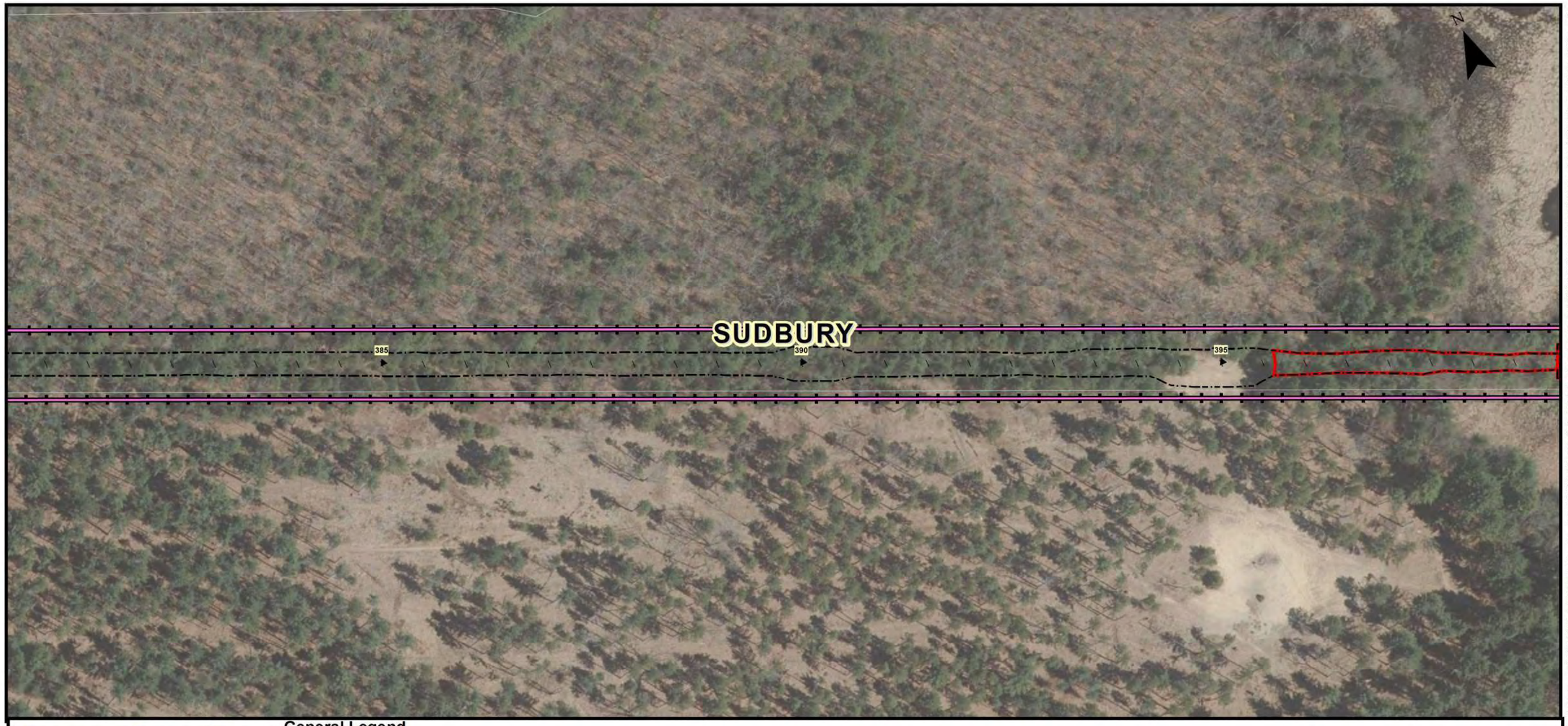

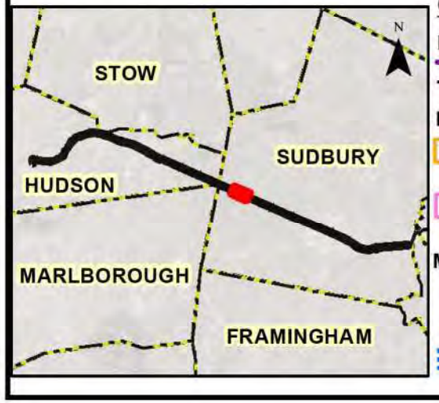

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 17 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

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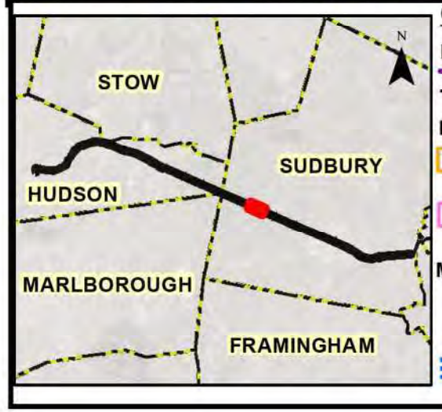

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 18 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

Weston & Sampson

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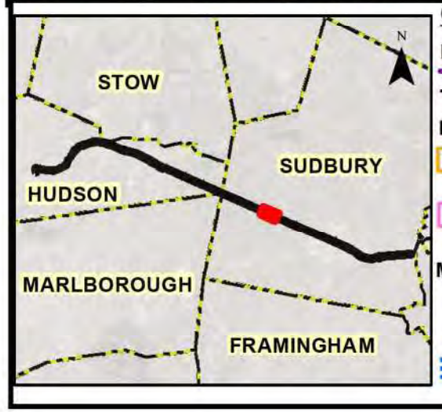

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 19 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

Weston & Sampson

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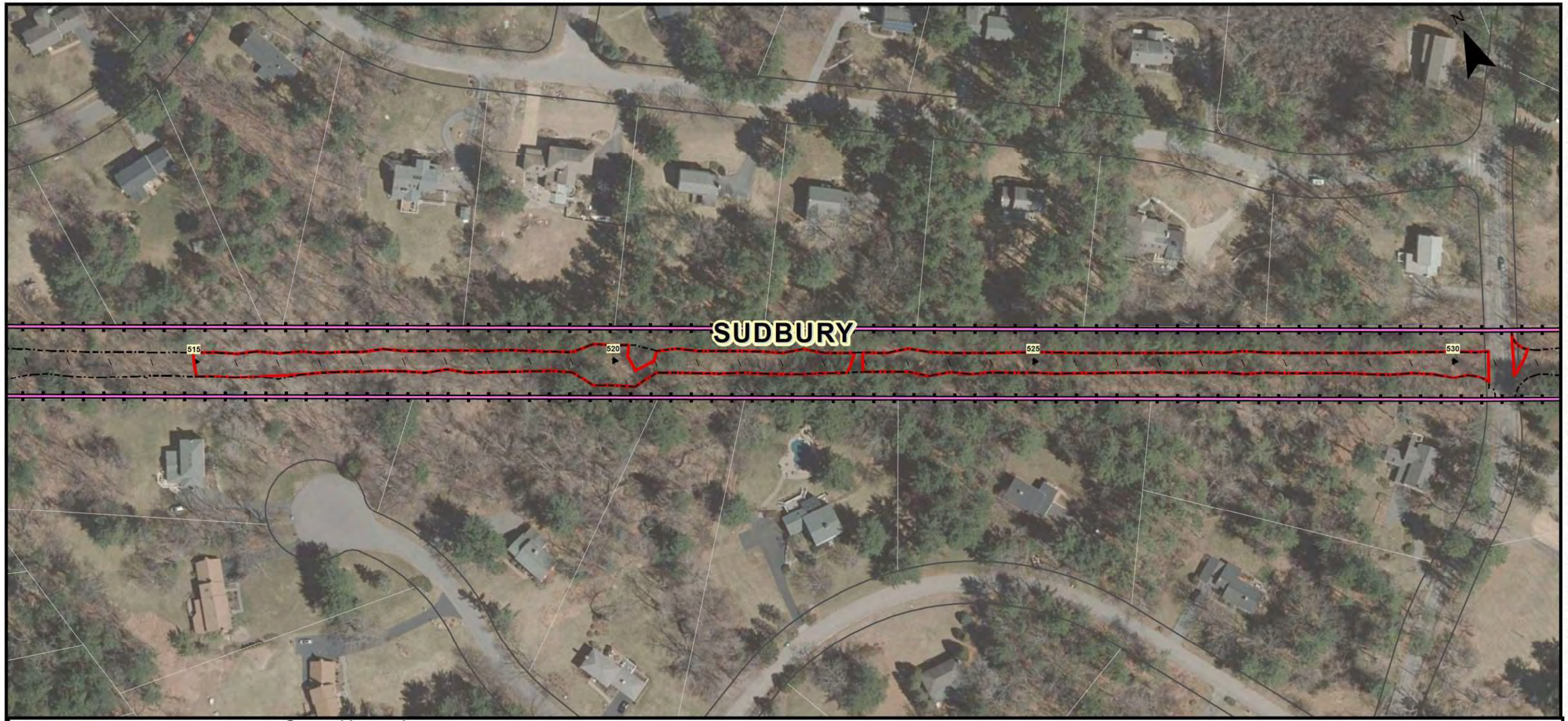

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 20 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

Weston & Sampson

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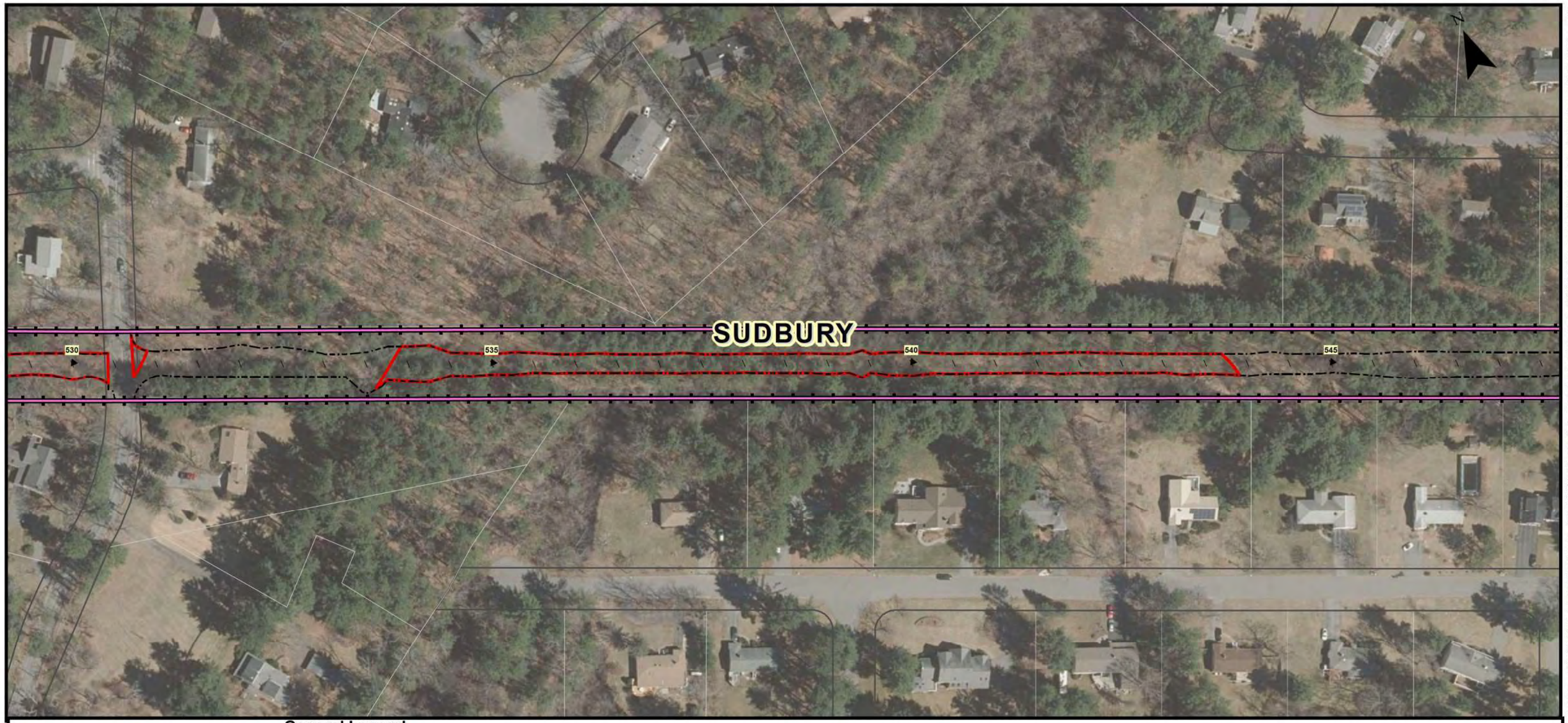

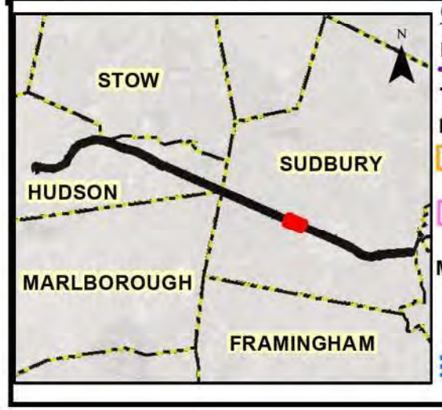

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 21 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

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General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 22 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

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General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 23 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

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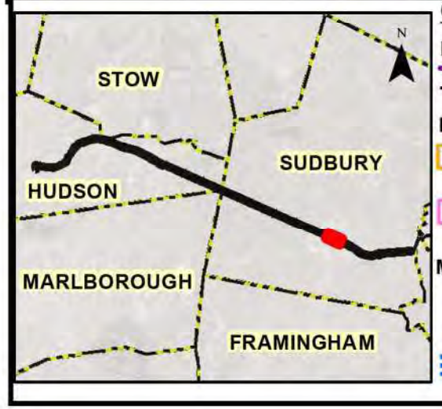

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 24 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

Weston & Sampson

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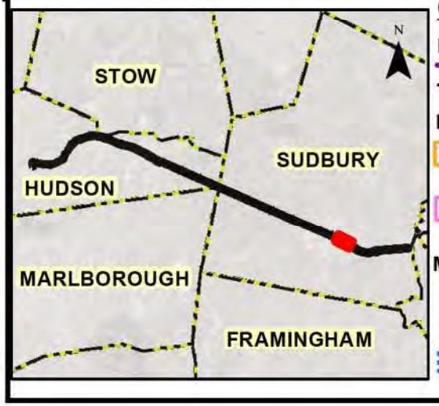

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 25 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

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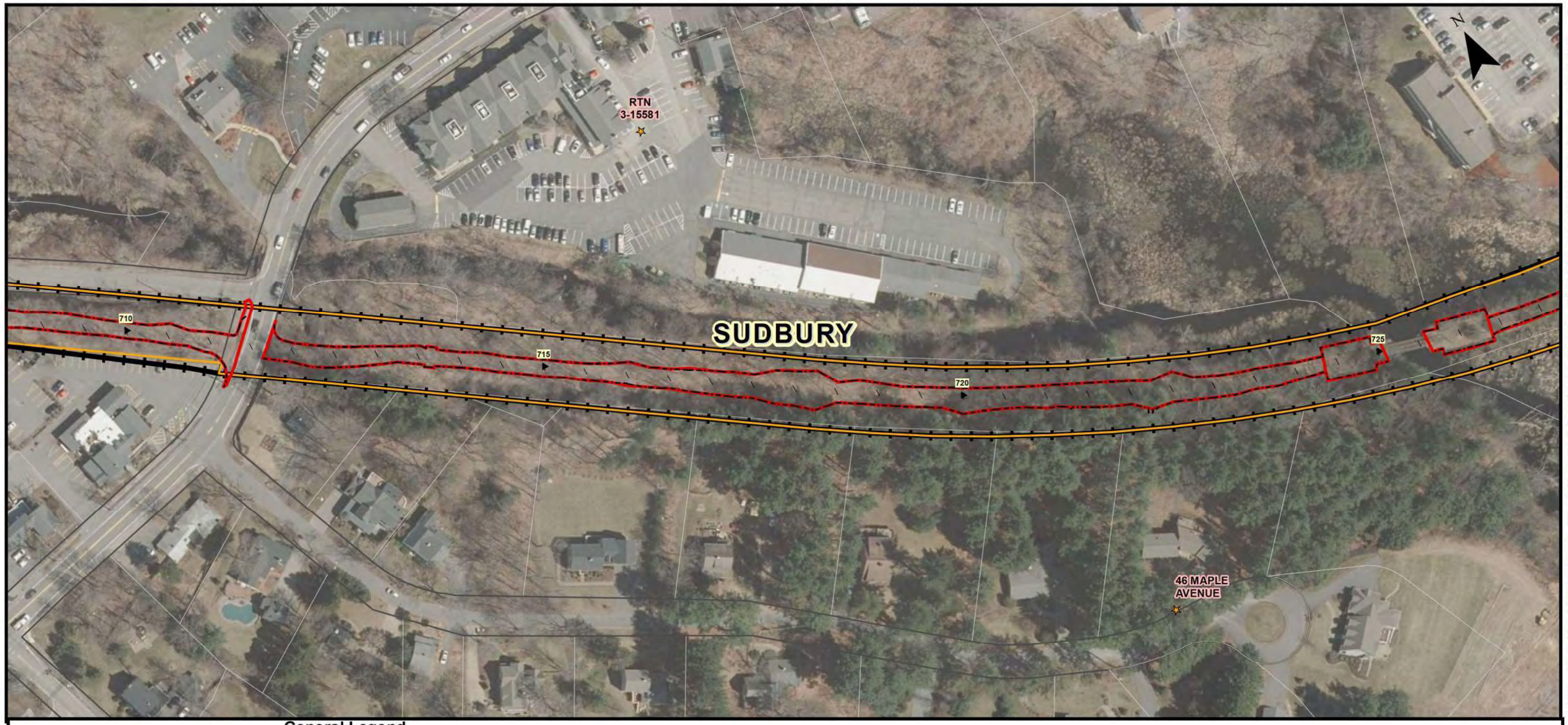
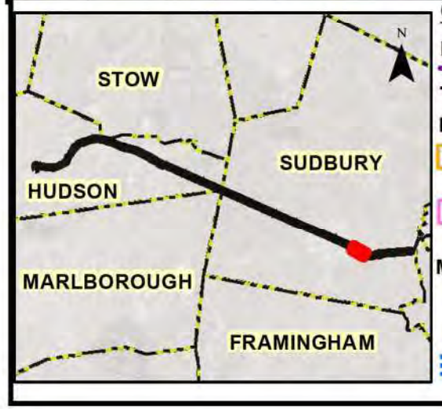




General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

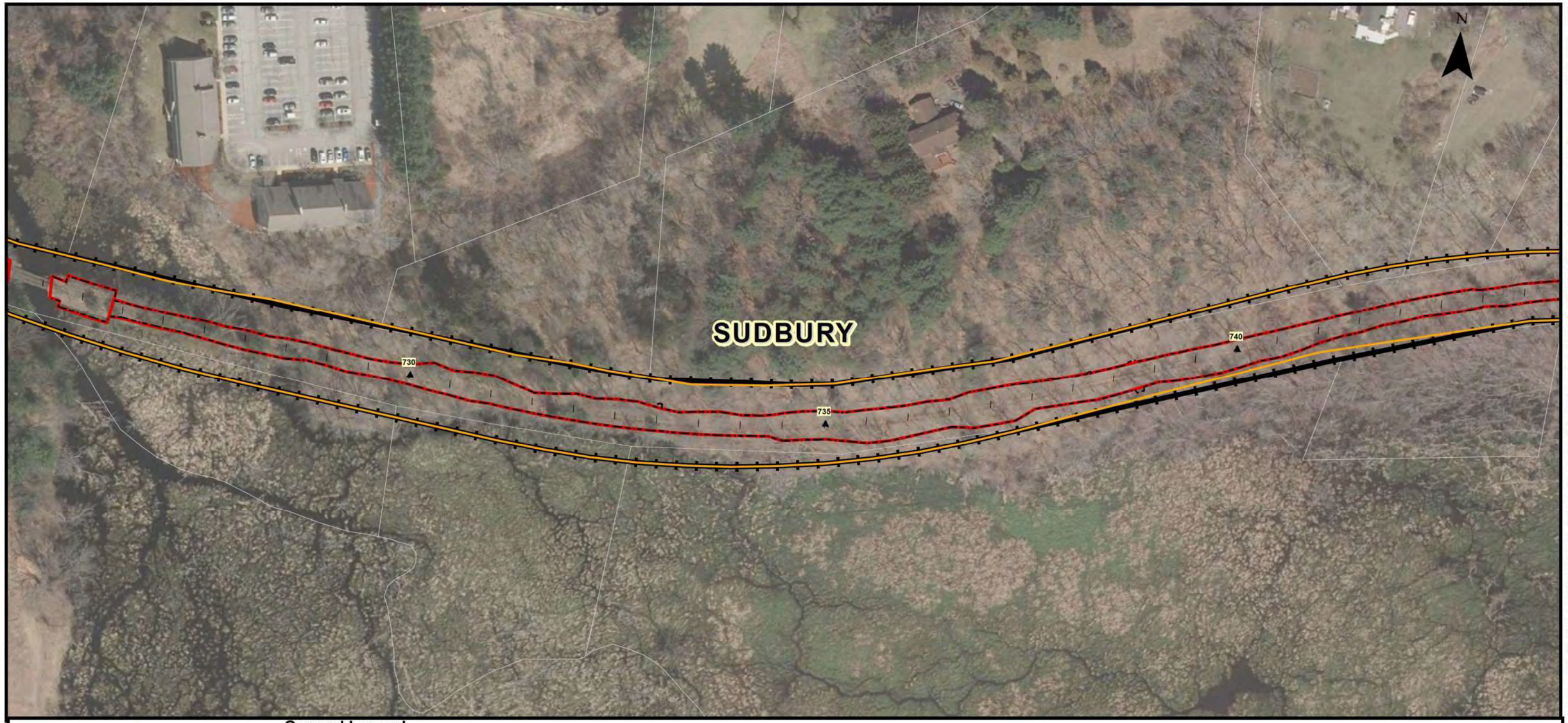
FIGURE 3 | Sheet 26 of 29

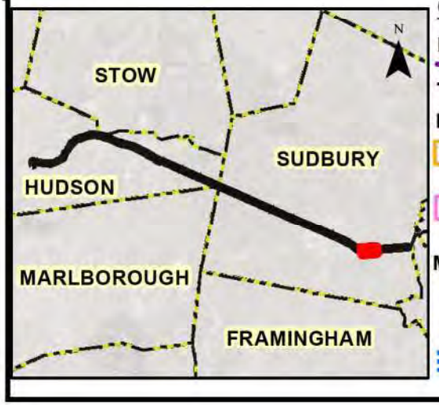
SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

Weston & Sampson





General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

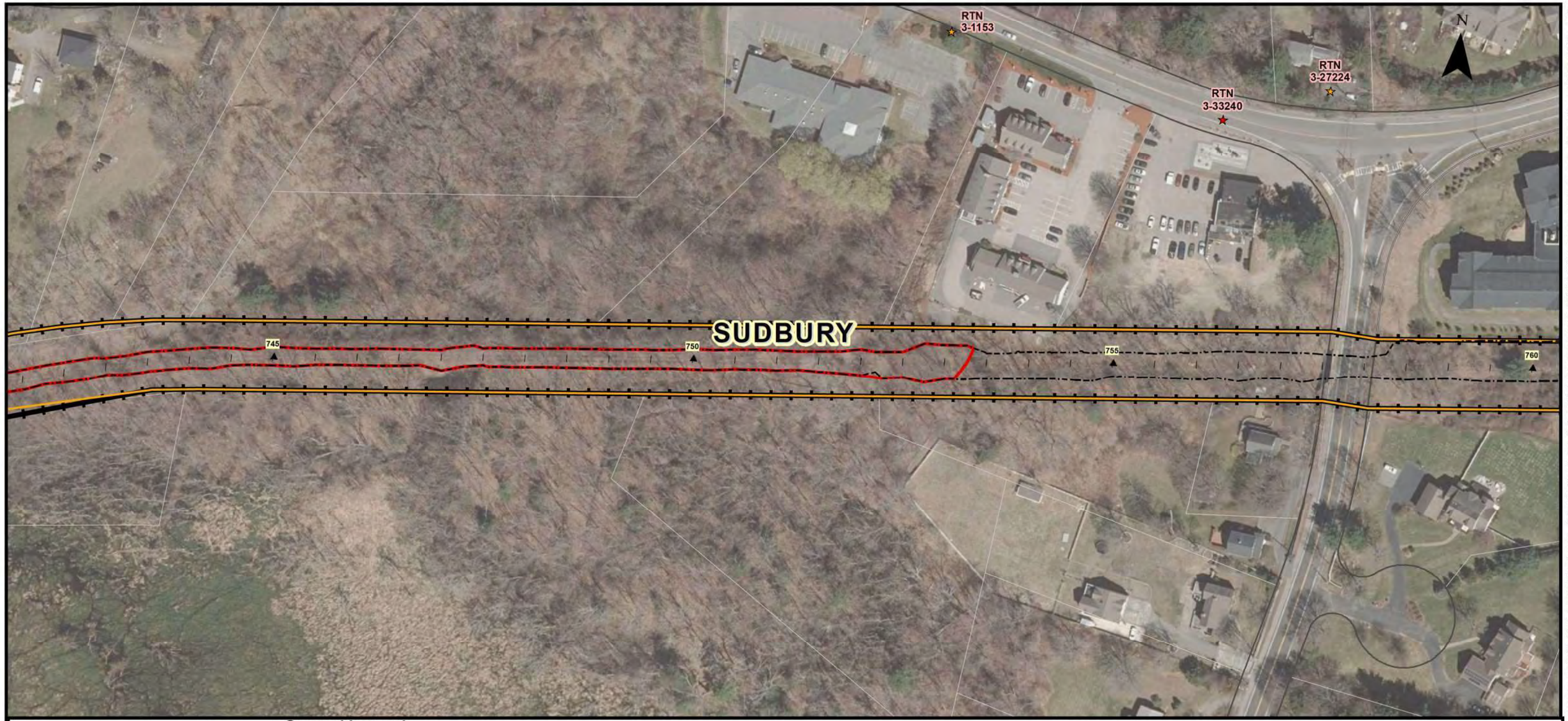
FIGURE 3 | Sheet 27 of 29

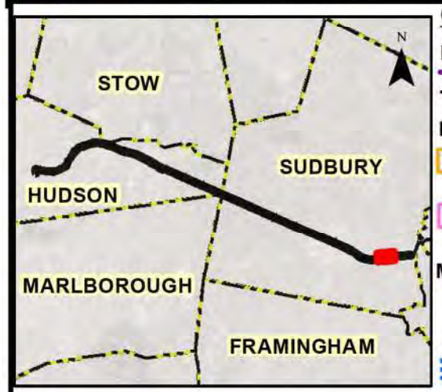
SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

Weston & Sampson





General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 28 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

Weston & Sampson

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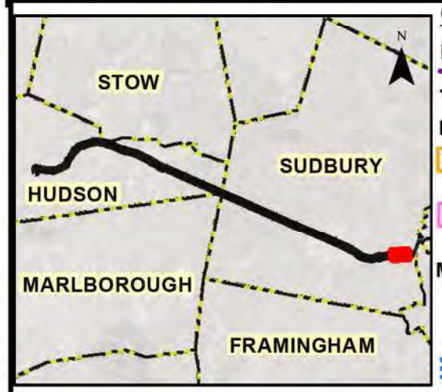

General Legend

Project Area
- In-Road
- MBTA ROW

MBTA Segments
- Industrial /Commercial
- Residential /Rural

MCP Disposal Sites
- Sites of Concern
- All Other Sites

URAM

Town Information
- Parcels
- Roads
- Boundary

STA Callout
- Work Limits
- 50ft Interval
- 500ft Interval

Former Railroad Stations

Wetland Information
- Areas subject to Wetland Jurisdiction

200 100 0
Scale In Feet

FIGURE 3 | Sheet 29 of 29

SUDBURY TO HUDSON TRANSMISSION RELIABILITY PROJECT

WETLAND RESOURCE AREAS JURISDICTIONAL LIMIT

OCTOBER 2021 SCALE: NOTED

Weston & Sampson

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TABLES

Table 1
Summary of In-Road Hudson Soil Data
Sudbury to Hudson Transmission Project
Hudson, Massachusetts

Sample Location								SB2		SB3		MP9		SB1		MP11		MP3		MP4		MP6		MP10		MP1		MP-2		MP13		MP14		MP25		MP21		MP-12		MP-5		MP-7		MP-8		MP-16	
Sample Date	RCS-1	RCS-2	Similar Soils for RCS-1	Concentrations in "Natural Soil" at RCS-1 Receiving Location	MA Lined Landfill	MA Unlined Landfill	Units	06/05/2018		6/5/2018		06/06/2018		06/07/2018		06/07/2018		06/07/2018		06/07/2018		06/07/2018		06/08/2018		6/26/2018		07/25/2018		08/01/2018		08/02/2018		08/06/2018		08/06/2018		08/08/2018		08/08/2018		08/20/2018		08/20/2018		08/23/2018	
Labnumber								18F0316-08		18F0316-15		18F0619-04		18F0619-06		18F0619-01		18F0619-10		18F0619-05		18F0619-03		18F0619-09		18F1479-04		18H0015-01		18H0260-01		18H0260-03		18H0260-05		18H0260-04		18H0744-02		18H0744-01		18H1308-02		18H1308-01		18H1308-03	
PID Reading (ppmV)								0.0		0.0		0.2		0.0		0.0		0.0		0.0		0.0		0.1		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
SM 2540G																																														
% SOLIDS	NE	NE	NE	NE	NE	NE	% Wt	93.9		82.7		87.8		94.4		82.3		96.7		95.2		89.5		88.3		88.4	---	90.5		96.1		91.9		94.3		95.4		96.5		93.8		93		90.3		92.5	
SM21-22 2510B Modified																																													
SPECIFIC CONDUCTANCE	NE	NE	NE	NE	8000	NE	µmhos/cm	21		13		13		12		21		9.9		12		32		16		4	---	20		21		17		8.4		8.3		37		23		31		24		6.8	
SW-846 1030																																													
IGNITABILITY	NE	NE	NE	NE	NE	NE	present/absent	Absent		Absent		Absent		Absent		Absent		Absent		Absent		Absent		Absent		Absent	---	Absent		Absent		Absent		Absent		Absent		Absent		Absent		Absent		Absent		Absent	
SW-846 6010D																																													
ANTIMONY	20	30	10	1	NE	NE	mg/Kg	1.8	U	2.1	U	2	U	1.7	U	2.1	U	1.8	U	1.7	U	1.9	U	1.9	U	1.9	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.7	U	1.8	U	1.8	U	1.8	U	1.8	U
ARSENIC	20	20	20	20	40	40	mg/Kg	7.2		5		13		8.3		8.2		14		3.9		17		7.1		3	---	15		8.6		8.2		5.3		8.4		16		5.1		7.8		11		9.7	
BARIUM	1000	3000	375	50	NE	NE	mg/Kg	18		22		40		22		32		21		31		**120**		23		**140**	---	**54**		28		19		15		30		18		28		**69**		18		33	
BERYLLIUM	90	200	4	0.4	NE	NE	mg/Kg	0.22		0.25		0.3		0.22		0.36		0.27		0.21		0.34		0.19	U	0.19	U	0.18	U	0.17	U	0.18	U	0.18	U	0.17	U	0.17	U	0.18	U	0.18	U	0.18	U	0.18	U
CADMIUM	70	100	20	2	80	30	mg/Kg	0.18	U	0.21	U	0.23		0.17	U	0.21	U	0.29		0.17	U	0.28		0.19	U	0.3	---	0.55		0.31		0.31		0.19		0.34		0.5		0.21		0.33		0.4		0.36	
CHROMIUM	100	200	100	30	1000	1000	mg/Kg	9		12		18		14		18		12		17		**40**		8.8		**39**	---	22		15		12		8.4		14		13		12		25		12		20	
LEAD	200	600	200	100	2000	1000	mg/Kg	3.2		6.5		13		5.1		6.3		8.6		8.4		12		3.5		11	---	36		8		16		33		38		6.5		36		7.8		7.1		12	
NICKEL	600	1000	150	20	NE	NE	mg/Kg	5.8		10		11		11		13		11		12		5		5.8		9	---	14		12		11		7		13		11		8.7		17		8.6		14	
SELENIUM	400	700	5	0.5	NE	NE	mg/Kg	3.5	U	4.1	U	3.9	U	3.4	U	4.2	U	3.5	U	3.3	U	3.7	U	3.8	U	3.7	U	3.6	U	3.5	U	3.6	U	3.5	U	3.5	U	3.4	U	3.5	U	3.6	U	3.6	U	3.6	U
SILVER	100	200	6	0.6	NE	NE	mg/Kg	0.35	U	0.41	U	0.56		0.34	U	0.42	U	0.35		0.43		1.3		0.38	U	0.37	U	0.36	U	0.35	U	0.36	U	0.35	U	0.35	U	0.34	U	0.35	U	0.36	U	0.36	U	0.36	U
THALLIUM	8	60	6	0.6	NE	NE	mg/Kg	1.8	U	2.1	U	2	U	1.7	U	2.1	U	1.8	U	1.7	U	1.9	U	1.9	U	1.9	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.7	U	1.8	U	1.8	U	1.8	U	1.8	U
VANADIUM	400	700	225	30	NE	NE	mg/Kg	9.4		13		20		12		16		10		17		**57**		9.3		**61**	---	26		15		12		9.6		18		13		13		28		13		21	
ZINC	1000	3000	500	100	NE	NE	mg/Kg	10		17		24		19		22		18		25		29		11		38	---	33		27		31		28		31		18		25		35		29		29	
SW-846 7471B																																													
MERCURY	20	30	3	0.3	10	10	mg/Kg	0.026	U	0.029	U	0.029	U	0.027	U	0.03	U	0.027	U	0.026	U	0.028	U	0.029	U	0.028	U	0.026	U	0.025	U	0.026	U	0.026	U	0.026	U	0.025	U	0.08		0.028	U	0.029	U	0.028	U
SW-846 8081B																																													
ALACHOR	NE	NE	NE	NE	NE	NE	mg/Kg	0.021	U	0.023	U	0.23	U	0.021	U	0.24	U	0.21	U	0.21	U	0.022	U	0.023	U	0.023	U	0.44	U	0.21	U	0.022	U	0.21	U	0.42	U	0.02	U	0.21	U	0.2	U	0.022	U	0.22	U
ALDRIN	0.08	0.5	NE	NE	NE	NE	mg/Kg	0.0053	U	0.0057	U	0.057	U	0.0053	U	0.061	U	0.052	U	0.053	U	0.0056	U	0.0057	U	0.0057	U	**0.11**	U	0.052	U	0.0054	U	0.053	U	**0.1**	U	0.0049	U	0.053	U	0.051	U	0.0055	U	0.054	U
ALPHA-BHC	50	500	NE	NE	NE	NE	mg/Kg	0.0053	U	0.0057	U	0.057	U	0.0053	U	0.061	U	0.052	U	0.053	U	0.0056	U	0.0057	U	0.0057	U	0.11	U	0.052	U	0.0054	U	0.053	U	0.1	U	0.0049	U	0.053	U	0.051	U	0.0055	U	0.054	U
BETA-BHC	10	100	NE	NE	NE	NE	mg/Kg	0.0053	U	0.0057	U	0.057	U	0.0053	U	0.061	U	0.052	U	0.053	U	0.0056	U	0.0057	U	0.0057	U	0.11	U	0.052	U	0.0054	U	0.053	U	0.1	U	0.0049	U	0.053	U	0.051	U	0.0055	U	0.054	U
DELTA-BHC	10	100	NE	NE	NE	NE	mg/Kg	0.0053	U	0.0057	U	0.057	**U**	0.0053	U	0.061	U	0.052	U	0.053	U	0.0056	U	0.0057	U	0.0057	U	0.11	U	0.052	U	0.0054	U	0.053	U	0.1	U	0.0049	U	0.053	U	0.051	U	0.0055	U	0.054	U
GAMMA-BHC (LINDANE)	0.003	0.5	NE	NE	NE	NE	mg/Kg	0.0021	U	0.0023	U	**0.023**	U	0.0021	U	**0.024**	U	**0.021**	U	**0.021**	U	**0.0022**	U	0.0023	U	0.0023	U	**0.044**	U	**0.021**	U	0.0022	U	**0.021**	U	**0.042**	U	0.002	U	0.021	U	**0.02**	U	0.0022	U	**0.022**	U
CHLORDANE	5	30	NE	NE	NE	NE	mg/Kg	0.021	U	0.023	U	0.23	U	0.021	U	0.24	U	0.21	U	0.21	U	0.022	U	0.023	U	0.023	U	0.44	U	0.21	U	0.022	U	0.21	U	0.42	U	0.02	U	0.21	U	0.2	U	0.022	U	0.22	U
4,4'-DDD	8	40	NE	NE	NE	NE	mg/Kg	0.0042	U	0.0046	U	0.046	U	0.0042	U	0.049	U	0.041	U	0.042	U	0.0045	U	0.0045	U	0.0045	U	0.088	U	0.042	U	0.0044	U	0.042	U	0.084	U	0.0039	U	0.042	U	0.041	U	0.0044	U	0.043	U
4,4'-DDE	6	30	NE	NE	NE	NE	mg/Kg	0.0042	U	0.0046	U	0.046	U	0.0042	U	0.049	U	0.041	U	0.042	U	0.0045	U	0.0045	U	0.0045	U	0.088	U	0.042	U	0.0044	U	0.042	U	0.084	U	0.0039	U	0.042	U	0.041	U	0.0044	U	0.043	U
4,4'-DDT	6	30	NE	NE	NE	NE	mg/Kg	0.0042	U	0.0046	U	0.046	U	0.008		0.049	U	0.041	U	0.042	U	0.0045	U	0.0045	U	0.0045	U	0.088	U	0.042	U	0.0044	U	0.042	U	0.084	U	0.0039	U	0.042	U	0.041	U	0.0044	U	0.043	U
DIELDRIN	0.08	0.5	NE	NE	NE	NE	mg/Kg	0.0042	U	0.0046	U	0.046	U	0.0042	U	0.049	U	0.041	U	0.042	U	0.0045	U	0.0045	U	0.0045	U	**0.088**	U	0.042	U	0.0044	U	0.042	U	**0.084**	U	0.0039	U	0.042	U	0.041	U	0.0044	U	0.043	U
ENDOSULFAN I	0.5	1	NE	NE	NE	NE	mg/Kg	0.0053	U	0.0057	U	0.057	U	0.0053	U	0.061	U	0.052	U	0.053	U	0.0056	U	0.0057	U	0.0057	U	0.11	U	0.052	U	0.0054	U	0.053	U	0.1	U	0.0049	U	0.053	U	0.051	U	0.0055	U	0.054	U
ENDOSULFAN II	0.5	1	NE	NE	NE	NE	mg/Kg	0.0084	U	0.0091	U	0.091	U	0.0085	U	0.097	U	0.083	U	0.084	U	0.0089	U	0.0091	U	0.0091	U	0.18	U	0.083	U	0.0087	U	0.085	U	0.17	U	0.0079	U	0.13		0.081	U	0.0089	U	0.087	U
ENDOSULFAN SULFATE	~	~	NE	NE	NE	NE	mg/Kg	0.0084	U	0.0091	U	0.091	U	0.0085	U	0.097	U	0.083	U	0.084	U	0.0089	U	0.0091	U	0.0091	U	0.18	U	0.083	U	0.0087	U	0.085	U	0.17	U	0.0079	U	0.084	U	0.081	U	0.0089	U	0.087	U
ENDRIN	10	20	NE	NE	NE	NE	mg/Kg	0.0084	U	0.0091	U	0.091	U	0.0085	U	0.097	U	0.083	U	0.084	U	0.0089	U	0.0091	U	0.0091	U	0.18	U	0.083	U	0.0087	U	0.085	U	0.17	U	0.0079	U	0.084	U	0.081	U	0.0089	U	0.087	U
ENDRIN ALDEHYDE	10	100	NE	NE	NE	NE	mg/Kg	0.0084	U	0.0091	U	0.091	U	0.0085	U	0.097	U	0.083	U	0.084	U	0.0089	U	0.0091	U	0.0091	U	0.18	U	0.083	U	0.0087	U	0.085	U	0.17	U	0.0079	U	0.084	U	0.081	U	0.0089	U	0.087	U
ENDRIN KETONE	~	~	NE	NE	NE	NE	mg/Kg	0.0084	U	0.0091	U	0.091	U	0.0085	U	0.097	U	0.083	U	0.084	U	0.0089	U	0.0091	U	0.0091	U	0.18	U	0.083	U	0.0087	U	0.085	U	0.17	U	0.0079	U	0.084	U	0.081	U	0.0089	U	0.087	U
HEPTACHLOR	0.3	2	NE	NE	NE	NE	mg/Kg	0.0053	U	0.0057	U	0.057	U	0.0053	U	0.061	U	0.052	U	0.053	U	0.0056	U	0.0057	U	0.0057	U	0.11	U	0.052	U	0.0054	U	0.053	U	0.1	U	0.0049	U	0.053	U	0.051	U	0.0055	U	0.054	U
HEPTACHLOR EPOXIDE	0.1	0.9	NE	NE	NE	NE	mg/Kg	0.0053	U	0.0057	U	0.057	U	0.0053	U	0.061	U	0.052	U	0.053	U	0.0056	U	0.0057	U	0.0057	U	**0.11**	U	0.052	U	0.0054	U	0.053	U	0.1	U	0.0049	U	0.053	U	0.051	U	0.0055	U	0.054	U
HEXACHLOROBENZENE	0.7	0.8	NE	NE	NE	NE	mg/Kg	0.0063	U	0.0068	U	0.068	U	0.0064	U	0.073	U	0.062	U	0.063	U	0.0067	U	0.0068	U	0.0068	U	0.13	U	0.062	U	0.0065	U	0.064	U	0.13	U	0.0059	U	**2.3**		0.061	U	0.0066	U	0.065	U
METHOXYCHLOR	200	400	NE	NE	NE	NE	mg/Kg	0.053	U	0.057	U	0.57	U	0.053	U	0.61	U	0.52	U	0.53	U	0.056	U	0.057	U	0.057	U	1.1	U	0.52	U	0.054	U	0.53	U	1	U	0.049	U	0.53	U	0.51	U	0.055	U	0.54	U
TOXAPHENE	10	100	NE	NE	NE	NE	mg/Kg	0.11	U	0.11	U	1.1	U	0.11	U	1.2	U	1	U	1.1	U	0.11	U	0.11	U	0.11	U	2.2	U	1	U	0.11	U	1.1	U	2.1	U	0.099	U	1.1	U	1	U	0.11	U	1.1	U
SW-846 8082A																																													
PCB 1016	1	4	NE	NE	NE	NE	mg/Kg	0.084	U	0.091	U	0.091	U	0.085	U	0.097	U	0.083	U	0.084	U	0.089	U	0.091	U	0.091	U	0.088	U	0.083	U	0.087	U	0.085	U	0.084	U	0.082	U	0.41	U	0.081	U	0.089	U	0.087	U
PCB 1221	1	4	NE	NE	NE	NE	mg/Kg	0.084	U	0.091	U	0.091	U	0.085	U	0.097	U	0.083	U	0.084	U	0.089	U	0.091	U	0.091	U	0.088	U	0.083	U	0.087	U	0.085	U	0.084	U	0.082	U	0.41	U	0.081	U	0.089	U	0.087	U
PCB 1232	1	4	NE	NE	NE	NE	mg/Kg	0.084	U	0.091	U	0.091	U	0.085	U	0.097	U	0.083	U	0.084	U	0.089	U	0.091	U	0.091	U	0.088	U	0.083	U	0.087	U	0.085	U	0.084	U	0.082	U	0.41	U	0.081	U	0.089	U	0.087	U
PCB 1242	1	4	NE	NE	NE	NE	mg/Kg	0.084	U	0.091	U	0.091	U	0.085	U	0.097	U	0.083	U	0.084	U	0.089	U	0.091	U	0.091	U	0.088	U	0.083	U	0.087	U	0.085	U	0.084	U	0.082	U	0.41	U	0.081	U	0.089	U	0.087	U
PCB 1248	1	4	NE	NE	NE	NE	mg/Kg	0.084	U	0.091	U	0.091	U	0.085	U	0.097	U	0.083	U	0.084	U	0.089	U	0.091	U	0.091	U	0.088	U	0.083	U	0.087	U	0.085	U	0.084	U	0.082	U	0.41	U	0.081	U	0.089	U	0.087	U
PCB 1254	1	4	NE	NE	NE	NE	mg/Kg	0.084	U	0.091	U	0.091	U	0.085	U	0.097	U	0.083	U	0.084	U	0.089	U	0.091	U	0.091	U	0.088	U	0.083	U	0.087	U	0.085	U	0.084	U	0.082	U	0.41	U	0.081	U	0.089	U	0.087	U
PCB 1260	1	4	NE	NE	NE	NE	mg/Kg	0.084	U	0.091	U	0.091	U	0.085	U	0.097	U	0.083	U	0.084	U	0.089	U	0.091	U	0.091	U	0.088	U	0.083	U	0.087	U	0.085	U	0.084	U	0.082	U	0.41	U	0.081	U	0.089	U	0.087	U
PCB 1262	1	4	NE	NE	NE	NE	mg/Kg	0.084	U	0.091	U	0.091	U	0.085	U	0.097	U	0.083	U	0.084	U	0.089	U	0.091	U	0.091	U	0.088	U	0.083	U	0.087	U	0.085	U	0.084	U	0.082	U	0.41	U	0.081	U	0.089	U	0.087	U
PCB 1268	1	4	NE	0.1	NE	NE	mg/Kg	0.084	U	0.091	U	0.091	U	0.085	U	0.097	U	0.083	U	0.084	U	0.089	U	0.091	U	0.091	U	0.088	U	0.083	U	0.087	U	0.085	U	0.084	U	0.082	U	0.41	U	0.081	U	0.089	U	0.087	U
SW-846 8100 Modified																																													
TPH	1000	3000	NE	NE	5000	2500	mg/Kg	8.8	U	28		250		24		130		320		100		230		16		9.7		260		290		92		89		670		110		470		65		130		71	
SW-846 8151A																																													
2,4-D	100000	1000000	NE	NE	NE	NE	µg/kg	27	U	30	U	28	U	26	U	30	U	26	U	26	U	28	U	28	U	28	U	28	U	26	U	27	U	26	U	26	U	26	U	26	U	27	U	28	U	27	U
2,4-DB	100000	1000000	NE	NE	NE	NE	µg/kg	27	U	30	U	28	U	26	U	30	U	26	U	26	U	28	U	28	U	28	U	28	U	26	U	27	U	26	U	26	U	26	U	26	U	27	U	28	U	27	U
2,4,5-TP (SILVEX)	100000	1000000	NE	NE	NE	NE	µg/kg	2.7	U	3	U	2.8	U	2.6	U	3	U	2.6	U	2.6	U	2.8	U	2.8	U	2.8	U	2.8	U	2.6	U	2.7	U	2.6	U	2.6	U	2.6	U	2.6	U	2.7	U	2.8	U	2.7	U
2,4,5-T	100000	1000000	NE	NE	NE	NE	µg/kg	2.7	U	3	U	2.8	U	2.6	U	3	U	2.6	U	2.6	U	2.8	U	2.8	U	2.8	U	2.8	U	2.6	U	2.7	U	2.6	U	2.6	U	2.6	U	2.6	U	2.7	U	2.8	U	2.7	U
DALAPON	NE	NE	NE	NE	NE	NE	µg/kg	67	U	75	U	70	U	66	U	75	U	64	U	65	U	69	U	71	U	70	U	69	U	65	U	67	U	66	U	65	U	64	U	66	U	67	U	69	U	67	U
DICAMBA	500000	5000000	NE	NE	NE	NE	µg/kg	2.7	U	3	U	2.8	U	2.6	U	3	U	2.6	U	2.6	U	2.8	U	2.8	U	2.8	U	2.8	U	2.6	U	2.7	U	2.6	U	2.6	U	2.6	U	2.6	U	2.7	U	2.8	U	2.7	U
DICHLOROPROP	NE	NE	NE	NE	NE	NE	µg/kg	27	U	30	U	28	U	26	U	30	U	26	U	26	U	28	U	28	U	28	U	28	U	26	U	27	U	26	U	26	U	26	U	26	U	27	U	28	U	27	U
DINOSEB	500000	5000000	NE	NE	NE	NE	µg/kg	13	U	15	U	14	U	13	U	15	U	13	U	13	U	14	U	14	U	14	U	14	U	13	U	13	U	13	U	13	U	13	U	13	U	13	U	14	U	13	U
MCPA	100000	1000000	NE	NE	NE	NE	µg/kg	2700	U	3000	U	2,800	U	2,600	U	3,000	U	2,600	U	2,600	U	2,800	U	2,800	U	2,800	U	2,800	U	2,600	U	2,700	U	2,600	U	2,600	U	2,600	U	2,600	U	2,700	U	2,800	U	2,700	U
MCPP	NE	NE	NE	NE	NE	NE	µg/kg	2700	U	3000	U	2800	U	2,600	U	3000	U	2600	U	2600	U	2800	U	2800	U	2,800	U	2,800	U	2,600	U	2,700	U	2,600	U	2,600	U	2,600	U	2,600	U	2,700	U	2,800	U	2,700	U

Table 1
Summary of In-Road Hudson Soil Data
Sudbury to Hudson Transmission Project
Hudson, Massachusetts

Sample Location	RCS-1	RCS-2	Similar Soils for RCS-1	Concentrations in "Natural Soil" at RCS-1 Receiving Location	MA Lined Landfill	MA Unlined Landfill	Units	SB2	SB3	MP9	SB1	MP11	MP3	MP4	MP6	MP10	MP1	MP-2	MP13	MP14	MP25	MP21	MP-12	MP-5	MP-7	MP-8	MP-16
Sample Date								06/05/2018	6/5/2018	06/06/2018	06/07/2018	06/07/2018	06/07/2018	06/07/2018	06/07/2018	06/08/2018	6/26/2018	07/25/2018	08/01/2018	08/02/2018	08/06/2018	08/06/2018	08/08/2018	08/08/2018	08/20/2018	08/20/2018	08/23/2018
Labnumber								18F0316-08	18F0316-15	18F0619-04	18F0619-06	18F0619-01	18F0619-10	18F0619-05	18F0619-03	18F0619-09	18F1479-04	18H0015-01	18H0260-01	18H0260-03	18H0260-05	18H0260-04	18H0744-02	18H0744-01	18H1308-02	18H1308-01	18H1308-03
PID Reading (ppmV)								0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SW-846 8260C																											
ACETONE	6	50	NE	NE	NE	NE	mg/Kg	0.081 U	0.079 U	0.045 U	0.082 U	0.1 U	0.047 U	0.086 U	0.078 U	0.077 U	0.074 U	0.081 U	0.093 U	0.067 U	0.081 U	0.067 U	0.078 U	0.072 U	0.068 U	0.055 U	0.059 U
TERT-AMYL METHYL ETHER	NE	NE	NE	NE	NE	NE	mg/Kg	0.00081 U	0.00079 U	0.00045 U	0.00082 U	0.001 U	0.00047 U	0.00086 U	0.00078 U	0.00077 U	0.00074 U	0.00081 U	0.00093 U	0.00067 U	0.00081 U	0.00067 U	0.00078 U	0.00072 U	0.00068 U	0.00055 U	0.00059 U
BENZENE	2	200	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
BROMOBENZENE	100	1000	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
BROMOCHLOROMETHANE	NE	NE	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
BROMODICHLOROMETHANE	0.1	0.1	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
BROMOFORM	0.1	1	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.0045 U	0.0082 U	0.002 U	0.0047 U	0.0086 U	0.0078 U	0.0077 U	0.0074 U	0.0016 U	0.0019 U	0.0013 U	0.0081 U	0.0067 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
BROMOMETHANE	0.5	0.5	NE	NE	NE	NE	mg/Kg	0.0081 U	0.0079 U	0.0045 U	0.0082 U	0.01 U	0.0047 U	0.0086 U	0.0078 U	0.0077 U	0.0074 U	0.0081 U	0.0093 U	0.0067 U	0.0081 U	0.0067 U	0.0078 U	0.0072 U	0.0068 U	0.0055 U	0.0059 U
2-BUTANONE (MEK)	4	50	NE	NE	NE	NE	mg/Kg	0.032 U	0.032 U	0.018 U	0.033 U	0.04 U	0.019 U	0.034 U	0.031 U	0.031 U	0.03 U	0.033 U	0.037 U	0.027 U	0.032 U	0.027 U	0.031 U	0.029 U	0.027 U	0.022 U	0.024 U
N-BUTYLBENZENE	NE	NE	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
SEC-BUTYLBENZENE	NE	NE	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
TERT-BUTYLBENZENE	100	1000	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
TERT-BUTYLETHYL ETHER	NE	NE	NE	NE	NE	NE	mg/Kg	0.00081 U	0.00079 U	0.00045 U	0.00082 U	0.001 U	0.00047 U	0.00086 U	0.00078 U	0.00077 U	0.00074 U	0.00081 U	0.00093 U	0.00067 U	0.00081 U	0.00067 U	0.00078 U	0.00072 U	0.00068 U	0.00055 U	0.00059 U
CARBON DISULFIDE	100	1000	NE	NE	NE	NE	mg/Kg	0.0048 U	0.0047 U	0.0027 U	0.0049 U	0.006 U	0.0028 U	0.0052 U	0.0047 U	0.0046 U	0.0044 U	0.0049 U	0.0056 U	0.004 U	0.0048 U	0.004 U	0.0047 U	0.0043 U	0.0041 U	0.0033 U	0.0036 U
CARBON TETRACHLORIDE	5	5	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.0018 U	0.0033 U	0.002 U	0.0019 U	0.0034 U	0.0031 U	0.0031 U	0.003 U	0.0016 U	0.0019 U	0.0013 U	0.0032 U	0.0027 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
CHLOROBENZENE	1	3	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
CHLORODIBROMOMETHANE	0.005	0.03	NE	NE	NE	NE	mg/Kg	0.00081 U	0.00079 U	0.00045 U	0.00082 U	0.001 U	0.00047 U	0.00086 U	0.00078 U	0.00077 U	0.00074 U	0.00081 U	0.00093 U	0.00067 U	0.00081 U	0.00067 U	0.00078 U	0.00072 U	0.00068 U	0.00055 U	0.00059 U
CHLOROETHANE	100	1000	NE	NE	NE	NE	mg/Kg	0.0081 U	0.0079 U	0.0045 U	0.0082 U	0.01 U	0.0047 U	0.0086 U	0.0078 U	0.0077 U	0.0074 U	0.0081 U	0.0093 U	0.0067 U	0.0081 U	0.0067 U	0.0078 U	0.0072 U	0.0068 U	0.0055 U	0.0059 U
CHLOROFORM	0.2	0.2	NE	NE	NE	NE	mg/Kg	0.0032 U	0.0032 U	0.0018 U	0.0033 U	0.004 U	0.0019 U	0.0034 U	0.0031 U	0.0031 U	0.003 U	0.0033 U	0.0037 U	0.0027 U	0.0032 U	0.0027 U	0.0031 U	0.0029 U	0.0027 U	0.0022 U	0.0024 U
CHLOROMETHANE	100	1000	NE	NE	NE	NE	mg/Kg	0.0081 U	0.0079 U	0.0045 U	0.0082 U	0.01 U	0.0047 U	0.0086 U	0.0078 U	0.0077 U	0.0074 U	0.0081 U	0.0093 U	0.0067 U	0.0081 U	0.0067 U	0.0078 U	0.0072 U	0.0068 U	0.0055 U	0.0059 U
2-CHLOROTOLUENE	100	1000	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
4-CHLOROTOLUENE	100	1000	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,2-DIBROMO-3-CHLOROPROPANE	10	100	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,2-DIBROMOETHANE (EDB)	0.1	0.1	NE	NE	NE	NE	mg/Kg	0.00081 U	0.00079 U	0.00045 U	0.00082 U	0.001 U	0.00047 U	0.00086 U	0.00078 U	0.00077 U	0.00074 U	0.00081 U	0.00093 U	0.00067 U	0.00081 U	0.00067 U	0.00078 U	0.00072 U	0.00068 U	0.00055 U	0.00059 U
DIBROMOMETHANE	500	5000	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,2-DICHLOROBENZENE	9	100	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,3-DICHLOROBENZENE	3	200	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,4-DICHLOROBENZENE	0.7	1	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
DICHLORODIFLUOROMETHANE	1000	10000	NE	NE	NE	NE	mg/Kg	0.0081 U	0.0079 U	0.0045 U	0.0082 U	0.01 U	0.0047 U	0.0086 U	0.0078 U	0.0077 U	0.0074 U	0.0081 U	0.0093 U	0.0067 U	0.0081 U	0.0067 U	0.0078 U	0.0072 U	0.0068 U	0.0055 U	0.0059 U
1,1-DICHLOROETHANE	0.4	9	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,2-DICHLOROETHANE	0.1	0.1	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,1-DICHLOROETHYLENE	3	40	NE	NE	NE	NE	mg/Kg	0.0032 U	0.0032 U	0.0018 U	0.0033 U	0.004 U	0.0019 U	0.0034 U	0.0031 U	0.0031 U	0.003 U	0.0033 U	0.0037 U	0.0027 U	0.0032 U	0.0027 U	0.0031 U	0.0029 U	0.0027 U	0.0022 U	0.0024 U
CIS-1,2-DICHLOROETHYLENE	0.1	0.1	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
TRANS-1,2-DICHLOROETHYLENE	1	1	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,2-DICHLOROPROPANE	0.1	0.1	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,3-DICHLOROPROPANE	500	5000	NE	NE	NE	NE	mg/Kg	0.00081 U	0.00079 U	0.00045 U	0.00082 U	0.001 U	0.00047 U	0.00086 U	0.00078 U	0.00077 U	0.00074 U	0.00081 U	0.00093 U	0.00067 U	0.00081 U	0.00067 U	0.00078 U	0.00072 U	0.00068 U	0.00055 U	0.00059 U
2,2-DICHLOROPROPANE	0.1	0.2	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.0045 U	0.0082 U	0.002 U	0.0047 U	0.0086 U	0.0078 U	0.0077 U	0.0074 U	0.0016 U	0.0019 U	0.0013 U	0.0081 U	0.0067 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,1-DICHLOROPROPENE	0.01	0.1	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
CIS-1,3-DICHLOROPROPENE	0.01	0.1	NE	NE	NE	NE	mg/Kg	0.00081 U	0.00079 U	0.00045 U	0.00082 U	0.001 U	0.00047 U	0.00086 U	0.00078 U	0.00077 U	0.00074 U	0.00081 U	0.00093 U	0.00067 U	0.00081 U	0.00067 U	0.00078 U	0.00072 U	0.00068 U	0.00055 U	0.00059 U
TRANS-1,3-DICHLOROPROPENE	0.01	0.1	NE	NE	NE	NE	mg/Kg	0.00081 U	0.00079 U	0.0045 U	0.0082 U	0.001 U	0.0047 U	0.0086 U	0.0078 U	0.0077 U	0.0074 U	0.00081 U	0.00093 U	0.00067 U	0.0081 U	0.0067 U	0.00078 U	0.00072 U	0.00068 U	0.00055 U	0.00059 U
DIETHYL ETHER	100	1000	NE	NE	NE	NE	mg/Kg	0.0081 U	0.0079 U	0.0045 U	0.0082 U	0.01 U	0.0047 U	0.0086 U	0.0078 U	0.0077 U	0.0074 U	0.0081 U	0.0093 U	0.0067 U	0.0081 U	0.0067 U	0.0078 U	0.0072 U	0.0068 U	0.0055 U	0.0059 U
DIISOPROPYL ETHER	100	1000	NE	NE	NE	NE	mg/Kg	0.00081 U	0.00079 U	0.00045 U	0.00082 U	0.001 U	0.00047 U	0.00086 U	0.00078 U	0.00077 U	0.00074 U	0.00081 U	0.00093 U	0.00067 U	0.00081 U	0.00067 U	0.00078 U	0.00072 U	0.00068 U	0.00055 U	0.00059 U
1,4-DIOXANE	0.2	6	NE	NE	NE	NE	mg/Kg	0.081 U	0.079 U	0.045 U	0.082 U	0.1 U	0.047 U	0.086 U	0.078 U	0.077 U	0.074 U	0.081 U	0.093 U	0.067 U	0.081 U	0.067 U	0.078 U	0.072 U	0.068 U	0.055 U	0.059 U
ETHYLBENZENE	40	1000	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
HEXACHLOROBUTADIENE	30	100	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
2-HEXANONE	100	1000	NE	NE	NE	NE	mg/Kg	0.016 U	0.016 U	0.0089 U	0.016 U	0.02 U	0.0094 U	0.017 U	0.016 U	0.015 U	0.015 U	0.016 U	0.019 U	0.013 U	0.016 U	0.013 U	0.016 U	0.014 U	0.014 U	0.011 U	0.012 U
ISOPROPYLBENZENE	1000	10000	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
P-ISOPROPYLTOLUENE	100	1000	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
METHYL TERT-BUTYL ETHER (MTBE)	0.1	100	NE	NE	NE	NE	mg/Kg	0.0032 U	0.0032 U	0.0018 U	0.0033 U	0.004 U	0.0019 U	0.0034 U	0.0031 U	0.0031 U	0.003 U	0.0033 U	0.0037 U	0.0027 U	0.0032 U	0.0027 U	0.0031 U	0.0029 U	0.0027 U	0.0022 U	0.0024 U
METHYLENE CHLORIDE	0.1	20	NE	NE	NE	NE	mg/Kg	0.0081 U	0.0079 U	0.0045 U	0.0082 U	0.01 U	0.0047 U	0.0086 U	0.0078 U	0.0077 U	0.0074 U	0.0081 U	0.0093 U	0.0067 U	0.0081 U	0.0067 U	0.0078 U	0.0072 U	0.0068 U	0.0055 U	0.0059 U
4-METHYL-2-PENTANONE (MIBK)	0.4	50	NE	NE	NE	NE	mg/Kg	0.016 U	0.016 U	0.0089 U	0.016 U	0.02 U	0.0094 U	0.017 U	0.016 U	0.015 U	0.015 U	0.016 U	0.019 U	0.013 U	0.016 U	0.013 U	0.016 U	0.014 U	0.014 U	0.011 U	0.012 U
NAPHTHALENE	4	20	NE	NE	NE	NE	mg/Kg	0.0032 U	0.0032 U	0.0018 U	0.0033 U	0.004 U	0.0019 U	0.0034 U	0.0031 U	0.0031 U	0.003 U	0.0033 U	0.0037 U	0.0027 U	0.0032 U	0.0027 U	0.0031 U	0.0029 U	0.0027 U	0.0022 U	0.0024 U
N-PROPYLBENZENE	100	1000	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.0018 U	0.0033 U	0.002 U	0.0019 U	0.0034 U	0.0031 U	0.0031 U	0.003 U	0.0016 U	0.0019 U	0.0013 U	0.0032 U	0.0027 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
STYRENE	3	4	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.0018 U	0.0033 U	0.002 U	0.0019 U	0.0034 U	0.0031 U	0.0031 U	0.003 U	0.0016 U	0.0019 U	0.0013 U	0.0032 U	0.0027 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,1,1,2-TETRACHLOROETHANE	0.1	0.1	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,1,2,2-TETRACHLOROETHANE	0.005	0.02	NE	NE	NE	NE	mg/Kg	0.00081 U	0.00079 U	0.00045 U	0.00082 U	0.001 U	0.00047 U	0.00086 U	0.00078 U	0.00077 U	0.00074 U	0.00081 U	0.00093 U	0.00067 U	0.00081 U	0.00067 U	0.00078 U	0.00072 U	0.00068 U	0.00055 U	0.00059 U
TETRACHLOROETHYLENE	1	10	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
TETRAHYDROFURAN	500	5000	NE	NE	NE	NE	mg/Kg	0.0081 U	0.0079 U	0.0045 U	0.0082 U	0.01 U	0.0047 U	0.0086 U	0.0078 U	0.0077 U	0.0074 U	0.0081 U	0.0093 U	0.0067 U	0.0081 U	0.0067 U	0.0078 U	0.0072 U	0.0068 U	0.0055 U	0.0059 U
TOLUENE	30	1000	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,2,3-TRICHLOROBENZENE	NE	NE	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,2,4-TRICHLOROBENZENE	2	6	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,1,1-TRICHLOROETHANE	30	600	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,1,2-TRICHLOROETHANE	0.1	2	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
TRICHLOROETHYLENE	0.3	0.3	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
TRICHLOROFLUOROMETHANE	1000	10000	NE	NE	NE	NE	mg/Kg	0.0081 U	0.0079 U	0.0045 U	0.0082 U	0.01 U	0.0047 U	0.0086 U	0.0078 U	0.0077 U	0.0074 U	0.0081 U	0.0093 U	0.0067 U	0.0081 U	0.0067 U	0.0078 U	0.0072 U	0.0068 U	0.0055 U	0.0059 U
1,2,3-TRICHLOROPROPANE	100	1000	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,2,4-TRIMETHYLBENZENE	1000	10000	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
1,3,5-TRIMETHYLBENZENE	10	100	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.0018 U	0.0033 U	0.002 U	0.0019 U	0.0034 U	0.0031 U	0.0031 U	0.003 U	0.0016 U	0.0019 U	0.0013 U	0.0032 U	0.0027 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U
VINYL CHLORIDE	0.7	0.7	NE	NE	NE	NE	mg/Kg	0.0081 U	0.0079 U	0.0045 U	0.0082 U	0.01 U	0.0047 U	0.0086 U	0.0078 U	0.0077 U	0.0074 U	0.0081 U	0.0093 U	0.0067 U	0.0081 U	0.0067 U	0.0078 U	0.0072 U	0.0068 U	0.0055 U	0.0059 U
M/P-XYLENE	100	100	NE	NE	NE	NE	mg/Kg	0.0032 U	0.0032 U	0.0018 U	0.0033 U	0.004 U	0.0019 U	0.0039	0.0031 U	0.0031 U	0.003 U	0.0033 U	0.0037 U	0.0027 U	0.0032 U	0.0027 U	0.0031 U	0.0029 U	0.0027 U	0.0022 U	0.0024 U
O-XYLENE	100	100	NE	NE	NE	NE	mg/Kg	0.0016 U	0.0016 U	0.00089 U	0.0016 U	0.002 U	0.00094 U	0.0017 U	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.0019 U	0.0013 U	0.0016 U	0.0013 U	0.0016 U	0.0014 U	0.0014 U	0.0011 U	0.0012 U

Table 1
Summary of In-Road Hudson Soil Data
Sudbury to Hudson Transmission Project
Hudson, Massachusetts

Sample Location								SB2		SB3		MP9		SB1		MP11		MP3		MP4		MP6		MP10		MP1		MP-2		MP13		MP14		MP25		MP21		MP-12		MP-5		MP-7		MP-8		MP-16	
Sample Date	RCS-1	RCS-2	Similar Soils for RCS-1	Concentrations in "Natural Soil" at RCS-1 Receiving Location	MA Lined Landfill	MA Unlined Landfill	Units	06/05/2018		6/5/2018		06/06/2018		06/06/2018		06/07/2018		06/07/2018		06/07/2018		06/07/2018		06/08/2018		6/26/2018		07/25/2018		08/01/2018		08/02/2018		08/06/2018		08/06/2018		08/08/2018		08/08/2018		08/20/2018		08/20/2018		08/23/2018	
Labnumber								18F0316-08		18F0316-15		18F0619-04		18F0619-06		18F0619-01		18F0619-10		18F0619-05		18F0619-03		18F0619-09		18F1479-04		18H0015-01		18H0260-01		18H0260-03		18H0260-05		18H0260-04		18H0744-02		18H0744-01		18H1308-02		18H1308-01		18H1308-03	
PID Reading (ppmV)								0.0		0.0		0.2		0.0		0.0		0.0		0.0		0.0		0.1		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
SW-846 8270D																																														
ACENAPHTHENE	4	3000	4	0.5	NE	NE	mg/Kg	0.18	U	0.2	U	0.19	U	0.18	U	0.21	U	0.17	U	0.18	U	0.19	U	0.19	U	0.19	U	0.19	U	0.17	U	0.18	U	0.18	U	0.71	U	0.18	U	0.18	U	0.18	U	0.19	U	0.18	U
ACENAPHTHYLENE	1	10	1	0.5	NE	NE	mg/Kg	0.18	U	0.2	U	0.22		0.18	U	0.21	U	0.17	U	0.18	U	0.19	U	0.19	U	0.19	U	**0.59**		0.47		0.18	U	0.18	U	0.71	U	0.18	U	0.44		0.18	U	0.19	U	0.18	U
ACETOPHENONE	1000	10000	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
ANILINE	1000	10000	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
ANTHRACENE	1000	3000	10	1	NE	NE	mg/Kg	0.18	U	0.2	U	0.19	U	0.18	U	0.21	U	0.17	U	0.18	U	0.19	U	0.19	U	0.19	U	0.45		0.2		0.18	U	0.18	U	0.71	U	0.18	U	0.27		0.18	U	0.19	U	0.18	U
BENZO(A)ANTHRACENE	7	40	7	2	NE	NE	mg/Kg	0.18	U	0.2	U	0.94		0.18	U	1		0.17	U	0.27		0.19	U	0.19	U	0.19	U	**2.5**		1.2		0.18	U	0.18	U	2.6		0.18	U	1.6		0.43		0.19	U	0.21	
BENZO(A)PYRENE	2	7	2	2	NE	NE	mg/Kg	0.18	U	0.2	U	1.4		0.22		1.3		0.28		0.41		0.19	U	0.19	U	0.19	U	**2.8**		1.6		0.18	U	0.24		**2.4**		0.19		**2.3**		0.57		0.19	U	0.3	
BENZO(B)FLUORANTHENE	7	40	7	2	NE	NE	mg/Kg	0.18	U	0.2	U	1.7		0.25		1.5		0.25		0.51		0.19	U	0.19	U	0.19	U	**3.3**		1.8		0.18	U	0.3		2.7		0.2		3		0.63		0.19	U	0.34	
BENZO(G,H,I)PERYLENE	1000	3000	10	1	NE	NE	mg/Kg	0.18	U	0.2	U	**1.1**		0.22		0.76		0.25		0.32		0.19	U	0.19	U	0.19	U	1.8		**2**		0.18	U	0.22		1.3		0.19		2.6		0.46		0.19	U	0.27	
BENZO(K)FLUORANTHENE	70	400	10	1	NE	NE	mg/Kg	0.18	U	0.2	U	0.65		0.18	U	0.64		0.17	U	0.19		0.19	U	0.19	U	0.19	U	1.2		0.71		0.18	U	0.18	U	**1.1**		0.18	U	1.1		0.26		0.19	U	0.18	U
BIS(2-CHLOROETHOXY)METHANE	500	5000	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
BIS(2-CHLOROETHYL)ETHER	0.7	0.7	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	**1.4**	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
BIS(2-CHLOROISOPROPYL)ETHER	0.7	0.7	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	**1.4**	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
BIS(2-ETHYLHEXYL)PHTHALATE	90	600	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
4-BROMOPHENYL PHENYL ETHER	100	1000	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
BUTYLBENZYLPHTHALATE	100	1000	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
4-CHLOROANILINE	1	3	NE	NE	NE	NE	mg/Kg	0.7	U	0.78	U	0.74	U	0.7	U	0.8	U	0.67	U	0.69	U	0.73	U	0.75	U	0.75	U	0.72	U	0.68	U	0.71	U	0.7	U	**2.7**	U	0.68	U	0.7	U	0.71	U	0.73	U	0.7	U
2-CHLORONAPHTHALENE	1000	10000	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
2-CHLOROPHENOL	0.7	100	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	**1.4**	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
CHRYSENE	70	400	20	2	NE	NE	mg/Kg	0.18	U	0.2	U	0.96		0.18	U	1		0.17	U	0.31		0.19	U	0.19	U	0.19	U	**2.4**		1.3		0.18	U	0.18	U	**2.6**		0.18	U	1.7		0.46		0.19	U	0.23	
DIBENZ(A,H)ANTHRACENE	0.7	4	0.7	0.5	NE	NE	mg/Kg	0.18	U	0.2	U	0.19		0.18	U	0.21	U	0.17	U	0.18	U	0.19	U	0.19	U	0.19	U	0.48		0.42		0.18	U	0.18	U	**0.71**	U	0.18	U	0.35		0.18	U	0.19	U	0.18	U
DIBENZOFURAN	100	1000	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
DI-N-BUTYLPHTHALATE	50	500	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
1,2-DICHLOROBENZENE	9	100	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
1,3-DICHLOROBENZENE	3	200	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
1,4-DICHLOROBENZENE	0.7	1	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	**1.4**	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
3,3'-DICHLOROBENZIDINE	3	20	NE	NE	NE	NE	mg/Kg	0.18	U	0.2	U	0.19	U	0.18	U	0.21	U	0.17	U	0.18	U	0.19	U	0.19	U	0.19	U	0.19	U	0.17	U	0.18	U	0.18	U	0.71	U	0.18	U	0.18	U	0.19	U	0.18	U
2,4-DICHLOROPHENOL	0.7	40	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	**1.4**	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
DIETHYLPHTHALATE	10	200	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
2,4-DIMETHYLPHENOL	0.7	100	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	**1.4**	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
DIMETHYLPHTHALATE	0.7	50	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	**1.4**	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
2,4-DINITROPHENOL	3	50	NE	NE	NE	NE	mg/Kg	0.7	U	0.78	U	0.74	U	0.7	U	0.8	U	0.67	U	0.69	U	0.73	U	0.75	U	0.75	U	0.72	U	0.68	U	0.71	U	0.7	U	2.7	U	0.68	U	0.7	U	0.71	U	0.73	U	0.7	U
2,4-DINITROTOLUENE	0.7	10	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	**1.4**	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
2,6-DINITROTOLUENE	100	1000	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
DI-N-OCTYLPHTHALATE	1000	10000	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	50	500	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
FLUORANTHENE	1000	3000	40	4	NE	NE	mg/Kg	0.18	U	0.2	U	1.7		0.18	U	1.5		0.25		0.58		0.19	U	0.19	U	0.19	U	4.4		1.8		0.18	U	0.27		3.4		0.18	U	2.4		0.78		0.19	U	0.44	
FLUORENE	1000	3000	10	1	NE	NE	mg/Kg	0.18	U	0.2	U	0.19	U	0.18	U	0.21	U	0.17	U	0.18	U	0.19	U	0.19	U	0.19	U	0.19	U	0.17	U	0.18	U	0.18	U	0.71	U	0.18	U	0.18	U	0.19	U	0.18	U	0.18	U
HEXACHLOROBENZENE	0.7	0.8	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	**1.4**	U	0.35	U	**1.7**		0.37	U	0.38	U	0.36	U
HEXACHLOROBUTADIENE	30	100	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
HEXACHLOROETHANE	0.7	3	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	**1.4**	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
INDENO(1,2,3-CD)PYRENE	7	40	7	1	NE	NE	mg/Kg	0.18	U	0.2	U	1.1		0.23		0.84		0.21		0.31		0.19	U	0.19	U	0.19	U	1.8		1.5		0.18	U	0.21		1.3		0.18	U	2.3		0.5		0.19	U	0.29	
ISOPHORONE	100	1000	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
2-METHYLNAPHTHALENE	0.7	80	0.7	0.5	NE	NE	mg/Kg	0.18	U	0.2	U	0.19	U	0.18	U	0.21	U	0.17	U	0.18	U	0.19	U	0.19	U	0.19	U	0.19	U	0.17	U	0.18	U	0.18	U	**0.71**	U	0.18	U	0.18	U	0.18	U	0.19	U	0.18	U
O-CRESOL	500	5000	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
M/P-CRESOL	500	5000	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
NAPHTHALENE	4	20	4	0.5	NE	NE	mg/Kg	0.18	U	0.2	U	0.19	U	0.18	U	0.21	U	0.17	U	0.18	U	0.19	U	0.19	U	0.19	U	0.19	U	0.17	U	0.18	U	0.18	U	0.71	U	0.18	U	0.18	U	0.18	U	0.19	U	0.18	U
NITROBENZENE	500	5000	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
2-NITROPHENOL	100	1000	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
4-NITROPHENOL	100	1000	NE	NE	NE	NE	mg/Kg	0.7	U	0.78	U	0.74	U	0.7	U	0.8	U	0.67	U	0.69	U	0.73	U	0.75	U	0.75	U	0.72	U	0.68	U	0.71	U	0.7	U	2.7	U	0.68	U	0.7	U	0.71	U	0.73	U	0.7	U
PENTACHLOROPHENOL	3	10	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
PHENANTHRENE	10	1000	10	3	NE	NE	mg/Kg	0.18	U	0.2	U	0.22		0.18	U	0.37		0.17	U	0.25		0.19	U	0.19	U	0.19	U	1.6		0.55		0.18	U	0.18	U	0.71	U	0.18	U	1.1		0.24		0.19	U	0.19	
PHENOL	1	20	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	**1.4**	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
PYRENE	1000	3000	40	4	NE	NE	mg/Kg	0.18	U	0.2	U	1.7		0.18	U	1.7		0.37		0.57		0.19	U	0.19	U	0.19	U	4.5		2.1		0.18	U	0.39		4.3		0.18	U	2.6		0.86		0.19	U	0.48	
PYRIDINE	500	5000	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
1,2,4-TRICHLOROBENZENE	2	6	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
2,4,5-TRICHLOROPHENOL	4	600	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	1.4	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
2,4,6-TRICHLOROPHENOL	0.7	20	NE	NE	NE	NE	mg/Kg	0.36	U	0.4	U	0.38	U	0.36	U	0.41	U	0.35	U	0.36	U	0.38	U	0.38	U	0.38	U	0.37	U	0.35	U	0.37	U	0.36	U	**1.4**	U	0.35	U	0.36	U	0.37	U	0.38	U	0.36	U
SW-846 9014																																														
REACTIVE CYANIDE	NE	NE	NE	NE	NE	NE	mg/Kg	3.9	U	4	U	4	U	3.9	U	3.9	U	3.9	U	4	U	4	U	4	U	3.9	U	3.9	U	4	U	3.9	U	4	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U
SW-846 9030A																																														
REACTIVE SULFIDE	NE	NE	NE	NE	NE	NE	mg/Kg	20	U	20	U	20	U	19	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	19	U	20	U	19	U	20	U
SW-846 9045C																																														
PH	NE	NE	NE	NE	NE	NE	pH Units	6.9		5.7		6		5.4		6.5		5.8		7.8		5.4		6.1		5.4	---	7.2		7.1		7.1		7.2		8		7.1		5.4		6.1		5.7		5.8	

NOTES:
Bolded, shaded, and underlined results meet or exceed regulatory threshold
Bolded results are a laboratory detection limit that exceed a regulatory threshold
RCS-x = MCP Reportable Concentrations for Soil Category x
U = Not detected above the laboratory reporting limits shown to the left of the "U"
NE = Standard not established
mg/kg = Milligrams per kilogram, aslo known as parts per million

SOIL DISPOSAL CLASSIFICATION CATEGORIES

Type A Soil: Reuse at Sand and Gravel facility: Soils which do not contain oil or hazardous material (OHM) or contain OHM below levels consistent with "natural" soil per MassDEP's Similar Soils Provision Guidance (WSC-13-500) are not considered Remediation Waste; this includes soil that exhibits concentrations of TPH less than or equal to 25 parts per million (ppm). These "natural" soils may be reused at specific beneficial reuse locations on a case by case basis under the discretion of Eversource and may be reused at an active sand and gravel processing facility that holds a Site Assignment Authorization with approval from the LSP-of-Record. Facilities that are reclaiming former sand and gravel pits must have a MassDEP approved ACO in place in accordance with MassDEP Interim Policy COMM-15-01: Re-Use of Soil for Large Reclamation Projects Policy.

Type B-1 Soil: <RCS-1 Beneficial Reuse: Soil containing OHM concentrations below MCP RCS-1 criteria can be used as fill material at off-site industrial/commercial locations provided that pre-existing OHM concentrations at the fill location are equal to or higher than those that exist in the construction generated soil and are not located within the Utility Related Abatement Measure (URAM). Facilities must have a MassDEP approved Administrative Consent Order (ACO) in place in accordance with MassDEP Interim Policy COMM-15-01.

Type C-1 Soil: Massachusetts Unlined Landfills: Soil that contains OHM concentrations above MCP RCS-1 levels but below the criteria for Massachusetts Unlined landfills per MassDEP Policy COMM-97-001.

Table 2
Summary of MBTA ROW Hudson Soil
Sudbury to Hudson Transmission Project
Hudson, Massachusetts

LOCATION / SAMPLING DATE / LAB SAMPLE ID / PID READING (ppmV)	RCS-1	RCS-2	Similar Soils for RCS-1	Concentrations in "Natural Soil" at RCS-1 Receiving Location	MA Lined Landfill	MA Unlined Landfill	Units
General Chemistry							
% SOLIDS	NE	NE	NE	NE	NE	NE	% Wt
Specific Conductivity							
SPECIFIC CONDUCTANCE	NE	NE	NE	NE	8000	NE	µmhos/cm
Ignitability of Solids							
IGNITABILITY	NE	NE	NE	NE	NE	NE	present/absent
Total Metals							
ANTIMONY	20	30	10	1	NE	NE	mg/Kg
ARSENIC	20	20	20	20	40	40	mg/Kg
BARIUM	1000	3000	375	50	NE	NE	mg/Kg
BERYLLIUM	90	200	4	0.4	NE	NE	mg/Kg
CADMIUM	70	100	20	2	80	30	mg/Kg
CHROMIUM	100	200	100	30	1000	1000	mg/Kg
LEAD	200	600	200	100	2000	1000	mg/Kg
NICKEL	600	1000	150	20	NE	NE	mg/Kg
SELENIUM	400	700	5	0.5	NE	NE	mg/Kg
SILVER	100	200	6	0.6	NE	NE	mg/Kg
THALLIUM	8	60	6	0.6	NE	NE	mg/Kg
VANADIUM	400	700	225	30	NE	NE	mg/Kg
ZINC	1000	3000	500	100	NE	NE	mg/Kg
Mercury							
MERCURY	20	30	3	0.3	10	10	mg/Kg
Organochlorine Pesticides							
ALACHOR	NE	NE	NE	NE	NE	NE	mg/Kg
ALDRIN	0.08	0.5	NE	NE	NE	NE	mg/Kg
ALPHA-BHC	50	500	NE	NE	NE	NE	mg/Kg
BETA-BHC	10	100	NE	NE	NE	NE	mg/Kg
DELTA-BHC	10	100	NE	NE	NE	NE	mg/Kg
GAMMA-BHC (LINDANE)	0.003	0.5	NE	NE	NE	NE	mg/Kg
CHLORDANE	5	30	NE	NE	NE	NE	mg/Kg
4,4'-DDD	8	40	NE	NE	NE	NE	mg/Kg
4,4'-DDE	6	30	NE	NE	NE	NE	mg/Kg
4,4'-DDT	6	30	NE	NE	NE	NE	mg/Kg
DIELDRIN	0.08	0.5	NE	NE	NE	NE	mg/Kg
ENDOSULFAN I	0.5	1	NE	NE	NE	NE	mg/Kg
ENDOSULFAN II	0.5	1	NE	NE	NE	NE	mg/Kg
ENDOSULFAN SULFATE	NE	NE	NE	NE	NE	NE	mg/Kg
ENDRIN	10	20	NE	NE	NE	NE	mg/Kg
ENDRIN ALDEHYDE	10	100	NE	NE	NE	NE	mg/Kg
ENDRIN KETONE	NE	NE	NE	NE	NE	NE	mg/Kg
HEPTACHLOR	0.3	2	NE	NE	NE	NE	mg/Kg
HEPTACHLOR EPOXIDE	0.1	0.9	NE	NE	NE	NE	mg/Kg
HEXACHLOROBENZENE	0.7	0.8	NE	NE	NE	NE	mg/Kg
METHOXYCHLOR	200	400	NE	NE	NE	NE	mg/Kg
TOXAPHENE	10	100	NE	NE	NE	NE	mg/Kg
Polychlorinated Biphenyls							
PCB 1016	1	4	NE	NE	NE	NE	mg/Kg
PCB 1221	1	4	NE	NE	NE	NE	mg/Kg
PCB 1232	1	4	NE	NE	NE	NE	mg/Kg
PCB 1242	1	4	NE	NE	NE	NE	mg/Kg
PCB 1248	1	4	NE	NE	NE	NE	mg/Kg
PCB 1254	1	4	NE	NE	NE	NE	mg/Kg
PCB 1260	1	4	NE	NE	NE	NE	mg/Kg
PCB 1262	1	4	NE	NE	NE	NE	mg/Kg
PCB 1268	1	4	NE	NE	NE	NE	mg/Kg
Total Petroleum Hydrocarbons							
TPH	1000	3000	NE	NE	5000	2500	mg/Kg
Herbicides					NE	NE	
2,4-D	100000	1000000	NE	NE	NE	NE	µg/kg
2,4-DB	100000	1000000	NE	NE	NE	NE	µg/kg
2,4,5-TP (SILVEX)	100000	1000000	NE	NE	NE	NE	µg/kg
2,4,5-T	100000	1000000	NE	NE	NE	NE	µg/kg
DALAPON	NE	NE	NE	NE	NE	NE	µg/kg
DICAMBA	500000	5000000	NE	NE	NE	NE	µg/kg
DICHLOROPROP	NE	NE	NE	NE	NE	NE	µg/kg
DINOSEB	500000	5000000	NE	NE	NE	NE	µg/kg
MCPA	100000	1000000	NE	NE	NE	NE	µg/kg
MCPP	NE	NE	NE	NE	NE	NE	µg/kg
Volatile Organic Compounds							
ACETONE	6	50	NE	NE	NE	NE	mg/Kg
TERT-AMYL METHYL ETHER	NE	NE	NE	NE	NE	NE	mg/Kg
BENZENE	2	200	NE	NE	NE	NE	mg/Kg
BROMOBENZENE	100	1000	NE	NE	NE	NE	mg/Kg
BROMOCHLOROMETHANE	NE	NE	NE	NE	NE	NE	mg/Kg
BROMODICHLOROMETHANE	0.1	0.1	NE	NE	NE	NE	mg/Kg
BROMOFORM	0.1	1	NE	NE	NE	NE	mg/Kg
BROMOMETHANE	0.5	0.5	NE	NE	NE	NE	mg/Kg
2-BUTANONE (MEK)	4	50	NE	NE	NE	NE	mg/Kg
N-BUTYLBENZENE	NE	NE	NE	NE	NE	NE	mg/Kg
SEC-BUTYLBENZENE	NE	NE	NE	NE	NE	NE	mg/Kg
TERT-BUTYLBENZENE	100	1000	NE	NE	NE	NE	mg/Kg
TERT-BUTYLETHYL ETHER	NE	NE	NE	NE	NE	NE	mg/Kg
CARBON DISULFIDE	100	1000	NE	NE	NE	NE	mg/Kg
CARBON TETRACHLORIDE	5	5	NE	NE	NE	NE	mg/Kg
CHLOROBENZENE	1	3	NE	NE	NE	NE	mg/Kg
CHLORODIBROMOMETHANE	0.005	0.03	NE	NE	NE	NE	mg/Kg
CHLOROETHANE	100	1000	NE	NE	NE	NE	mg/Kg
CHLOROFORM	0.2	0.2	NE	NE	NE	NE	mg/Kg
CHLOROMETHANE	100	1000	NE	NE	NE	NE	mg/Kg
2-CHLOROTOLUENE	100	1000	NE	NE	NE	NE	mg/Kg

LOCATION	MP24	SB/MW-24	SB16	SB17	SB18	SB19	SB2	SB3	SB43	SB45	SB47
SAMPLING DATE	06/04/2018	06/05/2018	06/01/2018	06/04/2018	06/01/2018	05/31/2018	06/05/2018	06/05/2018	06/04/2018	06/01/2018	05/31/2018
LAB SAMPLE ID	18F0316-12	18F0316-16	18F0316-17	18F0316-13	18F0316-07	18F0316-04	18F0316-08	18F0316-15	18F0316-14	18F0316-06	18F0316-05
PID READING (ppmV)	0.0	0.0	0.0	1.0	0.1	0.0	2.0	28.5	6.2	0.0	0.0
General Chemistry											
% SOLIDS	91.7 ---	89.8 ---	92 ---	92.9 ---	93.6 ---	95.3 ---	93.9 ---	82.7 ---	88.7 ---	92.4 ---	96.7 ---
Specific Conductivity											
SPECIFIC CONDUCTANCE	6.7 ---	2.9 ---	2.9 ---	2.8 ---	2.7 ---	4.7 ---	21 ---	13 ---	2.3 ---	2.8 ---	2.5 ---
Ignitability of Solids											
IGNITABILITY	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---
Total Metals											
ANTIMONY	1.9 U	1.9 U	1.8 U	1.8 U	1.9 U	1.7 U	1.8 U	2.1 U	2 U	1.9 U	1.8 U
ARSENIC	12 ---	6.8 ---	5.5 ---	6 ---	3.6 ---	4.7 ---	7.2 ---	5 ---	6.4 ---	7.9 ---	7.7 ---
BARIUM	44 ---	24 ---	18 ---	14 ---	34 ---	14 ---	18 ---	22 ---	15 ---	16 ---	19 ---
BERYLLIUM	0.32 ---	0.23 ---	0.28 ---	0.23 ---	0.21 ---	0.22 ---	0.22 ---	0.25 ---	0.2 U	0.19 U	0.22 ---
CADMIUM	0.26 ---	0.19 U	0.18 U	0.18 U	0.19 U	0.17 U	0.18 U	0.21 U	0.2 U	0.19 U	0.18 U
CHROMIUM	19 ---	12 ---	9 ---	9.1 ---	16 ---	10 ---	9 ---	12 ---	8.4 ---	8.7 ---	10 ---
LEAD	7.8 ---	13 ---	3.7 ---	4.1 ---	3.9 ---	3.5 ---	3.2 ---	6.5 ---	3 ---	3.7 ---	3.2 ---
NICKEL	13 ---	14 ---	7.1 ---	7.5 ---	6.6 ---	9.2 ---	5.8 ---	10 ---	6.9 ---	6.7 ---	8.2 ---
SELENIUM	3.8 U	3.7 U	3.6 U	3.5 U	3.7 U	3.5 U	3.5 U	4.1 U	3.9 U	3.7 U	3.5 U
SILVER	0.43 ---	0.37 U	0.36 U	0.35 U	0.37 U	0.35 U	0.35 U	0.41 U	0.39 U	0.37 U	0.35 U
THALLIUM	1.9 U	1.9 U	1.8 U	1.8 U	1.9 U	1.7 U	1.8 U	2.1 U	2 U	1.9 U	1.8 U
VANADIUM	18 ---	11 ---	8.5 ---	8.7 ---	19 ---	7.7 ---	9.4 ---	13 ---	7.4 ---	7.8 ---	8.6 ---
ZINC	19 ---	66 ---	13 ---	13 ---	16 ---	13 ---	10 ---	17 ---	12 ---	14 ---	14 ---
Mercury											
MERCURY	0.026 U	0.029 U	0.026 U	0.027 U	0.027 U	0.026 U	0.026 U	0.029 U	0.028 U	0.027 U	0.025 U
Organochlorine Pesticides											
ALACHOR	0.021 U	0.021 U	0.02 U	0.02 U	0.021 U	0.021 U	0.021 U	0.023 U	0.022 U	0.021 U	0.02 U
ALDRIN	0.0051 U	0.0053 U	0.005 U	0.0051 U	0.0051 U	0.0051 U	0.0053 U	0.0057 U	0.0055 U	0.0053 U	0.0049 U
ALPHA-BHC	0.0051 U	0.0053 U	0.005 U	0.0051 U	0.0051 U	0.0051 U	0.0053 U	0.0057 U	0.0055 U	0.0053 U	0.0049 U
BETA-BHC	0.0051 U	0.0053 U	0.005 U	0.0051 U	0.0051 U	0.0051 U	0.0053 U	0.0057 U	0.0055 U	0.0053 U	0.0049 U
DELTA-BHC	0.0051 U	0.0053 U	0.005 U	0.0051 U	0.0051 U	0.0051 U	0.0053 U	0.0057 U	0.0055 U	0.0053 U	0.0049 U
GAMMA-BHC (LINDANE)	0.0021 U	0.0021 U	0.002 U	0.002 U	0.0021 U	0.0021 U	0.0021 U	0.0023 U	0.0022 U	0.0021 U	0.002 U
CHLORDANE	0.021 U	0.021 U	0.02 U	0.02 U	0.021 U	0.021 U	0.021 U	0.023 U	0.022 U	0.021 U	0.02 U
4,4'-DDD	0.0041 U	0.0042 U	0.004 U	0.0041 U	0.0041 U	0.0041 U	0.0042 U	0.0046 U	0.0044 U	0.0042 U	0.0039 U
4,4'-DDE	0.0041 U	0.0042 U	0.004 U	0.0041 U	0.0041 U	0.0041 U	0.0042 U	0.0046 U	0.0044 U	0.0042 U	0.0039 U
4,4'-DDT	0.0041 U	0.0042 U	0.004 U	0.0041 U	0.0041 U	0.0041 U	0.0042 U	0.0046 U	0.0044 U	0.0042 U	0.0039 U
DIELDRIN	0.0041 U	0.0042 U	0.004 U	0.0041 U	0.0041 U	0.0041 U	0.0042 U	0.0046 U	0.0044 U	0.0042 U	0.0039 U
ENDOSULFAN I	0.0051 U	0.0053 U	0.005 U	0.0051 U	0.0051 U	0.0051 U	0.0053 U	0.0057 U	0.0055 U	0.0053 U	0.0049 U
ENDOSULFAN II	0.0082 U	0.0085 U	0.0081 U	0.0081 U	0.0082 U	0.0082 U	0.0084 U	0.0091 U	0.0088 U	0.0084 U	0.0079 U
ENDOSULFAN SULFATE	0.0082 U	0.0085 U	0.0081 U	0.0081 U	0.0082 U	0.0082 U	0.0084 U	0.0091 U	0.0088 U	0.0084 U	0.0079 U
ENDRIN	0.0082 U	0.0085 U	0.0081 U	0.0081 U	0.0082 U	0.0082 U	0.0084 U	0.0091 U	0.0088 U	0.0084 U	0.0079 U
ENDRIN ALDEHYDE	0.0082 U	0.0085 U	0.0081 U	0.0081 U	0.0082 U	0.0082 U	0.0084 U	0.0091 U	0.0088 U	0.0084 U	0.0079 U
ENDRIN KETONE	0.0082 U	0.0085 U	0.0081 U	0.0081 U	0.0082 U	0.0082 U	0.0084 U	0.0091 U	0.0088 U	0.0084 U	0.0079 U
HEPTACHLOR	0.0051 U	0.0053 U	0.005 U	0.0051 U	0.0051 U	0.0051 U	0.0053 U	0.0057 U	0.0055 U	0.0053 U	0.0049 U
HEPTACHLOR EPOXIDE	0.0051 U	0.0053 U	0.005 U	0.0051 U	0.0051 U	0.0051 U	0.0053 U	0.0057 U	0.0055 U	0.0053 U	0.0049 U
HEXACHLOROBENZENE	0.0062 U	0.0064 U	0.006 U	0.0061 U	0.0062 U	0.0062 U	0.0063 U	0.0068 U	0.0066 U	0.0063 U	0.0059 U
METHOXYCHLOR	0.051 U	0.053 U	0.05 U	0.051 U	0.051 U	0.051 U	0.053 U	0.057 U	0.055 U	0.053 U	0.049 U
TOXAPHENE	0.1 U	0.11 U	0.1 U	0.1 U	0.1 U	0.1 U	0.11 U	0.11 U	0.11 U	0.11 U	0.099 U
Polychlorinated Biphenyls											
PCB 1016	0.082 U	0.085 U	0.081 U	0.081 U	0.082 U	0.082 U	0.084 U	0.091 U	0.088 U	0.084 U	0.079 U
PCB 1221	0.082 U	0.085 U	0.081 U	0.081 U	0.082 U	0.082 U	0.084 U	0.091 U	0.088 U	0.084 U	0.079 U
PCB 1232	0.082 U	0.085 U	0.081 U	0.081 U	0.082 U	0.082 U	0.084 U	0.091 U	0.088 U	0.084 U	0.079 U
PCB 1242	0.082 U	0.085 U	0.081 U	0.081 U	0.082 U	0.082 U	0.084 U	0.091 U	0.088 U	0.084 U	0.079 U
PCB 1248	0.082 U	0.085 U	0.081 U	0.081 U	0.082 U	0.082 U	0.084 U	0.091 U	0.088 U	0.084 U	0.079 U
PCB 1254	0.082 U	0.085 U	0.081 U	0.081 U	0.082 U	0.082 U	0.084 U	0.091 U	0.088 U	0.084 U	0.079 U
PCB 1260	0.082 U	0.085 U	0.081 U	0.081 U	0.082 U	0.082 U	0.084 U	0.091 U	0.088 U	0.084 U	0.079 U
PCB 1262	0.082 U	0.085 U	0.081 U	0.081 U	0.082 U	0.082 U	0.084 U	0.091 U	0.088 U	0.084 U	0.079 U
PCB 1268	0.082 U	0.085 U	0.081 U	0.081 U	0.082 U	0.082 U	0.084 U	0.091 U	0.088 U	0.084 U	0.079 U
Total Petroleum Hydrocarbons											
TPH	15	16	11	23	8.9 U	8.6 U	8.8 U	28	9.2 U	9 U	11
Herbicides											
2,4-D	27 U	28 U	27 U	27 U	27 U	26 U	27 U	30 U	28 U	27 U	26 U
2,4-DB	27 U	28 U	27 U	27 U	27 U	26 U	27 U	30 U	28 U	27 U	26 U
2,4,5-TP (SILVEX)	2.7 U	2.8 U	2.7 U	2.7 U	2.7 U	2.6 U	2.7 U	3 U	2.8 U	2.7 U	2.6 U
2,4,5-T	2.7 U	2.8 U	2.7 U	2.7 U	2.7 U	2.6 U	2.7 U	3 U	2.8 U	2.7 U	2.6 U
DALAPON	68 U	69 U	68 U	67 U	66 U	65 U	67 U	75 U	70 U	68 U	64 U
DICAMBA	2.7 U	2.8 U	2.7 U	2.7 U	2.7 U	2.6 U	2.7 U	3 U	2.8 U	2.7 U	2.6 U
DICHLOROPROP	27 U	28 U	27 U	27 U	27 U	26 U	27 U	30 U	28 U	27 U	26 U
DINOSEB	14 U	14 U	14 U	13 U	13 U	13 U	13 U	15 U	14 U	14 U	13 U
MCPA	2700 U	2800 U	2700 U	2700 U	2700 U	2600 U	2700 U	3000 U	2800 U	2700 U	2600 U
MCPP	2700 U	2800 U	2700 U	2700 U	2700 U	2600 U	2700 U	3000 U	2800 U	2700 U	2600 U
Volatile Organic Compounds											
ACETONE	0.076 U	0.08 U	0.072 U	0.072 U	1.5 U	0.12 U	0.081 U	0.079 U	0.081 U	2.5 U	0.046 U
TERT-AMYL METHYL ETHER	0.0008 U	0.0008 U	0.0007 U	0.0007 U	0.015 U	0.0012 U	0.0008 U	0.0008 U	0.0008 U	0.025 U	0.0005 U
BENZENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U	0.0016 U	0.05 U	0.0009 U
BROMOBENZENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U	0.0016 U	0.05 U	0.0009 U
BROMOCHLOROMETHANE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U	0.0016 U	0.05 U	0.0009 U
BROMODICHLOROMETHANE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U	0.0016 U	0.05 U	0.0009 U
BROMOFORM	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.062 U	0.0023 U	0.0016 U	0.0016 U	0.0016 U	0.099 U	0.0009 U
BROMOMETHANE	0.0076 U	0.008 U	0.0072 U	0.0072 U	0.062 U	0.012 U	0.0081 U	0.0079 U	0.0081 U	0.099 U	0.0046 U
2-BUTANONE (MEK)	0.03 U	0.032 U	0.029 U	0.029 U	0.62 U	0.047 U	0.032 U	0.032 U	0.032 U	0.99 U	0.018 U
N-BUTYLBENZENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U	0.0016 U	0.05 U	0.0009 U
SEC-BUTYLBENZENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U	0.0016 U	0.05 U	0.0009 U
TERT-BUTYLBENZENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U	0.0016 U	0.05 U	0.0009 U
TERT-BUTYLETHYL ETHER	0.0008 U	0.0008 U	0.0007 U	0.0007 U	0.015 U	0.0012 U	0.0008 U	0.0008 U	0.0008 U	0.025 U	0.0005 U
CARBON DISULFIDE	0.0045 U	0.0048 U	0.0043 U	0.0043 U	0.31 U	0.007 U	0.0048 U	0.0047 U	0.0049 U	0.5 U	0.0027 U
CARBON TETRACHLORIDE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U	0.0016 U	0.05 U	0.0009 U
CHLOROBENZENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U	0.0016 U	0.05 U	0.0009 U
CHLORODIBROMOMETHANE	0.0008 U	0.0008 U	0.0007 U	0.0007 U	**0.015** U	0.0012 U	0.0008 U	0.0008 U	0.0008 U	**0.025** U	0.0005 U
CHLOROETHANE	0.0076 U	0.008 U	0.0072 U	0.0072 U	0.062 U	0.012 U	0.0081 U	0.0079 U	0.0081 U	0.099 U	0.0046 U
CHLOROFORM	0.003 U	0.0032 U	0.0029 U	0.0029 U	0.062 U	0.0047 U	0.0032 U	0.0032 U	0.0032 U	0.099 U	0.0018 U
CHLOROMETHANE	0.0076 U	0.008 U	0.0072 U	0.0072 U	0.062 U	0.012 U	0.0081 U	0.0079 U	0.0081 U	0.099 U	0.0046 U
2-CHLOROTOLUENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U	0.0016 U	0.05 U	0.0009 U

LOCATION	MP10	MP11	MP20	MP22	MP23	MP3	MP4	MP6	MP9
SAMPLING DATE	06/08/2018	06/07/2018	06/07/2018	06/07/2018	06/07/2018	06/07/2018	06/07/2018	06/07/2018	06/06/2018
LAB SAMPLE ID	18F0619-09	18F0619-01	18F0619-08	18F0619-07	18F0619-02	18F0619-10	18F0619-05	18F0619-03	18F0619-04
PID READING (ppmV)	56.9	0.0	19.0	3.1	37.1	0.0	50.2	0.0	0.0
General Chemistry									
% SOLIDS	88.3 ---	82.3 ---	86.8 ---	92.7 ---	86.2 ---	96.7 ---	95.2 ---	89.5 ---	87.8 ---
Specific Conductivity									
SPECIFIC CONDUCTANCE	16 ---	21 ---	5.2 ---	3 ---	3.4 ---	9.9 ---	12 ---	32 ---	13 ---
Ignitability of Solids									
IGNITABILITY	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---
Total Metals									
ANTIMONY	1.9 U	2.1 U	2 U	1.8 U	2 U	1.8 U	1.7 U	1.9 U	2 U
ARSENIC	7.1 ---	8.2 ---	7.4 ---	6.3 ---	6.1 ---	14 ---	3.9 ---	17 ---	13 ---
BARIUM	23 ---	32 ---	18 ---	14 ---	20 ---	21 ---	31 ---	120 ---	40 ---
BERYLLIUM	0.19 U	0.36 ---	0.2 U	0.2 ---	0.23 ---	0.27 ---	0.21 ---	0.34 ---	0.3 ---
CADMIUM	0.19 U	0.21 U	0.2 U	0.18 U	0.2 U	0.29 ---	0.17 U	0.28 ---	0.23 ---
CHROMIUM	8.8 ---	18 ---	9.3 ---	11 ---	11 ---	12 ---	17 ---	40 ---	18 ---
LEAD	3.5 ---	6.3 ---	3.9 ---	3.9 ---	4.6 ---	8.6 ---	8.4 ---	12 ---	13 ---
NICKEL	5.8 ---	13 ---	6.2 ---	8.7 ---	12 ---	11 ---	12 ---	5 ---	11 ---
SELENIUM	3.8 U	4.2 U	4 U	3.7 U	3.9 U	3.5 U	3.3 U	3.7 U	3.9 U
SILVER	0.38 U	0.42 U	0.4 U	0.37 U	0.39 U	0.35 ---	0.43 ---	1.3 ---	0.56 ---
THALLIUM	1.9 U	2.1 U	2 U	1.8 U	2 U	1.8 U	1.7 U	1.9 U	2 U
VANADIUM	9.3 ---	16 ---	8.9 ---	8.3 ---	9.1 ---	10 ---	17 ---	57 ---	20 ---
ZINC	11 ---	22 ---	14 ---	16 ---	16 ---	18 ---	25 ---	29 ---	24 ---
Mercury									
MERCURY	0.029 U	0.03 U	0.03 U	0.026 U	0.028 U	0.027 U	0.026 U	0.028 U	0.029 U
Organochlorine Pesticides									
ALACHOR	0.023 U	0.24 U	0.023 U	0.022 U	0.023 U	0.21 U	0.21 U	0.022 U	0.23 U
ALDRIN	0.0057 U	0.061 U	0.0058 U	0.0054 U	0.0058 U	0.052 U	0.053 U	0.0056 U	0.057 U
ALPHA-BHC	0.0057 U	0.061 U	0.0058 U	0.0054 U	0.0058 U	0.052 U	0.053 U	0.0056 U	0.057 U
BETA-BHC	0.0057 U	0.061 U	0.0058 U	0.0054 U	0.0058 U	0.052 U	0.053 U	0.0056 U	0.057 U
DELTA-BHC	0.0057 U	0.061 U	0.0058 U	0.0054 U	0.0058 U	0.052 U	0.053 U	0.0056 U	0.057 U
GAMMA-BHC (LINDANE)	0.0023 U	**0.024** U	0.0023 U	0.0022 U	0.0023 U	**0.021** U	**0.021** U	0.0022 U	**0.023** U
CHLORDANE	0.023 U	0.24 U	0.023 U	0.022 U	0.023 U	0.21 U	0.21 U	0.022 U	0.23 U
4,4'-DDD	0.0045 U	0.049 U	0.0046 U	0.0043 U	0.0046 U	0.041 U	0.042 U	0.0045 U	0.046 U
4,4'-DDE	0.0045 U	0.049 U	0.0046 U	0.0043 U	0.0046 U	0.041 U	0.042 U	0.0045 U	0.046 U
4,4'-DDT	0.0045 U	0.049 U	0.0046 U	0.0043 U	0.0046 U	0.041 U	0.042 U	0.0045 U	0.046 U
DIELDRIN	0.0045 U	0.049 U	0.0046 U	0.0043 U	0.0046 U	0.041 U	0.042 U	0.0045 U	0.046 U
ENDOSULFAN I	0.0057 U	0.061 U	0.0058 U	0.0054 U	0.0058 U	0.052 U	0.053 U	0.0056 U	0.057 U
ENDOSULFAN II	0.0091 U	0.097 U	0.0092 U	0.0086 U	0.0093 U	0.083 U	0.084 U	0.0089 U	0.091 U
ENDOSULFAN SULFATE	0.0091 U	0.097 U	0.0092 U	0.0086 U	0.0093 U	0.083 U	0.084 U	0.0089 U	0.091 U
ENDRIN	0.0091 U	0.097 U	0.0092 U	0.0086 U	0.0093 U	0.083 U	0.084 U	0.0089 U	0.091 U
ENDRIN ALDEHYDE	0.0091 U	0.097 U	0.0092 U	0.0086 U	0.0093 U	0.083 U	0.084 U	0.0089 U	0.091 U
ENDRIN KETONE	0.0091 U	0.097 U	0.0092 U	0.0086 U	0.0093 U	0.083 U	0.084 U	0.0089 U	0.091 U
HEPTACHLOR	0.0057 U	0.061 U	0.0058 U	0.0054 U	0.0058 U	0.052 U	0.053 U	0.0056 U	0.057 U
HEPTACHLOR EPOXIDE	0.0057 U	0.061 U	0.0058 U	0.0054 U	0.0058 U	0.052 U	0.053 U	0.0056 U	0.057 U
HEXACHLOROBENZENE	0.0068 U	0.073 U	0.0069 U	0.0065 U	0.007 U	0.062 U	0.063 U	0.0067 U	0.068 U
METHOXYCHLOR	0.057 U	0.61 U	0.058 U	0.054 U	0.058 U	0.52 U	0.53 U	0.056 U	0.57 U
TOXAPHENE	0.11 U	1.2 U	0.12 U	0.11 U	0.12 U	1 U	1.1 U	0.11 U	1.1 U
Polychlorinated Biphenyls									
PCB 1016	0.091 U	0.097 U	0.092 U	0.086 U	0.093 U	0.083 U	0.084 U	0.089 U	0.091 U
PCB 1221	0.091 U	0.097 U	0.092 U	0.086 U	0.093 U	0.083 U	0.084 U	0.089 U	0.091 U
PCB 1232	0.091 U	0.097 U	0.092 U	0.086 U	0.093 U	0.083 U	0.084 U	0.089 U	0.091 U
PCB 1242	0.091 U	0.097 U	0.092 U	0.086 U	0.093 U	0.083 U	0.084 U	0.089 U	0.091 U
PCB 1248	0.091 U	0.097 U	0.092 U	0.086 U	0.093 U	0.083 U	0.084 U	0.089 U	0.091 U
PCB 1254	0.091 U	0.097 U	0.092 U	0.086 U	0.093 U	0.083 U	0.084 U	0.089 U	0.091 U
PCB 1260	0.091 U	0.097 U	0.092 U	0.086 U	0.093 U	0.083 U	0.084 U	0.089 U	0.091 U
PCB 1262	0.091 U	0.097 U	0.092 U	0.086 U	0.093 U	0.083 U	0.084 U	0.089 U	0.091 U
PCB 1268	0.091 U	0.097 U	0.092 U	0.086 U	0.093 U	0.083 U	0.084 U	0.089 U	0.091 U
Total Petroleum Hydrocarbons									
TPH	16	130	16	14	18	320	100	230	250
Herbicides									
2,4-D	28 U	30 U	29 U	27 U	29 U	26 U	26 U	28 U	28 U
2,4-DB	28 U	30 U	29 U	27 U	29 U	26 U	26 U	28 U	28 U
2,4,5-TP (SILVEX)	2.8 U	3 U	2.9 U	2.7 U	2.9 U	2.6 U	2.6 U	2.8 U	2.8 U
2,4,5-T	2.8 U	3 U	2.9 U	2.7 U	2.9 U	2.6 U	2.6 U	2.8 U	2.8 U
DALAPON	71 U	75 U	72 U	66 U	71 U	64 U	65 U	69 U	70 U
DICAMBA	2.8 U	3 U	2.9 U	2.7 U	2.9 U	2.6 U	2.6 U	2.8 U	2.8 U
DICHLOROPROP	28 U	30 U	29 U	27 U	29 U	26 U	26 U	28 U	28 U
DINOSEB	14 U	15 U	14 U	13 U	14 U	13 U	13 U	14 U	14 U
MCPA	2800 U	3000 U	2900 U	2700 U	2900 U	2600 U	2600 U	2800 U	2800 U
MCPP	2800 U	3000 U	2900 U	2700 U	2900 U	2600 U	2600 U	2800 U	2800 U
Volatile Organic Compounds									
ACETONE	0.077 U	0.1 U	0.084 U	0.072 U	0.095 U	0.047 U	0.086 U	0.078 U	0.045 U
TERT-AMYL METHYL ETHER	0.0008 U	0.001 U	0.0008 U	0.0007 U	0.001 U	0.0005 U	0.0009 U	0.0008 U	0.0005 U
BENZENE	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U	0.0009 U	0.0017 U	0.0016 U	0.0009 U
BROMOBENZENE	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U	0.0009 U	0.0017 U	0.0016 U	0.0009 U
BROMOCHLOROMETHANE	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U	0.0009 U	0.0017 U	0.0016 U	0.0009 U
BROMODICHLOROMETHANE	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U	0.0009 U	0.0017 U	0.0016 U	0.0009 U
BROMOFORM	0.0077 U	0.002 U	0.0084 U	0.0072 U	0.0095 U	0.0047 U	0.0086 U	0.0078 U	0.0045 U
BROMOMETHANE	0.0077 U	0.01 U	0.0084 U	0.0072 U	0.0095 U	0.0047 U	0.0086 U	0.0078 U	0.0045 U
2-BUTANONE (MEK)	0.031 U	0.04 U	0.034 U	0.029 U	0.038 U	0.019 U	0.034 U	0.031 U	0.018 U
N-BUTYLBENZENE	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U	0.0009 U	0.0017 U	0.0016 U	0.0009 U
SEC-BUTYLBENZENE	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U	0.0009 U	0.0017 U	0.0016 U	0.0009 U
TERT-BUTYLBENZENE	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U	0.0009 U	0.0017 U	0.0016 U	0.0009 U
TERT-BUTYLETHYL ETHER	0.0008 U	0.001 U	0.0008 U	0.0007 U	0.001 U	0.0005 U	0.0009 U	0.0008 U	0.0005 U
CARBON DISULFIDE	0.0046 U	0.006 U	0.005 U	0.0043 U	0.0057 U	0.0028 U	0.0052 U	0.0047 U	0.0027 U
CARBON TETRACHLORIDE	0.0031 U	0.002 U	0.0034 U	0.0029 U	0.0038 U	0.0019 U	0.0034 U	0.0031 U	0.0018 U
CHLOROBENZENE	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U	0.0009 U	0.0017 U	0.0016 U	0.0009 U
CHLORODIBROMOMETHANE	0.0008 U	0.001 U	0.0008 U	0.0007 U	0.001 U	0.0005 U	0.0009 U	0.0008 U	0.0005 U
CHLOROETHANE	0.0077 U	0.01 U	0.0084 U	0.0072 U	0.0095 U	0.0047 U	0.0086 U	0.0078 U	0.0045 U
CHLOROFORM	0.0031 U	0.004 U	0.0034 U	0.0029 U	0.0038 U	0.0019 U	0.0034 U	0.0031 U	0.0018 U
CHLOROMETHANE	0.0077 U	0.01 U	0.0084 U	0.0072 U	0.0095 U	0.0047 U	0.0086 U	0.0078 U	0.0045 U
2-CHLOROTOLUENE	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U	0.0009 U	0.0017 U	0.0016 U	0.0009 U

LOCATION	SB1	MP15	SB/MW-5	SB14	MP1	MP17	MP19	SB15	SB44	SB20	SB/MW-21	SB46
SAMPLING DATE	06/07/2018	6/15/2018	6/21/2018	6/25/2018	6/26/2018	6/27/2018	6/27/2018	6/27/2018	6/27/2018	06/29/2018	06/29/2018	06/29/2018
LAB SAMPLE ID	18F0619-06	18F1479-02	18F1479-03	18F1479-01	18F1479-04	18F1479-07	18F1479-08	18F1479-06	18F1479-05	18G0202-03	18G0202-01	18G0202-02
PID READING (ppmV)	80.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
General Chemistry												
% SOLIDS	94.4 ---	93.6 ---	97.4 ---	91.1 ---	88.4 ---	94.8 ---	92.8 ---	96.8 ---	92.9 ---	96.5 ---	90.9 ---	94.3 ---
Specific Conductivity												
SPECIFIC CONDUCTANCE	12 ---	3.8 ---	2.2 ---	4.2 ---	4 ---	21 ---	2.5 ---	3.6 ---	8.9 ---	3.1 ---	3.7 ---	3.5 ---
Ignitability of Solids												
IGNITABILITY	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---	Absent ---
Total Metals												
ANTIMONY	1.7 U	1.7 U	1.6 U	1.8 U	1.9 U	1.7 U	1.7 U	1.7 U	1.8 U	1.7 U	1.8 U	1.7 U
ARSENIC	8.3 ---	5.4 ---	18 ---	4.1 ---	3 ---	4.5 ---	5.1 ---	6 ---	2.8 ---	4.9	2.4	5.6
BARIUM	22 ---	40 ---	42 ---	30 ---	140 ---	37 ---	23 ---	40 ---	32 ---	16	39	18
BERYLLIUM	0.22 ---	0.17 U	0.16 U	0.18 U	0.19 U	0.17 U	0.17 U	0.17 U	0.18 U	0.17 U	0.18 U	0.17 U
CADMIUM	0.17 U	0.26 ---	0.6 ---	0.2 ---	0.3 ---	0.22 ---	0.22 ---	0.24 ---	0.18 U	0.18	0.18 U	0.2
CHROMIUM	14 ---	22 ---	18 ---	15 ---	39 ---	17 ---	12 ---	17 ---	14 ---	8.3	15	9.7
LEAD	5.1 ---	7.1 ---	11 ---	6.2 ---	11 ---	8.1 ---	9.2 ---	8.5 ---	5.8 ---	3.6	4.4	3.8
NICKEL	11 ---	17 ---	12 ---	9.3 ---	9 ---	8.5 ---	8.2 ---	10 ---	9.3 ---	7	8.4	8.6
SELENIUM	3.4 U	3.4 U	3.3 U	3.6 U	3.7 U	3.5 U	3.4 U	3.4 U	3.6 U	3.4 U	3.6 U	3.4 U
SILVER	0.34 U	0.34 U	0.33 U	0.36 U	0.37 U	0.35 U	0.34 U	0.34 U	0.36 U	0.34 U	0.36 U	0.34 U
THALLIUM	1.7 U	1.7 U	1.6 U	1.8 U	1.9 U	1.7 U	1.7 U	1.7 U	1.8 U	1.7 U	1.8 U	1.7 U
VANADIUM	12 ---	24 ---	21 ---	17 ---	***61*** ---	21 ---	15 ---	20 ---	17 ---	8.7	20	10
ZINC	19 ---	30 ---	44 ---	19 ---	38 ---	22 ---	57 ---	25 ---	19 ---	14	20	15
Mercury												
MERCURY	0.027 U	0.026 U	0.026 U	0.027 U	0.028 U	0.026 U	0.027 U	0.025 U	0.028 U	0.026 U	0.027 U	0.027 U
Organochlorine Pesticides												
ALACHOR	0.021 U	0.021 U	0.021 U	0.022 U	0.023 U	0.021 U	0.022 U	0.021 U	0.022 U	0.021 U	0.022 U	0.021 U
ALDRIN	0.0053 U	0.0053 U	0.0051 U	0.0055 U	0.0057 U	0.0052 U	0.0054 U	0.0052 U	0.0054 U	0.0052 U	0.0055 U	0.0053 U
ALPHA-BHC	0.0053 U	0.0053 U	0.0051 U	0.0055 U	0.0057 U	0.0052 U	0.0054 U	0.0052 U	0.0054 U	0.0052 U	0.0055 U	0.0053 U
BETA-BHC	0.0053 U	0.0053 U	0.0051 U	0.0055 U	0.0057 U	0.0052 U	0.0054 U	0.0052 U	0.0054 U	0.0052 U	0.0055 U	0.0053 U
DELTA-BHC	0.0053 U	0.0053 U	0.0051 U	0.0055 U	0.0057 U	0.0052 U	0.0054 U	0.0052 U	0.0054 U	0.0052 U	0.0055 U	0.0053 U
GAMMA-BHC (LINDANE)	0.0021 U	0.0021 U	0.0021 U	0.0022 U	0.0023 U	0.0021 U	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.0022 U	0.0021 U
CHLORDANE	0.021 U	0.021 U	0.021 U	0.022 U	0.023 U	0.028 ---	0.022 U	0.021 U	0.022 U	0.021 U	0.022 U	0.021 U
4,4'-DDD	0.0042 U	0.0043 U	0.0041 U	0.0044 U	0.0045 U	0.0042 U	0.0043 U	0.0041 U	0.0043 U	0.0041 U	0.0044 U	0.0042 U
4,4'-DDE	0.0042 U	0.0043 U	0.0041 U	0.0044 U	0.0045 U	0.0042 U	0.012 ---	0.0041 U	0.0043 U	0.0041 U	0.0044 U	0.0042 U
4,4'-DDT	0.008 ---	0.0043 U	0.0041 U	0.0044 U	0.0045 U	0.0042 U	0.012 ---	0.0041 U	0.0043 U	0.0041 U	0.0044 U	0.0042 U
DIELDRIN	0.0042 U	0.0043 U	0.0041 U	0.0044 U	0.0045 U	0.0042 U	0.0043 U	0.0041 U	0.0043 U	0.0041 U	0.0044 U	0.0042 U
ENDOSULFAN I	0.0053 U	0.0053 U	0.0051 U	0.0055 U	0.0057 U	0.0052 U	0.0054 U	0.0052 U	0.0054 U	0.0052 U	0.0055 U	0.0053 U
ENDOSULFAN II	0.0085 U	0.0086 U	0.0082 U	0.0088 U	0.0091 U	0.0084 U	0.0086 U	0.0083 U	0.0086 U	0.0083 U	0.0088 U	0.0085 U
ENDOSULFAN SULFATE	0.0085 U	0.0086 U	0.0082 U	0.0088 U	0.0091 U	0.0084 U	0.0086 U	0.0083 U	0.0086 U	0.0083 U	0.0088 U	0.0085 U
ENDRIN	0.0085 U	0.0086 U	0.0082 U	0.0088 U	0.0091 U	0.0084 U	0.0086 U	0.0083 U	0.0086 U	0.0083 U	0.0088 U	0.0085 U
ENDRIN ALDEHYDE	0.0085 U	0.0086 U	0.0082 U	0.0088 U	0.0091 U	0.0084 U	0.0086 U	0.0083 U	0.0086 U	0.0083 U	0.0088 U	0.0085 U
ENDRIN KETONE	0.0085 U	0.0086 U	0.0082 U	0.0088 U	0.0091 U	0.0084 U	0.0086 U	0.0083 U	0.0086 U	0.0083 U	0.0088 U	0.0085 U
HEPTACHLOR	0.0053 U	0.0053 U	0.0051 U	0.0055 U	0.0057 U	0.0052 U	0.0054 U	0.0052 U	0.0054 U	0.0052 U	0.0055 U	0.0053 U
HEPTACHLOR EPOXIDE	0.0053 U	0.0053 U	0.0051 U	0.0055 U	0.0057 U	0.0052 U	0.0054 U	0.0052 U	0.0054 U	0.0052 U	0.0055 U	0.0053 U
HEXACHLOROBENZENE	0.0064 U	0.0064 U	0.0062 U	0.0066 U	0.0068 U	0.0063 U	0.0065 U	0.0062 U	0.0065 U	0.0062 U	0.0066 U	0.0064 U
METHOXYCHLOR	0.053 U	0.053 U	0.051 U	0.055 U	0.057 U	0.052 U	0.054 U	0.052 U	0.054 U	0.052 U	0.055 U	0.053 U
TOXAPHENE	0.11 U	0.11 U	0.1 U	0.11 U	0.11 U	0.1 U	0.11 U	0.1 U	0.11 U	0.1 U	0.11 U	0.11 U
Polychlorinated Biphenyls												
PCB 1016	0.085 U	0.082 U	0.082 U	0.088 U	0.091 U	0.084 U	0.086 U	0.083 U	0.086 U	0.083 U	0.088 U	0.085 U
PCB 1221	0.085 U	0.082 U	0.082 U	0.088 U	0.091 U	0.084 U	0.086 U	0.083 U	0.086 U	0.083 U	0.088 U	0.085 U
PCB 1232	0.085 U	0.082 U	0.082 U	0.088 U	0.091 U	0.084 U	0.086 U	0.083 U	0.086 U	0.083 U	0.088 U	0.085 U
PCB 1242	0.085 U	0.082 U	0.082 U	0.088 U	0.091 U	0.084 U	0.086 U	0.083 U	0.086 U	0.083 U	0.088 U	0.085 U
PCB 1248	0.085 U	0.082 U	0.082 U	0.088 U	0.091 U	0.084 U	0.086 U	0.083 U	0.086 U	0.083 U	0.088 U	0.085 U
PCB 1254	0.085 U	0.082 U	0.082 U	0.088 U	0.091 U	0.084 U	0.086 U	0.083 U	0.086 U	0.083 U	0.088 U	0.085 U
PCB 1260	0.085 U	0.082 U	0.082 U	0.088 U	0.091 U	0.084 U	0.086 U	0.083 U	0.086 U	0.083 U	0.088 U	0.085 U
PCB 1262	0.085 U	0.082 U	0.082 U	0.088 U	0.091 U	0.084 U	0.086 U	0.083 U	0.086 U	0.083 U	0.088 U	0.085 U
PCB 1268	0.085 U	0.082 U	0.082 U	0.088 U	0.091 U	0.084 U	0.086 U	0.083 U	0.086 U	0.083 U	0.088 U	0.085 U
Total Petroleum Hydrocarbons												
TPH	24	14	21	15	9.7	57	110	21	11	9.9	24	8.8 U
Herbicides												
2,4-D	26 U	27 U	26 U	27 U	28 U	26 U	27 U	26 U	27 U	26 U	28 U	27 U
2,4-DB	26 U	27 U	26 U	27 U	28 U	26 U	27 U	26 U	27 U	26 U	28 U	27 U
2,4,5-TP (SILVEX)	2.6 U	2.7 U	2.6 U	2.7 U	2.8 U	2.6 U	2.7 U	2.6 U	2.7 U	2.6 U	2.8 U	2.7 U
2,4,5-T	2.6 U	2.7 U	2.6 U	2.7 U	2.8 U	2.6 U	2.7 U	2.6 U	2.7 U	2.6 U	2.8 U	2.7 U
DALAPON	66 U	67 U	64 U	68 U	70 U	66 U	67 U	65 U	67 U	65 U	69 U	66 U
DICAMBA	2.6 U	2.7 U	2.6 U	2.7 U	2.8 U	2.6 U	2.7 U	2.6 U	2.7 U	2.6 U	2.8 U	2.7 U
DICHLOROPROP	26 U	27 U	26 U	27 U	28 U	26 U	27 U	26 U	27 U	26 U	28 U	27 U
DINOSEB	13 U	13 U	13 U	14 U	14 U	13 U	13 U	13 U	13 U	13 U	14 U	13 U
MCPA	2600 U	2,700 U	2,600 U	2,700 U	2,800 U	2,600 U	2,700 U	2,600 U	2,700 U	2600 U	2800 U	2700 U
MCPP	2600 U	2,700 U	2,600 U	2,700 U	2,800 U	2,600 U	2,700 U	2,600 U	2,700 U	2600 U	2800 U	2700 U
Volatile Organic Compounds												
ACETONE	0.082 U	0.065 U	0.086 U	0.063 U	0.074 U	0.057 U	0.18 U	0.042 U	0.054 U	0.13 U	0.097 U	0.092 U
TERT-AMYL METHYL ETHER	0.0008 U	0.0007 U	0.0009 U	0.0006 U	0.0007 U	0.0006 U	0.0018 U	0.0004 U	0.0005 U	0.0013 U	0.001 U	0.0009 U
BENZENE	0.0016 U	0.0013 U	0.0017 U	0.0013 U	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
BROMOBENZENE	0.0016 U	0.0013 U	0.0017 U	0.0013 U	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
BROMOCHLOROMETHANE	0.0016 U	0.0013 U	0.0017 U	0.0013 U	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
BROMODICHLOROMETHANE	0.0016 U	0.0013 U	0.0017 U	0.0013 U	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
BROMOFORM	0.0082 U	0.0065 U	0.0086 U	0.0063 U	0.0074 U	0.0011 U	0.0036 U	0.0042 U	0.0054 U	0.0027 U	0.0019 U	0.0018 U
BROMOMETHANE	0.0082 U	0.0065 U	0.0086 U	0.0063 U	0.0074 U	0.0057 U	0.018 U	0.0042 U	0.0054 U	0.013 U	0.0097 U	0.0092 U
2-BUTANONE (MEK)	0.033 U	0.026 U	0.034 U	0.025 U	0.03 U	0.023 U	0.071 U	0.017 U	0.022 U	0.053 U	0.039 U	0.037 U
N-BUTYLBENZENE	0.0016 U	0.0013 U	0.0017 U	0.0013 U	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
SEC-BUTYLBENZENE	0.0016 U	0.0013 U	0.0017 U	0.0013 U	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
TERT-BUTYLBENZENE	0.0016 U	0.0013 U	0.0017 U	0.0013 U	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
TERT-BUTYLETHYL ETHER	0.0008 U	0.0007 U	0.0009 U	0.0006 U	0.0007 U	0.0006 U	0.0018 U	0.0004 U	0.0005 U	0.0013 U	0.001 U	0.0009 U
CARBON DISULFIDE	0.0049 U	0.0039 U	0.0052 U	0.0038 U	0.0044 U	0.0034 U	0.011 U	0.0025 U	0.0032 U	0.008 U	0.0058 U	0.0055 U
CARBON TETRACHLORIDE	0.0033 U	0.0026 U	0.0034 U	0.0025 U	0.003 U	0.0011 U	0.0036 U	0.0017 U	0.0022 U	0.0027 U	0.0019 U	0.0018 U
CHLOROBENZENE	0.0016 U	0.0013 U	0.0017 U	0.0013 U	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
CHLORODIBROMOMETHANE	0.0008 U	0.0007 U	0.0009 U	0.0006 U	0.0007 U	0.0006 U	0.0018 U	0.0004 U	0.0005 U	0.0013 U	0.001 U	0.0009 U
CHLOROETHANE	0.0082 U	0.0065 U	0.0086 U	0.0063 U	0.0074 U	0.0057 U	0.018 U	0.0042 U	0.0054 U	0.013 U	0.0097 U	0.0092 U
CHLOROFORM	0.0033 U	0.0026 U	0.0034 U	0.0025 U	0.003 U	0.0023 U	0.0071 U	0.0017 U	0.0022 U	0.0053 U	0.0039 U	0.0037 U
CHLOROMETHANE	0.0082 U	0.0065 U	0.0086 U	0.0063 U	0.0074 U	0.0057 U	0.018 U	0.0042 U	0.0054 U	0.013 U	0.0097 U	0.0092 U
2-CHLOROTOLUENE	0.0016 U	0.0013 U	0.0017 U	0.0013 U	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U

Table 2
Summary of MBTA ROW Hudson Soil
Sudbury to Hudson Transmission Project
Hudson, Massachusetts

LOCATION	RCS-1	RCS-2	Similar Soils for RCS-1	Concentrations in "Natural Soil" at RCS-1 Receiving Location	MA Lined Landfill	MA Unlined Landfill	Units
4-CHLOROTOLUENE	100	1000	NE	NE	NE	NE	mg/Kg
1,2-DIBROMO-3-CHLOROPROPANE	10	100	NE	NE	NE	NE	mg/Kg
1,2-DIBROMOETHANE (EDB)	0.1	0.1	NE	NE	NE	NE	mg/Kg
DIBROMOMETHANE	500	5000	NE	NE	NE	NE	mg/Kg
1,2-DICHLOROBENZENE	9	100	NE	NE	NE	NE	mg/Kg
1,3-DICHLOROBENZENE	3	200	NE	NE	NE	NE	mg/Kg
1,4-DICHLOROBENZENE	0.7	1	NE	NE	NE	NE	mg/Kg
DICHLORODIFLUOROMETHANE	1000	10000	NE	NE	NE	NE	mg/Kg
1,1-DICHLOROETHANE	0.4	9	NE	NE	NE	NE	mg/Kg
1,2-DICHLOROETHANE	0.1	0.1	NE	NE	NE	NE	mg/Kg
1,1-DICHLOROETHYLENE	3	40	NE	NE	NE	NE	mg/Kg
CIS-1,2-DICHLOROETHYLENE	0.1	0.1	NE	NE	NE	NE	mg/Kg
TRANS-1,2-DICHLOROETHYLENE	1	1	NE	NE	NE	NE	mg/Kg
1,2-DICHLOROPROPANE	0.1	0.1	NE	NE	NE	NE	mg/Kg
1,3-DICHLOROPROPANE	500	5000	NE	NE	NE	NE	mg/Kg
2,2-DICHLOROPROPANE	0.1	0.2	NE	NE	NE	NE	mg/Kg
1,1-DICHLOROPROPENE	0.01	0.1	NE	NE	NE	NE	mg/Kg
CIS-1,3-DICHLOROPROPENE	0.01	0.1	NE	NE	NE	NE	mg/Kg
TRANS-1,3-DICHLOROPROPENE	0.01	0.1	NE	NE	NE	NE	mg/Kg
DIETHYL ETHER	100	1000	NE	NE	NE	NE	mg/Kg
DIISOPROPYL ETHER	100	1000	NE	NE	NE	NE	mg/Kg
1,4-DIOXANE	0.2	6	NE	NE	NE	NE	mg/Kg
ETHYLBENZENE	40	1000	NE	NE	NE	NE	mg/Kg
HEXACHLOROBUTADIENE	30	100	NE	NE	NE	NE	mg/Kg
2-HEXANONE	100	1000	NE	NE	NE	NE	mg/Kg
ISOPROPYLBENZENE	1000	10000	NE	NE	NE	NE	mg/Kg
P-ISOPROPYLTOLUENE	100	1000	NE	NE	NE	NE	mg/Kg
METHYL TERT-BUTYL ETHER (MTBE)	0.1	100	NE	NE	NE	NE	mg/Kg
METHYLENE CHLORIDE	0.1	20	NE	NE	NE	NE	mg/Kg
4-METHYL-2-PENTANONE (MIBK)	0.4	50	NE	NE	NE	NE	mg/Kg
NAPHTHALENE	4	20	NE	NE	NE	NE	mg/Kg
N-PROPYLBENZENE	100	1000	NE	NE	NE	NE	mg/Kg
STYRENE	3	4	NE	NE	NE	NE	mg/Kg
1,1,1,2-TETRACHLOROETHANE	0.1	0.1	NE	NE	NE	NE	mg/Kg
1,1,2,2-TETRACHLOROETHANE	0.005	0.02	NE	NE	NE	NE	mg/Kg
TETRACHLOROETHYLENE	1	10	NE	NE	NE	NE	mg/Kg
TETRAHYDROFURAN	500	5000	NE	NE	NE	NE	mg/Kg
TOLUENE	30	1000	NE	NE	NE	NE	mg/Kg
1,2,3-TRICHLOROBENZENE	NE	NE	NE	NE	NE	NE	mg/Kg
1,2,4-TRICHLOROBENZENE	2	6	NE	NE	NE	NE	mg/Kg
1,1,1-TRICHLOROETHANE	30	600	NE	NE	NE	NE	mg/Kg
1,1,2-TRICHLOROETHANE	0.1	2	NE	NE	NE	NE	mg/Kg
TRICHLOROETHYLENE	0.3	0.3	NE	NE	NE	NE	mg/Kg
TRICHLOROFLUOROMETHANE	1000	10000	NE	NE	NE	NE	mg/Kg
1,2,3-TRICHLOROPROPANE	100	1000	NE	NE	NE	NE	mg/Kg
1,2,4-TRIMETHYLBENZENE	1000	10000	NE	NE	NE	NE	mg/Kg
1,3,5-TRIMETHYLBENZENE	10	100	NE	NE	NE	NE	mg/Kg
VINYL CHLORIDE	0.7	0.7	NE	NE	NE	NE	mg/Kg
M/P-XYLENE	100	100	NE	NE	NE	NE	mg/Kg
O-XYLENE	100	100	NE	NE	NE	NE	mg/Kg
SVOCs 8270							
ACENAPHTHENE	4	3000	4	NE	NE	NE	mg/Kg
ACENAPHTHYLENE	1	10	1	0.5	NE	NE	mg/Kg
ACETOPHENONE	1000	10000	NE	0.5	NE	NE	mg/Kg
ANILINE	1000	10000	NE	NE	NE	NE	mg/Kg
ANTHRACENE	1000	3000	10	NE	NE	NE	mg/Kg
BENZO(A)ANTHRACENE	7	40	7	1	NE	NE	mg/Kg
BENZO(A)PYRENE	2	7	2	2	NE	NE	mg/Kg
BENZO(B)FLUORANTHENE	7	40	7	2	NE	NE	mg/Kg
BENZO(G,H,I)PERYLENE	1000	3000	10	2	NE	NE	mg/Kg
BENZO(K)FLUORANTHENE	70	400	10	1	NE	NE	mg/Kg
BIS(2-CHLOROETHOXY)METHANE	500	5000	NE	1	NE	NE	mg/Kg
BIS(2-CHLOROETHYL)ETHER	0.7	0.7	NE	NE	NE	NE	mg/Kg
BIS(2-CHLOROISOPROPYL)ETHER	0.7	0.7	NE	NE	NE	NE	mg/Kg
BIS(2-ETHYLHEXYL)PHTHALATE	90	600	NE	NE	NE	NE	mg/Kg
4-BROMOPHENYL PHENYL ETHER	100	1000	NE	NE	NE	NE	mg/Kg
BUTYLBENZYLPHTHALATE	100	1000	NE	NE	NE	NE	mg/Kg
4-CHLOROANILINE	1	3	NE	NE	NE	NE	mg/Kg
2-CHLORONAPHTHALENE	1000	10000	NE	NE	NE	NE	mg/Kg
2-CHLOROPHENOL	0.7	100	NE	NE	NE	NE	mg/Kg
CHRYSENE	70	400	20	NE	NE	NE	mg/Kg
DIBENZ(A,H)ANTHRACENE	0.7	4	0.7	2	NE	NE	mg/Kg
DIBENZOFURAN	100	1000	NE	0.5	NE	NE	mg/Kg
DI-N-BUTYLPHTHALATE	50	500	NE	NE	NE	NE	mg/Kg
1,2-DICHLOROBENZENE	9	100	NE	NE	NE	NE	mg/Kg
1,3-DICHLOROBENZENE	3	200	NE	NE	NE	NE	mg/Kg
1,4-DICHLOROBENZENE	0.7	1	NE	NE	NE	NE	mg/Kg
3,3'-DICHLOROBENZIDINE	3	20	NE	NE	NE	NE	mg/Kg
2,4-DICHLOROPHENOL	0.7	40	NE	NE	NE	NE	mg/Kg
DIETHYLPHTHALATE	10	200	NE	NE	NE	NE	mg/Kg
2,4-DIMETHYLPHENOL	0.7	100	NE	NE	NE	NE	mg/Kg
DIMETHYLPHTHALATE	0.7	50	NE	NE	NE	NE	mg/Kg
2,4-DINITROPHENOL	3	50	NE	NE	NE	NE	mg/Kg
2,4-DINITROTOLUENE	0.7	10	NE	NE	NE	NE	mg/Kg
2,6-DINITROTOLUENE	100	1000	NE	NE	NE	NE	mg/Kg
DI-N-OCTYLPHTHALATE	1000	10000	NE	NE	NE	NE	mg/Kg
1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	50	500	NE	NE	NE	NE	mg/Kg
FLUORANTHENE	1000	3000	40	NE	NE	NE	mg/Kg
FLUORENE	1000	3000	10	4	NE	NE	mg/Kg
HEXACHLOROBENZENE	0.7	0.8	NE	1	NE	NE	mg/Kg
HEXACHLOROBUTADIENE	30	100	NE	NE	NE	NE	mg/Kg
HEXACHLOROETHANE	0.7	3	NE	NE	NE	NE	mg/Kg
INDENO(1,2,3-CD)PYRENE	7	40	7	NE	NE	NE	mg/Kg
ISOPHORONE	100	1000	NE	1	NE	NE	mg/Kg

LOCATION	MP24	SB/MW-24	SB16	SB17	SB18	SB19	SB2	SB3
SAMPLING DATE	06/04/2018	06/05/2018	06/01/2018	06/04/2018	06/01/2018	05/31/2018	06/05/2018	06/05/2018
LAB SAMPLE ID	18F0316-12	18F0316-16	18F0316-17	18F0316-13	18F0316-07	18F0316-04	18F0316-08	18F0316-15
PID READING (ppmV)	0.0	0.0	0.0	1.0	0.1	0.0	2.0	28.5
4-CHLOROTOLUENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
1,2-DIBROMO-3-CHLOROPROPANE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.12 U	0.0023 U	0.0016 U	0.0016 U
1,2-DIBROMOETHANE (EDB)	0.0008 U	0.0008 U	0.0007 U	0.0007 U	0.015 U	0.0012 U	0.0008 U	0.0008 U
DIBROMOMETHANE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
1,2-DICHLOROBENZENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
1,3-DICHLOROBENZENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
1,4-DICHLOROBENZENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
DICHLORODIFLUOROMETHANE	0.0076 U	0.008 U	0.0072 U	0.0072 U	0.062 U	0.012 U	0.0081 U	0.0079 U
1,1-DICHLOROETHANE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
1,2-DICHLOROETHANE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
1,1-DICHLOROETHYLENE	0.003 U	0.0032 U	0.0029 U	0.0029 U	0.031 U	0.0047 U	0.0032 U	0.0032 U
CIS-1,2-DICHLOROETHYLENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
TRANS-1,2-DICHLOROETHYLENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
1,2-DICHLOROPROPANE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
1,3-DICHLOROPROPANE	0.0008 U	0.0008 U	0.0007 U	0.0007 U	0.015 U	0.0012 U	0.0008 U	0.0008 U
2,2-DICHLOROPROPANE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
1,1-DICHLOROPROPENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	**0.062** U	0.0023 U	0.0016 U	0.0016 U
CIS-1,3-DICHLOROPROPENE	0.0008 U	0.0008 U	0.0007 U	0.0007 U	**0.015** U	0.0012 U	0.0008 U	0.0008 U
TRANS-1,3-DICHLOROPROPENE	0.0008 U	0.0008 U	0.0007 U	0.0007 U	**0.015** U	0.0012 U	0.0008 U	0.0008 U
DIETHYL ETHER	0.0076 U	0.008 U	0.0072 U	0.0072 U	0.062 U	0.012 U	0.0081 U	0.0079 U
DIISOPROPYL ETHER	0.0008 U	0.0008 U	0.0007 U	0.0007 U	0.015 U	0.0012 U	0.0008 U	0.0008 U
1,4-DIOXANE	0.076 U	0.08 U	0.072 U	0.072 U	**1.5** U	0.12 U	0.081 U	0.079 U
ETHYLBENZENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
HEXACHLOROBUTADIENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
2-HEXANONE	0.015 U	0.016 U	0.014 U	0.014 U	0.31 U	0.023 U	0.016 U	0.016 U
ISOPROPYLBENZENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
P-ISOPROPYLTOLUENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
METHYL TERT-BUTYL ETHER (MTBE)	0.003 U	0.0032 U	0.0029 U	0.0029 U	0.031 U	0.0047 U	0.0032 U	0.0032 U
METHYLENE CHLORIDE	0.0076 U	0.008 U	0.0072 U	0.0072 U	**0.15** U	0.012 U	0.0081 U	0.0079 U
4-METHYL-2-PENTANONE (MIBK)	0.015 U	0.016 U	0.014 U	0.014 U	0.31 U	0.023 U	0.016 U	0.016 U
NAPHTHALENE	0.003 U	0.0032 U	0.0029 U	0.0029 U	0.062 U	0.0047 U	0.0032 U	0.0032 U
N-PROPYLBENZENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
STYRENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
1,1,1,2-TETRACHLOROETHANE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
1,1,2,2-TETRACHLOROETHANE	0.0008 U	0.0008 U	0.0007 U	0.0007 U	**0.015** U	0.0012 U	0.0008 U	0.0008 U
TETRACHLOROETHYLENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
TETRAHYDROFURAN	0.0076 U	0.008 U	0.0072 U	0.0072 U	0.12 U	0.012 U	0.0081 U	0.0079 U
TOLUENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
1,2,3-TRICHLOROBENZENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.12 U	0.0023 U	0.0016 U	0.0016 U
1,2,4-TRICHLOROBENZENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
1,1,1-TRICHLOROETHANE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
1,1,2-TRICHLOROETHANE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
TRICHLOROETHYLENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
TRICHLOROFLUOROMETHANE	0.0076 U	0.008 U	0.0072 U	0.0072 U	0.062 U	0.012 U	0.0081 U	0.0079 U
1,2,3-TRICHLOROPROPANE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.062 U	0.0023 U	0.0016 U	0.0016 U
1,2,4-TRIMETHYLBENZENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
1,3,5-TRIMETHYLBENZENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
VINYL CHLORIDE	0.0076 U	0.008 U	0.0072 U	0.0072 U	0.062 U	0.012 U	0.0081 U	0.0079 U
M/P-XYLENE	0.003 U	0.0032 U	0.0029 U	0.0029 U	0.062 U	0.0047 U	0.0032 U	0.0032 U
O-XYLENE	0.0015 U	0.0016 U	0.0014 U	0.0014 U	0.031 U	0.0023 U	0.0016 U	0.0016 U
SVOCs 8270								
ACENAPHTHENE	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.2 U
ACENAPHTHYLENE	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.2 U
ACETOPHENONE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
ANILINE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
ANTHRACENE	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.2 U
BENZO(A)ANTHRACENE	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.2 U
BENZO(A)PYRENE	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.2 U
BENZO(B)FLUORANTHENE	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.2 U
BENZO(G,H,I)PERYLENE	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.2 U
BENZO(K)FLUORANTHENE	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.2 U
BIS(2-CHLOROETHOXY)METHANE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
BIS(2-CHLOROETHYL)ETHER	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
BIS(2-CHLOROISOPROPYL)ETHER	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
BIS(2-ETHYLHEXYL)PHTHALATE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
4-BROMOPHENYL PHENYL ETHER	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
BUTYLBENZYLPHTHALATE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
4-CHLOROANILINE	0.71 U	0.73 U	0.71 U	0.7 U	0.71 U	0.68 U	0.7 U	0.78 U
2-CHLORONAPHTHALENE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
2-CHLOROPHENOL	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
CHRYSENE	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.2 U
DIBENZ(A,H)ANTHRACENE	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.2 U
DIBENZOFURAN	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
DI-N-BUTYLPHTHALATE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
1,2-DICHLOROBENZENE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
1,3-DICHLOROBENZENE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
1,4-DICHLOROBENZENE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
3,3'-DICHLOROBENZIDINE	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.2 U
2,4-DICHLOROPHENOL	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
DIETHYLPHTHALATE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
2,4-DIMETHYLPHENOL	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
DIMETHYLPHTHALATE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
2,4-DINITROPHENOL	0.71 U	0.73 U	0.71 U	0.7 U	0.71 U	0.68 U	0.7 U	0.78 U
2,4-DINITROTOLUENE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
2,6-DINITROTOLUENE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
DI-N-OCTYLPHTHALATE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
FLUORANTHENE	0.18 U	0.19 U	0.18 U	0.22 ---	0.18 U	0.18 U	0.18 U	0.2 U
FLUORENE	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.2 U
HEXACHLOROBENZENE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
HEXACHLOROBUTADIENE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
HEXACHLOROETHANE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U
INDENO(1,2,3-CD)PYRENE	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.2 U
ISOPHORONE	0.37 U	0.38 U	0.37 U	0.36 U	0.36 U	0.35 U	0.36 U	0.4 U

LOCATION	SB43	SB45	SB47	MP10	MP11	MP20	MP22	MP23
SAMPLING DATE	06/04/2018	06/01/2018	05/31/2018	06/08/2018	06/07/2018	06/07/2018	06/07/2018	06/07/2018
LAB SAMPLE ID	18F0316-14	18F0316-06	18F0316-05	18F0619-09	18F0619-01	18F0619-08	18F0619-07	18F0619-02
PID READING (ppmV)	6.2	0.0	0.0	56.9	0.0	19.0	3.1	37.1
4-CHLOROTOLUENE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
1,2-DIBROMO-3-CHLOROPROPANE	0.0016 U	0.2 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
1,2-DIBROMOETHANE (EDB)	0.0008 U	0.025 U	0.0005 U	0.0008 U	0.001 U	0.0008 U	0.0007 U	0.001 U
DIBROMOMETHANE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
1,2-DICHLOROBENZENE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
1,3-DICHLOROBENZENE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
1,4-DICHLOROBENZENE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
DICHLORODIFLUOROMETHANE	0.0081 U	0.099 U	0.0046 U	0.0077 U	0.01 U	0.0084 U	0.0072 U	0.0095 U
1,1-DICHLOROETHANE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
1,2-DICHLOROETHANE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
1,1-DICHLOROETHYLENE	0.0032 U	0.05 U	0.0018 U	0.0031 U	0.004 U	0.0034 U	0.0029 U	0.0038 U
CIS-1,2-DICHLOROETHYLENE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
TRANS-1,2-DICHLOROETHYLENE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
1,2-DICHLOROPROPANE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
1,3-DICHLOROPROPANE	0.0008 U	0.025 U	0.0005 U	0.0008 U	0.001 U	0.0008 U	0.0007 U	0.001 U
2,2-DICHLOROPROPANE	0.0016 U	0.05 U	0.0009 U	0.0077 U	0.002 U	0.0084 U	0.0072 U	0.0095 U
1,1-DICHLOROPROPENE	0.0016 U	**0.099** U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
CIS-1,3-DICHLOROPROPENE	0.0008 U	**0.025** U	0.0005 U	0.0008 U	0.001 U	0.0008 U	0.0007 U	0.001 U
TRANS-1,3-DICHLOROPROPENE	0.0008 U	**0.025** U	0.0005 U	0.0077 U	0.001 U	0.0084 U	0.0072 U	0.0095 U
DIETHYL ETHER	0.0081 U	0.099 U	0.0046 U	0.0077 U	0.01 U	0.0084 U	0.0072 U	0.0095 U
DIISOPROPYL ETHER	0.0008 U	0.025 U	0.0005 U	0.0008 U	0.001 U	0.0008 U	0.0007 U	0.001 U
1,4-DIOXANE	0.081 U	**2.5** U	0.046 U	0.077 U	0.1 U	0.084 U	0.072 U	0.095 U
ETHYLBENZENE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
HEXACHLOROBUTADIENE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
2-HEXANONE	0.016 U	0.5 U	0.0092 U	0.015 U	0.02 U	0.017 U	0.014 U	0.019 U
ISOPROPYLBENZENE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.011 ---	0.0014 U	0.0019 U
P-ISOPROPYLTOLUENE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
METHYL TERT-BUTYL ETHER (MTBE)	0.0032 U	0.05 U	0.0018 U	0.0031 U	0.004 U	0.0034 U	0.0029 U	0.0038 U
METHYLENE CHLORIDE	0.0081 U	**0.25** U	0.0052 ---	0.0077 U	0.01 U	0.0084 U	0.0072 U	0.0095 U
4-METHYL-2-PENTANONE (MIBK)	0.016 U	**0.5** U	0.0092 U	0.015 U	0.02 U	0.017 U	0.014 U	0.019 U
NAPHTHALENE	0.0032 U	0.099 U	0.0018 U	0.0031 U	0.004 U	0.0034 U	0.0029 U	0.0038 U
N-PROPYLBENZENE	0.0016 U	0.05 U	0.0009 U	0.0031 U	0.002 U	0.0034 U	0.0029 U	0.0038 U
STYRENE	0.0016 U	0.05 U	0.0009 U	0.0031 U	0.002 U	0.0034 U	0.0029 U	0.0038 U
1,1,1,2-TETRACHLOROETHANE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
1,1,2,2-TETRACHLOROETHANE	0.0008 U	**0.025** U	0.0005 U	0.0008 U	0.001 U	0.0008 U	0.0007 U	0.001 U
TETRACHLOROETHYLENE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
TETRAHYDROFURAN	0.0081 U	0.2 U	0.0046 U	0.0077 U	0.01 U	0.0084 U	0.0072 U	0.0095 U
TOLUENE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
1,2,3-TRICHLOROBENZENE	0.0016 U	0.2 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
1,2,4-TRICHLOROBENZENE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
1,1,1-TRICHLOROETHANE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
1,1,2-TRICHLOROETHANE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
TRICHLOROETHYLENE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
TRICHLOROFLUOROMETHANE	0.0081 U	0.099 U	0.0046 U	0.0077 U	0.01 U	0.0084 U	0.0072 U	0.0095 U
1,2,3-TRICHLOROPROPANE	0.0016 U	0.099 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
1,2,4-TRIMETHYLBENZENE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
1,3,5-TRIMETHYLBENZENE	0.0016 U	0.05 U	0.0009 U	0.0031 U	0.002 U	0.0034 U	0.0029 U	0.0038 U
VINYL CHLORIDE	0.0081 U	0.099 U	0.0046 U	0.0077 U	0.01 U	0.0084 U	0.0072 U	0.0095 U
M/P-XYLENE	0.0032 U	0.099 U	0.0018 U	0.0031 U	0.004 U	0.0034 U	0.0029 U	0.0038 U
O-XYLENE	0.0016 U	0.05 U	0.0009 U	0.0015 U	0.002 U	0.0017 U	0.0014 U	0.0019 U
SVOCs 8270								
ACENAPHTHENE	0.19 U	0.18 U	0.18 U	0.19 U	0.21 U	0.19 U	0.18 U	0.2 U
ACENAPHTHYLENE	0.19 U	0.18 U	0.18 U	0.19 U	0.21 U	0.19 U	0.18 U	0.2 U
ACETOPHENONE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
ANILINE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
ANTHRACENE	0.19 U	0.18 U	0.18 U	0.19 U	0.21 U	0.19 U	0.18 U	0.2 U
BENZO(A)ANTHRACENE	0.19 U	0.18 U	0.18 U	0.19 U	1 ---	0.19 U	0.18 U	0.2 U
BENZO(A)PYRENE	0.19 U	0.18 U	0.18 U	0.19 U	1.3 ---	0.19 U	0.18 U	0.2 U
BENZO(B)FLUORANTHENE	0.19 U	0.18 U	0.18 U	0.19 U	1.5 ---	0.19 U	0.18 U	0.2 U
BENZO(G,H,I)PERYLENE	0.19 U	0.18 U	0.18 U	0.19 U	0.76 ---	0.19 U	0.18 U	0.2 U
BENZO(K)FLUORANTHENE	0.19 U	0.18 U	0.18 U	0.19 U	0.64 ---	0.19 U	0.18 U	0.2 U
BIS(2-CHLOROETHOXY)METHANE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
BIS(2-CHLOROETHYL)ETHER	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
BIS(2-CHLOROISOPROPYL)ETHER	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
BIS(2-ETHYLHEXYL)PHTHALATE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
4-BROMOPHENYL PHENYL ETHER	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
BUTYLBENZYLPHTHALATE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
4-CHLOROANILINE	0.73 U	0.71 U	0.68 U	0.75 U	0.8 U	0.75 U	0.7 U	0.76 U
2-CHLORONAPHTHALENE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
2-CHLOROPHENOL	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
CHRYSENE	0.19 U	0.18 U	0.18 U	0.19 U	1 ---	0.19 U	0.18 U	0.2 U
DIBENZ(A,H)ANTHRACENE	0.19 U	0.18 U	0.18 U	0.19 U	0.21 U	0.19 U	0.18 U	0.2 U
DIBENZOFURAN	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
DI-N-BUTYLPHTHALATE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
1,2-DICHLOROBENZENE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
1,3-DICHLOROBENZENE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
1,4-DICHLOROBENZENE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
3,3'-DICHLOROBENZIDINE	0.19 U	0.18 U	0.18 U	0.19 U	0.21 U	0.19 U	0.18 U	0.2 U
2,4-DICHLOROPHENOL	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
DIETHYLPHTHALATE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
2,4-DIMETHYLPHENOL	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
DIMETHYLPHTHALATE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
2,4-DINITROPHENOL	0.73 U	0.71 U	0.68 U	0.75 U	0.8 U	0.75 U	0.7 U	0.76 U
2,4-DINITROTOLUENE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
2,6-DINITROTOLUENE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
DI-N-OCTYLPHTHALATE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
FLUORANTHENE	0.19 U	0.18 U	0.18 U	0.19 U	1.5 ---	0.19 U	0.18 U	0.2 U
FLUORENE	0.19 U	0.18 U	0.18 U	0.19 U	0.21 U	0.19 U	0.18 U	0.2 U
HEXACHLOROBENZENE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
HEXACHLOROBUTADIENE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
HEXACHLOROETHANE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U
INDENO(1,2,3-CD)PYRENE	0.19 U	0.18 U	0.18 U	0.19 U	0.84 ---	0.19 U	0.18 U	0.2 U
ISOPHORONE	0.38 U	0.37 U	0.35 U	0.38 U	0.41 U	0.39 U	0.36 U	0.39 U

LOCATION	MP3	MP4	MP6	MP9	SB1	MP15	SB/MW-5	SB14
SAMPLING DATE	06/07/2018	06/07/2018	06/07/2018	06/06/2018	06/07/2018	6/15/2018	6/21/2018	6/25/2018
LAB SAMPLE ID	18F0619-10	18F0619-05	18F0619-03	18F0619-04	18F0619-06	18F1479-02	18F1479-03	18F1479-01
PID READING (ppmV)	0.0	50.2	0.0	0.0	80.2	0.0	0.0	0.0
4-CHLOROTOLUENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
1,2-DIBROMO-3-CHLOROPROPANE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
1,2-DIBROMOETHANE (EDB)	0.0005 U	0.0009 U	0.0008 U	0.0005 U	0.0008 U	0.0007 U	0.0009 U	0.0006 U
DIBROMOMETHANE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
1,2-DICHLOROBENZENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
1,3-DICHLOROBENZENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
1,4-DICHLOROBENZENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
DICHLORODIFLUOROMETHANE	0.0047 U	0.0086 U	0.0078 U	0.0045 U	0.0082 U	0.0065 U	0.0086 U	0.0063 U
1,1-DICHLOROETHANE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
1,2-DICHLOROETHANE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
1,1-DICHLOROETHYLENE	0.0019 U	0.0034 U	0.0031 U	0.0018 U	0.0033 U	0.0026 U	0.0034 U	0.0025 U
CIS-1,2-DICHLOROETHYLENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
TRANS-1,2-DICHLOROETHYLENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
1,2-DICHLOROPROPANE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
1,3-DICHLOROPROPANE	0.0005 U	0.0009 U	0.0008 U	0.0005 U	0.0008 U	0.0007 U	0.0009 U	0.0006 U
2,2-DICHLOROPROPANE	0.0047 U	0.0086 U	0.0078 U	0.0045 U	0.0082 U	0.0065 U	0.0086 U	0.0063 U
1,1-DICHLOROPROPENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
CIS-1,3-DICHLOROPROPENE	0.0005 U	0.0009 U	0.0008 U	0.0005 U	0.0008 U	0.0007 U	0.0009 U	0.0006 U
TRANS-1,3-DICHLOROPROPENE	0.0047 U	0.0086 U	0.0078 U	0.0045 U	0.0082 U	0.0065 U	0.0086 U	0.0063 U
DIETHYL ETHER	0.0047 U	0.0086 U	0.0078 U	0.0045 U	0.0082 U	0.0065 U	0.0086 U	0.0063 U
DIISOPROPYL ETHER	0.0005 U	0.0009 U	0.0008 U	0.0005 U	0.0008 U	0.0007 U	0.0009 U	0.0006 U
1,4-DIOXANE	0.047 U	0.086 U	0.078 U	0.045 U	0.082 U	0.065 U	0.086 U	0.063 U
ETHYLBENZENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
HEXACHLOROBUTADIENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
2-HEXANONE	0.0094 U	0.017 U	0.016 U	0.0089 U	0.016 U	0.013 U	0.017 U	0.013 U
ISOPROPYLBENZENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
P-ISOPROPYLTOLUENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
METHYL TERT-BUTYL ETHER (MTBE)	0.0019 U	0.0034 U	0.0031 U	0.0018 U	0.0033 U	0.0026 U	0.0034 U	0.0025 U
METHYLENE CHLORIDE	0.0047 U	0.0086 U	0.0078 U	0.0045 U	0.0082 U	0.0065 U	0.0086 U	0.0063 U
4-METHYL-2-PENTANONE (MIBK)	0.0094 U	0.017 U	0.016 U	0.0089 U	0.016 U	0.013 U	0.017 U	0.013 U
NAPHTHALENE	0.0019 U	0.0034 U	0.0031 U	0.0018 U	0.0033 U	0.0026 U	0.0034 U	0.0025 U
N-PROPYLBENZENE	0.0019 U	0.0034 U	0.0031 U	0.0018 U	0.0033 U	0.0026 U	0.0034 U	0.0025 U
STYRENE	0.0019 U	0.0034 U	0.0031 U	0.0018 U	0.0033 U	0.0026 U	0.0034 U	0.0025 U
1,1,1,2-TETRACHLOROETHANE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
1,1,2,2-TETRACHLOROETHANE	0.0005 U	0.0009 U	0.0008 U	0.0005 U	0.0008 U	0.0007 U	0.0009 U	0.0006 U
TETRACHLOROETHYLENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
TETRAHYDROFURAN	0.0047 U	0.0086 U	0.0078 U	0.0045 U	0.0082 U	0.0065 U	0.0086 U	0.0063 U
TOLUENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
1,2,3-TRICHLOROBENZENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
1,2,4-TRICHLOROBENZENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
1,1,1-TRICHLOROETHANE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
1,1,2-TRICHLOROETHANE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
TRICHLOROETHYLENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
TRICHLOROFLUOROMETHANE	0.0047 U	0.0086 U	0.0078 U	0.0045 U	0.0082 U	0.0065 U	0.0086 U	0.0063 U
1,2,3-TRICHLOROPROPANE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
1,2,4-TRIMETHYLBENZENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
1,3,5-TRIMETHYLBENZENE	0.0019 U	0.0034 U	0.0031 U	0.0018 U	0.0033 U	0.0026 U	0.0034 U	0.0025 U
VINYL CHLORIDE	0.0047 U	0.0086 U	0.0078 U	0.0045 U	0.0082 U	0.0065 U	0.0086 U	0.0063 U
M/P-XYLENE	0.0019 U	0.0039 ---	0.0031 U	0.0018 U	0.0033 U	0.0026 U	0.0034 U	0.0025 U
O-XYLENE	0.0009 U	0.0017 U	0.0016 U	0.0009 U	0.0016 U	0.0013 U	0.0017 U	0.0013 U
SVOCs 8270								
ACENAPHTHENE	0.17 U	0.18 U	0.19 U	0.19 U	0.18 U	0.18 U	0.17 U	0.19 U
ACENAPHTHYLENE	0.17 U	0.18 U	0.19 U	0.22 ---	0.18 U	0.18 U	0.17 U	0.19 U
ACETOPHENONE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
ANILINE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
ANTHRACENE	0.17 U	0.18 U	0.19 U	0.19 U	0.18 U	0.18 U	0.17 U	0.19 U
BENZO(A)ANTHRACENE	0.17 U	0.27 ---	0.19 U	0.94 ---	0.18 U	0.18 U	0.17 U	0.19 U
BENZO(A)PYRENE	0.28 ---	0.41 ---	0.19 U	1.4 ---	0.22 ---	0.18 U	0.17 U	0.19 U
BENZO(B)FLUORANTHENE	0.25 ---	0.51 ---	0.19 U	1.7 ---	0.25 ---	0.18 U	0.17 U	0.19 U
BENZO(G,H,I)PERYLENE	0.25 ---	0.32 ---	0.19 U	1.1 ---	0.22 ---	0.18 U	0.17 U	0.19 U
BENZO(K)FLUORANTHENE	0.17 U	0.19 ---	0.19 U	0.65 ---	0.18 U	0.18 U	0.17 U	0.19 U
BIS(2-CHLOROETHOXY)METHANE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
BIS(2-CHLOROETHYL)ETHER	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
BIS(2-CHLOROISOPROPYL)ETHER	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
BIS(2-ETHYLHEXYL)PHTHALATE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
4-BROMOPHENYL PHENYL ETHER	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
BUTYLBENZYLPHTHALATE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
4-CHLOROANILINE	0.67 U	0.69 U	0.73 U	0.74 U	0.7 U	0.69 U	0.68 U	0.72 U
2-CHLORONAPHTHALENE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
2-CHLOROPHENOL	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
CHRYSENE	0.17 U	0.31 ---	0.19 U	0.96 ---	0.18 U	0.18 U	0.17 U	0.19 U
DIBENZ(A,H)ANTHRACENE	0.17 U	0.18 U	0.19 U	0.19 ---	0.18 U	0.18 U	0.17 U	0.19 U
DIBENZOFURAN	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
DI-N-BUTYLPHTHALATE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
1,2-DICHLOROBENZENE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
1,3-DICHLOROBENZENE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
1,4-DICHLOROBENZENE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
3,3'-DICHLOROBENZIDINE	0.17 U	0.18 U	0.19 U	0.19 U	0.18 U	0.18 U	0.17 U	0.19 U
2,4-DICHLOROPHENOL	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
DIETHYLPHTHALATE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
2,4-DIMETHYLPHENOL	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
DIMETHYLPHTHALATE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
2,4-DINITROPHENOL	0.67 U	0.69 U	0.73 U	0.74 U	0.7 U	0.69 U	0.68 U	0.72 U
2,4-DINITROTOLUENE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
2,6-DINITROTOLUENE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
DI-N-OCTYLPHTHALATE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
FLUORANTHENE	0.25 ---	0.58 ---	0.19 U	1.7 ---	0.18 U	0.18 U	0.17 U	0.19 U
FLUORENE	0.17 U	0.18 U	0.19 U	0.19 U	0.18 U	0.18 U	0.17 U	0.19 U
HEXACHLOROBENZENE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
HEXACHLOROBUTADIENE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
HEXACHLOROETHANE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U
INDENO(1,2,3-CD)PYRENE	0.21 ---	0.31 ---	0.19 U	1.1 ---	0.23 ---	0.18 U	0.17 U	0.19 U
ISOPHORONE	0.35 U	0.36 U	0.38 U	0.38 U	0.36 U	0.36 U	0.35 U	0.37 U

LOCATION	MP1	MP17	MP19	SB15	SB44	SB20	SB/MW-21	SB46
SAMPLING DATE	6/26/2018	6/27/2018	6/27/2018	6/27/2018	6/27/2018	06/29/2018	06/29/2018	06/29/2018
LAB SAMPLE ID	18F1479-04	18F1479-07	18F1479-08	18F1479-06	18F1479-05	18G0202-03	18G0202-01	18G0202-02
PID READING (ppmV)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4-CHLOROTOLUENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
1,2-DIBROMO-3-CHLOROPROPANE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
1,2-DIBROMOETHANE (EDB)	0.0007 U	0.0006 U	0.0018 U	0.0004 U	0.0005 U	0.0013 U	0.001 U	0.0009 U
DIBROMOMETHANE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
1,2-DICHLOROBENZENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
1,3-DICHLOROBENZENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
1,4-DICHLOROBENZENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
DICHLORODIFLUOROMETHANE	0.0074 U	0.0057 U	0.018 U	0.0042 U	0.0054 U	0.013 U	0.0097 U	0.0092 U
1,1-DICHLOROETHANE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
1,2-DICHLOROETHANE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
1,1-DICHLOROETHYLENE	0.003 U	0.0023 U	0.0071 U	0.0017 U	0.0022 U	0.0053 U	0.0039 U	0.0037 U
CIS-1,2-DICHLOROETHYLENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
TRANS-1,2-DICHLOROETHYLENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
1,2-DICHLOROPROPANE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
1,3-DICHLOROPROPANE	0.0007 U	0.0006 U	0.0018 U	0.0004 U	0.0005 U	0.0013 U	0.001 U	0.0009 U
2,2-DICHLOROPROPANE	0.0074 U	0.0011 U	0.0036 U	0.0042 U	0.0054 U	0.0027 U	0.0019 U	0.0018 U
1,1-DICHLOROPROPENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
CIS-1,3-DICHLOROPROPENE	0.0007 U	0.0006 U	0.0018 U	0.0004 U	0.0005 U	0.0013 U	0.001 U	0.0009 U
TRANS-1,3-DICHLOROPROPENE	0.0074 U	0.0006 U	0.0018 U	0.0042 U	0.0054 U	0.0013 U	0.001 U	0.0009 U
DIETHYL ETHER	0.0074 U	0.0057 U	0.018 U	0.0042 U	0.0054 U	0.013 U	0.0097 U	0.0092 U
DIISOPROPYL ETHER	0.0007 U	0.0006 U	0.0018 U	0.0004 U	0.0005 U	0.0013 U	0.001 U	0.0009 U
1,4-DIOXANE	0.074 U	0.057 U	0.18 U	0.042 U	0.054 U	0.13 U	0.097 U	0.092 U
ETHYLBENZENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
HEXACHLOROBUTADIENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
2-HEXANONE	0.015 U	0.011 U	0.036 U	0.0083 U	0.011 U	0.027 U	0.019 U	0.018 U
ISOPROPYLBENZENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
P-ISOPROPYLTOLUENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
METHYL TERT-BUTYL ETHER (MTBE)	0.003 U	0.0023 U	0.0071 U	0.0017 U	0.0022 U	0.0053 U	0.0039 U	0.0037 U
METHYLENE CHLORIDE	0.0074 U	0.0057 U	0.018 U	0.0042 U	0.0054 U	0.013 U	0.0097 U	0.0092 U
4-METHYL-2-PENTANONE (MIBK)	0.015 U	0.011 U	0.036 U	0.0083 U	0.011 U	0.027 U	0.019 U	0.018 U
NAPHTHALENE	0.003 U	0.0023 U	0.0071 U	0.0017 U	0.0022 U	0.0053 U	0.0039 U	0.0037 U
N-PROPYLBENZENE	0.003 U	0.0011 U	0.0036 U	0.0017 U	0.0022 U	0.0027 U	0.0019 U	0.0018 U
STYRENE	0.003 U	0.0011 U	0.0036 U	0.0017 U	0.0022 U	0.0027 U	0.0019 U	0.0018 U
1,1,1,2-TETRACHLOROETHANE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
1,1,2,2-TETRACHLOROETHANE	0.0007 U	0.0006 U	0.0018 U	0.0004 U	0.0005 U	0.0013 U	0.001 U	0.0009 U
TETRACHLOROETHYLENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
TETRAHYDROFURAN	0.0074 U	0.0057 U	0.018 U	0.0042 U	0.0054 U	0.013 U	0.0097 U	0.0092 U
TOLUENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
1,2,3-TRICHLOROBENZENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
1,2,4-TRICHLOROBENZENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
1,1,1-TRICHLOROETHANE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
1,1,2-TRICHLOROETHANE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
TRICHLOROETHYLENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
TRICHLOROFLUOROMETHANE	0.0074 U	0.0057 U	0.018 U	0.0042 U	0.0054 U	0.013 U	0.0097 U	0.0092 U
1,2,3-TRICHLOROPROPANE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
1,2,4-TRIMETHYLBENZENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
1,3,5-TRIMETHYLBENZENE	0.003 U	0.0011 U	0.0036 U	0.0017 U	0.0022 U	0.0027 U	0.0019 U	0.0018 U
VINYL CHLORIDE	0.0074 U	0.0057 U	0.018 U	0.0042 U	0.0054 U	0.013 U	0.0097 U	0.0092 U
M/P-XYLENE	0.003 U	0.0023 U	0.0071 U	0.0017 U	0.0022 U	0.0053 U	0.0039 U	0.0037 U
O-XYLENE	0.0015 U	0.0011 U	0.0036 U	0.0008 U	0.0011 U	0.0027 U	0.0019 U	0.0018 U
SVOCs 8270								
ACENAPHTHENE	0.19 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U	0.19 U	0.18 U
ACENAPHTHYLENE	0.19 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U	0.19 U	0.18 U
ACETOPHENONE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
ANILINE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
ANTHRACENE	0.19 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U	0.19 U	0.18 U
BENZO(A)ANTHRACENE	0.19 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U	0.19 U	0.18 U
BENZO(A)PYRENE	0.19 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U	0.19 U	0.18 U
BENZO(B)FLUORANTHENE	0.19 U	0.2 ---	0.18 U	0.17 U	0.18 U	0.17 U	0.19 U	0.18 U
BENZO(G,H,I)PERYLENE	0.19 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U	0.19 U	0.18 U
BENZO(K)FLUORANTHENE	0.19 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U	0.19 U	0.18 U
BIS(2-CHLOROETHOXY)METHANE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
BIS(2-CHLOROETHYL)ETHER	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
BIS(2-CHLOROISOPROPYL)ETHER	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
BIS(2-ETHYLHEXYL)PHTHALATE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
4-BROMOPHENYL PHENYL ETHER	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
BUTYLBENZYLPHTHALATE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
4-CHLOROANILINE	0.75 U	0.7 U	0.71 U	0.68 U	0.71 U	0.68 U	0.72 U	0.7 U
2-CHLORONAPHTHALENE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
2-CHLOROPHENOL	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
CHRYSENE	0.19 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U	0.19 U	0.18 U
DIBENZ(A,H)ANTHRACENE	0.19 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U	0.19 U	0.18 U
DIBENZOFURAN	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
DI-N-BUTYLPHTHALATE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
1,2-DICHLOROBENZENE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
1,3-DICHLOROBENZENE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
1,4-DICHLOROBENZENE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
3,3'-DICHLOROBENZIDINE	0.19 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U	0.19 U	0.18 U
2,4-DICHLOROPHENOL	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
DIETHYLPHTHALATE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
2,4-DIMETHYLPHENOL	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
DIMETHYLPHTHALATE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
2,4-DINITROPHENOL	0.75 U	0.7 U	0.71 U	0.68 U	0.71 U	0.68 U	0.72 U	0.7 U
2,4-DINITROTOLUENE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
2,6-DINITROTOLUENE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
DI-N-OCTYLPHTHALATE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
FLUORANTHENE	0.19 U	0.31	0.18 U	0.17 U	0.18 U	0.17 U	0.19 U	0.18 U
FLUORENE	0.19 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U	0.19 U	0.18 U
HEXACHLOROBENZENE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
HEXACHLOROBUTADIENE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
HEXACHLOROETHANE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U
INDENO(1,2,3-CD)PYRENE	0.19 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U	0.19 U	0.18 U
ISOPHORONE	0.38 U	0.36 U	0.37 U	0.35 U	0.37 U	0.35 U	0.37 U	0.36 U

Table 2
Summary of MBTA ROW Hudson Soil
Sudbury to Hudson Transmission Project
Hudson, Massachusetts

LOCATION								MP24		SB/MW-24		SB16		SB17		SB18		SB19		SB2		SB3		SB43		SB45		SB47		MP10		MP11		MP20		MP22		MP23		MP3		MP4		MP6		MP9		SB1		MP15		SB/MW-5		SB14		MP1		MP17		MP19		SB15		SB44		SB20		SB/MW-21		SB46	
SAMPLING DATE	RCS-1	RCS-2	Similar Soils for RCS-1	Concentrations in "Natural Soil" at RCS-1 Receiving Location	MA Lined Landfill	MA Unlined Landfill	Units	06/04/2018		06/05/2018		06/01/2018		06/04/2018		06/01/2018		05/31/2018		06/05/2018		06/05/2018		06/04/2018		06/01/2018		05/31/2018		06/08/2018		06/07/2018		06/07/2018		06/07/2018		06/07/2018		06/07/2018		06/07/2018		06/07/2018		06/06/2018		06/07/2018		6/15/2018		6/21/2018		6/25/2018		6/26/2018		6/27/2018		6/27/2018		6/27/2018		6/27/2018		06/29/2018		06/29/2018		06/29/2018	
LAB SAMPLE ID								18F0316-12		18F0316-16		18F0316-17		18F0316-13		18F0316-07		18F0316-04		18F0316-08		18F0316-15		18F0316-14		18F0316-06		18F0316-05		18F0619-09		18F0619-01		18F0619-08		18F0619-07		18F0619-02		18F0619-10		18F0619-05		18F0619-03		18F0619-04		18F0619-06		18F1479-02		18F1479-03		18F1479-01		18F1479-04		18F1479-07		18F1479-08		18F1479-06		18F1479-05		18G0202-03		18G0202-01		18G0202-02	
PID READING (ppmV)								0.0		0.0		0.0		1.0		0.1		0.0		2.0		28.5		6.2		0.0		0.0		56.9		0.0		19.0		3.1		37.1		0.0		50.2		0.0		0.0		80.2		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
2-METHYLNAPHTHALENE	0.7	80	0.7	NE	NE	NE	mg/Kg	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.18	U	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.21	U	0.19	U	0.18	U	0.2	U	0.17	U	0.18	U	0.19	U	0.19	U	0.18	U	0.18	U	0.17	U	0.19	U	0.18	U	0.17	U	0.18	U	0.17	U	0.19	U	0.18	U
O-CRESOL	500	5000	NE	0.5	NE	NE	mg/Kg	0.37	U	0.38	U	0.37	U	0.36	U	0.36	U	0.35	U	0.36	U	0.4	U	0.38	U	0.37	U	0.35	U	0.38	U	0.41	U	0.39	U	0.36	U	0.39	U	0.35	U	0.36	U	0.38	U	0.38	U	0.36	U	0.36	U	0.35	U	0.37	U	0.38	U	0.36	U	0.37	U	0.35	U	0.37	U	0.35	U	0.37	U	0.36	U
M/P-CRESOL	500	5000	NE	NE	NE	NE	mg/Kg	0.37	U	0.38	U	0.37	U	0.36	U	0.36	U	0.35	U	0.36	U	0.4	U	0.38	U	0.37	U	0.35	U	0.38	U	0.41	U	0.39	U	0.36	U	0.39	U	0.35	U	0.36	U	0.38	U	0.38	U	0.36	U	0.36	U	0.35	U	0.37	U	0.38	U	0.36	U	0.37	U	0.35	U	0.37	U	0.35	U	0.37	U	0.36	U
NAPHTHALENE	4	20	4	NE	NE	NE	mg/Kg	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.18	U	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.21	U	0.19	U	0.18	U	0.2	U	0.17	U	0.18	U	0.19	U	0.19	U	0.18	U	0.18	U	0.17	U	0.19	U	0.18	U	0.17	U	0.18	U	0.17	U	0.19	U	0.18	U	0.17	U	0.19	U	0.18	U
NITROBENZENE	500	5000	NE	0.5	NE	NE	mg/Kg	0.37	U	0.38	U	0.37	U	0.36	U	0.36	U	0.35	U	0.36	U	0.4	U	0.38	U	0.37	U	0.35	U	0.38	U	0.41	U	0.39	U	0.36	U	0.39	U	0.35	U	0.36	U	0.38	U	0.38	U	0.36	U	0.36	U	0.35	U	0.37	U	0.38	U	0.36	U	0.37	U	0.35	U	0.37	U	0.35	U	0.37	U	0.36	U
2-NITROPHENOL	100	1000	NE	NE	NE	NE	mg/Kg	0.37	U	0.38	U	0.37	U	0.36	U	0.36	U	0.35	U	0.36	U	0.4	U	0.38	U	0.37	U	0.35	U	0.38	U	0.41	U	0.39	U	0.36	U	0.39	U	0.35	U	0.36	U	0.38	U	0.38	U	0.36	U	0.36	U	0.35	U	0.37	U	0.38	U	0.36	U	0.37	U	0.35	U	0.37	U	0.35	U	0.37	U	0.36	U
4-NITROPHENOL	100	1000	NE	NE	NE	NE	mg/Kg	0.71	U	0.73	U	0.71	U	0.7	U	0.71	U	0.68	U	0.7	U	0.78	U	0.73	U	0.71	U	0.68	U	0.75	U	0.8	U	0.75	U	0.7	U	0.76	U	0.67	U	0.69	U	0.73	U	0.74	U	0.7	U	0.69	U	0.68	U	0.72	U	0.75	U	0.7	U	0.71	U	0.68	U	0.71	U	0.68	U	0.72	U	0.7	U
PENTACHLOROPHENOL	3	10	NE	NE	NE	NE	mg/Kg	0.37	U	0.38	U	0.37	U	0.36	U	0.36	U	0.35	U	0.36	U	0.4	U	0.38	U	0.37	U	0.35	U	0.38	U	0.41	U	0.39	U	0.36	U	0.39	U	0.35	U	0.36	U	0.38	U	0.38	U	0.36	U	0.36	U	0.35	U	0.37	U	0.38	U	0.36	U	0.37	U	0.35	U	0.37	U	0.35	U	0.37	U	0.36	U
PHENANTHRENE	10	1000	10	NE	NE	NE	mg/Kg	0.18	U	0.19	U	0.18	U	0.18	U	0.18	U	0.18	U	0.18	U	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.37	---	0.19	U	0.18	U	0.2	U	0.17	U	0.25	---	0.19	U	0.22	---	0.18	U	0.18	U	0.17	U	0.19	U	0.19	U	0.18	U	0.18	U	0.17	U	0.18	U	0.17	U	0.19	U	0.18	U
PHENOL	1	20	NE	3	NE	NE	mg/Kg	0.37	U	0.38	U	0.37	U	0.36	U	0.36	U	0.35	U	0.36	U	0.4	U	0.38	U	0.37	U	0.35	U	0.38	U	0.41	U	0.39	U	0.36	U	0.39	U	0.35	U	0.36	U	0.38	U	0.38	U	0.36	U	0.36	U	0.35	U	0.37	U	0.38	U	0.36	U	0.37	U	0.35	U	0.37	U	0.35	U	0.37	U	0.36	U
PYRENE	1000	3000	40	NE	NE	NE	mg/Kg	0.18	U	0.19	U	0.18	U	0.21	---	0.18	U	0.18	U	0.18	U	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	1.7	---	0.19	U	0.18	U	0.2	U	0.37	---	0.57	---	0.19	U	1.7	---	0.18	U	0.18	U	0.17	U	0.19	U	0.19	U	0.26		0.18	U	0.17	U	0.18	U	0.17	U	0.19	U	0.18	U
PYRIDINE	500	5000	NE	4	NE	NE	mg/Kg	0.37	U	0.38	U	0.37	U	0.36	U	0.36	U	0.35	U	0.36	U	0.4	U	0.38	U	0.37	U	0.35	U	0.38	U	0.41	U	0.39	U	0.36	U	0.39	U	0.35	U	0.36	U	0.38	U	0.38	U	0.36	U	0.36	U	0.35	U	0.37	U	0.38	U	0.36	U	0.37	U	0.35	U	0.37	U	0.35	U	0.37	U	0.36	U
1,2,4-TRICHLOROBENZENE	2	6	NE	NE	NE	NE	mg/Kg	0.37	U	0.38	U	0.37	U	0.36	U	0.36	U	0.35	U	0.36	U	0.4	U	0.38	U	0.37	U	0.35	U	0.38	U	0.41	U	0.39	U	0.36	U	0.39	U	0.35	U	0.36	U	0.38	U	0.38	U	0.36	U	0.36	U	0.35	U	0.37	U	0.38	U	0.36	U	0.37	U	0.35	U	0.37	U	0.35	U	0.37	U	0.36	U
2,4,5-TRICHLOROPHENOL	4	600	NE	NE	NE	NE	mg/Kg	0.37	U	0.38	U	0.37	U	0.36	U	0.36	U	0.35	U	0.36	U	0.4	U	0.38	U	0.37	U	0.35	U	0.38	U	0.41	U	0.39	U	0.36	U	0.39	U	0.35	U	0.36	U	0.38	U	0.38	U	0.36	U	0.36	U	0.35	U	0.37	U	0.38	U	0.36	U	0.37	U	0.35	U	0.37	U	0.35	U	0.37	U	0.36	U
2,4,6-TRICHLOROPHENOL	0.7	20	NE	NE	NE	NE	mg/Kg	0.37	U	0.38	U	0.37	U	0.36	U	0.36	U	0.35	U	0.36	U	0.4	U	0.38	U	0.37	U	0.35	U	0.38	U	0.41	U	0.39	U	0.36	U	0.39	U	0.35	U	0.36	U	0.38	U	0.38	U	0.36	U	0.36	U	0.35	U	0.37	U	0.38	U	0.36	U	0.37	U	0.35	U	0.37	U	0.35	U	0.37	U	0.36	U
Cyanide in Waters and Extracts																																																																									
REACTIVE CYANIDE	NE	NE	NE	NE	NE	NE	mg/Kg	4	U	4	U	3.9	U	3.9	U	3.9	U	4	U	3.9	U	4	U	3.9	U	3.9	U	3.9	U	4	U	3.9	U	3.9	U	4	U	3.9	U	3.9	U	4	U	4	U	4	U	4	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	4	U	4	U	3.9	U
Acid-Soluble and Acid-Insoluble Sulfides																																																																			
REACTIVE SULFIDE	NE	NE	NE	NE	NE	NE	mg/Kg	20	U	20	U	20	U	19	U	19	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	19	U	20	U	20	U	20	U	20	U	20	U	20	U	19	U	20	U	19	U
PH																																																																		
PH	NE	NE	NE	NE	NE	NE	pH Units	5.2	---	5.9	---	5.3	---	5.2	---	5.6	---	4.7	---	6.9	---	5.7	---	5.3	---	5.9	---	5.8	---	6.1	---	6.5	---	6.1	---	5.8	---	5.7	---	5.8	---	7.8	---	5.4	---	6	---	5.4	---	6	---	5.9	---	7	---	5.4	---	8.7	---	6.8	---	7.6	---	8.4	---	5.1	---	6.7	---	7.4	---

NOTES:
Bolded, shaded, and underlined results meet or exceed regulatory threshold
Bolded results are a laboratory detection limit that exceed a regulatory threshold
RCS-x = MCP Reportable Concentrations for Soil Category x
U = Not detected above the laboratory reporting limits shown to the left of the "U"
NE = Standard not established
mg/kg = Milligrams per kilogram, aslo known as parts per million
SOIL DISPOSAL CLASSIFICATION CATEGORIES

Type A Soil: Reuse at Sand and Gravel facility: Soils which do not contain oil or hazardous material (OHM) or contain OHM below levels consistent with "natural" soil per MassDEP's Similar Soils Provision Guidance (WSC-13-500) are not considered Remediation Waste; this includes soil that exhibits concentrations of TPH less than or equal to 25 parts per million (ppm). These "natural" soils may be reused at specific beneficial reuse locations on a case by case basis under the discretion of Eversource and may be reused at an active sand and gravel processing facility that holds a Site Assignment Authorization with approval from the LSP-of-Record. Facilities that are reclaiming former sand and gravel pits must have a MassDEP approved ACO in place in accordance with MassDEP Interim Policy COMM-15-01: Re-

Type B-1 Soil: <RCS-1 Beneficial Reuse: Soil containing OHM concentrations below MCP RCS-1 criteria can be used as fill material at off-site industrial/commercial locations provided that pre-existing OHM concentrations at the fill location are equal to or higher than those that exist in the construction generated soil and are not located within the Utility Related Abatement Measure (URAM). Facilities must have a MassDEP approved Administrative Consent Order (ACO) in place in accordance with MassDEP Interim Policy COMM-15-01.

Type C-1 Soil: Massachusetts Unlined Landfills: Soil that contains OHM concentrations above MCP RCS-1 levels but below the criteria for Massachusetts Unlined landfills per MassDEP Policy COMM-97-001.

Table 3
Summary of MBTA ROW Sudbury Soil
Sudbury to Hudson Transmission Project
Sudbury, Massachusetts

SAMPLE LOCATION	RCS-1	RCS-2	Similar Soils for RCS-1	Concentrations in "Natural Soil" at RCS-1 Receiving	MA Lined Landfill	MA Unlined Landfill	Units
SM 2540G							
% SOLIDS	NE	NE	NE	NE	NE	NE	% Wt
SM21-22 2510B Modified							
SPECIFIC CONDUCTANCE	NE	NE	NE	NE	8000	NE	µmhos/cm
SW-846 1030							
IGNITABILITY	NE	NE	NE	NE	NE	NE	present/absent
SW-846 6010D							
ANTIMONY	20	30	10	1	NE	NE	mg/Kg
ARSENIC	20	20	20	20	40	40	mg/Kg
BARIUM	1000	3000	375	50	NE	NE	mg/Kg
BERYLLIUM	90	200	4	0.4	NE	NE	mg/Kg
CADMIUM	70	100	20	2	80	30	mg/Kg
CHROMIUM	100	200	100	30	1000	1000	mg/Kg
LEAD	200	600	200	100	2000	1000	mg/Kg
NICKEL	600	1000	150	20	NE	NE	mg/Kg
SELENIUM	400	700	5	0.5	NE	NE	mg/Kg
SILVER	100	200	6	0.6	NE	NE	mg/Kg
THALLIUM	8	60	6	0.6	NE	NE	mg/Kg
VANADIUM	400	700	225	30	NE	NE	mg/Kg
ZINC	1000	3000	500	100	NE	NE	mg/Kg
SW-846 7471B							
MERCURY	20	30	3	0.3	10	10	mg/Kg
SW-846 8081B							
ALACHOR	NE	NE	NE	NE	NE	NE	mg/Kg
ALDRIN	0.08	0.5	NE	NE	NE	NE	mg/Kg
ALPHA-BHC	50	500	NE	NE	NE	NE	mg/Kg
BETA-BHC	10	100	NE	NE	NE	NE	mg/Kg
DELTA-BHC	10	100	NE	NE	NE	NE	mg/Kg
GAMMA-BHC (LINDANE)	0.003	0.5	NE	NE	NE	NE	mg/Kg
CHLORDANE	5	30	NE	NE	NE	NE	mg/Kg
4,4'-DDD	8	40	NE	NE	NE	NE	mg/Kg
4,4'-DDE	6	30	NE	NE	NE	NE	mg/Kg
4,4'-DDT	6	30	NE	NE	NE	NE	mg/Kg
DIELDRIN	0.08	0.5	NE	NE	NE	NE	mg/Kg
ENDOSULFAN I	0.5	1	NE	NE	NE	NE	mg/Kg
ENDOSULFAN II	0.5	1	NE	NE	NE	NE	mg/Kg
ENDOSULFAN SULFATE	~	~	NE	NE	NE	NE	mg/Kg
ENDRIN	10	20	NE	NE	NE	NE	mg/Kg
ENDRIN ALDEHYDE	10	100	NE	NE	NE	NE	mg/Kg
ENDRIN KETONE	~	~	NE	NE	NE	NE	mg/Kg
HEPTACHLOR	0.3	2	NE	NE	NE	NE	mg/Kg
HEPTACHLOR EPOXIDE	0.1	0.9	NE	NE	NE	NE	mg/Kg
HEXACHLOROBENZENE	0.7	0.8	NE	NE	NE	NE	mg/Kg
METHOXYCHLOR	200	400	NE	NE	NE	NE	mg/Kg
TOXAPHENE	10	100	NE	NE	NE	NE	mg/Kg
SW-846 8082A							
PCB 1016	1	4	NE	NE	NE	NE	mg/Kg
PCB 1221	1	4	NE	NE	NE	NE	mg/Kg
PCB 1232	1	4	NE	NE	NE	NE	mg/Kg
PCB 1242	1	4	NE	NE	NE	NE	mg/Kg
PCB 1248	1	4	NE	NE	NE	NE	mg/Kg
PCB 1254	1	4	NE	NE	NE	NE	mg/Kg
PCB 1260	1	4	NE	NE	NE	NE	mg/Kg
PCB 1262	1	4	NE	NE	NE	NE	mg/Kg
PCB 1268	1	4	NE	NE	NE	NE	mg/Kg
Total PCBs	NE	NE	NE	0.1	NE	NE	mg/Kg
SW-846 8100 Modified							
TPH	1000	3000	NE	NE	5000	2500	mg/Kg
SW-846 8151A							
2,4-D	100000	1000000	NE	NE	NE	NE	µg/kg
2,4-DB	100000	1000000	NE	NE	NE	NE	µg/kg
2,4,5-TP (SILVEX)	100000	1000000	NE	NE	NE	NE	µg/kg
2,4,5-T	100000	1000000	NE	NE	NE	NE	µg/kg
DALAPON	NE	NE	NE	NE	NE	NE	µg/kg
DICAMBA	500000	5000000	NE	NE	NE	NE	µg/kg
DICHLOROPROP	NE	NE	NE	NE	NE	NE	µg/kg
DINOSEB	500000	5000000	NE	NE	NE	NE	µg/kg
MCPA	100000	1000000	NE	NE	NE	NE	µg/kg
MCPP	NE	NE	NE	NE	NE	NE	µg/kg
SW-846 8260C							
ACETONE	6	50	NE	NE	NE	NE	mg/Kg
TERT-AMYL METHYL ETHER	NE	NE	NE	NE	NE	NE	mg/Kg
BENZENE	2	200	NE	NE	NE	NE	mg/Kg
BROMOBENZENE	100	1000	NE	NE	NE	NE	mg/Kg
BROMOCHLOROMETHANE	NE	NE	NE	NE	NE	NE	mg/Kg
BROMODICHLOROMETHANE	0.1	0.1	NE	NE	NE	NE	mg/Kg
BROMOFORM	0.1	1	NE	NE	NE	NE	mg/Kg
BROMOMETHANE	0.5	0.5	NE	NE	NE	NE	mg/Kg
2-BUTANONE (MEK)	4	50	NE	NE	NE	NE	mg/Kg
N-BUTYLBENZENE	NE	NE	NE	NE	NE	NE	mg/Kg
SEC-BUTYLBENZENE	NE	NE	NE	NE	NE	NE	mg/Kg
TERT-BUTYLBENZENE	100	1000	NE	NE	NE	NE	mg/Kg
TERT-BUTYLETHYL ETHER	NE	NE	NE	NE	NE	NE	mg/Kg
CARBON DISULFIDE	100	1000	NE	NE	NE	NE	mg/Kg
CARBON TETRACHLORIDE	5	5	NE	NE	NE	NE	mg/Kg
CHLOROBENZENE	1	3	NE	NE	NE	NE	mg/Kg
CHLORODIBROMOMETHANE	0.005	0.03	NE	NE	NE	NE	mg/Kg
CHLOROETHANE	100	1000	NE	NE	NE	NE	mg/Kg
CHLOROFORM	0.2	0.2	NE	NE	NE	NE	mg/Kg
CHLOROMETHANE	100	1000	NE	NE	NE	NE	mg/Kg
2-CHLOROTOLUENE	100	1000	NE	NE	NE	NE	mg/Kg
4-CHLOROTOLUENE	100	1000	NE	NE	NE	NE	mg/Kg
1,2-DIBROMO-3-CHLOROPROPANE	10	100	NE	NE	NE	NE	mg/Kg
1,2-DIBROMOETHANE (EDB)	0.1	0.1	NE	NE	NE	NE	mg/Kg
DIBROMOMETHANE	500	5000	NE	NE	NE	NE	mg/Kg
1,2-DICHLOROBENZENE	9	100	NE	NE	NE	NE	mg/Kg
1,3-DICHLOROBENZENE	3	200	NE	NE	NE	NE	mg/Kg
1,4-DICHLOROBENZENE	0.7	1	NE	NE	NE	NE	mg/Kg
DICHLORODIFLUOROMETHANE	1000	10000	NE	NE	NE	NE	mg/Kg
1,1-DICHLOROETHANE	0.4	9	NE	NE	NE	NE	mg/Kg
1,2-DICHLOROETHANE	0.1	0.1	NE	NE	NE	NE	mg/Kg
1,1-DICHLOROETHYLENE	3	40	NE	NE	NE	NE	mg/Kg
CIS-1,2-DICHLOROETHYLENE	0.1	0.1	NE	NE	NE	NE	mg/Kg
TRANS-1,2-DICHLOROETHYLENE	1	1	NE	NE	NE	NE	mg/Kg
1,2-DICHLOROPROPANE	0.1	0.1	NE	NE	NE	NE	mg/Kg
1,3-DICHLOROPROPANE	500	5000	NE	NE	NE	NE	mg/Kg
2,2-DICHLOROPROPANE	0.1	0.2	NE	NE	NE	NE	mg/Kg
1,1-DICHLOROPROPENE	0.01	0.1	NE	NE	NE	NE	mg/Kg

SAMPLE LOCATION	MP32	MP34	SB49	MP36	MW/SB-33	SB34	MW/SB-35	SB36
SAMPLE DATE	10/11/2018	10/11/2018	10/11/2018	10/18/2018	11/07/2018	11/07/2018	11/07/2018	11/07/2018
LAB NUMBER	18J0746-01	18J0746-02	18J0746-03	1810642-01	18K0569-01	18K0569-04	18K0569-03	18K0569-02
PID READING (ppmV)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SM 2540G								
% SOLIDS	84	84.5	83.9	77.0	80.6	82.4	83.3	89
SM21-22 2510B Modified								
SPECIFIC CONDUCTANCE	8.1	4.5	5.9	318	2.7	7.3	3.1	2.2
SW-846 1030								
IGNITABILITY	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
SW-846 6010D								
ANTIMONY	**2** U	**2** U	**2** U	**5.25** U	**2.1** U	**2** U	**2** U	**1.9** U
ARSENIC	18	**<u>21</u>**	14	8.42	4.4	2.9	2.5	**<u>21</u>**
BARIUM	22	32	21	17.0	19	16	16	19
BERYLLIUM	0.26	***0.42***	0.31	0.23	0.21	0.24	0.23	0.21
CADMIUM	0.62	0.73	0.47	0.52 U	0.21 U	0.2 U	0.2 U	0.41
CHROMIUM	13	16	11	11.0	9.3	8.2	9.2	8.8
LEAD	26	27	6.4	8.08	3.3	6.8	6.9	7.9
NICKEL	8.4	12	8.3	7.21	5.1	4.4	7.7	4.7
SELENIUM	3.9 U	**4** U	**3.9** U	**5.25** U	**4.1** U	**4** U	**4** U	**3.7** U
SILVER	0.39 U	0.4 U	0.39 U	0.52 U	0.41 U	0.4 U	0.4 U	0.37 U
THALLIUM	2 U	2 U	2 U	5.25 U	2.1 U	2 U	2 U	1.9 U
VANADIUM	14	24	13	10.2	12	10	10	11
ZINC	28	26	15	13.2	10	27	16	10
SW-846 7471B								
MERCURY	0.029 U	0.039	0.029 U	0.028 U	0.031 U	0.03 U	0.029 U	0.028 U
SW-846 8081B								
ALACHOR	0.23 U	0.023 U	0.022 U	0.0032 U	0.023 U	0.023 U	0.022 U	0.022 U
ALDRIN	0.057 U	0.0057 U	0.0056 U	0.0032 U	0.0058 U	0.0057 U	0.0056 U	0.0054 U
ALPHA-BHC	0.057 U	0.0057 U	0.0056 U	0.0032 U	0.0058 U	0.0057 U	0.0056 U	0.0054 U
BETA-BHC	0.057 U	0.0057 U	0.0056 U	0.0032 U	0.0058 U	0.0057 U	0.0056 U	0.0054 U
DELTA-BHC	0.057 U	0.0057 U	0.0056 U	0.0032 U	0.0058 U	0.0057 U	0.0056 U	0.0054 U
GAMMA-BHC (LINDANE)	**0.023** U	0.0023 U	0.0022 U	0.0019 U	0.0023 U	0.0023 U	0.0022 U	0.0022 U
CHLORDANE	0.23 U	0.023 U	0.022 U	0.0259 U	0.023 U	0.023 U	0.022 U	0.022 U
4,4'-DDD	0.046 U	0.0046 U	0.0045 U	0.0032 U	0.0047 U	0.0046 U	0.0045 U	0.0043 U
4,4'-DDE	0.046 U	0.0084	0.0045 U	0.0032 U	0.0047 U	0.0046 U	0.0045 U	0.0043 U
4,4'-DDT	0.046 U	0.05	0.0045 U	0.0032 U	0.0047 U	0.0046 U	0.0045 U	0.0043 U
DIELDRIN	0.046 U	0.0046 U	0.0045 U	0.0032 U	0.0047 U	0.0046 U	0.0045 U	0.0043 U
ENDOSULFAN I	0.057 U	0.0057 U	0.0056 U	0.0032 U	0.0058 U	0.0057 U	0.0056 U	0.0054 U
ENDOSULFAN II	0.092 U	0.0091 U	0.009 U	0.0032 U	0.0094 U	0.0092 U	0.009 U	0.0086 U
ENDOSULFAN SULFATE	0.092 U	0.0091 U	0.009 U	0.0032 U	0.0094 U	0.0092 U	0.009 U	0.0086 U
ENDRIN	0.092 U	0.0091 U	0.009 U	0.0032 U	0.0094 U	0.0092 U	0.009 U	0.0086 U
ENDRIN ALDEHYDE	0.092 U	0.0091 U	0.009 U	0.0032 U	0.0094 U	0.0092 U	0.009 U	0.0086 U
ENDRIN KETONE	0.092 U	0.0091 U	0.009 U	0.0032 U	0.0094 U	0.0092 U	0.009 U	0.0086 U
HEPTACHLOR	0.057 U	0.0057 U	0.0056 U	0.0032 U	0.0058 U	0.0057 U	0.0056 U	0.0054 U
HEPTACHLOR EPOXIDE	0.057 U	0.0057 U	0.0056 U	0.0032 U	0.0058 U	0.0057 U	0.0056 U	0.0054 U
HEXACHLOROBENZENE	0.069 U	0.0068 U	0.0067 U	0.0032 U	0.007 U	0.0069 U	0.0067 U	0.0065 U
METHOXYCHLOR	0.57 U	0.057 U	0.056 U	0.0032 U	0.058 U	0.057 U	0.056 U	0.054 U
TOXAPHENE	1.1 U	0.11 U	0.11 U	0.162 U	0.12 U	0.11 U	0.11 U	0.11 U
SW-846 8082A								
PCB 1016	0.092 U	0.091 U	0.09 U	0.07 U	0.094 U	0.095 U	0.089 U	0.089 U
PCB 1221	0.092 U	0.091 U	0.09 U	0.07 U	0.094 U	0.095 U	0.089 U	0.089 U
PCB 1232	0.092 U	0.091 U	0.09 U	0.07 U	0.094 U	0.095 U	0.089 U	0.089 U
PCB 1242	0.092 U	0.091 U	0.09 U	0.07 U	0.094 U	0.095 U	0.089 U	0.089 U
PCB 1248	0.092 U	0.091 U	0.09 U	0.07 U	0.094 U	0.095 U	0.089 U	0.089 U
PCB 1254	0.092 U	0.091 U	0.09 U	0.07 U	0.094 U	0.095 U	0.089 U	0.089 U
PCB 1260	0.092 U	0.091 U	0.09 U	0.07 U	0.094 U	0.095 U	0.089 U	0.089 U
PCB 1262	0.092 U	0.091 U	0.09 U	0.07 U	0.094 U	0.095 U	0.089 U	0.089 U
PCB 1268	0.092 U	0.091 U	0.09 U	0.07 U	0.094 U	0.095 U	0.089 U	0.089 U
Total PCBs	0.092 U	0.091 U	0.09 U	0.07 U	0.094 U	0.095 U	0.089 U	0.089 U
SW-846 8100 Modified								
TPH	330	340	21	51.7	12	22	180	18
SW-846 8151A								
2,4-D	30 U	30 U	30 U	0.059 U	31 U	150 U	150 U	28 U
2,4-DB	30 U	30 U	30 U	0.059 U	31 U	150 U	150 U	28 U
2,4,5-TP (SILVEX)	3 U	3 U	3 U	0.012 U	3.1 U	15 U	15 U	2.8 U
2,4,5-T	3 U	3 U	3 U	0.012 U	3.1 U	15 U	15 U	2.8 U
DALAPON	74 U	74 U	75 U	0.057 U	78 U	380 U	380 U	70 U
DICAMBA	3 U	3 U	3 U	0.012 U	3.1 U	15 U	15 U	2.8 U
DICHLOROPROP	30 U	30 U	30 U	0.059 U	31 U	150 U	150 U	28 U
DINOSEB	15 U	15 U	15 U	0.059 U	16 U	76 U	75 U	14 U
MCPA	3,000 U	3,000 U	3,000 U	2.91 U	3100 U	15000 U	15000 U	2800 U
MCPP	3,000 U	3,000 U	3,000 U	2.94 J	3100 U	15000 U	15000 U	2800 U
SW-846 8260C								
ACETONE	0.049 U	0.1 U	0.089 U	0.168	0.076 U	0.069 U	0.12 U	0.083 U
TERT-AMYL METHYL ETHER	0.00049 U	0.001 U	0.00089 U	0.0022 U	0.00076 U	0.00069 U	0.0012 U	0.00083 U
BENZENE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
BROMOBENZENE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
BROMOCHLOROMETHANE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
BROMODICHLOROMETHANE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
BROMOFORM	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
BROMOMETHANE	0.0049 U	0.01 U	0.0089 U	0.0045 U	0.0076 U	0.0069 U	0.012 U	0.0083 U
2-BUTANONE (MEK)	0.02 U	0.042 U	0.036 U	0.0266	0.03 U	0.028 U	0.05 U	0.033 U
N-BUTYLBENZENE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
SEC-BUTYLBENZENE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
TERT-BUTYLBENZENE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
TERT-BUTYLETHYL ETHER	0.00049 U	0.001 U	0.00089 U	0.0022 U	0.00076 U	0.00069 U	0.0012 U	0.00083 U
CARBON DISULFIDE	0.0029 U	0.0063 U	0.0054 U	0.0022 U	0.0045 U	0.0042 U	0.0074 U	0.005 U
CARBON TETRACHLORIDE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
CHLOROBENZENE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
CHLORODIBROMOMETHANE	0.00049 U	0.001 U	0.00089 U	0.0009 U	0.00076 U	0.00069 U	0.0012 U	0.00083 U
CHLOROETHANE	0.0049 U	0.01 U	0.0089 U	0.0045 U	0.0076 U	0.0069 U	0.012 U	0.0083 U
CHLOROFORM	0.002 U	0.0042 U	0.0036 U	0.0022 U	0.003 U	0.0028 U	0.005 U	0.0033 U
CHLOROMETHANE	0.0049 U	0.01 U	0.0089 U	0.0045 U	0.0076 U	0.0069 U	0.012 U	0.0083 U
2-CHLOROTOLUENE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
4-CHLOROTOLUENE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
1,2-DIBROMO-3-CHLOROPROPANE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
1,2-DIBROMOETHANE (EDB)	0.00049 U	0.001 U	0.00089 U	0.0022 U	0.00076 U	0.00069 U	0.0012 U	0.00083 U
DIBROMOMETHANE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
1,2-DICHLOROBENZENE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
1,3-DICHLOROBENZENE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
1,4-DICHLOROBENZENE	0.00098 U	0.0021 U	0.0018 U	0.0449 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
DICHLORODIFLUOROMETHANE	0.0049 U	0.01 U	0.0089 U	0.0045 U	0.0076 U	0.0069 U	0.012 U	0.0083 U
1,1-DICHLOROETHANE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
1,2-DICHLOROETHANE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
1,1-DICHLOROETHYLENE	0.002 U	0.0042 U	0.0036 U	0.0022 U	0.003 U	0.0028 U	0.005 U	0.0033 U
CIS-1,2-DICHLOROETHYLENE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
TRANS-1,2-DICHLOROETHYLENE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
1,2-DICHLOROPROPANE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
1,3-DICHLOROPROPANE	0.00049 U	0.001 U	0.00089 U	0.0022 U	0.00076 U	0.00069 U	0.0012 U	0.00083 U
2,2-DICHLOROPROPANE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U
1,1-DICHLOROPROPENE	0.00098 U	0.0021 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0025 U	0.0017 U

SAMPLE LOCATION	B28	MP27	MP28	MP29	MP30	MP31	MP33	MP35
SAMPLE DATE	11/13/2018	11/05/2018	11/05/2018	11/05/2018	11/06/2018	11/06/2018	11/01/2018	11/06/2018
LAB NUMBER	18K0931-01	18K0278-02	18K0278-03	18K0278-04	18K0278-05	18K0278-06	18K0278-01	18K0278-07
PID READING (ppmV)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SM 2540G								
% SOLIDS	87.7	89.1	86.3	92.6	82	81.6	78.6	83.4
SM21-22 2510B Modified								
SPECIFIC CONDUCTANCE	6	2.2	2.7	2.6	3.8	3.3	3.4	2.8
SW-846 1030								
IGNITABILITY	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
SW-846 6010D								
ANTIMONY	**1.9** U	**1.9** U	**1.9** U	**1.8** U	**2** U	**2** U	**2.1** U	**2** U
ARSENIC	14	7.3	3.6	5	9.3	3.2	5	5.9
BARIUM	46	16	21	19	19	17	16	36
BERYLLIUM	0.29	0.19 U	0.19 U	0.18 U	0.27	0.2 U	0.21 U	***0.41***
CADMIUM	0.37	0.26	0.19 U	0.2	0.34	0.2 U	0.21 U	0.26
CHROMIUM	13	7.4	7	11	11	6.9	8.2	16
LEAD	26	5.2	6	3.6	7.4	13	7.3	10
NICKEL	13	4.4	4	6.1	5.8	5.4	4.7	12
SELENIUM	**3.8** U	**3.7** U	**3.8** U	**3.6** U	**4.1** U	**4.1** U	**4.2** U	**3.9** U
SILVER	0.38 U	0.37 U	0.38 U	0.36 U	0.41 U	0.41 U	0.42 U	0.39 U
THALLIUM	1.9 U	1.9 U	1.9 U	1.8 U	2 U	2 U	2.1 U	2 U
VANADIUM	16	8.9	9.9	13	15	7.8	9.4	21
ZINC	14	9.5	7.8	12	14	57	9.1	22
SW-846 7471B								
MERCURY	0.028 U	0.029 U	0.029 U	0.026 U	0.03 U	0.031 U	0.03 U	0.03 U
SW-846 8081B								
ALACHOR	0.021 U	0.022 U	0.022 U	0.021 U	0.024 U	0.022 U	0.24 U	0.022 U
ALDRIN	0.0053 U	0.0054 U	0.0055 U	0.0052 U	0.0059 U	0.0056 U	0.061 U	0.0055 U
ALPHA-BHC	0.0053 U	0.0054 U	0.0055 U	0.0052 U	0.0059 U	0.0056 U	0.061 U	0.0055 U
BETA-BHC	0.0053 U	0.0054 U	0.0055 U	0.0052 U	0.0059 U	0.0056 U	0.061 U	0.0055 U
DELTA-BHC	0.0053 U	0.0054 U	0.0055 U	0.0052 U	0.0059 U	0.0056 U	0.061 U	0.0055 U
GAMMA-BHC (LINDANE)	0.0021 U	0.0022 U	0.0022 U	0.0021 U	0.0024 U	0.0022 U	**0.024** U	0.0022 U
CHLORDANE	0.021 U	0.022 U	0.022 U	0.021 U	0.024 U	0.022 U	0.24 U	0.022 U
4,4'-DDD	0.0043 U	0.0043 U	0.0044 U	0.0042 U	0.0047 U	0.0045 U	0.048 U	0.0044 U
4,4'-DDE	0.0043 U	0.0043 U	0.0044 U	0.0042 U	0.0047 U	0.0045 U	0.048 U	0.0044 U
4,4'-DDT	0.0078	0.0043 U	0.0044 U	0.0042 U	0.0047 U	0.0045 U	0.048 U	0.0044 U
DIELDRIN	0.0043 U	0.0043 U	0.0044 U	0.0042 U	0.0047 U	0.0045 U	0.048 U	0.0044 U
ENDOSULFAN I	0.0053 U	0.0054 U	0.0055 U	0.0052 U	0.0059 U	0.0056 U	0.061 U	0.0055 U
ENDOSULFAN II	0.0085 U	0.0086 U	0.0087 U	0.0084 U	0.0095 U	0.009 U	0.097 U	0.0089 U
ENDOSULFAN SULFATE	0.0085 U	0.0086 U	0.0087 U	0.0084 U	0.0095 U	0.009 U	0.097 U	0.0089 U
ENDRIN	0.0085 U	0.0086 U	0.0087 U	0.0084 U	0.0095 U	0.009 U	0.097 U	0.0089 U
ENDRIN ALDEHYDE	0.0085 U	0.0086 U	0.0087 U	0.0084 U	0.0095 U	0.009 U	0.097 U	0.0089 U
ENDRIN KETONE	0.0085 U	0.0086 U	0.0087 U	0.0084 U	0.0095 U	0.009 U	0.097 U	0.0089 U
HEPTACHLOR	0.0053 U	0.0054 U	0.0055 U	0.0052 U	0.0059 U	0.0056 U	0.061 U	0.0055 U
HEPTACHLOR EPOXIDE	0.0053 U	0.0054 U	0.0055 U	0.0052 U	0.0059 U	0.0056 U	0.061 U	0.0055 U
HEXACHLOROBENZENE	0.0064 U	0.0065 U	0.0066 U	0.0063 U	0.0071 U	0.0067 U	0.073 U	0.0067 U
METHOXYCHLOR	0.053 U	0.054 U	0.055 U	0.052 U	0.059 U	0.056 U	0.61 U	0.055 U
TOXAPHENE	0.11 U	0.11 U	0.11 U	0.1 U	0.12 U	0.11 U	1.2 U	0.11 U
SW-846 8082A								
PCB 1016	0.085 U	0.086 U	0.087 U	0.084 U	0.095 U	0.09 U	0.097 U	0.089 U
PCB 1221	0.085 U	0.086 U	0.087 U	0.084 U	0.095 U	0.09 U	0.097 U	0.089 U
PCB 1232	0.085 U	0.086 U	0.087 U	0.084 U	0.095 U	0.09 U	0.097 U	0.089 U
PCB 1242	0.085 U	0.086 U	0.087 U	0.084 U	0.095 U	0.09 U	0.097 U	0.089 U
PCB 1248	0.085 U	0.086 U	0.087 U	0.084 U	0.095 U	0.09 U	0.097 U	0.089 U
PCB 1254	0.085 U	0.086 U	0.087 U	0.084 U	0.095 U	0.09 U	0.097 U	0.089 U
PCB 1260	0.085 U	0.086 U	0.087 U	0.084 U	0.095 U	0.09 U	0.097 U	0.089 U
PCB 1262	0.085 U	0.086 U	0.087 U	0.084 U	0.095 U	0.09 U	0.097 U	0.089 U
PCB 1268	0.085 U	0.086 U	0.087 U	0.084 U	0.095 U	0.09 U	0.097 U	0.089 U
Total PCBs	0.085 U	0.086 U	0.087 U	0.084 U	0.095 U	0.09 U	0.097 U	0.089 U
SW-846 8100 Modified								
TPH	61	20	32	12	26	18	360	21
SW-846 8151A								
2,4-D	29 U	28 U	29 U	27 U	30 U	30 U	31 U	30 U
2,4-DB	29 U	28 U	29 U	27 U	30 U	30 U	31 U	30 U
2,4,5-TP (SILVEX)	2.9 U	2.8 U	2.9 U	2.7 U	3 U	3 U	3.1 U	3 U
2,4,5-T	2.9 U	2.8 U	2.9 U	2.7 U	3 U	3 U	3.1 U	3 U
DALAPON	71 U	70 U	72 U	67 U	75 U	76 U	78 U	75 U
DICAMBA	2.9 U	2.8 U	2.9 U	2.7 U	3 U	3 U	3.1 U	3 U
DICHLOROPROP	29 U	28 U	29 U	27 U	30 U	30 U	31 U	30 U
DINOSEB	14 U	14 U	14 U	13 U	15 U	15 U	16 U	15 U
MCPA	2900 U	2,800 U	2,900 U	2,700 U	3,000 U	3,000 U	3,100 U	3,000 U
MCPP	2900 U	2,800 U	2,900 U	2,700 U	3,000 U	3,000 U	3,100 U	3,000 U
SW-846 8260C								
ACETONE	0.056 U	0.08 U	0.074 U	0.072 U	0.088 U	0.095 U	0.049 U	0.071 U
TERT-AMYL METHYL ETHER	0.00056 U	0.0008 U	0.00074 U	0.00072 U	0.00088 U	0.00095 U	0.00049 U	0.00071 U
BENZENE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
BROMOBENZENE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
BROMOCHLOROMETHANE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
BROMODICHLOROMETHANE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
BROMOFORM	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
BROMOMETHANE	0.0056 U	0.008 U	0.0074 U	0.0072 U	0.0088 U	0.0095 U	0.0049 U	0.0071 U
2-BUTANONE (MEK)	0.022 U	0.032 U	0.029 U	0.029 U	0.035 U	0.038 U	0.02 U	0.028 U
N-BUTYLBENZENE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
SEC-BUTYLBENZENE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
TERT-BUTYLBENZENE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
TERT-BUTYLETHYL ETHER	0.00056 U	0.0008 U	0.00074 U	0.00072 U	0.00088 U	0.00095 U	0.00049 U	0.00071 U
CARBON DISULFIDE	0.0033 U	0.0048 U	0.0044 U	0.0043 U	0.0053 U	0.0057 U	0.0029 U	0.0043 U
CARBON TETRACHLORIDE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
CHLOROBENZENE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
CHLORODIBROMOMETHANE	0.00056 U	0.0008 U	0.00074 U	0.00072 U	0.00088 U	0.00095 U	0.00049 U	0.00071 U
CHLOROETHANE	0.0056 U	0.008 U	0.0074 U	0.0072 U	0.0088 U	0.0095 U	0.0049 U	0.0071 U
CHLOROFORM	0.0022 U	0.0032 U	0.0029 U	0.0029 U	0.0035 U	0.0038 U	0.002 U	0.0028 U
CHLOROMETHANE	0.0056 U	0.008 U	0.0074 U	0.0072 U	0.0088 U	0.0095 U	0.0049 U	0.0071 U
2-CHLOROTOLUENE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
4-CHLOROTOLUENE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
1,2-DIBROMO-3-CHLOROPROPANE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
1,2-DIBROMOETHANE (EDB)	0.00056 U	0.0008 U	0.00074 U	0.00072 U	0.00088 U	0.00095 U	0.00049 U	0.00071 U
DIBROMOMETHANE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
1,2-DICHLOROBENZENE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
1,3-DICHLOROBENZENE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
1,4-DICHLOROBENZENE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
DICHLORODIFLUOROMETHANE	0.0056 U	0.008 U	0.0074 U	0.0072 U	0.0088 U	0.0095 U	0.0049 U	0.0071 U
1,1-DICHLOROETHANE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
1,2-DICHLOROETHANE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
1,1-DICHLOROETHYLENE	0.0022 U	0.0032 U	0.0029 U	0.0029 U	0.0035 U	0.0038 U	0.002 U	0.0028 U
CIS-1,2-DICHLOROETHYLENE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
TRANS-1,2-DICHLOROETHYLENE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
1,2-DICHLOROPROPANE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
1,3-DICHLOROPROPANE	0.00056 U	0.0008 U	0.00074 U	0.00072 U	0.00088 U	0.00095 U	0.00049 U	0.00071 U
2,2-DICHLOROPROPANE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U
1,1-DICHLOROPROPENE	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U

SAMPLE LOCATION	MP37	MP38	MP39	SB-37	SB-38	SB-39	SB-50
SAMPLE DATE	10/26/2018	10/26/2018	10/26/2018	10/25/2018	10/25/2018	10/25/2018	10/25/2018
LAB NUMBER	18J1553-06	18J1553-07	18J1553-08	18J1553-03	18J1553-04	18J1553-05	18J1553-02
PID READING (ppmV)	0.0	0.0	0.0	2.9	0.2	3.1	1.0
SM 2540G							
% SOLIDS	91.3	91.5	90.6	90.7	86.2	90.9	79.6
SM21-22 2510B Modified							
SPECIFIC CONDUCTANCE	3	3.5	2.4	2 U	4.4	2.8	3.8
SW-846 1030							
IGNITABILITY	Absent	Absent	Absent	Absent	Absent	Absent	Absent
SW-846 6010D							
ANTIMONY	**1.8** U	**1.8** U	**1.8** U	**1.8** U	**1.9** U	**1.8** U	**2.1** U
ARSENIC	5.6	11	7.3	14	3.9	11	7.2
BARIUM	26	***78***	***120***	***52***	26	***92***	36
BERYLLIUM	0.26	***0.49***	***0.6***	***0.48***	***0.43***	***0.48***	***0.42***
CADMIUM	0.18	0.35	0.27	0.43	0.19 U	0.38	0.26
CHROMIUM	8.6	21	20	17	12	21	14
LEAD	19	12	8.7	14	13	12	9.3
NICKEL	7.2	18	16	13	8.1	16	8.2
SELENIUM	**3.6** U	**3.6** U	**3.7** U	**3.7** U	**3.8** U	**3.7** U	**4.2** U
SILVER	0.36 U	0.36 U	0.37 U	0.37 U	0.38 U	0.37 U	0.42 U
THALLIUM	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	2.1 U
VANADIUM	11	23	22	21	15	29	15
ZINC	15	43	33	29	16	40	21
SW-846 7471B							
MERCURY	0.027 U	0.027 U	0.027 U	0.027 U	0.028 U	0.027 U	0.031 U
SW-846 8081B							
ALACHOR	0.021 U	0.022 U	0.022 U	0.021 U	0.023 U	0.022 U	0.025 U
ALDRIN	0.0052 U	0.0054 U	0.0055 U	0.0052 U	0.0056 U	0.0054 U	0.0062 U
ALPHA-BHC	0.0052 U	0.0054 U	0.0055 U	0.0052 U	0.0056 U	0.0054 U	0.0062 U
BETA-BHC	0.0052 U	0.0054 U	0.0055 U	0.0052 U	0.0056 U	0.0054 U	0.0062 U
DELTA-BHC	0.0052 U	0.0054 U	0.0055 U	0.0052 U	0.0056 U	0.0054 U	0.0062 U
GAMMA-BHC (LINDANE)	0.0021 U	0.0022 U	0.0022 U	0.0021 U	0.0023 U	0.0022 U	0.0025 U
CHLORDANE	0.021 U	0.022 U	0.022 U	0.021 U	0.023 U	0.022 U	0.025 U
4,4'-DDD	0.0042 U	0.0043 U	0.0044 U	0.0042 U	0.0045 U	0.0044 U	0.0049 U
4,4'-DDE	0.0042 U	0.0043 U	0.0044 U	0.0042 U	0.0045 U	0.0044 U	0.0049 U
4,4'-DDT	0.0042 U	0.0043 U	0.0044 U	0.0098	0.0045 U	0.0089	0.0049 U
DIELDRIN	0.0042 U	0.0043 U	0.0044 U	0.0042 U	0.0045 U	0.0044 U	0.0049 U
ENDOSULFAN I	0.0052 U	0.0054 U	0.0055 U	0.0052 U	0.0056 U	0.0054 U	0.0062 U
ENDOSULFAN II	0.0083 U	0.0087 U	0.0087 U	0.0083 U	0.009 U	0.0087 U	0.0099 U
ENDOSULFAN SULFATE	0.0083 U	0.0087 U	0.0087 U	0.0083 U	0.009 U	0.0087 U	0.0099 U
ENDRIN	0.0083 U	0.0087 U	0.0087 U	0.0083 U	0.009 U	0.0087 U	0.0099 U
ENDRIN ALDEHYDE	0.0083 U	0.0087 U	0.0087 U	0.0083 U	0.009 U	0.0087 U	0.0099 U
ENDRIN KETONE	0.0083 U	0.0087 U	0.0087 U	0.0083 U	0.009 U	0.0087 U	0.0099 U
HEPTACHLOR	0.0052 U	0.0054 U	0.0055 U	0.0052 U	0.0056 U	0.0054 U	0.0062 U
HEPTACHLOR EPOXIDE	0.0052 U	0.0054 U	0.0055 U	0.0052 U	0.0056 U	0.0054 U	0.0062 U
HEXACHLOROBENZENE	0.0063 U	0.0065 U	0.0066 U	0.0062 U	0.0068 U	0.0065 U	0.0074 U
METHOXYCHLOR	0.052 U	0.054 U	0.055 U	0.052 U	0.056 U	0.054 U	0.062 U
TOXAPHENE	0.1 U	0.11 U	0.11 U	0.1 U	0.11 U	0.11 U	0.12 U
SW-846 8082A							
PCB 1016	0.081 U	0.086 U	0.082 U	0.081 U	0.089 U	0.085 U	0.1 U
PCB 1221	0.081 U	0.086 U	0.082 U	0.081 U	0.089 U	0.085 U	0.1 U
PCB 1232	0.081 U	0.086 U	0.082 U	0.081 U	0.089 U	0.085 U	0.1 U
PCB 1242	0.081 U	0.086 U	0.082 U	0.081 U	0.089 U	0.085 U	0.1 U
PCB 1248	0.081 U	0.086 U	0.082 U	0.081 U	0.089 U	0.085 U	0.1 U
PCB 1254	0.081 U	0.086 U	0.082 U	0.081 U	0.089 U	0.085 U	0.1 U
PCB 1260	0.081 U	0.086 U	0.082 U	0.081 U	0.089 U	0.085 U	0.1 U
PCB 1262	0.081 U	0.086 U	0.082 U	0.081 U	0.089 U	0.085 U	0.1 U
PCB 1268	0.081 U	0.086 U	0.082 U	0.081 U	0.089 U	0.085 U	0.1 U
Total PCBs	0.081 U	0.086 U	0.082 U	0.081 U	0.089 U	0.085 U	0.1 U
SW-846 8100 Modified							
TPH	26	18	31	32	12	100	12
SW-846 8151A							
2,4-D	27 U	27 U	27 U	27 U	29 U	27 U	31 U
2,4-DB	27 U	27 U	27 U	27 U	29 U	27 U	31 U
2,4,5-TP (SILVEX)	2.7 U	2.7 U	2.7 U	2.7 U	2.9 U	2.7 U	3.1 U
2,4,5-T	2.7 U	2.7 U	2.7 U	2.7 U	2.9 U	2.7 U	3.1 U
DALAPON	68 U	68 U	69 U	69 U	72 U	68 U	78 U
DICAMBA	2.7 U	2.7 U	2.7 U	2.7 U	2.9 U	2.7 U	3.1 U
DICHLOROPROP	27 U	27 U	27 U	27 U	29 U	27 U	31 U
DINOSEB	14 U	14 U	14 U	14 U	14 U	14 U	16 U
MCPA	2,700 U	2,700 U	2,700 U	2,700 U	2,900 U	2,700 U	3,100 U
MCPP	2,700 U	2,700 U	2,700 U	2,700 U	2,900 U	2,700 U	3,100 U
SW-846 8260C							
ACETONE	0.069 U	0.073 U	0.077 U	0.082 U	0.091 U	0.086 U	0.085 U
TERT-AMYL METHYL ETHER	0.00069 U	0.00073 U	0.00077 U	0.00082 U	0.00091 U	0.00086 U	0.00085 U
BENZENE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
BROMOBENZENE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
BROMOCHLOROMETHANE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
BROMODICHLOROMETHANE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
BROMOFORM	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
BROMOMETHANE	0.0069 U	0.0073 U	0.0077 U	0.0082 U	0.0091 U	0.0086 U	0.0085 U
2-BUTANONE (MEK)	0.028 U	0.029 U	0.031 U	0.033 U	0.036 U	0.034 U	0.034 U
N-BUTYLBENZENE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
SEC-BUTYLBENZENE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
TERT-BUTYLBENZENE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
TERT-BUTYLETHYL ETHER	0.00069 U	0.00073 U	0.00077 U	0.00082 U	0.00091 U	0.00086 U	0.00085 U
CARBON DISULFIDE	0.0042 U	0.0044 U	0.0046 U	0.0049 U	0.0054 U	0.0052 U	0.0051 U
CARBON TETRACHLORIDE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
CHLOROBENZENE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
CHLORODIBROMOMETHANE	0.00069 U	0.00073 U	0.00077 U	0.00082 U	0.00091 U	0.00086 U	0.00085 U
CHLOROETHANE	0.0069 U	0.0073 U	0.0077 U	0.0082 U	0.0091 U	0.0086 U	0.0085 U
CHLOROFORM	0.0028 U	0.0029 U	0.0031 U	0.0033 U	0.0036 U	0.0034 U	0.0034 U
CHLOROMETHANE	0.0069 U	0.0073 U	0.0077 U	0.0082 U	0.0091 U	0.0086 U	0.0085 U
2-CHLOROTOLUENE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
4-CHLOROTOLUENE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
1,2-DIBROMO-3-CHLOROPROPANE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
1,2-DIBROMOETHANE (EDB)	0.00069 U	0.00073 U	0.00077 U	0.00082 U	0.00091 U	0.00086 U	0.00085 U
DIBROMOMETHANE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
1,2-DICHLOROBENZENE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
1,3-DICHLOROBENZENE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
1,4-DICHLOROBENZENE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
DICHLORODIFLUOROMETHANE	0.0069 U	0.0073 U	0.0077 U	0.0082 U	0.0091 U	0.0086 U	0.0085 U
1,1-DICHLOROETHANE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
1,2-DICHLOROETHANE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
1,1-DICHLOROETHYLENE	0.0028 U	0.0029 U	0.0031 U	0.0033 U	0.0036 U	0.0034 U	0.0034 U
CIS-1,2-DICHLOROETHYLENE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
TRANS-1,2-DICHLOROETHYLENE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
1,2-DICHLOROPROPANE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
1,3-DICHLOROPROPANE	0.00069 U	0.00073 U	0.00077 U	0.00082 U	0.00091 U	0.00086 U	0.00085 U
2,2-DICHLOROPROPANE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U
1,1-DICHLOROPROPENE	0.0014 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U

SAMPLE LOCATION	SB-51	SB40	SB41	MW/SB-42	SB48	MP-40
SAMPLE DATE	10/24/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	10/02/2018
LAB NUMBER	18J1553-01	18K1190-02	18K1190-03	18K1190-04	18K1190-01	18J0192-01
PID READING (ppmV)	0.0	0.0	0.0	0.0	0.0	0.0
SM 2540G						
% SOLIDS	84.6	82.6	79.9	80.6	77.3	83.3
SM21-22 2510B Modified						
SPECIFIC CONDUCTANCE	2.9	4.3	3.6	8.1	2 U	5.7
SW-846 1030						
IGNITABILITY	Absent	Absent	Absent	Absent	Absent	Absent
SW-846 6010D						
ANTIMONY	**2** U	**2** U	**2.1** U	**2.1** U	**2.2** U	**2** U
ARSENIC	18	12	9.2	14	4.2	3.4
BARIUM	***61***	23	19	***57***	32	35
BERYLLIUM	***0.43***	0.37	0.35	0.36	***0.42***	***0.45***
CADMIUM	0.57	0.45	0.35	0.68	0.22 U	0.2 U
CHROMIUM	18	11	10	20	13	16
LEAD	13	8.9	8.9	***180***	9.4	5.1
NICKEL	15	8.1	7.8	15	8.7	11
SELENIUM	**4** U	**4** U	**4.2** U	**4.1** U	**4.3** U	**3.9** U
SILVER	0.4 U	0.4 U	0.42 U	0.41 U	0.43 U	0.39 U
THALLIUM	2 U	2 U	2.1 U	2.1 U	2.2 U	2 U
VANADIUM	26	15	13	28	13	22
ZINC	26	18	14	50	17	22
SW-846 7471B						
MERCURY	0.03 U	0.03 U	0.033 U	0.038	0.032 U	0.029 U
SW-846 8081B						
ALACHOR	0.023 U	0.024 U	0.025 U	0.48 U	0.025 U	0.24 U
ALDRIN	0.0057 U	0.0059 U	0.0062 U	0.12 U	0.0062 U	0.059 U
ALPHA-BHC	0.0057 U	0.0059 U	0.0062 U	0.12 U	0.0062 U	0.059 U
BETA-BHC	0.0057 U	0.0059 U	0.0062 U	0.12 U	0.0062 U	0.059 U
DELTA-BHC	0.0057 U	0.0059 U	0.0062 U	0.12 U	0.0062 U	0.059 U
GAMMA-BHC (LINDANE)	0.0023 U	0.0024 U	0.0025 U	0.048 U	0.0025 U	0.024 U
CHLORDANE	0.023 U	0.024 U	0.025 U	0.48 U	0.025 U	0.24 U
4,4'-DDD	0.0046 U	0.0047 U	0.005 U	0.095 U	0.0049 U	0.048 U
4,4'-DDE	0.0046 U	0.0047 U	0.005 U	0.095 U	0.0049 U	0.048 U
4,4'-DDT	0.0088	0.0047 U	0.005 U	0.34	0.0049 U	0.048 U
DIELDRIN	0.0046 U	0.0047 U	0.005 U	0.095 U	0.0049 U	0.048 U
ENDOSULFAN I	0.0057 U	0.0059 U	0.0062 U	0.12 U	0.0062 U	0.059 U
ENDOSULFAN II	0.0092 U	0.0095 U	0.0099 U	0.19 U	0.0099 U	0.095 U
ENDOSULFAN SULFATE	0.0092 U	0.0095 U	0.0099 U	0.19 U	0.0099 U	0.095 U
ENDRIN	0.0092 U	0.0095 U	0.0099 U	0.19 U	0.0099 U	0.095 U
ENDRIN ALDEHYDE	0.0092 U	0.0095 U	0.0099 U	0.19 U	0.0099 U	0.095 U
ENDRIN KETONE	0.0092 U	0.0095 U	0.0099 U	0.19 U	0.0099 U	0.095 U
HEPTACHLOR	0.0057 U	0.0059 U	0.0062 U	0.12 U	0.0062 U	0.059 U
HEPTACHLOR EPOXIDE	0.0057 U	0.0059 U	0.0062 U	0.12 U	0.0062 U	0.059 U
HEXACHLOROBENZENE	0.0069 U	0.0071 U	0.0074 U	0.14 U	0.0074 U	0.071 U
METHOXYCHLOR	0.057 U	0.059 U	0.062 U	1.2 U	0.062 U	0.59 U
TOXAPHENE	0.11 U	0.12 U	0.12 U	2.4 U	0.12 U	1.2 U
SW-846 8082A						
PCB 1016	0.09 U	0.092 U	0.098 U	0.096 U	0.1 U	0.095 U
PCB 1221	0.09 U	0.092 U	0.098 U	0.096 U	0.1 U	0.095 U
PCB 1232	0.09 U	0.092 U	0.098 U	0.096 U	0.1 U	0.095 U
PCB 1242	0.09 U	0.092 U	0.098 U	0.096 U	0.1 U	0.095 U
PCB 1248	0.09 U	0.092 U	0.098 U	0.096 U	0.1 U	0.095 U
PCB 1254	0.09 U	0.092 U	0.098 U	0.23	0.1 U	0.095 U
PCB 1260	0.09 U	0.092 U	0.098 U	0.18	0.1 U	0.095 U
PCB 1262	0.09 U	0.092 U	0.098 U	0.096 U	0.1 U	0.095 U
PCB 1268	0.09 U	0.092 U	0.098 U	0.096 U	0.1 U	0.095 U
Total PCBs	0.09 U	0.092 U	0.098 U	***0.41***	0.1 U	0.095 U
SW-846 8100 Modified						
TPH	24	29	47	**<u>1000</u>**	29	10
SW-846 8151A						
2,4-D	29 U	150 U	160 U	310 U	160 U	30 U
2,4-DB	29 U	150 U	160 U	310 U	160 U	30 U
2,4,5-TP (SILVEX)	2.9 U	15 U	16 U	31 U	16 U	3 U
2,4,5-T	2.9 U	15 U	16 U	31 U	16 U	3 U
DALAPON	73 U	380 U	390 U	760 U	400 U	75 U
DICAMBA	2.9 U	15 U	16 U	31 U	16 U	3 U
DICHLOROPROP	29 U	150 U	160 U	310 U	160 U	30 U
DINOSEB	15 U	76 U	78 U	150 U	80 U	15 U
MCPA	2,900 U	15000 U	16000 U	31000 U	16000 U	3000 U
MCPP	2,900 U	15000 U	16000 U	31000 U	16000 U	3000 U
SW-846 8260C						
ACETONE	2.1 U	0.061 U	0.078 U	0.35	0.065 U	0.062 U
TERT-AMYL METHYL ETHER	0.084 U	0.00061 U	0.00078 U	0.00074 U	0.00065 U	0.00062 U
BENZENE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
BROMOBENZENE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
BROMOCHLOROMETHANE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
BROMODICHLOROMETHANE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
BROMOFORM	0.084 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
BROMOMETHANE	0.084 U	0.0061 U	0.0078 U	0.0074 U	0.0065 U	0.0062 U
2-BUTANONE (MEK)	0.84 U	0.024 U	0.031 U	0.03 U	0.026 U	0.025 U
N-BUTYLBENZENE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
SEC-BUTYLBENZENE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
TERT-BUTYLBENZENE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
TERT-BUTYLETHYL ETHER	0.042 U	0.00061 U	0.00078 U	0.00074 U	0.00065 U	0.00062 U
CARBON DISULFIDE	0.42 U	0.0036 U	0.0047 U	0.0045 U	0.0039 U	0.0037 U
CARBON TETRACHLORIDE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
CHLOROBENZENE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
CHLORODIBROMOMETHANE	**0.021** U	0.00061 U	0.00078 U	0.00074 U	0.00065 U	0.00062 U
CHLOROETHANE	0.084 U	0.0061 U	0.0078 U	0.0074 U	0.0065 U	0.0062 U
CHLOROFORM	0.084 U	0.0024 U	0.0031 U	0.003 U	0.0026 U	0.0025 U
CHLOROMETHANE	0.084 U	0.0061 U	0.0078 U	0.0074 U	0.0065 U	0.0062 U
2-CHLOROTOLUENE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
4-CHLOROTOLUENE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
1,2-DIBROMO-3-CHLOROPROPANE	0.17 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
1,2-DIBROMOETHANE (EDB)	0.021 U	0.00061 U	0.00078 U	0.00074 U	0.00065 U	0.00062 U
DIBROMOMETHANE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
1,2-DICHLOROBENZENE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
1,3-DICHLOROBENZENE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
1,4-DICHLOROBENZENE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
DICHLORODIFLUOROMETHANE	0.084 U	0.0061 U	0.0078 U	0.0074 U	0.0065 U	0.0062 U
1,1-DICHLOROETHANE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
1,2-DICHLOROETHANE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
1,1-DICHLOROETHYLENE	0.042 U	0.0024 U	0.0031 U	0.003 U	0.0026 U	0.0025 U
CIS-1,2-DICHLOROETHYLENE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
TRANS-1,2-DICHLOROETHYLENE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
1,2-DICHLOROPROPANE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
1,3-DICHLOROPROPANE	0.021 U	0.00061 U	0.00078 U	0.00074 U	0.00065 U	0.00062 U
2,2-DICHLOROPROPANE	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
1,1-DICHLOROPROPENE	0.084 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U

Table 3
Summary of MBTA ROW Sudbury Soil
Sudbury to Hudson Transmission Project
Sudbury, Massachusetts

SAMPLE LOCATION	RCS-1	RCS-2	Similar Soils for RCS-1	Concentrations in "Natural Soil" at RCS-1 Receiving	MA Lined Landfill	MA Unlined Landfill	Units	MP32	MP34	SB49	MP36
SAMPLE DATE								10/11/2018	10/11/2018	10/11/2018	10/18/2018
LAB NUMBER								18J0746-01	18J0746-02	18J0746-03	1810642-01
PID READING (ppmV)								0.0	0.0	0.0	0.0
CIS-1,3-DICHLOROPROPENE	0.01	0.1	NE	NE	NE	NE	mg/Kg	0.00049 U	0.001 U	0.00089 U	0.0022 U
TRANS-1,3-DICHLOROPROPENE	0.01	0.1	NE	NE	NE	NE	mg/Kg	0.00049 U	0.001 U	0.00089 U	0.0022 U
DIETHYL ETHER	100	1000	NE	NE	NE	NE	mg/Kg	0.0049 U	0.01 U	0.0089 U	0.0022 U
DIISOPROPYL ETHER	100	1000	NE	NE	NE	NE	mg/Kg	0.00049 U	0.001 U	0.00089 U	0.0022 U
1,4-DIOXANE	0.2	6	NE	NE	NE	NE	mg/Kg	0.049 U	0.1 U	0.089 U	0.0449 U
ETHYLBENZENE	40	1000	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
HEXACHLOROBUTADIENE	30	100	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
2-HEXANONE	100	1000	NE	NE	NE	NE	mg/Kg	0.0098 U	0.021 U	0.018 U	0.0045 U
ISOPROPYLBENZENE	1000	10000	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
P-ISOPROPYLTOLUENE	100	1000	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
METHYL TERT-BUTYL ETHER (MTBE)	0.1	100	NE	NE	NE	NE	mg/Kg	0.002 U	0.0042 U	0.0036 U	0.0022 U
METHYLENE CHLORIDE	0.1	20	NE	NE	NE	NE	mg/Kg	0.0049 U	0.01 U	0.0089 U	0.0045 U
4-METHYL-2-PENTANONE (MIBK)	0.4	50	NE	NE	NE	NE	mg/Kg	0.0098 U	0.021 U	0.018 U	0.0045 U
NAPHTHALENE	4	20	NE	NE	NE	NE	mg/Kg	0.0049 U	0.01 U	0.0089 U	0.0022 U
N-PROPYLBENZENE	100	1000	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
STYRENE	3	4	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
1,1,1,2-TETRACHLOROETHANE	0.1	0.1	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
1,1,2,2-TETRACHLOROETHANE	0.005	0.02	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
TETRACHLOROETHYLENE	1	10	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
TETRAHYDROFURAN	500	5000	NE	NE	NE	NE	mg/Kg	0.0049 U	0.01 U	0.0089 U	0.0022 U
TOLUENE	30	1000	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
1,2,3-TRICHLOROBENZENE	NE	NE	NE	NE	NE	NE	mg/Kg	0.002 U	0.0042 U	0.0036 U	0.0022 U
1,2,4-TRICHLOROBENZENE	2	6	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
1,1,1-TRICHLOROETHANE	30	600	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
1,1,2-TRICHLOROETHANE	0.1	2	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
TRICHLOROETHYLENE	0.3	0.3	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
TRICHLOROFLUOROMETHANE	1000	10000	NE	NE	NE	NE	mg/Kg	0.0049 U	0.01 U	0.0089 U	0.0022 U
1,2,3-TRICHLOROPROPANE	100	1000	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
1,2,4-TRIMETHYLBENZENE	1000	10000	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
1,3,5-TRIMETHYLBENZENE	10	100	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
VINYL CHLORIDE	0.7	0.7	NE	NE	NE	NE	mg/Kg	0.0049 U	0.01 U	0.0089 U	0.0045 U
M/P-XYLENE	100	100	NE	NE	NE	NE	mg/Kg	0.002 U	0.0042 U	0.0036 U	0.0045 U
O-XYLENE	100	100	NE	NE	NE	NE	mg/Kg	0.00098 U	0.0021 U	0.0018 U	0.0022 U
SW-846 8270D				NE							
ACENAPHTHENE	4	3000	4	0.5	NE	NE	mg/Kg	0.2 U	***1.1***	0.2 U	0.411 U
ACENAPHTHYLENE	1	10	1	0.5	NE	NE	mg/Kg	0.2 U	0.2 U	0.2 U	0.411 U
ACETOPHENONE	1000	10000	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.824 U
ANILINE	1000	10000	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	2.06 U
ANTHRACENE	1000	3000	10	1	NE	NE	mg/Kg	0.2 U	***2.3***	0.2 U	0.411 U
BENZO(A)ANTHRACENE	7	40	7	2	NE	NE	mg/Kg	0.2 U	1.1	0.2 U	0.411 U
BENZO(A)PYRENE	2	7	2	2	NE	NE	mg/Kg	0.2 U	0.4	0.2 U	0.206 U
BENZO(B)FLUORANTHENE	7	40	7	2	NE	NE	mg/Kg	0.24	1	0.2 U	0.411 U
BENZO(G,H,I)PERYLENE	1000	3000	10	1	NE	NE	mg/Kg	0.2 U	0.2	0.2 U	0.411 U
BENZO(K)FLUORANTHENE	70	400	10	1	NE	NE	mg/Kg	0.2 U	0.36	0.2 U	0.411 U
BIS(2-CHLOROETHOXY)METHANE	500	5000	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
BIS(2-CHLOROETHYL)ETHER	0.7	0.7	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
BIS(2-CHLOROISOPROPYL)ETHER	0.7	0.7	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
BIS(2-ETHYLHEXYL)PHTHALATE	90	600	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
4-BROMOPHENYL PHENYL ETHER	100	1000	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
BUTYLBENZYLPHTHALATE	100	1000	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
4-CHLOROANILINE	1	3	NE	NE	NE	NE	mg/Kg	0.79 U	0.77 U	0.78 U	0.824 U
2-CHLORONAPHTHALENE	1000	10000	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
2-CHLOROPHENOL	0.7	100	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
CHRYSENE	70	400	20	2	NE	NE	mg/Kg	0.2 U	1.2	0.2 U	0.206 U
DIBENZ(A,H)ANTHRACENE	0.7	4	0.7	0.5	NE	NE	mg/Kg	0.2 U	0.2 U	0.2 U	0.206 U
DIBENZOFURAN	100	1000	NE	NE	NE	NE	mg/Kg	0.4 U	1.6	0.4 U	0.411 U
DI-N-BUTYLPHTHALATE	50	500	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
1,2-DICHLOROBENZENE	9	100	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
1,3-DICHLOROBENZENE	3	200	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
1,4-DICHLOROBENZENE	0.7	1	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
3,3'-DICHLOROBENZIDINE	3	20	NE	NE	NE	NE	mg/Kg	0.2 U	0.2 U	0.2 U	0.824 U
2,4-DICHLOROPHENOL	0.7	40	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
DIETHYLPHTHALATE	10	200	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
2,4-DIMETHYLPHENOL	0.7	100	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
DIMETHYLPHTHALATE	0.7	50	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
2,4-DINITROPHENOL	3	50	NE	NE	NE	NE	mg/Kg	0.79 U	0.77 U	0.78 U	2.06 U
2,4-DINITROTOLUENE	0.7	10	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
2,6-DINITROTOLUENE	100	1000	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
DI-N-OCTYLPHTHALATE	1000	10000	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	50	500	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
FLUORANTHENE	1000	3000	40	4	NE	NE	mg/Kg	0.26	***6.1***	0.2 U	0.411 U
FLUORENE	1000	3000	10	1	NE	NE	mg/Kg	0.2 U	0.65	0.2 U	0.411 U
HEXACHLOROBENZENE	0.7	0.8	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
HEXACHLOROBUTADIENE	30	100	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
HEXACHLOROETHANE	0.7	3	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
INDENO(1,2,3-CD)PYRENE	7	40	7	1	NE	NE	mg/Kg	0.2 U	0.24	0.2 U	0.411 U
ISOPHORONE	100	1000	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
2-METHYLNAPHTHALENE	0.7	80	0.7	0.5	NE	NE	mg/Kg	0.2 U	***0.67***	0.2 U	0.411 U
O-CRESOL	500	5000	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
M/P-CRESOL	500	5000	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.824 U
NAPHTHALENE	4	20	4	0.5	NE	NE	mg/Kg	0.2 U	***0.85***	0.2 U	0.411 U
NITROBENZENE	500	5000	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
2-NITROPHENOL	100	1000	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
4-NITROPHENOL	100	1000	NE	NE	NE	NE	mg/Kg	0.79 U	0.77 U	0.78 U	2.06 U
PENTACHLOROPHENOL	3	10	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	2.06 U
PHENANTHRENE	10	1000	10	3	NE	NE	mg/Kg	0.2 U	**10**	0.2 U	0.411 U
PHENOL	1	20	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
PYRENE	1000	3000	40	4	NE	NE	mg/Kg	0.22	***4.2***	0.2 U	0.411 U
PYRIDINE	500	5000	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	2.06 U
1,2,4-TRICHLOROBENZENE	2	6	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
2,4,5-TRICHLOROPHENOL	4	600	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
2,4,6-TRICHLOROPHENOL	0.7	20	NE	NE	NE	NE	mg/Kg	0.4 U	0.39 U	0.4 U	0.411 U
SW-846 9014											
REACTIVE CYANIDE	NE	NE	NE	NE	NE	NE	mg/Kg	4 U	4 U	3.9 U	2 U
SW-846 9030A											
REACTIVE SULFIDE	NE	NE	NE	NE	NE	NE	mg/Kg	20 U	20 U	20 U	2 U
SW-846 9045C											
PH	NE	NE	NE	NE	NE	NE	pH Units	6.4	6.6	5.9	5.64

SAMPLE LOCATION	MW/SB-33	SB34	MW/SB-35	SB36	B28	MP27	MP28	MP29	MP30	MP31	MP33	MP35	MP37
SAMPLE DATE	11/07/2018	11/07/2018	11/07/2018	11/07/2018	11/13/2018	11/05/2018	11/05/2018	11/05/2018	11/06/2018	11/06/2018	11/01/2018	11/06/2018	10/26/2018
LAB NUMBER	18K0569-01	18K0569-04	18K0569-03	18K0569-02	18K0931-01	18K0278-02	18K0278-03	18K0278-04	18K0278-05	18K0278-06	18K0278-01	18K0278-07	18J1553-06
PID READING (ppmV)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CIS-1,3-DICHLOROPROPENE	0.00076 U	0.00069 U	0.0012 U	0.00083 U	0.00056 U	0.0008 U	0.00074 U	0.00072 U	0.00088 U	0.00095 U	0.00049 U	0.00071 U	0.00069 U
TRANS-1,3-DICHLOROPROPENE	0.00076 U	0.00069 U	0.0012 U	0.00083 U	0.00056 U	0.0008 U	0.00074 U	0.00072 U	0.00088 U	0.00095 U	0.00049 U	0.00071 U	0.00069 U
DIETHYL ETHER	0.0076 U	0.0069 U	0.012 U	0.0083 U	0.0056 U	0.008 U	0.0074 U	0.0072 U	0.0088 U	0.0095 U	0.0049 U	0.0071 U	0.0069 U
DIISOPROPYL ETHER	0.00076 U	0.00069 U	0.0012 U	0.00083 U	0.00056 U	0.0008 U	0.00074 U	0.00072 U	0.00088 U	0.00095 U	0.00049 U	0.00071 U	0.00069 U
1,4-DIOXANE	0.076 U	0.028 U	0.05 U	0.083 U	0.022 U	0.08 U	0.074 U	0.072 U	0.088 U	0.095 U	0.049 U	0.071 U	0.069 U
ETHYLBENZENE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
HEXACHLOROBUTADIENE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
2-HEXANONE	0.015 U	0.014 U	0.025 U	0.017 U	0.011 U	0.016 U	0.015 U	0.014 U	0.018 U	0.019 U	0.0098 U	0.014 U	0.014 U
ISOPROPYLBENZENE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
P-ISOPROPYLTOLUENE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
METHYL TERT-BUTYL ETHER (MTBE)	0.003 U	0.0028 U	0.005 U	0.0033 U	0.0022 U	0.0032 U	0.0029 U	0.0029 U	0.0035 U	0.0038 U	0.002 U	0.0028 U	0.0028 U
METHYLENE CHLORIDE	0.0076 U	0.0069 U	0.012 U	0.0083 U	0.0056 U	0.008 U	0.0074 U	0.0072 U	0.0088 U	0.0095 U	0.0049 U	0.0071 U	0.0069 U
4-METHYL-2-PENTANONE (MIBK)	0.015 U	0.014 U	0.025 U	0.017 U	0.011 U	0.016 U	0.015 U	0.014 U	0.018 U	0.019 U	0.0098 U	0.014 U	0.014 U
NAPHTHALENE	0.0076 U	0.0069 U	0.012 U	0.0083 U	0.0056 U	0.0032 U	0.0029 U	0.0029 U	0.0035 U	0.0038 U	0.002 U	0.0028 U	0.0069 U
N-PROPYLBENZENE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
STYRENE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
1,1,1,2-TETRACHLOROETHANE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
1,1,2,2-TETRACHLOROETHANE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
TETRACHLOROETHYLENE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
TETRAHYDROFURAN	0.0076 U	0.0069 U	0.012 U	0.0083 U	0.0056 U	0.008 U	0.0074 U	0.0072 U	0.0088 U	0.0095 U	0.0049 U	0.0071 U	0.0069 U
TOLUENE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
1,2,3-TRICHLOROBENZENE	0.003 U	0.0028 U	0.005 U	0.0033 U	0.0022 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0028 U
1,2,4-TRICHLOROBENZENE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
1,1,1-TRICHLOROETHANE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
1,1,2-TRICHLOROETHANE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
TRICHLOROETHYLENE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
TRICHLOROFLUOROMETHANE	0.0076 U	0.0069 U	0.012 U	0.0083 U	0.0056 U	0.008 U	0.0074 U	0.0072 U	0.0088 U	0.0095 U	0.0049 U	0.0071 U	0.0069 U
1,2,3-TRICHLOROPROPANE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
1,2,4-TRIMETHYLBENZENE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
1,3,5-TRIMETHYLBENZENE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
VINYL CHLORIDE	0.0076 U	0.0069 U	0.012 U	0.0083 U	0.0056 U	0.008 U	0.0074 U	0.0072 U	0.0088 U	0.0095 U	0.0049 U	0.0071 U	0.0069 U
M/P-XYLENE	0.003 U	0.0028 U	0.005 U	0.0033 U	0.0022 U	0.0032 U	0.0029 U	0.0029 U	0.0035 U	0.0038 U	0.002 U	0.0028 U	0.0028 U
O-XYLENE	0.0015 U	0.0014 U	0.0025 U	0.0017 U	0.0011 U	0.0016 U	0.0015 U	0.0014 U	0.0018 U	0.0019 U	0.00098 U	0.0014 U	0.0014 U
SW-846 8270D													
ACENAPHTHENE	0.21 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	0.22 U	0.2 U	0.18 U
ACENAPHTHYLENE	0.21 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	0.49	0.2 U	0.18 U
ACETOPHENONE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
ANILINE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
ANTHRACENE	0.21 U	0.2 U	0.35	0.19 U	0.19 U	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	0.56	0.2 U	0.18 U
BENZO(A)ANTHRACENE	0.21 U	0.2 U	0.45	0.19 U	0.19 U	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	***3.2***	0.2 U	0.18 U
BENZO(A)PYRENE	0.21 U	0.2 U	0.29	0.19 U	0.19 U	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	**2**	0.2 U	0.18 U
BENZO(B)FLUORANTHENE	0.21 U	0.2 U	0.68	0.19 U	0.26	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	***2.9***	0.2 U	0.18 U
BENZO(G,H,I)PERYLENE	0.21 U	0.2 U	0.2	0.19 U	0.19 U	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	0.77	0.2 U	0.18 U
BENZO(K)FLUORANTHENE	0.21 U	0.2 U	0.23	0.19 U	0.19 U	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	***1.2***	0.2 U	0.18 U
BIS(2-CHLOROETHOXY)METHANE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
BIS(2-CHLOROETHYL)ETHER	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
BIS(2-CHLOROISOPROPYL)ETHER	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
BIS(2-ETHYLHEXYL)PHTHALATE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
4-BROMOPHENYL PHENYL ETHER	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
BUTYLBENZYLPHTHALATE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
4-CHLOROANILINE	0.82 U	0.79 U	0.78 U	0.73 U	0.75 U	0.73 U	0.76 U	0.69 U	0.79 U	0.8 U	0.84 U	0.77 U	0.71 U
2-CHLORONAPHTHALENE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
2-CHLOROPHENOL	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
CHRYSENE	0.21 U	0.2 U	0.51	0.19 U	0.23	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	***2.6***	0.2 U	0.18 U
DIBENZ(A,H)ANTHRACENE	0.21 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	0.34	0.2 U	0.18 U
DIBENZOFURAN	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
DI-N-BUTYLPHTHALATE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
1,2-DICHLOROBENZENE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
1,3-DICHLOROBENZENE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
1,4-DICHLOROBENZENE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
3,3'-DICHLOROBENZIDINE	0.21 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	0.22 U	0.2 U	0.18 U
2,4-DICHLOROPHENOL	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
DIETHYLPHTHALATE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
2,4-DIMETHYLPHENOL	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
DIMETHYLPHTHALATE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
2,4-DINITROPHENOL	0.82 U	0.79 U	0.78 U	0.73 U	0.75 U	0.73 U	0.76 U	0.69 U	0.79 U	0.8 U	0.84 U	0.77 U	0.71 U
2,4-DINITROTOLUENE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
2,6-DINITROTOLUENE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
DI-N-OCTYLPHTHALATE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
FLUORANTHENE	0.21 U	0.2 U	1.4	0.19 U	0.31	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	***8.3***	0.2 U	0.18 U
FLUORENE	0.21 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	0.22 U	0.2 U	0.18 U
HEXACHLOROBENZENE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
HEXACHLOROBUTADIENE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
HEXACHLOROETHANE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
INDENO(1,2,3-CD)PYRENE	0.21 U	0.2 U	0.23	0.19 U	0.19 U	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	***1.1***	0.2 U	0.18 U
ISOPHORONE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
2-METHYLNAPHTHALENE	0.21 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	0.22 U	0.2 U	0.18 U
O-CRESOL	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
M/P-CRESOL	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
NAPHTHALENE	0.21 U	0.2 U	0.25	0.19 U	0.19 U	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	0.22 U	0.2 U	0.18 U
NITROBENZENE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
2-NITROPHENOL	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
4-NITROPHENOL	0.82 U	0.79 U	0.78 U	0.73 U	0.75 U	0.73 U	0.76 U	0.69 U	0.79 U	0.8 U	0.84 U	0.77 U	0.71 U
PENTACHLOROPHENOL	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
PHENANTHRENE	0.21 U	0.2 U	1.3	0.19 U	0.19 U	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	0.22 U	0.2 U	0.18 U
PHENOL	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
PYRENE	0.21 U	0.2 U	1.1	0.19 U	0.25	0.19 U	0.2 U	0.18 U	0.2 U	0.21 U	***6.4***	0.2 U	0.18 U
PYRIDINE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
1,2,4-TRICHLOROBENZENE	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
2,4,5-TRICHLOROPHENOL	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
2,4,6-TRICHLOROPHENOL	0.42 U	0.41 U	0.4 U	0.38 U	0.39 U	0.37 U	0.39 U	0.36 U	0.41 U	0.41 U	0.43 U	0.4 U	0.37 U
SW-846 9014													
REACTIVE CYANIDE	3.9 U	3.9 U	3.9 U	4 U	4 U	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	4 U	3.9 U
SW-846 9030A													
REACTIVE SULFIDE	20 U	19 U	20 U	20 U	20 U	19 U	19 U	19 U	19 U	20 U	20 U	20 U	19 U
SW-846 9045C													
PH	5.9	4.9	6.3	5.4	4.8	5.2	5.5	5.1	4.6	5.3	5.9	5.5	4.9

SAMPLE LOCATION	MP38	MP39	SB-37	SB-38	SB-39	SB-50	SB-51	SB40	SB41	MW/SB-42	SB48	MP-40
SAMPLE DATE	10/26/2018	10/26/2018	10/25/2018	10/25/2018	10/25/2018	10/25/2018	10/24/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	10/02/2018
LAB NUMBER	18J1553-07	18J1553-08	18J1553-03	18J1553-04	18J1553-05	18J1553-02	18J1553-01	18K1190-02	18K1190-03	18K1190-04	18K1190-01	18J0192-01
PID READING (ppmV)	0.0	0.0	2.9	0.2	3.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0
CIS-1,3-DICHLOROPROPENE	0.00073 U	0.00077 U	0.00082 U	0.00091 U	0.00086 U	0.00085 U	**0.021** U	0.00061 U	0.00078 U	0.00074 U	0.00065 U	0.00062 U
TRANS-1,3-DICHLOROPROPENE	0.00073 U	0.00077 U	0.00082 U	0.00091 U	0.00086 U	0.00085 U	**0.021** U	0.00061 U	0.00078 U	0.00074 U	0.00065 U	0.00062 U
DIETHYL ETHER	0.0073 U	0.0077 U	0.0082 U	0.0091 U	0.0086 U	0.0085 U	0.084 U	0.0061 U	0.0078 U	0.0074 U	0.0065 U	0.0062 U
DIISOPROPYL ETHER	0.00073 U	0.00077 U	0.00082 U	0.00091 U	0.00086 U	0.00085 U	0.021 U	0.00061 U	0.00078 U	0.00074 U	0.00065 U	0.00062 U
1,4-DIOXANE	0.073 U	0.077 U	0.082 U	0.091 U	0.086 U	0.085 U	**2.1** U	0.061 U	0.078 U	0.074 U	0.065 U	0.062 U
ETHYLBENZENE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
HEXACHLOROBUTADIENE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	0.084 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
2-HEXANONE	0.015 U	0.015 U	0.016 U	0.018 U	0.017 U	0.017 U	0.42 U	0.012 U	0.016 U	0.015 U	0.013 U	0.012 U
ISOPROPYLBENZENE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
P-ISOPROPYLTOLUENE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
METHYL TERT-BUTYL ETHER (MTBE)	0.0029 U	0.0031 U	0.0033 U	0.0036 U	0.0034 U	0.0034 U	0.042 U	0.0024 U	0.0031 U	0.003 U	0.0026 U	0.0025 U
METHYLENE CHLORIDE	0.0073 U	0.0077 U	0.0082 U	0.0091 U	0.0086 U	0.0085 U	**0.21** U	0.0061 U	0.0078 U	0.0074 U	0.0065 U	0.0062 U
4-METHYL-2-PENTANONE (MIBK)	0.015 U	0.015 U	0.016 U	0.018 U	0.017 U	0.017 U	**0.42** U	0.012 U	0.016 U	0.015 U	0.013 U	0.012 U
NAPHTHALENE	0.0073 U	0.0077 U	0.0082 U	0.0091 U	0.0086 U	0.0085 U	0.21 U	0.0024 U	0.0031 U	0.003 U	0.0026 U	0.0062 U
N-PROPYLBENZENE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
STYRENE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
1,1,1,2-TETRACHLOROETHANE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
1,1,2,2-TETRACHLOROETHANE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	**0.021** U	0.00061 U	0.00078 U	0.00074 U	0.00065 U	0.0012 U
TETRACHLOROETHYLENE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
TETRAHYDROFURAN	0.0073 U	0.0077 U	0.0082 U	0.0091 U	0.0086 U	0.0085 U	0.17 U	0.0061 U	0.0078 U	0.0074 U	0.0065 U	0.0062 U
TOLUENE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
1,2,3-TRICHLOROBENZENE	0.0029 U	0.0031 U	0.0033 U	0.0036 U	0.0034 U	0.0034 U	0.21 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0025 U
1,2,4-TRICHLOROBENZENE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	0.084 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
1,1,1-TRICHLOROETHANE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
1,1,2-TRICHLOROETHANE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
TRICHLOROETHYLENE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
TRICHLOROFLUOROMETHANE	0.0073 U	0.0077 U	0.0082 U	0.0091 U	0.0086 U	0.0085 U	0.084 U	0.0061 U	0.0078 U	0.0074 U	0.0065 U	0.0062 U
1,2,3-TRICHLOROPROPANE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	0.084 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
1,2,4-TRIMETHYLBENZENE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
1,3,5-TRIMETHYLBENZENE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
VINYL CHLORIDE	0.0073 U	0.0077 U	0.0082 U	0.0091 U	0.0086 U	0.0085 U	0.084 U	0.0061 U	0.0078 U	0.0074 U	0.0065 U	0.0062 U
M/P-XYLENE	0.0029 U	0.0031 U	0.0033 U	0.0036 U	0.0034 U	0.0034 U	0.084 U	0.0024 U	0.0031 U	0.003 U	0.0026 U	0.0025 U
O-XYLENE	0.0015 U	0.0015 U	0.0016 U	0.0018 U	0.0017 U	0.0017 U	0.042 U	0.0012 U	0.0016 U	0.0015 U	0.0013 U	0.0012 U
SW-846 8270D												
ACENAPHTHENE	0.18 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.21 U	0.21 U	0.21 U	0.22 U	0.2 U
ACENAPHTHYLENE	0.18 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.21 U	0.21 U	0.31	0.22 U	0.2 U
ACETOPHENONE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
ANILINE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
ANTHRACENE	0.18 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.21 U	0.21 U	0.21 U	0.22 U	0.2 U
BENZO(A)ANTHRACENE	0.18 U	0.45	0.18 U	0.2 U	0.57	0.21 U	0.2 U	0.21 U	0.21 U	0.95	0.22 U	0.2 U
BENZO(A)PYRENE	0.18 U	0.45	0.18 U	0.2 U	0.29	0.21 U	0.2 U	0.21 U	0.21 U	0.98	0.22 U	0.2 U
BENZO(B)FLUORANTHENE	0.18 U	0.83	0.23	0.2 U	0.59	0.21 U	0.2 U	0.21 U	0.21 U	1.5	0.22 U	0.2 U
BENZO(G,H,I)PERYLENE	0.18 U	0.22	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.21 U	0.21 U	0.69	0.22 U	0.2 U
BENZO(K)FLUORANTHENE	0.18 U	0.35	0.18 U	0.2 U	0.24	0.21 U	0.2 U	0.21 U	0.21 U	0.65	0.22 U	0.2 U
BIS(2-CHLOROETHOXY)METHANE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
BIS(2-CHLOROETHYL)ETHER	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
BIS(2-CHLOROISOPROPYL)ETHER	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
BIS(2-ETHYLHEXYL)PHTHALATE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
4-BROMOPHENYL PHENYL ETHER	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
BUTYLBENZYLPHTHALATE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
4-CHLOROANILINE	0.71 U	0.73 U	0.72 U	0.77 U	0.71 U	0.81 U	0.76 U	0.8 U	0.82 U	0.82 U	0.85 U	0.78 U
2-CHLORONAPHTHALENE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
2-CHLOROPHENOL	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
CHRYSENE	0.18 U	0.46	0.19	0.2 U	0.56	0.21 U	0.2 U	0.21 U	0.21 U	1.3	0.22 U	0.2 U
DIBENZ(A,H)ANTHRACENE	0.18 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.21 U	0.21 U	0.21 U	0.22 U	0.2 U
DIBENZOFURAN	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
DI-N-BUTYLPHTHALATE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
1,2-DICHLOROBENZENE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
1,3-DICHLOROBENZENE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
1,4-DICHLOROBENZENE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
3,3'-DICHLOROBENZIDINE	0.18 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.21 U	0.21 U	0.21 U	0.22 U	0.2 U
2,4-DICHLOROPHENOL	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
DIETHYLPHTHALATE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
2,4-DIMETHYLPHENOL	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
DIMETHYLPHTHALATE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
2,4-DINITROPHENOL	0.71 U	0.73 U	0.72 U	0.77 U	0.71 U	0.81 U	0.76 U	0.8 U	0.82 U	0.82 U	0.85 U	0.78 U
2,4-DINITROTOLUENE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
2,6-DINITROTOLUENE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
DI-N-OCTYLPHTHALATE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
FLUORANTHENE	0.18 U	0.45	0.26	0.2 U	1	0.21 U	0.23	0.21 U	0.21 U	1.8	0.22 U	0.2 U
FLUORENE	0.18 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.21 U	0.21 U	0.21 U	0.22 U	0.2 U
HEXACHLOROBENZENE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
HEXACHLOROBUTADIENE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
HEXACHLOROETHANE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
INDENO(1,2,3-CD)PYRENE	0.18 U	0.3	0.18 U	0.2 U	0.2	0.21 U	0.2 U	0.21 U	0.21 U	0.78	0.22 U	0.2 U
ISOPHORONE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
2-METHYLNAPHTHALENE	0.18 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.21 U	0.21 U	0.21 U	0.22 U	0.2 U
O-CRESOL	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
M/P-CRESOL	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
NAPHTHALENE	0.18 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.21 U	0.21 U	0.21 U	0.22 U	0.2 U
NITROBENZENE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
2-NITROPHENOL	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
4-NITROPHENOL	0.71 U	0.73 U	0.72 U	0.77 U	0.71 U	0.81 U	0.76 U	0.8 U	0.82 U	0.82 U	0.85 U	0.78 U
PENTACHLOROPHENOL	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
PHENANTHRENE	0.18 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.21 U	0.21 U	0.61	0.22 U	0.2 U
PHENOL	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
PYRENE	0.18 U	0.72	0.3	0.2 U	1.1	0.21 U	0.27	0.21 U	0.21 U	2	0.22 U	0.2 U
PYRIDINE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
1,2,4-TRICHLOROBENZENE	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
2,4,5-TRICHLOROPHENOL	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
2,4,6-TRICHLOROPHENOL	0.37 U	0.38 U	0.37 U	0.39 U	0.36 U	0.42 U	0.39 U	0.41 U	0.42 U	0.42 U	0.44 U	0.4 U
SW-846 9014												
REACTIVE CYANIDE	4 U	3.9 U	3.9 U	4 U	4 U	4 U	3.9 U	3.9 U	3.9 U	4 U	3.9 U	3.9 U
SW-846 9030A												
REACTIVE SULFIDE	20 U	20 U	19 U	20 U	20 U	20 U	20 U	19 U	20 U	20 U	20 U	20 U
SW-846 9045C												
PH	5.6	5.7	4.8	4.3	5.7	5.6	6.5	5	5.2	5.3	5.2	5.8

NOTES:
Bolded, shaded, and underlined results meet or exceed regulatory threshold
Bolded results are a laboratory detection limit that exceed a regulatory threshold
Bolded and italic results meet or exceed Similar Soils Natural Background
RCS-x = MCP Reportable Concentrations for Soil Category x
U = Not detected above the laboratory reporting limits shown to the left of the "U"
NE = Standard not established
mg/kg = Milligrams per kilogram, aslo known as parts per million
J = Modfied results based on quality control analysis

SOIL DISPOSAL CLASSIFICATION CATEGORIES

Type A Soil: Reuse at Sand and Gravel facility: Soils which do not contain oil or hazardous material (OHM) or contain OHM below levels consistent with "natural" soil per MassDEP's Similar Soils Provision Guidance (WSC-13-500) are not considered Remediation Waste; this includes soil that exhibits concentrations of TPH less than or equal to 25 parts per million (ppm). These "natural" soils may be reused at specific beneficial reuse locations on a case by case basis under the discretion of Eversource and may be reused at an active sand and gravel processing facility that holds a Site Assignment Authorization with approval from the LSP-of-Record. Facilities that are reclaiming former sand and gravel pits must have a MassDEP approved ACO in place in accordance with MassDEP Interim Policy COMM-15-01: Re-Use of Soil for Large Reclamation Projects Policy.

Type B-1 Soil: <RCS-1 Beneficial Reuse: Soil containing OHM concentrations below MCP RCS-1 criteria can be used as fill material at off-site industrial/commercial locations provided that pre-existing OHM concentrations at the fill location are equal to or higher than those that exist in the construction generated soil and are not located within the Utility Related Abatement Measure (URAM). Facilities must have a MassDEP approved Administrative Consent Order (ACO) in place in accordance with MassDEP Interim Policy COMM-15-01.

Type C-1 Soil: Massachusetts Unlined Landfills: Soil that contains OHM concentrations above MCP RCS-1 levels but below the criteria for Massachusetts Unlined landfills per MassDEP Policy COMM-97-001.

Table 4
Summary of Hudson Groundwater Data
Sudbury to Hudson Transmission Project
Hudson, Massachusetts

LOCATION	RCGW-1	RCGW-2	Units	SB/MW-21		SB/MW-24		SB/MW-5	
SAMPLING DATE				08/03/2018		08/02/2018		08/02/2018	
LAB SAMPLE ID				18H0264-01		18H0264-02		18H0264-03	
RCRA 8 METALS									
ARSENIC	10	900	µg/L	9		2	U	2	U
BARIUM	2000	50000	µg/L	53		50	U	50	U
CADMIUM	4	4	µg/L	2.5	U	2.5	U	2.5	U
CHROMIUM	100	300	µg/L	5	U	5	U	5	U
LEAD	10	10	µg/L	5	U	5	U	5	U
SELENIUM	50	100	µg/L	25	U	25	U	25	U
SILVER	7	7	µg/L	2.5	U	2.5	U	2.5	U
MERCURY	0.002	0.02	mg/L	0.0001	U	0.0001	U	0.0001	U
TOTAL PETROLEUM HYDROCARBONS									
DIESEL RANGE ORGANICS	~	~	mg/L	0.2	U	0.2	U	0.2	U
POLYCHLORINATED BIPHENYLS									
PCB 1016	0.5	5	µg/L	0.22	U	0.2	U	0.2	U
PCB 1221	0.5	5	µg/L	0.22	U	0.2	U	0.2	U
PCB 1232	0.5	5	µg/L	0.22	U	0.2	U	0.2	U
PCB 1242	0.5	5	µg/L	0.22	U	0.2	U	0.2	U
PCB 1248	0.5	5	µg/L	0.22	U	0.2	U	0.2	U
PCB 1254	0.5	5	µg/L	0.22	U	0.2	U	0.2	U
PCB 1260	0.5	5	µg/L	0.22	U	0.2	U	0.2	U
PCB 1262	0.5	5	µg/L	0.22	U	0.2	U	0.2	U
PCB 1268	0.5	5	µg/L	0.22	U	0.2	U	0.2	U
VOLATILE ORGANIC COMPOUNDS									
ACETONE	6300	50000	µg/L	10	U	11		10	U
TERT-AMYL METHYL ETHER	~	~	µg/L	0.5	U	0.5	U	0.5	U
BENZENE	5	1000	µg/L	1	U	1	U	1	U
BROMOBENZENE	1000	10000	µg/L	1	U	1	U	1	U
BROMOCHLOROMETHANE	~	~	µg/L	1	U	1	U	1	U
BROMODICHLOROMETHANE	3	6	µg/L	1	U	1	U	1	U
BROMOFORM	4	700	µg/L	2	U	2	U	2	U
BROMOMETHANE	7	7	µg/L	2	U	2	U	2	U
2-BUTANONE (MEK)	4000	50000	µg/L	10	U	10	U	10	U
N-BUTYLBENZENE	~	~	µg/L	1	U	1	U	1	U
SEC-BUTYLBENZENE	~	~	µg/L	1	U	1	U	1	U
TERT-BUTYLBENZENE	1000	10000	µg/L	1	U	1	U	1	U
TERT-BUTYLETHYL ETHER	~	~	µg/L	0.5	U	0.5	U	0.5	U
CARBON DISULFIDE	1000	10000	µg/L	5	U	5	U	5	U
CARBON TETRACHLORIDE	2	2	µg/L	1	U	1	U	1	U
CHLOROBENZENE	100	200	µg/L	1	U	1	U	1	U
CHLORODIBROMOMETHANE	2	20	µg/L	0.5	U	0.5	U	0.5	U
CHLOROETHANE	1000	10000	µg/L	2	U	2	U	2	U
CHLOROFORM	50	50	µg/L	2	U	2	U	2	U
CHLOROMETHANE	1000	10000	µg/L	2	U	2	U	2	U
2-CHLOROTOLUENE	1000	10000	µg/L	1	U	1	U	1	U
4-CHLOROTOLUENE	1000	10000	µg/L	1	U	1	U	1	U
1,2-DIBROMO-3-CHLOROPROPANE	100	1000	µg/L	2	U	2	U	2	U
1,2-DIBROMOETHANE (EDB)	0.02	2	µg/L	**0.5**	U	**0.5**	U	**0.5**	U
DIBROMOMETHANE	5000	50000	µg/L	1	U	1	U	1	U
1,2-DICHLOROBENZENE	600	2000	µg/L	1	U	1	U	1	U
1,3-DICHLOROBENZENE	100	6000	µg/L	1	U	1	U	1	U
1,4-DICHLOROBENZENE	5	60	µg/L	1	U	1	U	1	U
DICHLORODIFLUOROMETHANE	10000	100000	µg/L	2	U	2	U	2	U
1,1-DICHLOROETHANE	70	2000	µg/L	1	U	1	U	1	U
1,2-DICHLOROETHANE	5	5	µg/L	1	U	1	U	1	U
1,1-DICHLOROETHYLENE	7	80	µg/L	1	U	1	U	1	U
CIS-1,2-DICHLOROETHYLENE	20	20	µg/L	1	U	1	U	1	U
TRANS-1,2-DICHLOROETHYLENE	80	80	µg/L	1	U	1	U	1	U
1,2-DICHLOROPROPANE	3	3	µg/L	1	U	1	U	1	U
1,3-DICHLOROPROPANE	5000	50000	µg/L	0.5	U	0.5	U	0.5	U
2,2-DICHLOROPROPANE	5	9	µg/L	1	U	1	U	1	U
1,1-DICHLOROPROPENE	0.5	5	µg/L	0.5	U	0.5	U	0.5	U
CIS-1,3-DICHLOROPROPENE	0.5	5	µg/L	0.4	U	0.4	U	0.4	U
TRANS-1,3-DICHLOROPROPENE	0.5	5	µg/L	0.4	U	0.4	U	0.4	U

Table 4
Summary of Hudson Groundwater Data
Sudbury to Hudson Transmission Project
Hudson, Massachusetts

LOCATION	RCGW-1	RCGW-2	Units	SB/MW-21		SB/MW-24		SB/MW-5	
SAMPLING DATE				08/03/2018		08/02/2018		08/02/2018	
LAB SAMPLE ID				18H0264-01		18H0264-02		18H0264-03	
DIETHYL ETHER	1000	10000	µg/L	2	U	2	U	2	U
DIISOPROPYL ETHER	1000	10000	µg/L	0.5	U	0.5	U	0.5	U
1,4-DIOXANE	0.3	6000	µg/L	**50**	U	**50**	U	**50**	U
ETHYLBENZENE	700	5000	µg/L	1	U	1	U	1	U
HEXACHLOROBUTADIENE	0.6	50	µg/L	0.6	U	0.6	U	0.6	U
2-HEXANONE	1000	10000	µg/L	10	U	10	U	10	U
ISOPROPYLBENZENE	10000	100000	µg/L	1	U	1	U	1	U
P-ISOPROPYLTOLUENE	1000	10000	µg/L	1	U	1	U	1	U
METHYL TERT-BUTYL ETHER (MTBE)	70	5000	µg/L	1	U	1	U	1	U
METHYLENE CHLORIDE	5	2000	µg/L	5	U	5	U	5	U
4-METHYL-2-PENTANONE (MIBK)	350	50000	µg/L	10	U	10	U	10	U
NAPHTHALENE	140	700	µg/L	2	U	2	U	2	U
N-PROPYLBENZENE	1000	10000	µg/L	1	U	1	U	1	U
STYRENE	100	100	µg/L	1	U	1	U	1	U
1,1,1,2-TETRACHLOROETHANE	5	10	µg/L	1	U	1	U	1	U
1,1,2,2-TETRACHLOROETHANE	2	9	µg/L	0.5	U	0.5	U	0.5	U
TETRACHLOROETHYLENE	5	50	µg/L	1	U	1	U	1	U
TETRAHYDROFURAN	5000	50000	µg/L	2	U	2	U	2	U
TOLUENE	1000	40000	µg/L	1	U	1	U	1	U
1,2,3-TRICHLOROBENZENE	~	~	µg/L	2	U	2	U	2	U
1,2,4-TRICHLOROBENZENE	70	200	µg/L	1	U	1	U	1	U
1,1,1-TRICHLOROETHANE	200	4000	µg/L	1	U	1	U	1	U
1,1,2-TRICHLOROETHANE	5	900	µg/L	1	U	1	U	1	U
TRICHLOROETHYLENE	5	5	µg/L	1	U	1	U	1	U
TRICHLOROFLUOROMETHANE	10000	100000	µg/L	2	U	2	U	2	U
1,2,3-TRICHLOROPROPANE	1000	10000	µg/L	2	U	2	U	2	U
1,2,4-TRIMETHYLBENZENE	10000	100000	µg/L	1	U	1	U	1	U
1,3,5-TRIMETHYLBENZENE	100	1000	µg/L	1	U	1	U	1	U
VINYL CHLORIDE	2	2	µg/L	2	U	2	U	2	U
M/P-XYLENE	3000	3000	µg/L	2	U	2	U	2	U
O-XYLENE	3000	3000	µg/L	1	U	1	U	1	U

NOTES:
Bolded, shaded, and underlined results meet or exceed regulatory threshold
Bolded results are a laboratory detection limit that exceed a regulatory threshold
RCGW-x = MCP Reportable Concentrations for Groundwater Category x
U = Not detected above the laboratory reporting limits shown to the left of the "U"
NE = Standard not established
ug/L = micrograms per liter, aslo known as parts per billion

Table 5
Summary of Sudbury Groundwater Data
Sudbury to Hudson Transmission Project
Sudbury, Massachusetts

Sample Location	RCGW-1	RCGW-2	Units	MW33		MW35		MW42	
Sample Date				12/05/2018		12/05/2018		12/05/2018	
Labnumber				18L0240-01		18L0240-02		18L0240-03	
SW-846 6020B									
ARSENIC	10	900	µg/L	0.4	U	0.4	U	4.4	
BARIUM	2000	50000	µg/L	16		18		87	
CADMIUM	4	4	µg/L	0.5	U	0.5	U	0.5	U
CHROMIUM	100	300	µg/L	1	U	1		1.7	
LEAD	10	10	µg/L	1	U	1	U	1	
SELENIUM	50	100	µg/L	5	U	5	U	5	U
SILVER	7	7	µg/L	0.5	U	0.5	U	0.5	U
SW-846 7470A									
MERCURY	0.002	0.02	mg/L	0.0001	U	0.0001	U	0.0001	U
SW-846 8082A									
PCB 1016	0.5	5	µg/L	0.19	U	0.2	U	0.2	U
PCB 1221	0.5	5	µg/L	0.19	U	0.2	U	0.2	U
PCB 1232	0.5	5	µg/L	0.19	U	0.2	U	0.2	U
PCB 1242	0.5	5	µg/L	0.19	U	0.2	U	0.2	U
PCB 1248	0.5	5	µg/L	0.19	U	0.2	U	0.2	U
PCB 1254	0.5	5	µg/L	0.19	U	0.2	U	0.2	U
PCB 1260	0.5	5	µg/L	0.19	U	0.2	U	0.2	U
PCB 1262	0.5	5	µg/L	0.19	U	0.2	U	0.2	U
PCB 1268	0.5	5	µg/L	0.19	U	0.2	U	0.2	U
SW-846 8100 Modified									
TPH	0.2	5	mg/L	0.19	U	**0.22**	U	0.19	U
SW-846 8260C									
ACETONE	6300	50000	µg/L	10	U	10	U	10	U
TERT-AMYL METHYL ETHER	NE	NE	µg/L	0.5	U	0.5	U	0.5	U
BENZENE	5	1000	µg/L	1	U	1	U	1	U
BROMOBENZENE	1000	10000	µg/L	1	U	1	U	1	U
BROMOCHLOROMETHANE	NE	NE	µg/L	1	U	1	U	1	U
BROMODICHLOROMETHANE	3	6	µg/L	1	U	1	U	1	U
BROMOFORM	4	700	µg/L	2	U	2	U	2	U
BROMOMETHANE	7	7	µg/L	2	U	2	U	2	U
2-BUTANONE (MEK)	4000	50000	µg/L	10	U	10	U	10	U
N-BUTYLBENZENE	NE	NE	µg/L	1	U	1	U	1	U
SEC-BUTYLBENZENE	NE	NE	µg/L	1	U	1	U	1	U
TERT-BUTYLBENZENE	1000	10000	µg/L	1	U	1	U	1	U
TERT-BUTYLETHYL ETHER	NE	NE	µg/L	0.5	U	0.5	U	0.5	U
CARBON DISULFIDE	1000	10000	µg/L	5	U	5	U	5	U
CARBON TETRACHLORIDE	2	2	µg/L	1	U	1	U	1	U
CHLOROBENZENE	100	200	µg/L	1	U	1	U	1	U
CHLORODIBROMOMETHANE	2	20	µg/L	0.5	U	0.5	U	0.5	U
CHLOROETHANE	1000	10000	µg/L	2	U	2	U	2	U
CHLOROFORM	50	50	µg/L	2	U	2	U	2	U
CHLOROMETHANE	1000	10000	µg/L	2	U	2	U	2	U
2-CHLOROTOLUENE	1000	10000	µg/L	1	U	1	U	1	U
4-CHLOROTOLUENE	1000	10000	µg/L	1	U	1	U	1	U
1,2-DIBROMO-3-CHLOROPROPANE	100	1000	µg/L	2	U	2	U	2	U
1,2-DIBROMOETHANE (EDB)	0.02	2	µg/L	0.5	U	0.5	U	0.5	U
DIBROMOMETHANE	5000	50000	µg/L	1	U	1	U	1	U
1,2-DICHLOROBENZENE	600	2000	µg/L	1	U	1	U	1	U
1,3-DICHLOROBENZENE	100	6000	µg/L	1	U	1	U	1	U
1,4-DICHLOROBENZENE	5	60	µg/L	1	U	1	U	1	U
DICHLORODIFLUOROMETHANE	10000	100000	µg/L	2	U	2	U	2	U
1,1-DICHLOROETHANE	70	2000	µg/L	1	U	1	U	1	U
1,2-DICHLOROETHANE	5	5	µg/L	1	U	1	U	1	U
1,1-DICHLOROETHYLENE	7	80	µg/L	1	U	1	U	1	U
CIS-1,2-DICHLOROETHYLENE	20	20	µg/L	1	U	1	U	1	U
TRANS-1,2-DICHLOROETHYLENE	80	80	µg/L	1	U	1	U	1	U
1,2-DICHLOROPROPANE	3	3	µg/L	1	U	1	U	1	U
1,3-DICHLOROPROPANE	5000	50000	µg/L	0.5	U	0.5	U	0.5	U
2,2-DICHLOROPROPANE	5	9	µg/L	1	U	1	U	1	U
1,1-DICHLOROPROPENE	0.5	5	µg/L	0.5	U	0.5	U	0.5	U
CIS-1,3-DICHLOROPROPENE	0.5	5	µg/L	0.4	U	0.4	U	0.4	U
TRANS-1,3-DICHLOROPROPENE	0.5	5	µg/L	0.4	U	0.4	U	0.4	U
DIETHYL ETHER	1000	10000	µg/L	2	U	2	U	2	U
DIISOPROPYL ETHER	1000	10000	µg/L	0.5	U	0.5	U	0.5	U

Table 5
Summary of Sudbury Groundwater Data
Sudbury to Hudson Transmission Project
Sudbury, Massachusetts

Sample Location	RCGW-1	RCGW-2	Units	MW33		MW35		MW42	
Sample Date				12/05/2018		12/05/2018		12/05/2018	
Labnumber				18L0240-01		18L0240-02		18L0240-03	
1,4-DIOXANE	0.3	6000	µg/L	**50**	U	**50**	U	**50**	U
ETHYLBENZENE	700	5000	µg/L	1	U	1	U	1	U
HEXACHLOROBUTADIENE	0.6	50	µg/L	0.6	U	0.6	U	0.6	U
2-HEXANONE	1000	10000	µg/L	10	U	10	U	10	U
ISOPROPYLBENZENE	10000	100000	µg/L	1	U	1	U	1	U
P-ISOPROPYLTOLUENE	1000	10000	µg/L	1	U	1	U	1	U
METHYL TERT-BUTYL ETHER (MTBE)	70	5000	µg/L	1	U	1	U	1	U
METHYLENE CHLORIDE	5	2000	µg/L	5	U	5	U	5	U
4-METHYL-2-PENTANONE (MIBK)	350	50000	µg/L	10	U	10	U	10	U
NAPHTHALENE	140	700	µg/L	2	U	2	U	2	U
N-PROPYLBENZENE	1000	10000	µg/L	1	U	1	U	1	U
STYRENE	100	100	µg/L	1	U	1	U	1	U
1,1,1,2-TETRACHLOROETHANE	5	10	µg/L	1	U	1	U	1	U
1,1,2,2-TETRACHLOROETHANE	2	9	µg/L	0.5	U	0.5	U	0.5	U
TETRACHLOROETHYLENE	5	50	µg/L	1	U	1	U	1	U
TETRAHYDROFURAN	5000	50000	µg/L	2	U	2	U	2	U
TOLUENE	1000	40000	µg/L	1	U	1	U	1	U
1,2,3-TRICHLOROBENZENE	NE	NE	µg/L	2	U	2	U	2	U
1,2,4-TRICHLOROBENZENE	70	200	µg/L	1	U	1	U	1	U
1,1,1-TRICHLOROETHANE	200	4000	µg/L	1	U	1	U	1	U
1,1,2-TRICHLOROETHANE	5	900	µg/L	1	U	1	U	1	U
TRICHLOROETHYLENE	5	5	µg/L	1	U	1	U	1	U
TRICHLOROFLUOROMETHANE	10000	100000	µg/L	2	U	2	U	2	U
1,2,3-TRICHLOROPROPANE	1000	10000	µg/L	2	U	2	U	2	U
1,2,4-TRIMETHYLBENZENE	10000	100000	µg/L	1	U	1	U	1	U
1,3,5-TRIMETHYLBENZENE	100	1000	µg/L	1	U	1	U	1	U
VINYL CHLORIDE	2	2	µg/L	2	U	2	U	2	U
M/P-XYLENE	3000	3000	µg/L	2	U	2	U	2	U
O-XYLENE	3000	3000	µg/L	1	U	1	U	1	U

NOTES:
Bolded, shaded, and underlined results meet or exceed regulatory threshold
Bolded results are a laboratory detection limit that exceed a regulatory threshold
RCGW-x = MCP Reportable Concentrations for Groundwater Category x
U = Not detected above the laboratory reporting limits shown to the left of the "U"
NE = Standard not established
ug/L = micrograms per liter, aslo known as parts per billion

APPENDIX B

ERIS Database Report

DATABASE REPORT

Project Property:	*Underground Transmission Line* *Middlesex County* *Sudbury/Hudson MA 01776*
Project No:	*ENG20-0498*
Report Type:	*Database Report*
Order No:	*20302700358*
Requested by:	*Weston & Sampson*
Date Completed:	*October 28, 2020*

Environmental Risk Information Services
A division of Glacier Media Inc.
1.866.517.5204 | info@erisinfo.com | erisinfo.com

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Executive Summary

Property Information:

Project Property:		*Underground Transmission Line* *Middlesex County Sudbury/Hudson MA 01776*
Project No:		*ENG20-0498*
Coordinates:		
	Latitude:	*42.380899*
	Longitude:	*-71.476286*
	UTM Northing:	*4,695,038.82*
	UTM Easting:	*296,141.55*
	UTM Zone:	*19T*
Elevation:		*194 FT*

Order Information:

Order No:	*20302700358*
Date Requested:	*October 27, 2020*
Requested by:	*Weston & Sampson*
Report Type:	*Database Report*

Historicals/Products:

Executive Summary: Report Summary

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
Standard Environmental Records								
Federal								
FRP	Y	0.25	0	0	0	-	-	0
NPL	Y	1	0	0	0	0	0	0
PROPOSED NPL	Y	1	0	0	0	0	0	0
DELETED NPL	Y	0.5	0	0	0	0	-	0
SEMS	Y	0.5	0	0	**1**	**1**	-	**2**
ODI	Y	0.5	0	0	0	0	-	0
SEMS ARCHIVE	Y	0.5	0	**2**	**1**	0	-	**3**
CERCLIS	Y	0.5	0	**2**	**2**	**1**	-	**5**
IODI	Y	0.5	0	0	0	0	-	0
CERCLIS NFRAP	Y	0.5	0	**2**	**1**	0	-	**3**
CERCLIS LIENS	Y	PO	0	-	-	-	-	0
RCRA CORRACTS	Y	1	0	0	0	0	0	0
RCRA TSD	Y	0.5	0	0	0	**1**	-	**1**
RCRA LQG	Y	0.25	0	0	0	-	-	0
RCRA SQG	Y	0.25	0	**3**	**4**	-	-	**7**
RCRA CESQG	Y	0.25	0	**12**	**7**	-	-	**19**
RCRA NON GEN	Y	0.25	0	**15**	**9**	-	-	**24**
FED ENG	Y	0.5	0	0	0	0	-	0
FED INST	Y	0.5	0	0	0	0	-	0
ERNS 1982 TO 1986	Y	PO	0	-	-	-	-	0
ERNS 1987 TO 1989	Y	PO	0	-	-	-	-	0
ERNS	Y	PO	0	-	-	-	-	0
FED BROWNFIELDS	Y	0.5	0	0	0	0	-	0
FEMA UST	Y	0.25	0	0	0	-	-	0
REFN	Y	0.25	0	0	0	-	-	0
BULK TERMINAL	Y	0.25	0	0	0	-	-	0
SEMS LIEN	Y	PO	0	-	-	-	-	0

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
SUPERFUND ROD	Y	1	0	0	0	0	0	0
State								
RELEASE	Y	1	0	**14**	**26**	**60**	**59**	**159**
DELISTED REL	Y	1	0	0	0	0	**1**	**1**
SWF/LF	Y	0.5	0	0	0	**3**	-	**3**
LST	Y	0.5	0	**3**	**3**	**15**	-	**21**
LUST	Y	0.5	0	**4**	**4**	**15**	-	**23**
LAST	Y	0.5	0	**1**	**4**	**5**	-	**10**
DELISTED LST	Y	0.5	0	0	0	0	-	0
HIST LUST	Y	0.5	0	**3**	**1**	**6**	-	**10**
HIST LAST	Y	0.5	0	0	**1**	**1**	-	**2**
UST	Y	0.25	0	**11**	**5**	-	-	**16**
AST	Y	0.25	0	**2**	**2**	-	-	**4**
DELISTED STORAGE TANK	Y	0.25	0	0	0	-	-	0
AUL	Y	0.5	0	**1**	**1**	**4**	-	**6**
BROWNFIELDS COV	Y	0.5	0	0	0	0	-	0
BROWNFIELDS	Y	0.5	0	**1**	**1**	**2**	-	**4**
Tribal								
INDIAN LUST	Y	0.5	0	0	0	0	-	0
INDIAN UST	Y	0.25	0	0	0	-	-	0
DELISTED ILST	Y	0.5	0	0	0	0	-	0
DELISTED IUST	Y	0.25	0	0	0	-	-	0
County	***No County standard environmental record sources available for this State.***							
Additional Environmental Records								
Federal								
PFAS NPL	Y	0.5	0	0	0	0	-	0
FINDS/FRS	Y	PO	0	**8**	-	-	-	**8**
TRIS	Y	PO	0	-	-	-	-	0
PFAS TRI	Y	0.5	0	0	0	0	-	0
PFAS WATER	Y	0.5	0	0	0	0	-	0
HMIRS	Y	0.125	0	0	-	-	-	0
NCDL	Y	0.125	0	0	-	-	-	0
TSCA	Y	0.125	0	0	-	-	-	0

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
HIST TSCA	Y	0.125	0	0	-	-	-	0
FTTS ADMIN	Y	PO	0	-	-	-	-	0
FTTS INSP	Y	PO	0	-	-	-	-	0
PRP	Y	PO	0	-	-	-	-	0
SCRD DRYCLEANER	Y	0.5	0	0	0	0	-	0
ICIS	Y	PO	0	**1**	-	-	-	**1**
FED DRYCLEANERS	Y	0.25	0	0	0	-	-	0
DELISTED FED DRY	Y	0.25	0	0	0	-	-	0
FUDS	Y	1	0	0	0	0	0	0
PIPELINE INCIDENT	Y	PO	0	-	-	-	-	0
MLTS	Y	PO	0	-	-	-	-	0
HIST MLTS	Y	PO	0	-	-	-	-	0
MINES	Y	0.25	0	0	0	-	-	0
ALT FUELS	Y	0.25	0	0	0	-	-	0
SSTS	Y	0.25	0	0	0	-	-	0
PCB	Y	0.5	0	**1**	0	0	-	**1**
State								
SPILLS	Y	0.125	0	**15**	-	-	-	**15**
HIS SPILLS	Y	0.125	0	**2**	-	-	-	**2**
PFAS	Y	0.5	0	0	0	0	-	0
OIL & HAZ MAT	Y	0.25	0	**1**	**2**	-	-	**3**
GEN	Y	0.125	0	**21**	-	-	-	**21**
ASBESTOS PROJECT	Y	0.125	0	**44**	-	-	-	**44**
Tribal	***No Tribal additional environmental record sources available for this State.***							
County	***No County additional environmental record sources available for this State.***							
Total:			0	**169**	**75**	**114**	**60**	**418**

**** PO – Property Only***
**** 'Property and adjoining properties' database search radii are set at 0.25 miles.***

Executive Summary: Site Report Summary - Project Property

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number

No records found in the selected databases for the project property.

Executive Summary: Site Report Summary - Surrounding Properties

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
1	SPILLS	NO LOCATION AID	PARMENTER RD AND WHITE POND RD HUDSON MA 01749-0000	NW	0.11 / 600.75	-5	85
2	RELEASE	NO LOCATION AID	161 DUTTON RD SUDBURY MA ***RTN:*** 3-0020880 ***Current Status:*** RAO	SE	0.64 / 3,384.85	-11	86
3	RELEASE	ABANDONED HOUSE	1073 CONCORD RD MARLBOROUGH MA ***RTN:*** 2-0018760 ***Current Status:*** RAO	W	0.76 / 4,004.63	62	88
4	UST	WVJV-TV TRANSMITTER SITE	111 PARMENTER RD HUDSON MA 01749 ***Facility ID:*** 9936 ***Tank ID | Status | Status Date:*** 1 | Tank Removed | 19-Mar-1990	WNW	0.23 / 1,228.11	30	90
5	RELEASE	BOYD COATING RESEARCH CO	51 PARMENTER RD HUDSON MA ***RTN:*** 2-0000248 ***Current Status:*** RAO	WNW	0.13 / 694.02	16	91
5	RCRA SQG	PRECISION COATING CO INC	51 PARMENTER RD HUDSON MA 01749 ***EPA Handler ID:*** MAD043399906	WNW	0.13 / 694.02	16	92
5	RELEASE	FMR BOYD COATINGS RESEARCH CO	51 PARMENTER ROAD HUDSON MA ***RTN:*** 2-0020439 ***Current Status:*** TIERI	WNW	0.13 / 694.02	16	98
5	OIL & HAZ MAT	FMR BOYD COATINGS RESEARCH CO	51 PARMENTER ROAD HUDSON MA	WNW	0.13 / 694.02	16	107
6	RELEASE	MA DFS FIREFIGHTING ACADEMY	664 SUDBURY RD STOW MA ***RTN:*** 2-0021045 ***Current Status:*** UNCLSS	N	0.82 / 4,341.24	6	108
7	GEN	LINCOLN TOOL & MACHINE CORP	43 PARMENTER RD HUDSON MA 01749	WNW	0.09 / 462.02	14	111
7	RCRA CESQG	LINCOLN TOOL & MACHINE CORP.	43 PARMENTER RD HUDSON MA 01749 ***EPA Handler ID:*** MAR000545384	WNW	0.09 / 462.02	14	111
8	RELEASE	STATE FIRE ACADEMY STOW	1 STATE ROAD STOW MA	NNW	0.75 / 3,984.24	2	113

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			RTN: 2-0019241 ***Current Status:*** PSNC				
9	UST	SILVER KING BROADCASTING OF MA	71 PARMENTER RD HUDSON MA 01749	WNW	0.04 / 207.98	14	114
			Facility ID: 19417 ***Tank ID | Status | Status Date:*** 1 | Tank Removed | 10-Jan-1990				
10	CERCLIS	SUDBURY ROD AND GUN	33 BULKLEY ROAD SUDBURY MA 017762640	E	0.06 / 323.49	1	115
			Site EPA ID: MAN000103316				
10	CERCLIS NFRAP	SUDBURY ROD AND GUN	33 BULKLEY ROAD SUDBURY MA 17762640	E	0.06 / 323.49	1	117
			Site EPA ID: MAN000103316				
10	RELEASE	FORMER ROD & GUN CLUB	33 BULKLEY RD SUDBURY MA	E	0.06 / 323.49	1	118
			RTN: 3-0024573 ***Current Status:*** RAO				
10	SEMS ARCHIVE	SUDBURY ROD AND GUN	33 BULKLEY ROAD SUDBURY MA 01776-2640	E	0.06 / 323.49	1	119
			EPA ID: MAN000103316				
10	SPILLS	FORMER ROD & GUN CLUB	33 BULKLEY RD SUDBURY MA 01776-0000	E	0.06 / 323.49	1	120
11	LUST	CONTINENTAL CITGO	706 MAIN ST HUDSON MA	NW	0.35 / 1,834.46	7	121
			RTN: 2-0015576				
11	LUST	FORMER CITGO	706 MAIN ST HUDSON MA	NW	0.35 / 1,834.46	7	135
			RTN: 2-0017095				
11	RELEASE	LAKE BOON SERVICE STATION	706 MAIN ST HUDSON MA	NW	0.35 / 1,834.46	7	138
			RTN: 2-0000261 ***Current Status:*** DEPNDS				
11	RELEASE	CITGO STATION	706 MAIN ST HUDSON MA	NW	0.35 / 1,834.46	7	139
			RTN: 2-0014026 ***Current Status:*** RAO				
11	LST	FORMER CITGO	706 MAIN ST HUDSON MA 01749-0000	NW	0.35 / 1,834.46	7	141
			Site No | Current Date | Status Desc: 2-0017095 | 9/18/2008 | Release Tracking Number Closed				
11	LST	CONTINENTAL CITGO	706 MAIN ST HUDSON MA 01749-0000	NW	0.35 / 1,834.46	7	142
			Site No | Current Date | Status Desc: 2-0015576 | 6/1/2010 | Remedy Operation Status				
11	RELEASE	CONTINENTAL CITGO	706 MAIN ST HUDSON MA	NW	0.35 / 1,834.46	7	144

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			RTN: 2-0015576 ***Current Status:*** REMOPS				
11	RELEASE	FORMER CITGO	706 MAIN ST HUDSON MA ***RTN:*** 2-0017095 ***Current Status:*** RAONR	NW	0.35 / 1,834.46	7	157
12	RCRA SQG	ANVER CORPORATION	36 PARMENTER RD HUDSON MA 01749 ***EPA Handler ID:*** MAC300096161	WNW	0.09 / 486.70	10	161
12	GEN	ANVER CORPORATION	36 PARMENTER RD HUDSON MA 01749	WNW	0.09 / 486.70	10	164
13	RELEASE	GELPKE RESIDENCE	53 LAKESIDE AVE HUDSON MA ***RTN:*** 2-0015157 ***Current Status:*** RAO	NW	0.54 / 2,837.61	14	164
13	RELEASE	GELPKE RESIDENCE	53 LAKESIDE AVE HUDSON MA ***RTN:*** 2-0015220 ***Current Status:*** RAONR	NW	0.54 / 2,837.61	14	168
14	LAST	KLAUK RESIDENCE	40 LAKESIDE AVE HUDSON MA ***RTN:*** 2-0015407	NW	0.46 / 2,437.59	13	171
14	RELEASE	KLAUK RESIDENCE	40 LAKESIDE AVE HUDSON MA ***RTN:*** 2-0015407 ***Current Status:*** RAO	NW	0.46 / 2,437.59	13	175
15	RELEASE	JAMES GORIN REALTY TRUST	577 MAIN ST HUDSON MA ***RTN:*** 2-0000204 ***Current Status:*** WCSPRM	WNW	0.12 / 652.93	9	179
15	RCRA NON GEN	ATLANTIC BUSINESS FORMS	577 MAIN ST HUDSON MA 01749 ***EPA Handler ID:*** MAD004461885	WNW	0.12 / 652.93	9	180
15	RCRA NON GEN	INSTRUMENTATION LAB INC	577 MAIN ST HUDSON MA 01749 ***EPA Handler ID:*** MAD982200099	WNW	0.12 / 652.93	9	181
15	RCRA SQG	CENTERLINE TECHNOLOGIES LLC	577 MAIN ST HUDSON MA 01749 ***EPA Handler ID:*** MAC300005709	WNW	0.12 / 652.93	9	182
15	SPILLS	JAMES GORIN REALTY TRUST	577 MAIN ST HUDSON MA 01749	WNW	0.12 / 652.93	9	184
15	GEN	ADAPTIVE WIRELESS SOLUTIONS	577 MAIN ST HUDSON MA 01749	WNW	0.12 / 652.93	9	185

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
15	GEN	CENTERLINE TECHNOLOGIES LLC	577 MAIN ST HUDSON MA 01749	WNW	0.12 / 652.93	9	186
15	GEN	JET MAIL SERVICES	577 MAIN ST HUDSON MA 01749	WNW	0.12 / 652.93	9	186
16	RCRA CESQG	HUDSON POLY BAG INC	578 MAIN ST HUDSON MA 01749 ***EPA Handler ID:*** MAR000577213	WNW	0.18 / 964.82	20	186
17	RELEASE	SOUTH SIDE MAIN ST WEST OF PARMENTER RD	571 MAIN ST HUDSON MA ***RTN:*** 2-0010785 ***Current Status:*** RAO	WNW	0.13 / 688.89	15	187
17	RCRA NON GEN	LUND PRECISION PRODUCTS INC	571 MAIN ST HUDSON MA 01749 ***EPA Handler ID:*** MAD981062631	WNW	0.13 / 688.89	15	188
18	RELEASE	COMMERCIAL BUILDING	569 MAIN ST HUDSON MA ***RTN:*** 2-0017024 ***Current Status:*** RAO	WNW	0.07 / 394.11	14	194
18	SPILLS	COMMERCIAL BUILDING	569 MAIN ST HUDSON MA 01749-0000	WNW	0.07 / 394.11	14	196
18	RCRA CESQG	MACH MACHINE INC	569 MAIN ST HUDSON MA 01749 ***EPA Handler ID:*** MAD985297415	WNW	0.07 / 394.11	14	198
18	GEN	MACH MACHINE INC	569 MAIN ST HUDSON MA 01749	WNW	0.07 / 394.11	14	202
18	ASBESTOS PROJECT	COMMERCIAL	569 MAIN STREET HUDSON MA	WNW	0.07 / 394.11	14	202
18	ASBESTOS PROJECT	COMMERCIAL	569 MAIN STREET HUDSON MA	WNW	0.07 / 394.11	14	203
18	ASBESTOS PROJECT	COMMERCIAL	569 MAIN STREET HUDSON MA	WNW	0.07 / 394.11	14	203
19	AUL	NO LOCATION AID	17 BRNT DRIVE HUDSON MA	WNW	0.23 / 1,238.51	56	203

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
19	RELEASE	NO LOCATION AID	17 BRNT DRIVE HUDSON MA ***RTN:*** 2-0017907 ***Current Status:*** RAO	WNW	0.23 / 1,238.51	56	206
19	RCRA NON GEN	NORTHEAST GREAT DANE	17 BRENT DR HUDSON MA 01749 ***EPA Handler ID:*** MAD079525242	WNW	0.23 / 1,238.51	56	209
19	BROWNFIELDS	Blank Industrial Realty	17 Brent Drive Hudson MA	WNW	0.23 / 1,238.51	56	211
20	RELEASE	HYPERTRONICS - HYPERTAC	16 BRENT DR. HUDSON MA ***RTN:*** 2-0018206 ***Current Status:*** RAO	WNW	0.23 / 1,214.14	55	211
20	RCRA CESQG	HYPERTRONICS CORP	16 BRENT DR HUDSON MA 01749 ***EPA Handler ID:*** MAD980915813	WNW	0.23 / 1,214.14	55	213
21	RELEASE	RESIDENCE	150 NORTH SHORE DR STOW MA ***RTN:*** 2-0010012 ***Current Status:*** RAO	NW	0.55 / 2,879.18	15	217
22	HIS SPILLS	ENGINE CLEANING	1 KANE INDUSTRIAL PARK HUDSON MA ***Spill ID*** **|** ***Case Closed:*** C92-0122	YES	WNW	0.06 / 312.01	10	219
22	HIS SPILLS	WASTE OIL AND LUBRICANTS	1 KANE INDUSTRIAL DR. HUDSON MA ***Spill ID*** **|** ***Case Closed:*** C93-0030	YES	WNW	0.06 / 312.01	10	220
23	RCRA NON GEN	RICHS AUTO PARTS INC	566 MAIN ST HUDSON MA 01749 ***EPA Handler ID:*** MAD041701699	WNW	0.01 / 31.29	15	220
23	FINDS/FRS	RICHS AUTO PARTS INC	566 MAIN ST HUDSON MA 017490000	WNW	0.01 / 31.29	15	221
23	ICIS	RICHS AUTO PARTS INC	566 MAIN ST HUDSON MA 01749	WNW	0.01 / 31.29	15	222
24	RCRA CESQG	A&S DELIVERY SERVICE INC	6 KANE INDUSTRIAL DR HUDSON MA 01749 ***EPA Handler ID:*** MAR000504878	WNW	0.10 / 521.83	6	222
24	GEN	A&S DELIVERY SERVICE INC	6 KANE INDUSTRIAL DR HUDSON MA 01749	WNW	0.10 / 521.83	6	224

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
25	GEN	JEKTEK SCREENPRINTING & EMBROIDERY LLC	5 KANE INDUSTRIAL DR HUDSON MA 01749	WNW	0.12 / 649.78	8	224
26	RELEASE	CHESTNUT STREET PFAS	308 CHESTNUT STREET HUDSON MA ***RTN:*** 2-0020923 ***Current Status:*** UNCLSS	W	0.83 / 4,393.39	87	224
27	CERCLIS	A & M ADVANCED PROTOTYPES	8 KANE INDUSTRIAL DRIVE HUDSON MA 017492906 ***Site EPA ID:*** MA0001296904	WNW	0.13 / 673.05	7	227
27	CERCLIS NFRAP	A & M ADVANCED PROTOTYPES	8 KANE INDUSTRIAL DRIVE HUDSON MA 17492906 ***Site EPA ID:*** MA0001296904	WNW	0.13 / 673.05	7	228
27	SEMS ARCHIVE	A & M ADVANCED PROTOTYPES	8 KANE INDUSTRIAL DRIVE HUDSON MA 01749-2906 ***EPA ID:*** MA0001296904	WNW	0.13 / 673.05	7	229
28	GEN	R&L AUTOMOTIVE	561 MAIN ST HUDSON MA 01749	WNW	0.05 / 269.50	17	230
29	ASBESTOS PROJECT	C/O FLAVIO BRITO	66 JARMAN RD SUDBURY MA	ESE	0.05 / 265.76	-34	230
30	UST	E H PERKINS CONSTRUCTION INC	560 MAIN ST HUDSON MA 01749 ***Facility ID:*** 9946 ***Tank ID | Status | Status Date:*** 3 | Tank Removed | 24-Jan-1999, 2 | Tank Removed | 24-Jan-1999, 1 | Tank Removed | 24-Jan-1999	WNW	0.07 / 355.90	16	230
30	RELEASE	M&M DRILLING KANE PERKINS	560 MAIN ST HUDSON MA ***RTN:*** 2-0000275 ***Current Status:*** RAO	WNW	0.07 / 355.90	16	232
30	RCRA NON GEN	KORO CORP	560 MAIN ST HUDSON MA 01749 ***EPA Handler ID:*** MAD001408624	WNW	0.07 / 355.90	16	233
30	RCRA CESQG	KANE PERKINS CO INC	560 MAIN ST HUDSON MA 01749 ***EPA Handler ID:*** MAD981209166	WNW	0.07 / 355.90	16	234
30	RCRA CESQG	KANE PERKINS CO INC	560 MAIN ST HUDSON MA 01749 ***EPA Handler ID:*** MAD981897077	WNW	0.07 / 355.90	16	236
30	SPILLS	M&M DRILLING KANE PERKINS	560 MAIN ST HUDSON MA 01749	WNW	0.07 / 355.90	16	240

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
30	GEN	KANE PERKINS CO INC	560 MAIN ST HUDSON MA 01749	WNW	0.07 / 355.90	16	242
30	GEN	GRAND IMAGE	560 MAIN ST HUDSON MA 01749	WNW	0.07 / 355.90	16	242
30	GEN	PAO CORP	560 MAIN ST HUDSON MA 01749	WNW	0.07 / 355.90	16	242
30	RCRA CESQG	PAO CORP	560 MAIN ST HUDSON MA 01749 ***EPA Handler ID:*** MAR000554840	WNW	0.07 / 355.90	16	242
30	ASBESTOS PROJECT	E H PERKINS CONSTRUCTION	560 MAIN ST HUDSON MA	WNW	0.07 / 355.90	16	244
31	LAST	ARROW AUTOMOTIVE IND INC	555 MAIN ST HUDSON MA ***RTN:*** 2-0000068	WNW	0.08 / 446.08	15	244
31	RELEASE	HUDSON MAIN 555 LLC	555 MAIN ST HUDSON MA ***RTN:*** 2-0016560 ***Current Status:*** RAONR	WNW	0.08 / 446.08	15	266
31	RCRA NON GEN	LOWFIELD REALTY GROUP 555 MAIN HUDSON LL	555 MAIN ST HUDSON MA 01749 ***EPA Handler ID:*** MAC300013851	WNW	0.08 / 446.08	15	270
31	RCRA NON GEN	ARROW AUTOMOTIVE IND	555 MAIN ST HUDSON MA 01749 ***EPA Handler ID:*** MAD001062942	WNW	0.08 / 446.08	15	271
31	RCRA NON GEN	RR DONNELLY & SONS CO	555 MAIN ST HUDSON MA 01749 ***EPA Handler ID:*** MAD121006241	WNW	0.08 / 446.08	15	272
31	SPILLS	ARROW AUTOMOTIVE IND INC	555 MAIN ST HUDSON MA 01749-0000	WNW	0.08 / 446.08	15	280
31	SPILLS	HUDSON MAIN 555 LLC	555 MAIN ST HUDSON MA 01749-0000	WNW	0.08 / 446.08	15	292

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
31	LUST	ARROW AUTOMOTIVE IND INC	555 MAIN ST HUDSON MA ***RTN:*** 2-0000068	WNW	0.08 / 446.08	15	296
31	RELEASE	ARROW AUTOMOTIVE IND INC	555 MAIN ST HUDSON MA ***RTN:*** 2-0000068 ***Current Status:*** RAO	WNW	0.08 / 446.08	15	318
31	BROWNFIELDS	Arrow Automotive Ind Inc	555 Main St Hudson MA	WNW	0.08 / 446.08	15	340
32	RELEASE	KANE INDUSTRIAL PARK	15 KANE INDUSTRIAL DR HUDSON MA ***RTN:*** 2-0000515 ***Current Status:*** DEPNDS	WNW	0.23 / 1,236.50	18	340
32	RCRA SQG	ALTERNATE FINISHING INC	15 KANE INDUSTRIAL DR HUDSON MA 01749 ***EPA Handler ID:*** MAR000505123	WNW	0.23 / 1,236.50	18	341
33	RCRA NON GEN	SANDOZ COLORS & CHEMICALS	16 KANE INDUSTRIAL DR HUDSON MA 01740 ***EPA Handler ID:*** MAD075360602	WNW	0.24 / 1,245.09	18	343
34	RELEASE	BARTON ROAD NEIGHBORHOOD	220 AND 216 BARTON ROAD STOW MA ***RTN:*** 2-0020337 ***Current Status:*** TIER1D	NW	0.52 / 2,723.67	8	344
35	LAST	RENTAL PROPERTY	63 BROOK ST HUDSON MA ***RTN:*** 2-0013064	WNW	0.45 / 2,399.08	9	350
35	RELEASE	RENTAL PROPERTY	63 BROOK ST HUDSON MA ***RTN:*** 2-0013064 ***Current Status:*** RAO	WNW	0.45 / 2,399.08	9	352
36	LAST	NO LOCATION AID	17 HOWELL ST SUDBURY MA ***RTN:*** 3-0025370	ESE	0.49 / 2,600.97	-18	354
36	RELEASE	NO LOCATION AID	17 HOWELL ST SUDBURY MA ***RTN:*** 3-0025370 ***Current Status:*** RAO	ESE	0.49 / 2,600.97	-18	357
37	ASBESTOS PROJECT	SUDBURY WATER DEPARTMENT	1 JARMAN ROAD SUDBURY MA	ESE	0.05 / 289.13	-25	360
38	HIST LUST		578 BOSTON POST RD; RTE 20 SUDBURY MA ***Spill ID | Case Closed:*** N88-1159 | YES	ESE	0.48 / 2,539.93	-24	360

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
38	AUL	BARTLETTS GREENHOUSE	578 BOSTON POST RD SUDBURY MA	ESE	0.48 / 2,539.93	-24	361
38	RELEASE	BARTLETTS GREENHOUSE	578 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0003267 ***Current Status:*** RAO	ESE	0.48 / 2,539.93	-24	366
39	OIL & HAZ MAT	CHESTNUT STREET WELL	CHESTNUT STREET HUDSON MA	WNW	0.23 / 1,216.26	3	371
40	RELEASE	RESIDENTIAL COMMUNITY	200 BAY DRIVE SUDBURY MA ***RTN:*** 3-0035104 ***Current Status:*** PSNC	ESE	0.23 / 1,227.62	-43	372
40	RCRA NON GEN	BEACON ROOFING SUPPLY	200 BAY DR SUDBURY MA 01776 ***EPA Handler ID:*** MAR000527127	ESE	0.23 / 1,227.62	-43	373
41	RELEASE	NO LOCATION AID	528 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0027243 ***Current Status:*** TIERI	ESE	0.39 / 2,042.35	-43	374
41	RELEASE	RAYTHEON EAST DRIVEWAY	528 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0017106 ***Current Status:*** RAO	ESE	0.39 / 2,042.35	-43	379
41	RELEASE	RAYTHEON COMPANY	528 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0003037 ***Current Status:*** PENNFA	ESE	0.39 / 2,042.35	-43	381
41	RCRA TSD	RAYTHEON COMPANY	528 BOSTON POST RD SUDBURY MA 01776 ***EPA Handler ID:*** MAD001410539	ESE	0.39 / 2,042.35	-43	384
42	ASBESTOS PROJECT	YLK REALTY TRUST	40 CHESTNUT STREET HUDSON MA	WNW	0.10 / 502.87	20	404
43	RELEASE	SUNRISE CLEANERS	523 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0015591 ***Current Status:*** RAONR	ESE	0.37 / 1,934.08	-48	405
43	RELEASE	SUNRISE CLEANERS	523 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0004339 ***Current Status:*** RAO	ESE	0.37 / 1,934.08	-48	410
44	LAST	RESIDENCE	47 MARLBOROUGH RD STOW MA ***RTN:*** 2-0013499	WNW	0.17 / 880.39	-3	427

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
44	RELEASE	RESIDENCE	47 MARLBOROUGH RD STOW MA ***RTN:*** 2-0013499 ***Current Status:*** RAO	WNW	0.17 / 880.39	-3	430
45	LUST	RTE 20	475 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0015951	ESE	0.29 / 1,556.57	-59	434
45	LUST	RTE 20	475 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0015872	ESE	0.29 / 1,556.57	-59	439
45	LST	RTE 20	475 BOSTON POST RD SUDBURY MA 01776-0000 ***Site No | Current Date | Status Desc:*** 3-0015872 | 3/3/1998 | Response Action Outcome	ESE	0.29 / 1,556.57	-59	440
45	LST	RTE 20	475 BOSTON POST RD SUDBURY MA 01776-0000 ***Site No | Current Date | Status Desc:*** 3-0015951 | 10/3/2007 | Response Action Outcome	ESE	0.29 / 1,556.57	-59	442
45	RELEASE	RTE 20	475 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0015872 ***Current Status:*** RAO	ESE	0.29 / 1,556.57	-59	444
45	RELEASE	RTE 20	475 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0015951 ***Current Status:*** RAO	ESE	0.29 / 1,556.57	-59	445
46	RELEASE	SOUSA	477 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0000602 ***Current Status:*** RAO	ESE	0.29 / 1,555.93	-59	450
47	LUST	CUMBERLAND FARMS/GULF	470 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0004202	ESE	0.26 / 1,370.95	-57	451
47	RELEASE	CUMBERLAND FARMS	470 BOSTON POST ROAD SUDBURY MA ***RTN:*** 3-0029588 ***Current Status:*** RAONR	ESE	0.26 / 1,370.95	-57	468
47	RELEASE	CUMBERLAND FARMS	470 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0023429 ***Current Status:*** RAONR	ESE	0.26 / 1,370.95	-57	473
47	LST	CUMBERLAND FARMS/GULF	470 BOSTON POST RD SUDBURY MA 01776-0000 ***Site No | Current Date | Status Desc:*** 3-0004202 | 2/5/2009 | Response Action Outcome	ESE	0.26 / 1,370.95	-57	476
47	RELEASE	CUMBERLAND FARMS/GULF	470 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0004202 ***Current Status:*** RAO	ESE	0.26 / 1,370.95	-57	478
48	LST	MOBIL STATION	465 BOSTON POST RD SUDBURY MA 01776-0000	ESE	0.26 / 1,390.43	-57	495

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			Site No | Current Date | Status Desc: 3-0002341 | 9/20/2006 | Response Action Outcome				
48	LUST	MOBIL STATION	465 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0002341	ESE	0.26 / 1,390.43	-57	496
48	RELEASE	MOBIL STATION	465 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0002341 ***Current Status:*** RAO	ESE	0.26 / 1,390.43	-57	508
49	HIST LUST	STORM DRAIN OUTFALL	239 NOBSCOT RD SUDBURY MA ***Spill ID | Case Closed:*** N93-0018 | YES	ESE	0.30 / 1,576.70	-54	519
49	LUST	INTERSTATE GAS & OIL	239 NOBSCOT RD SUDBURY MA ***RTN:*** 3-0004668	ESE	0.30 / 1,576.70	-54	519
49	RELEASE	NO LOCATION AID	239 NOBSCOT RD SUDBURY MA ***RTN:*** 3-0026639 ***Current Status:*** RAO	ESE	0.30 / 1,576.70	-54	521
49	LST	INTERSTATE GAS & OIL	239 NOBSCOT RD SUDBURY MA 01776-0000 ***Site No | Current Date | Status Desc:*** 3-0004668 | 9/24/2001 | Downgradient Property Status	ESE	0.30 / 1,576.70	-54	523
49	RELEASE	INTERSTATE GAS & OIL	239 NOBSCOT RD SUDBURY MA ***RTN:*** 3-0004668 ***Current Status:*** DPS	ESE	0.30 / 1,576.70	-54	524
50	RCRA NON GEN	I C TESTING INC	31 C UNION AVE SUDBURY MA 01776 ***EPA Handler ID:*** MAD055304604	ESE	0.02 / 127.73	-60	526
51	UST	COATINGS ENGINEERING CORP	33 UNION AVE SUDBURY MA 01776 ***Facility ID:*** 11009 ***Tank ID | Status | Status Date:*** 4 | Tank Removed | 10-Jun-1987, 7 | Tank Removed | 10-Jun-1987, 2 | Tank Removed | 10-Jun-1987, 6 | Tank Removed | 10-Jun-1987, 3 | Tank Removed | 10-Jun-1987, 8 | Tank Removed | 10-Jun-1987, 1 | Tank Removed | 10-Jun-1987, 9 | Tank Removed | 10-Jun-1987, 5 | Tank Removed | 10-Jun-1987, 10 | Tank Removed | 10-Jun-1987	ESE	0.03 / 173.74	-60	528
51	RELEASE	COATINGS ENGINEERING	33 UNION RD SUDBURY MA ***RTN:*** 3-0000074 ***Current Status:*** RAO	ESE	0.03 / 173.74	-60	532
51	RCRA NON GEN	COATINGS ENGR CORP	33 UNION AVE SUDBURY MA 01776 ***EPA Handler ID:*** MAD001063338	ESE	0.03 / 173.74	-60	546
51	SPILLS	COATINGS ENGINEERING	33 UNION RD SUDBURY MA 01776-0000	ESE	0.03 / 173.74	-60	548
51	RCRA CESQG	STAPLES CONTRACT AND COMMERCIAL	33 UNION AVE SUDBURY MA 01776	ESE	0.03 / 173.74	-60	555

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			EPA Handler ID: MAC300093028				
51	GEN	STAPLES CONTRACT AND COMMERCIAL	33 UNION AVE SUDBURY MA 01776	ESE	0.03 / 173.74	-60	557
52	RELEASE	MULLEN LUMBER	39 UNION AVE SUDBURY MA	ESE	0.04 / 201.52	-61	557
			RTN: 3-0002640 ***Current Status:*** RAO				
52	SPILLS	MULLEN LUMBER	39 UNION AVE SUDBURY MA 01776	ESE	0.04 / 201.52	-61	561
53	UST	UNION AVE REALTY	46 UNION AVE SUDBURY MA 01776	ESE	0.03 / 168.10	-61	564
			Facility ID: 10992 ***Tank ID | Status | Status Date:*** 1 | Tank Closure In-Place | 22-Sep-2010				
53	GEN	CHARLES J PERCOURT & SONS INC	46 UNION AVE SUDBURY MA 01776	ESE	0.03 / 168.10	-61	565
53	RCRA CESQG	CHARLES J PRECOURT & SON INC	46 UNION AVE SUDBURY MA 01776	ESE	0.03 / 168.10	-61	566
			EPA Handler ID: MAR000535054				
54	UST	E H PERKINS CONSTRUCTION INC	50 UNION AVE SUDBURY MA 01776	ESE	0.06 / 315.40	-61	567
			Facility ID: 10995 ***Tank ID | Status | Status Date:*** 1 | Tank Removed | 10-Jun-1987, 2 | Tank Removed | 10-Jun-1987				
55	RCRA SQG	METHODS MACHINE TOOLS INC	65 UNION AVE SUDBURY MA 01776	ESE	0.14 / 731.78	-62	568
			EPA Handler ID: MAD019659044				
55	RCRA NON GEN	WORTHINGTON CYLINDERS	65 UNION ST REAR SUDBURY MA 01776	ESE	0.14 / 731.78	-62	570
			EPA Handler ID: MAC300102399				
56	RCRA NON GEN	COMREX CORP	60 UNION AVE SUDBURY MA 01776	ESE	0.11 / 574.57	-62	572
			EPA Handler ID: MAD001071083				
57	RELEASE	FUEL DEPOT FMR	450 BOSTON POST RD SUDBURY MA	ESE	0.20 / 1,030.15	-57	573
			RTN: 3-0004638 ***Current Status:*** RAO				
58	RCRA NON GEN	HYCOMP INC	75 UNION AVE SUDBURY MA 01776	ESE	0.18 / 930.42	-61	575
			EPA Handler ID: MAD048281240				
59	UST	ERNEST SCHOFIELD	80 UNION AVE SUDBURY MA 01776	ESE	0.19 / 987.05	-62	576

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			Facility ID: 10999 ***Tank ID | Status | Status Date:*** 3 | Tank Removed | 01-Jan-1985, 1 | Tank Removed | 01-Jan-1985, 2 | Tank Removed | 01-Jan-1985				
59	HIST LAST	UNION & PALMER REALTY TRUST	80 UNION STREET SUDBURY MA ***Spill ID | Case Closed:*** N89-1502 | YES	ESE	0.19 / 987.05	-62	578
59	LAST	UNION PALMER REALTY TRUST	80 UNION AVE SUDBURY MA ***RTN:*** 3-0003371	ESE	0.19 / 987.05	-62	578
59	RELEASE	UNION PALMER REALTY TRUST	80 UNION AVE SUDBURY MA ***RTN:*** 3-0003371 ***Current Status:*** RAO	ESE	0.19 / 987.05	-62	580
60	UST	MULLEN LUMBER CO INC	28 UNION AVE SUDBURY MA 01776 ***Facility ID:*** 10991 ***Tank ID | Status | Status Date:*** 1 | Tank Removed | 05-May-1993	ESE	0.07 / 355.76	-60	582
61	LUST	15 UNION AVENUE	15 UNION AVE SUDBURY MA ***RTN:*** 3-0014107	ESE	0.09 / 452.87	-60	583
61	LST	15 UNION AVENUE	15 UNION AVE SUDBURY MA 01776-0000 ***Site No | Current Date | Status Desc:*** 3-0014107 | 4/3/2002 | Response Action Outcome	ESE	0.09 / 452.87	-60	585
61	SPILLS	15 UNION AVENUE	15 UNION AVE SUDBURY MA 01776-0000	ESE	0.09 / 452.87	-60	587
61	RELEASE	15 UNION AVENUE	15 UNION AVE SUDBURY MA ***RTN:*** 3-0014107 ***Current Status:*** RAO	ESE	0.09 / 452.87	-60	590
62	ASBESTOS PROJECT	SUDBURY POST OFFICE	18 UNION AVE SUDBURY MA	ESE	0.08 / 433.37	-61	592
62	ASBESTOS PROJECT	us post office	18 union avenue SUDBURY MA	ESE	0.08 / 433.37	-61	593
62	ASBESTOS PROJECT	POST OFFICE	18 UNION ST SUDBURY MA	ESE	0.08 / 433.37	-61	593
62	ASBESTOS PROJECT	USPS SUDBURY	18 UNION AVE. SUDBURY MA	ESE	0.08 / 433.37	-61	593
62	ASBESTOS PROJECT	SUDBURY POST OFFICE	18 UNION AVE SUDBURY MA	ESE	0.08 / 433.37	-61	593

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
62	ASBESTOS PROJECT	US POST OFFICE	18 UNION AVE SUDBURY MA	ESE	0.08 / 433.37	-61	594
63	GEN	CONTRONAUTICS INCORPORATED	31 WILKINS HUDSON MA 01749	WNW	0.07 / 372.65	30	594
63	RCRA CESQG	CONTRONAUTICS, INCORPORATED	31 WILKINS HUDSON MA 01749 ***EPA Handler ID:*** MAR000526368	WNW	0.07 / 372.65	30	594
63	ASBESTOS PROJECT	PAUL MCGUIRE	31 WILKINS ST HUDSON MA	WNW	0.07 / 372.65	30	596
64	UST	SUDBURY MOBIL	432 BOSTON POST RD SUDBURY MA 01776 ***Facility ID:*** 11006 ***Tank ID | Status | Status Date:*** 5 | Tank Removed | 14-Jun-1989, 3 | Tank Removed | 05-May-1993, 4 | Tank Removed | 14-Jun-1989, 9 | Tank Removed | 05-Nov-2008, 6 | In Use | , 10 | Tank Removed | 05-Nov-2008, 1 | Tank Removed | 14-Jun-1989, 8 | Tank Closure In-Place | 05-Apr-2019, 7 | In Use | , 2 | Tank Removed | 14-Jun-1989	ESE	0.17 / 884.40	-58	596
64	LUST	MOBIL STATION	432 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0002423	ESE	0.17 / 884.40	-58	600
64	RELEASE	MOBIL STATION	432 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0028383 ***Current Status:*** RAO	ESE	0.17 / 884.40	-58	618
64	RELEASE	MOBIL STATION	432 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0028384 ***Current Status:*** RAO	ESE	0.17 / 884.40	-58	621
64	RELEASE	MOBIL SERVICE STA #10381 (FRMR 01-474)	432 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0026036 ***Current Status:*** RAONR	ESE	0.17 / 884.40	-58	623
64	RELEASE	MOBIL STATION 01-474	432 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0024771 ***Current Status:*** RAONR	ESE	0.17 / 884.40	-58	629
64	RELEASE	MOBIL SERVICE STATION 01-474	432 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0023726 ***Current Status:*** RAONR	ESE	0.17 / 884.40	-58	633
64	RCRA CESQG	MOBIL 2477	432 BOSTON POST RD SUDBURY MA 01776 ***EPA Handler ID:*** MAD985296128	ESE	0.17 / 884.40	-58	637
64	LST	MOBIL STATION	432 BOSTON POST RD SUDBURY MA 01776-0000	ESE	0.17 / 884.40	-58	646

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			Site No* | *Current Date* | *Status Desc: 3-0002423 | 9/13/2006 | Response Action Outcome				
64	RELEASE	MOBIL STATION	432 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0002423 ***Current Status:*** RAO	ESE	0.17 / 884.40	-58	647
65	RCRA CESQG	EXXONMOBIL OIL CORPORATION 01CY7	431 RTE 20 SUDBURY MA 01776 ***EPA Handler ID:*** MAD985296243	ESE	0.17 / 888.07	-58	665
66	RCRA NON GEN	STEVES AUTO BODY	40 STATION RD SUDBURY MA 01776 ***EPA Handler ID:*** MAD019658582	ESE	0.01 / 57.56	-62	667
66	RCRA CESQG	STATION ROAD AUTO BODY & GARAGE INC	40 STATION RD SUDBURY MA 01776 ***EPA Handler ID:*** MAD982190373	ESE	0.01 / 57.56	-62	669
66	FINDS/FRS	STATION ROAD AUTO BODY & GARAG	40 STATION RD SUDBURY MA 01776	ESE	0.01 / 57.56	-62	672
66	FINDS/FRS	STEVES AUTO BODY	40 STATION RD SUDBURY MA 01776	ESE	0.01 / 57.56	-62	672
66	GEN	STATION ROAD AUTO BODY & GARAGE INC	40 STATION RD SUDBURY MA 01776	ESE	0.01 / 57.56	-62	673
67	RELEASE	CHISWICK PROPERTIES FMR	BOSTON POST ROAD UNION ST SUDBURY MA ***RTN:*** 3-0000020 ***Current Status:*** RAO	ESE	0.16 / 834.61	-58	673
68	RELEASE	SUDBURY CLEANERS	428 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0010592 ***Current Status:*** REMOPS	ESE	0.15 / 777.52	-58	677
68	RCRA NON GEN	SUDBURY CLEANERS	428 BOSTON POST RD SUDBURY MA 01776 ***EPA Handler ID:*** MAD091499897	ESE	0.15 / 777.52	-58	683
69	RCRA CESQG	COLONIAL AUTO OF SUDBURY	430 BOSTON POST RD SUDBURY MA 01776 ***EPA Handler ID:*** MAD980906911	ESE	0.14 / 759.70	-58	684
70	RELEASE	NO LOCATION AID	425 BOSTON POST ROAD SUDBURY MA ***RTN:*** 3-0030065 ***Current Status:*** RAO	ESE	0.14 / 745.84	-57	692
70	LST	NO LOCATION AID	425 BOSTON POST ROAD SUDBURY MA 01776-3011	ESE	0.14 / 745.84	-57	693

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			***Site No*	*Current Date*	*Status Desc:*** 3-0030065 | 8/4/2011 | Response Action Outcome		
70	LUST	NO LOCATION AID	425 BOSTON POST ROAD SUDBURY MA ***RTN:*** 3-0030065	ESE	0.14 / 745.84	-57	694
71	RCRA CESQG	MOSHER AUTO BODY INC	34 STATION RD SUDBURY MA 01776 ***EPA Handler ID:*** MAD019679059	ESE	0.01 / 55.22	-63	696
71	FINDS/FRS	MOSHER AUTO BODY INC	34 STATION RD SUDBURY MA 01776	ESE	0.01 / 55.22	-63	700
71	GEN	MOSHER AUTO BODY INC	34 STATION RD SUDBURY MA 01776	ESE	0.01 / 55.22	-63	701
71	FINDS/FRS	MOSHER AUTOBODY	34 STATION RD SUDBURY MA 01776	ESE	0.01 / 55.22	-63	701
72	RCRA CESQG	SUDBURY PIZZA	426 BOSTON POST RD SUDBURY MA 01776 ***EPA Handler ID:*** MAR000567180	ESE	0.13 / 709.15	-58	701
72	RELEASE	SUDBURY PIZZA	426 BOSTON POST ROAD SUDBURY MA ***RTN:*** 3-0035807 ***Current Status:*** PSNC	ESE	0.13 / 709.15	-58	702
72	LUST	SUDBURY PIZZA	426 BOSTON POST ROAD SUDBURY MA ***RTN:*** 3-0035807	ESE	0.13 / 709.15	-58	704
73	HIST LUST	SUDBURY MOBIL	423 BOSTON POST RD SUDBURY MA ***Spill ID* | *Case Closed:*** N92-1121 | YES	ESE	0.12 / 631.62	-58	706
73	RCRA NON GEN	FORMER DBA RITE AID 10106	423 BOSTON POST RD SUDBURY MA 01776 ***EPA Handler ID:*** MAC300021102	ESE	0.12 / 631.62	-58	706
74	RELEASE	FAHEY EXHIBITS BUILDING	501 GLEASONDALE RD STOW MA ***RTN:*** 2-0000427 ***Current Status:*** RAO	WNW	0.57 / 3,024.48	-15	710
74	RELEASE	GLEASONDALE MILL	501 GLEASONDALE ROAD STOW MA ***RTN:*** 2-0021116 ***Current Status:*** UNCLSS	WNW	0.57 / 3,024.48	-15	718
75	RELEASE	WASTE MANAGEMENT INC	66 FORT MEADOW RD HUDSON MA	W	0.88 / 4,657.14	101	718

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			RTN: 2-0011278 ***Current Status:*** RAO				
76	ASBESTOS PROJECT	OLD SUDBURY POLICE STATION	415 BOSTON POST ROAD SUDBURY MA	ESE	0.10 / 542.21	-58	720
76	ASBESTOS PROJECT	415 BOSTON POST ROAD	415 BOSTON POST ROAD SUDBURY MA	ESE	0.10 / 542.21	-58	720
77	RCRA CESQG	TJ MAXX T0281	437 BOSTON POST RD SUDBURY MA 01776 ***EPA Handler ID:*** MAR000544221	ESE	0.20 / 1,042.56	-55	720
78	RELEASE	MASSACHUSETTS FIREFIGHTING ACADEMY	1 SUDBURY RD STOW MA ***RTN:*** 2-0017327 ***Current Status:*** RAO	WNW	0.80 / 4,200.92	12	722
79	RCRA NON GEN	1 HR INSTANT PHOTO	410 BOSTON POST RD SUDBURY MA 01776 ***EPA Handler ID:*** MAD985307750	ESE	0.09 / 480.71	-58	724
80	ASBESTOS PROJECT	VACANT BUILDING	400 BOSTON POST ROAD SUDBURY MA	ESE	0.07 / 348.96	-57	726
81	RELEASE	MIDDLEBORO TRAIN YARD	1 STATION RD MIDDLEBOROUGH MA ***RTN:*** 4-0022510 ***Current Status:*** RAO	ESE	0.01 / 43.46	-63	726
81	SPILLS	MIDDLEBORO TRAIN YARD	1 STATION RD MIDDLEBOROUGH MA	ESE	0.01 / 43.46	-63	728
82	ASBESTOS PROJECT	CHERYL SALATINO	14 MAPLE AVENUE SUDBURY MA	ESE	0.06 / 301.33	-47	729
83	LAST	BEHIND MACKINNONS LIQUOR	5 CONCORD RD SUDBURY MA ***RTN:*** 3-0026018	ESE	0.13 / 683.06	-47	730
83	RELEASE	BEHIND MACKINNONS LIQUOR	5 CONCORD RD SUDBURY MA ***RTN:*** 3-0026018 ***Current Status:*** RAO	ESE	0.13 / 683.06	-47	731
84	ASBESTOS PROJECT	CHICKEN COOPS	6 WILKINS ST HUDSON MA	WNW	0.00 / 11.90	26	733
85	ASBESTOS PROJECT	CITI GROUP	5-10 CONCORD RD SUDBURY MA	ESE	0.12 / 638.79	-47	733

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
86	ASBESTOS PROJECT	WOLFE RESIDENCE	159-61 FORREST ST HUDSON MA	WNW	0.00 / 9.89	25	733
87	ASBESTOS PROJECT	RESIDENTIAL	156 FOREST AVENUE HUDSON MA	WNW	0.00 / 9.92	24	733
87	ASBESTOS PROJECT	RESIDENTIAL	156 FOREST AVENUE HUDSON MA	WNW	0.00 / 9.92	24	734
88	HIST LUST		457N MAIN STREET HUDSON MA ***Spill ID*	*Case Closed:*** C88-0102 | YES	WNW	0.02 / 127.79	26	734
89	UST	VERIZON MASSACHUSETTS #568506	351 BOSTON POST RD SUDBURY MA 01776 ***Facility ID:*** 10996	ESE	0.12 / 659.51	-47	734
89	ASBESTOS PROJECT	VERIZON	351 BOSTON POST ROAD SUDBURY MA	ESE	0.12 / 659.51	-47	735
90	UST	MOBIL LUBE AND OIL	457 MAIN ST HUDSON MA 01749 ***Facility ID:*** 19415 ***Tank ID* | *Status* | *Status Date:*** 3 | In Use | , 1 | In Use | , 2 | In Use |	WNW	0.06 / 320.80	25	735
90	GEN	MOPBIL LUBE & OIL	457 MAIN ST HUDSON MA 01749	WNW	0.06 / 320.80	25	737
91	CERCLIS	PIERCE ROSE	46 MAPLE AVENUE SUDBURY MA 017763441 ***Site EPA ID:*** MA0001094572	ESE	0.05 / 274.13	-39	737
91	CERCLIS NFRAP	PIERCE ROSE	46 MAPLE AVENUE SUDBURY MA 17763441 ***Site EPA ID:*** MA0001094572	ESE	0.05 / 274.13	-39	738
91	SEMS ARCHIVE	PIERCE ROSE	46 MAPLE AVENUE SUDBURY MA 01776-3441 ***EPA ID:*** MA0001094572	ESE	0.05 / 274.13	-39	739
92	RCRA NON GEN	PEIRCE ROSE INC	60 MAPLE AVE SUDBURY MA 01776 ***EPA Handler ID:*** MAD066616145	ESE	0.05 / 253.23	-32	739
93	FINDS/FRS	FOREST AVENUE ELEMENTARY SCHOOL	138 FOREST AVENUE HUDSON MA 01749-2840	W	0.00 / 3.52	41	741

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
94	ASBESTOS PROJECT	HUDSON PUBLIC SCHOOLS	136 FOREST AVE HUDSON MA	W	0.00 / 3.75	43	741
94	ASBESTOS PROJECT	FOREST AVE. SCHOOL	136 FOREST AVENUE HUDSON MA	W	0.00 / 3.75	43	742
94	ASBESTOS PROJECT	FOREST AVE ELEMENTARY SCHOOL	136 FOREST AVE HUDSON MA	W	0.00 / 3.75	43	742
94	ASBESTOS PROJECT	FOREST AVE. SCHOOL	136 FOREST AVENUE HUDSON MA	W	0.00 / 3.75	43	742
94	ASBESTOS PROJECT	FOREST AVE. SCHOOL	136 FOREST AVENUE HUDSON MA	W	0.00 / 3.75	43	742
94	ASBESTOS PROJECT	FORREST AVE SCHOOL	136 FORREST AVE HUDSON MA	W	0.00 / 3.75	43	742
94	ASBESTOS PROJECT	FOREST AVE ELEMENTARY SCHOOL	136 FOREST AVE HUDSON MA	W	0.00 / 3.75	43	743
94	ASBESTOS PROJECT	FOREST AVE. SCHOOL	136 FOREST AVENUE HUDSON MA	W	0.00 / 3.75	43	743
94	ASBESTOS PROJECT	FOREST AVENUE SCHOOL	136 FOREST AVE HUDSON MA	W	0.00 / 3.75	43	743
94	ASBESTOS PROJECT	FOREST AVE. SCHOOL	136 FOREST AVENUE HUDSON MA	W	0.00 / 3.75	43	743
95	ASBESTOS PROJECT	CHILDRENS AFTER SCHOOL PROGRAMS INC	127 FOREST AVE HUDSON MA	W	0.00 / 14.33	45	744
95	ASBESTOS PROJECT	CHILDRENS AFTER SCHOOL PROGRAMS INC	127 FOREST AVE HUDSON MA	W	0.00 / 14.33	45	744
96	ASBESTOS PROJECT	MARY AKINS	39 WOODROW STREET HUDSON MA	W	0.12 / 615.60	42	744

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
97	SWF/LF	HUDSON TRANSFER STATION	300 COX ST HUDSON, MA 01749 MA	WNW	0.34 / 1,781.68	15	744
98	FINDS/FRS	FAMILY ORTHODONTICS OF HUDSON	118 FOREST AVE HUDSON MA 017490000	W	0.00 / 10.64	44	745
99	HIST LUST	BELOW GND TANK REMOVAL	422 MAIN ST. HUDSON MA ***Spill ID*	*Case Closed:*** C89-0213 | YES	WNW	0.39 / 2,083.56	5	746
100	AUL	GASOLINE STATION FMR	225 AND 227 BOSTON POST RD SUDBURY MA	ESE	0.10 / 506.68	-45	746
100	RELEASE	GASOLINE STATION FMR	225 AND 227 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0001153 ***Current Status:*** RAO	ESE	0.10 / 506.68	-45	749
101	CERCLIS	HUDSON LIGHT & POWER	CHERRY ST. STATION HUDSON MA 01749 ***Site EPA ID:*** MAD980671051	W	0.15 / 783.67	44	752
102	LUST	POPLINS FURNITURE WAREHOUSE	420 MAIN ST HUDSON MA ***RTN:*** 2-0012541	WNW	0.43 / 2,251.30	5	754
102	RELEASE	WASTE SOLUTIONS, INC	420 MAIN ST HUDSON MA ***RTN:*** 2-0015477 ***Current Status:*** RAO	WNW	0.43 / 2,251.30	5	755
102	LST	POPLINS FURNITURE WAREHOUSE	420 MAIN ST HUDSON MA 01749-0000 ***Site No* | *Current Date* | *Status Desc:*** 2-0012541 | 5/13/1999 | Response Action Outcome	WNW	0.43 / 2,251.30	5	757
102	RELEASE	POPLINS FURNITURE WAREHOUSE	420 MAIN ST HUDSON MA ***RTN:*** 2-0012541 ***Current Status:*** RAO	WNW	0.43 / 2,251.30	5	758
103	ASBESTOS PROJECT	TRACY FACILE	106 FOREST AVENUE HUDSON MA	W	0.00 / 7.55	39	760
104	RELEASE	ZINA FARM	1 ZINA RD HUDSON MA ***RTN:*** 2-0016208 ***Current Status:*** TIER1D	WNW	0.61 / 3,206.88	8	760
105	UST	SUDBURY GETTY	227 BOSTON POST RD SUDBURY MA 01776	ESE	0.09 / 459.18	-51	764

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			Facility ID: 11002 ***Tank ID | Status | Status Date:*** 2 | Tank Removed | 05-May-1992, 3 | Tank Removed | 05-May-1992, 1 | Tank Removed | 05-May-1992				
105	SPILLS	GASOLINE STATION FMR	225 AND 227 BOSTON POST RD SUDBURY MA 01776	ESE	0.09 / 459.18	-51	766
106	FINDS/FRS	KUSTOM KREATIONS INC	104 FOREST ST HUDSON MA 017490000	W	0.00 / 7.29	37	768
106	GEN	KUSTOM KREATIONS INC	104 FOREST AVE HUDSON MA 01749	W	0.00 / 7.29	37	769
106	RCRA CESQG	KUSTOM KREATIONS INC	104 FOREST AVE HUDSONHUDSON MA 01749 ***EPA Handler ID:*** MAR000573824	W	0.00 / 7.29	37	769
107	ASBESTOS PROJECT	BARRETT RESIDENCE	222 BOSTON POST ROAD SUDBURY MA	ESE	0.08 / 432.13	-49	770
108	RELEASE	MOREL FOREIGN AUTO REPAIR	406 MAIN ST HUDSON MA ***RTN:*** 2-0000255 ***Current Status:*** RAO	WNW	0.39 / 2,047.25	10	770
109	UST	SUDBURY AUTOMOTIVE	209 BOSTON POST RD SUDBURY MA 01776 ***Facility ID:*** 11003 ***Tank ID | Status | Status Date:*** 1 | Tank Removed | 03-Nov-2015, 3 | Tank Removed | 03-Nov-2015, 2 | Tank Removed | 03-Nov-2015, 6 | In Use | 22-Jan-2016, 5 | In Use | 22-Jan-2016, 4 | Tank Removed | 01-Jan-2002	ESE	0.05 / 283.47	-39	772
109	LUST	NO LOCATION AID	209 BOSTON POST ROAD SUDBURY MA ***RTN:*** 3-0033240	ESE	0.05 / 283.47	-39	775
109	LST	NO LOCATION AID	209 BOSTON POST ROAD SUDBURY MA 01776-0000 ***Site No | Current Date | Status Desc:*** 3-0033240 | 11/8/2016 | Tier 2	ESE	0.05 / 283.47	-39	780
109	SPILLS	NO LOCATION AID	209 BOSTON POST ROAD SUDBURY MA 01776-0000	ESE	0.05 / 283.47	-39	781
109	RELEASE	NO LOCATION AID	209 BOSTON POST ROAD SUDBURY MA ***RTN:*** 3-0033240 ***Current Status:*** TIERII	ESE	0.05 / 283.47	-39	785
109	GEN	SUDBURY AUTOMOTIVE INC	209 BOSTON POST RD SUDBURY MA 01776	ESE	0.05 / 283.47	-39	790

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
109	OIL & HAZ MAT	NO LOCATION AID	209 BOSTON POST ROAD SUDBURY MA	ESE	0.05 / 283.47	-39	790
109	RCRA NON GEN	SUDBURY AUTOMOTIVE INC	209 BOSTON POST RD SUDBURY MA 01776 ***EPA Handler ID:*** MAV000011143	ESE	0.05 / 283.47	-39	791
110	ASBESTOS PROJECT	PATRICK DELANEY	206 BOSTON POST ROAD SUDBURY MA	ESE	0.05 / 286.16	-41	791
111	HIST LUST	SUDBURY AUTOMOTIVE	RTE 20 @ LANHAM RD SUDBURY MA ***Spill ID*** **|** ***Case Closed:*** N91-1290	YES	ESE	0.05 / 268.70	-41	792
111	RELEASE	NO LOCATION AID	BOSTON POST ROAD AT LANDHAM RD SUDBURY MA ***RTN:*** 3-0027224 ***Current Status:*** URAM	ESE	0.05 / 268.70	-41	792
111	SPILLS	NO LOCATION AID	BOSTON POST ROAD AT LANDHAM RD SUDBURY MA 01776-0000	ESE	0.05 / 268.70	-41	793
112	RELEASE	LPM HOLDING INC	90 CHERRY ST HUDSON MA ***RTN:*** 2-0015363 ***Current Status:*** DPS	W	0.26 / 1,363.83	8	795
113	ASBESTOS PROJECT	TED SHYLOUSKY	192 BOSTON POST ROAD SUDBURY MA	ESE	0.07 / 354.42	-44	796
113	ASBESTOS PROJECT	HOUSE	192 BOSTON POST RD SUDBURY MA	ESE	0.07 / 354.42	-44	797
114	ASBESTOS PROJECT	KEITH CONSTRUCTION	189 BOSTON POST ROAD SUDBURY MA	ESE	0.06 / 337.15	-44	797
115	AST	HUDSON LIGHT & POWER DEPT - CHERRY ST	77 CHERRY ST HUDSON MA 01749 ***License No:*** OSFM-00741 ***License Status:*** Tank Removed	W	0.24 / 1,280.80	8	797
115	AST	HUDSON LIGHT & POWER DEPT - CHERRY ST	77 CHERRY ST HUDSON MA 01749 ***License No:*** OSFM-00783 ***License Status:*** Tank Removed	W	0.24 / 1,280.80	8	797
115	LAST	HUDSON LIGHT & POWER DEPARTMENT	77 CHERRY ST HUDSON MA	W	0.24 / 1,280.80	8	798

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			RTN: 2-0017400				
115	RCRA SQG	HUDSON LIGHT & POWER DEPT	77 CHERRY ST HUDSON MA 01749 ***EPA Handler ID:*** MAD980671051	W	0.24 / 1,280.80	8	799
115	SEMS	HUDSON LIGHT & POWER GENERATING STATION	77 CHERRY ST HUDSON MA 01749 ***EPA ID:*** MAD980671051	W	0.24 / 1,280.80	8	802
115	RELEASE	HUDSON LIGHT & POWER DEPARTMENT	77 CHERRY ST HUDSON MA ***RTN:*** 2-0017400 ***Current Status:*** RAO	W	0.24 / 1,280.80	8	803
116	RELEASE	PROPERTY	78 CHERRY STREET HUDSON MA ***RTN:*** 2-0018467 ***Current Status:*** RAO	W	0.24 / 1,292.28	9	805
116	RCRA NON GEN	ASSABET MACHINE CORP	78 CHERRY ST HUDSON MA 01749 ***EPA Handler ID:*** MAD081567877	W	0.24 / 1,292.28	9	806
117	RELEASE	DIGITAL EQUIPMENT CORP	75 REED RD HUDSON MA ***RTN:*** 2-0012171 ***Current Status:*** RAO	W	0.50 / 2,661.61	171	809
117	RELEASE	DIGITAL EQUIPMENT CORP	75 REED RD HUDSON MA ***RTN:*** 2-0001049 ***Current Status:*** RAO	W	0.50 / 2,661.61	171	811
117	RELEASE	DIGITAL EQUIPMENT FACILITY	75 REED RD HUDSON MA ***RTN:*** 2-0012116 ***Current Status:*** RAO	W	0.50 / 2,661.61	171	812
117	RELEASE	INTEL CENTRAL UTILITY BLDG	75 REED RD HUDSON MA ***RTN:*** 2-0013852 ***Current Status:*** RAO	W	0.50 / 2,661.61	171	814
117	RELEASE	DIGITAL EQUIPMENT CORP	75 REED RD HUDSON MA ***RTN:*** 2-0010471 ***Current Status:*** RAO	W	0.50 / 2,661.61	171	815
117	RELEASE	INTEL CORP BLDG HD2	75 REED RD HUDSON MA ***RTN:*** 2-0014517 ***Current Status:*** RAO	W	0.50 / 2,661.61	171	816
117	RELEASE	INTEL CORP.	75 REED RD HUDSON MA ***RTN:*** 2-0017100 ***Current Status:*** RAO	W	0.50 / 2,661.61	171	818
117	RELEASE	FORMER INTEL CO.	75 REED ROAD HUDSON MA	W	0.50 / 2,661.61	171	819

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			RTN: 2-0020485 ***Current Status:*** PSNC				
117	RELEASE	DIESEL FUEL RELEASE	75 REED ROAD HUDSON MA	W	0.50 / 2,661.61	171	821
			RTN: 2-0020935 ***Current Status:*** PSNC				
118	AST	HUDSON LIGHT & POWER DEPT - STOW CT	49 Forest St Hudson MA 01749	W	0.04 / 230.59	26	822
			License No: OSFM-00740 ***License Status:*** Active				
118	AST	HUDSON LIGHT & POWER DEPT - STOW CT	49 Forest St Hudson MA 01749	W	0.04 / 230.59	26	822
			License No: OSFM-00784 ***License Status:*** Tank Removed				
118	UST	TOWN OF HUDSON LIGHT & POWER	49 FOREST AVE HUDSON MA 01749	W	0.04 / 230.59	26	823
			Facility ID: 9934 ***Tank ID | Status | Status Date:*** 1 | Tank Removed | 20-Oct-1997				
118	RELEASE	HUDSON LIGHT & POWER	49 FOREST AVE HUDSON MA	W	0.04 / 230.59	26	824
			RTN: 2-0010202 ***Current Status:*** RAO				
118	RCRA SQG	HUDSON LIGHT & POWER DEPT	49 FOREST AVE HUDSON MA 01749	W	0.04 / 230.59	26	825
			EPA Handler ID: MAD000887180				
118	LST	HUDSON LIGHT & POWER	49 FOREST AVE HUDSON MA 1749	W	0.04 / 230.59	26	826
			Site No | Current Date | Status Desc: 2-0010202 | 4/19/1994 | Response Action Outcome				
118	SPILLS	HUDSON LIGHT & POWER	49 FOREST AVE HUDSON MA 01749	W	0.04 / 230.59	26	828
118	LUST	HUDSON LIGHT & POWER	49 FOREST AVE HUDSON MA	W	0.04 / 230.59	26	830
			RTN: 2-0010202				
118	PCB	HUDSON LIGHT AND POWER	49 FOREST AVE HUDSON MA 01749	W	0.04 / 230.59	26	831
118	GEN	HUDSON LIGHT & POWER DEPT	49 FOREST AVE HUDSON MA 01749	W	0.04 / 230.59	26	832
119	ASBESTOS PROJECT	KENNETH LAVACHE	44 FOREST AVE HUDSON MA	W	0.07 / 390.47	19	832

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
120	UST	STOCKROOM (OLD)	CHERRY ST HUDSON MA 01749	W	0.23 / 1,208.65	8	832
			Facility ID: 9933 ***Tank ID	Status	Status Date:*** 1 | Tank Removed | 01-Apr-1989			
121	RELEASE	LEVINS PROPERTY	1 HARVEY ST HUDSON MA	WNW	0.97 / 5,140.03	29	833
			RTN: 2-0015087 ***Current Status:*** RAO				
122	RELEASE	AFFORDABLE INTERIOR SYSTEMS	54 CHERRY ST HUDSON MA	W	0.23 / 1,220.74	8	835
			RTN: 2-0015979 ***Current Status:*** RAO				
123	RELEASE	BUDDY DOG ANIMAL HOSPITAL	163 BOSTON POST RD SUDBURY MA	E	0.14 / 719.53	-62	837
			RTN: 3-0018895 ***Current Status:*** RAO				
124	LUST	TOWER ST	350 MAIN ST HUDSON MA	W	0.30 / 1,565.34	13	838
			RTN: 2-0010717				
124	LST	TOWER ST	350 MAIN ST HUDSON MA 01749-0000	W	0.30 / 1,565.34	13	841
			***Site No	Current Date	Status Desc:*** 2-0010717 | 6/8/1999 | Response Action Outcome			
124	RELEASE	QUALITY GAS	350 MAIN STREET HUDSON MA	W	0.30 / 1,565.34	13	843
			RTN: 2-0019282 ***Current Status:*** PSNC				
124	RELEASE	TOWER ST	350 MAIN ST HUDSON MA	W	0.30 / 1,565.34	13	845
			RTN: 2-0010717 ***Current Status:*** RAO				
125	RELEASE	ROADWAY RELEASE	8 STEVENS ROAD HUDSON MA	W	0.25 / 1,323.27	102	848
			RTN: 2-0021281				
126	RELEASE	CARLTON ST	30 TOWER ST HUDSON MA	W	0.38 / 1,993.05	24	848
			RTN: 2-0013390 ***Current Status:*** DPS				
126	RELEASE	N E SMALL BUSINESS INVEST CORP	30 TOWER ST HUDSON MA	W	0.38 / 1,993.05	24	850
			RTN: 2-0010326 ***Current Status:*** RAO				
127	RELEASE	PARADISE GYM	312 MAIN ST HUDSON MA	W	0.30 / 1,588.81	11	853
			RTN: 2-0013121 ***Current Status:*** RAO				
127	RELEASE	MAIN AND TOWER PARTNERS LLC	312 MAIN ST HUDSON MA	W	0.30 / 1,588.81	11	855
			RTN: 2-0017090 ***Current Status:*** RAO				
128	HIST LUST	CONTAM. SOIL	34 TOWER STREET HUDSON MA	WNW	0.48 / 2,536.97	58	857

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			***Spill ID*	*Case Closed:*** C90-0012 | YES			
128	LUST	LAPOINTE MACHINE TOOL CO FMR	34 TOWER ST HUDSON MA	WNW	0.48 / 2,536.97	58	857
			RTN: 2-0013687				
128	LUST	L AND S INDUSTRIAL PARK	34 TOWER ST HUDSON MA	WNW	0.48 / 2,536.97	58	859
			RTN: 2-0000735				
128	LST	LAPOINTE MACHINE TOOL CO FMR	34 TOWER ST HUDSON MA 01749-0000	WNW	0.48 / 2,536.97	58	860
			Site No* | *Current Date* | *Status Desc: 2-0013687 | 2/20/2002 | Response Action Outcome				
128	LST	L & S INDUSTRIAL PARK	34 TOWER ST HUDSON MA 1749	WNW	0.48 / 2,536.97	58	862
			Site No* | *Current Date* | *Status Desc: 2-0000735 | 6/21/1995 | Waiver Completion Statement				
128	RELEASE	LAPOINTE MACHINE TOOL CO FMR	34 TOWER ST HUDSON MA	WNW	0.48 / 2,536.97	58	862
			RTN: 2-0013687 ***Current Status:*** RAO				
128	RELEASE	L AND S INDUSTRIAL PARK	34 TOWER ST HUDSON MA	WNW	0.48 / 2,536.97	58	864
			RTN: 2-0000735 ***Current Status:*** WCSPRM				
129	UST	LINDE GASES OF NEW ENGLAND INC	141 BOSTON POST RD SUDBURY MA 01776	E	0.23 / 1,195.98	-60	865
			Facility ID: 20615 ***Tank ID* | *Status* | *Status Date:*** 1 | Tank Removed | 01-Dec-1988, 2 | Tank Removed | 01-Dec-1988, 3 | Tank Removed | 04-Apr-1988				
129	HIST LUST		141 BOSTON POST RD SUDBURY MA	E	0.23 / 1,195.98	-60	867
			Spill ID* | *Case Closed: N88-0430 | YES				
129	LUST	UNION CARBIDE LINDE DIV	141 BOSTON POST RD SUDBURY MA	E	0.23 / 1,195.98	-60	867
			RTN: 3-0002545				
129	RCRA NON GEN	PRAXAIR INC	141 BOSTON POST RD SUDBURY MA 01776	E	0.23 / 1,195.98	-60	869
			EPA Handler ID: MAD001018357				
129	LST	UNION CARBIDE LINDE DIV	141 BOSTON POST RD SUDBURY MA 1776	E	0.23 / 1,195.98	-60	870
			Site No* | *Current Date* | *Status Desc: 3-0002545 | 3/11/1996 | Waiver Completion Statement				
129	RELEASE	UNION CARBIDE LINDE DIV	141 BOSTON POST RD SUDBURY MA	E	0.23 / 1,195.98	-60	871
			RTN: 3-0002545 ***Current Status:*** WCSPRM				
130	RELEASE	RESIDENTIAL PROPERTY	292 MAIN STREET HUDSON MA	W	0.32 / 1,694.23	12	872

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			RTN: 2-0019870 ***Current Status:*** TIERI				
131	LUST	G BONNAZOLI AND SONS INC	262 SAWYER LN HUDSON MA ***RTN:*** 2-0012775	W	0.37 / 1,956.47	15	877
131	RELEASE	MR PROPERTY MANAGEMENT	262 SAWYER LN HUDSON MA ***RTN:*** 2-0013741 ***Current Status:*** RAO	W	0.37 / 1,956.47	15	880
131	RELEASE	LOWER MAIN ST LLC C-O MR PROPERTY MGMT I	262 SAWYER LN HUDSON MA ***RTN:*** 2-0014944 ***Current Status:*** RAO	W	0.37 / 1,956.47	15	883
131	RELEASE	MP DEVELOPMENT LLC	262 SAWYER LN HUDSON MA ***RTN:*** 2-0015183 ***Current Status:*** RAO	W	0.37 / 1,956.47	15	885
131	LST	G BONNAZOLI AND SONS INC	262 SAWYER LN HUDSON MA 01749-0000 ***Site No | Current Date | Status Desc:*** 2-0012775 | 7/25/2000 | Response Action Outcome	W	0.37 / 1,956.47	15	888
131	RELEASE	G BONNAZOLI AND SONS INC	262 SAWYER LN HUDSON MA ***RTN:*** 2-0012775 ***Current Status:*** RAO	W	0.37 / 1,956.47	15	889
132	AUL	THORNDIKE PROPERTIES OF MA	12 WHEELER RD HUDSON MA	W	0.32 / 1,695.30	9	892
132	AUL	HUDSON LAGOONS	12 WHEELER RD HUDSON MA	W	0.32 / 1,695.30	9	895
132	RELEASE	HUDSON LAGOONS	12 WHEELER RD HUDSON MA ***RTN:*** 2-0010526 ***Current Status:*** RAO	W	0.32 / 1,695.30	9	902
132	RELEASE	THORNDIKE PROPERTIES OF MA	12 WHEELER RD HUDSON MA ***RTN:*** 2-0016411 ***Current Status:*** RAO	W	0.32 / 1,695.30	9	910
132	BROWNFIELDS	Hudson Lagoons	12 Wheeler Rd Hudson MA	W	0.32 / 1,695.30	9	913
133	RELEASE	STOP & SHOP SUPERMARKET	10 TECHNOLOGY DR HUDSON MA ***RTN:*** 2-0016344 ***Current Status:*** RAO	W	0.86 / 4,563.02	120	913
134	RELEASE	ST MICHAELS PARISH	246 MAIN ST HUDSON MA	W	0.40 / 2,137.55	16	914

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			RTN: 2-0015179 ***Current Status:*** RAO				
135	AUL	TUCKS SERVICE CENTER	244 BROAD ST HUDSON MA	W	0.48 / 2,509.36	85	918
135	RELEASE	TUCKS SERVICE CENTER	244 BROAD ST HUDSON MA ***RTN:*** 2-0000938 ***Current Status:*** RAO	W	0.48 / 2,509.36	85	923
136	RELEASE	RICHEY & CLAPPER LANDSCAPE SUPPLY CO.	33 BOSTON POST ROAD SUDBURY MA ***RTN:*** 3-0029754 ***Current Status:*** RAO	E	0.36 / 1,922.68	-62	927
137	RELEASE	ACT MANUFACTURING CORP	TECHNOLOGY DR AND RTE 85 HUDSON MA ***RTN:*** 2-0013377 ***Current Status:*** RAO	W	0.88 / 4,662.48	119	929
138	RELEASE	TUCKS TRUCKS	242 244 WASHINGTON ST HUDSON MA ***RTN:*** 2-0013492 ***Current Status:*** RAO	W	0.79 / 4,191.72	114	930
139	SWF/LF	SUDBURY SAND HILL LANDFILL	20 BOSTON POST RD SUDBURY, MA 01776 MA	E	0.37 / 1,967.39	-64	931
139	SWF/LF	SUDBURY TRANSFER & RECYCLING CENTER	20 BOSTON POST RD SUDBURY, MA 01776 MA	E	0.37 / 1,967.39	-64	932
139	LAST	DPW TRANSFER STATION	20 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0017083	E	0.37 / 1,967.39	-64	933
139	RELEASE	BELL TELL MANHOLE 206	20 BOSTON POST ROAD SUDBURY MA ***RTN:*** 3-0029909 ***Current Status:*** ADQREG	E	0.37 / 1,967.39	-64	934
139	RELEASE	BELL TELL MANHOLE 206	20 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0023624 ***Current Status:*** ADQREG	E	0.37 / 1,967.39	-64	937
139	LST	MA HWY DEPT DEPOT	RT 20 BOSTON POST RD SUDBURY MA 01776-0000 ***Site No | Current Date | Status Desc:*** 3-0010426 | 7/27/1995 | Response Action Outcome	E	0.37 / 1,967.39	-64	943
139	RELEASE	SUDBURY TRANSFER STATION	20 BOSTON POST ROAD SUDBURY MA ***RTN:*** 3-0033503 ***Current Status:*** ADQREG	E	0.37 / 1,967.39	-64	944

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
139	RELEASE	DPW TRANSFER STATION	20 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0017083 ***Current Status:*** RAO	E	0.37 / 1,967.39	-64	946
139	RELEASE	SUDBURY LANDFILL	20 BOSTON POST ROAD SUDBURY MA ***RTN:*** 3-0034148 ***Current Status:*** PSNC	E	0.37 / 1,967.39	-64	947
140	RELEASE	NO LOCATION AID	83 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0021843 ***Current Status:*** DPS	E	0.38 / 1,990.43	-65	949
141	HIST LUST	TANK REMOVAL	43 BROAD ST. HUDSON MA ***Spill ID*** **	** ***Case Closed:*** C92-0247	YES	W	0.41 / 2,155.67	17	950
141	LUST	HUDSON WORSLED CO FORMER	43 BROAD ST HUDSON MA ***RTN:*** 2-0012725	W	0.41 / 2,155.67	17	951
141	RELEASE	INDEPENDENT CABLE	43 BROAD ST HUDSON MA ***RTN:*** 2-0010063 ***Current Status:*** RAO	W	0.41 / 2,155.67	17	952
141	LST	HUDSON WORSLED CO FORMER	43 BROAD ST HUDSON MA 01749-0000 ***Site No*** **|** ***Current Date*** **|** ***Status Desc:*** 2-0012725	5/28/1999	Response Action Outcome	W	0.41 / 2,155.67	17	954
141	RELEASE	HUDSON WORSLED CO FORMER	43 BROAD ST HUDSON MA ***RTN:*** 2-0012725 ***Current Status:*** RAO	W	0.41 / 2,155.67	17	956
142	LUST	MA HWY DEPT DEPOT	RT 20 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0010426	E	0.38 / 2,014.85	-65	957
142	RELEASE	MA HWY DEPT DEPOT	RT 20 BOSTON POST RD SUDBURY MA ***RTN:*** 3-0010426 ***Current Status:*** RAO	E	0.38 / 2,014.85	-65	959
143	LAST	TEST DEVICES INC	6 LORING ST HUDSON MA ***RTN:*** 2-0011703	W	0.43 / 2,277.42	18	962
143	RELEASE	TEST DEVICES INC	6 LORING ST HUDSON MA ***RTN:*** 2-0011703 ***Current Status:*** RAO	W	0.43 / 2,277.42	18	963
144	CERCLIS	H LAROSEE AND SONS INC	15 BROAD STREET HUDSON MA 017492501 ***Site EPA ID:*** MAD980731624	W	0.43 / 2,282.87	21	964

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
144	RELEASE	PROPERTY	15 BROAD STREET HUDSON MA ***RTN:*** 2-0018830 ***Current Status:*** TIER1D	W	0.43 / 2,282.87	21	967
144	SEMS	H LAROSEE AND SONS INC	15 BROAD STREET HUDSON MA 01749-2501 ***EPA ID:*** MAD980731624	W	0.43 / 2,282.87	21	971
144	BROWNFIELDS	H. LaRosee & Sons, Inc.	15 Broad Street Hudson MA	W	0.43 / 2,282.87	21	973
145	LUST	SHELL GASOLINE STATION	181 MAIN ST HUDSON MA ***RTN:*** 2-0016273	W	0.45 / 2,386.69	15	973
145	LST	SHELL GASOLINE STATION	181 MAIN ST HUDSON MA 01749-0000 ***Site No	Current Date	Status Desc:*** 2-0016273 | 5/29/2007 | Response Action Outcome	W	0.45 / 2,386.69	15	976
145	RELEASE	SHELL GASOLINE STATION	181 MAIN ST HUDSON MA ***RTN:*** 2-0016273 ***Current Status:*** RAO	W	0.45 / 2,386.69	15	977
146	HIST LUST	TUCK'S SERVICE CENTER	WASHINGTON ST. AND BROAD ST. HUDSON MA ***Spill ID	Case Closed:*** C92-0095 | YES	W	0.45 / 2,357.30	17	979
146	HIST LAST	WARMER FUEL OIL CO.	BROAD & WASHINGTON ST. HUDSON MA ***Spill ID	Case Closed:*** C85-0179 | YES	W	0.45 / 2,357.30	17	980
147	RELEASE	NO LOCATION AID	6 OLD COUNTY RD SUDBURY MA ***RTN:*** 3-0025622 ***Current Status:*** RAO	E	0.52 / 2,727.58	-39	980
148	RELEASE	KM HIGH STREET LLC	186 MAIN STREET HUDSON MA ***RTN:*** 2-0019510 ***Current Status:*** PSNC	W	0.46 / 2,424.31	15	982
149	RELEASE	NO LOCATION AID	19 HAWTHORNE ROAD SUDBURY MA ***RTN:*** 3-0030271 ***Current Status:*** RAO	ESE	0.45 / 2,355.26	-65	984
150	RELEASE	PROPERTY	533 BOSTON POST RD WAYLAND MA ***RTN:*** 3-0003351 ***Current Status:*** RAO	E	0.43 / 2,278.26	-65	985
151	RELEASE	DIESEL FUEL LEAK	133 COX ST HUDSON MA ***RTN:*** 2-0013998 ***Current Status:*** RAO	WNW	0.94 / 4,940.34	77	986

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
152	RELEASE	HOUGHTON STREET LLC	50 HOUGHTON ST HUDSON MA ***RTN:*** 2-0015202 ***Current Status:*** RAO	W	0.53 / 2,795.82	16	988
153	RELEASE	THOMAS TAYLOR & SONS	52-54 HOUGHTON ST HUDSON MA ***RTN:*** 2-0000524 ***Current Status:*** RAO	W	0.53 / 2,805.01	19	990
154	RELEASE	SHOE FACTORY FMR	1 HOUGHTON ST HUDSON MA ***RTN:*** 2-0000922 ***Current Status:*** RAO	W	0.53 / 2,783.96	12	991
155	RELEASE	THOMAS TAYLOR & SONS	49 HOUGHTON ST HUDSON MA ***RTN:*** 2-0011299 ***Current Status:*** RAO	W	0.53 / 2,790.41	5	994
156	RELEASE	FORMER LARKIN LUMBER	136 MAIN STREET HUDSON MA ***RTN:*** 2-0019349 ***Current Status:*** PSNC	W	0.54 / 2,861.59	12	996
157	RELEASE	CUMBERLAND FARMS	200 WASHINGTON ST HUDSON MA ***RTN:*** 2-0013611 ***Current Status:*** RAO	W	0.75 / 3,937.61	97	999
157	RELEASE	CUMBERLAND FARMS	200 WASHINGTON ST HUDSON MA ***RTN:*** 2-0016604 ***Current Status:*** RAO	W	0.75 / 3,937.61	97	1000
157	RELEASE	CUMBERLAND FARMS	200 WASHINGTON ST HUDSON MA ***RTN:*** 2-0011145 ***Current Status:*** RAO	W	0.75 / 3,937.61	97	1001
157	RELEASE	CUMBERLAND FARMS INC	200 WASHINGTON ST HUDSON MA ***RTN:*** 2-0015666 ***Current Status:*** RAO	W	0.75 / 3,937.61	97	1003
158	RELEASE	PURDY PROPERTY	191A WASHINGTON ST HUDSON MA ***RTN:*** 2-0016830 ***Current Status:*** RAO	W	0.74 / 3,884.50	88	1005
159	RELEASE	MUNICIPAL ROADWAY	NEARBY 44 RIVER ROAD WAYLAND MA ***RTN:*** 3-0031870 ***Current Status:*** RAO	E	0.91 / 4,820.51	-70	1007
160	RELEASE	COMMERCIAL PROPERTY	173 WASHINGTON STREET HUDSON MA ***RTN:*** 2-0018043 ***Current Status:*** PSC	W	0.73 / 3,844.12	77	1008
161	RELEASE	HUDSON SENIOR CENTER	29 CHURCH ST HUDSON MA ***RTN:*** 2-0017550 ***Current Status:*** RAO	W	0.64 / 3,390.22	37	1015

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
162	RELEASE	WASTE MANAGEMENT INC	154 WASHINGTON AVE HUDSON MA ***RTN:*** 2-0013689 ***Current Status:*** RAO	W	0.72 / 3,816.77	78	1016
163	RELEASE	CELLUCI HUDSON CORP	153 WASHINGTON ST HUDSON MA ***RTN:*** 2-0010317 ***Current Status:*** RAO	W	0.73 / 3,845.20	80	1017
164	RELEASE	WATERS MANUFACTURING	522 BOSTON POST RD LONGFELLOW WAYLAND MA ***RTN:*** 3-0000059 ***Current Status:*** RAO	E	0.61 / 3,205.91	-24	1019
164	DELISTED REL	CHILDCARE CENTER	522 BOSTON POST ROAD WAYLAND MA 01778-0000	E	0.61 / 3,205.91	-24	1021
165	RELEASE	RJ CURLEY & SONS PROPERTY	152 MANNING ST LOT 234 HUDSON MA ***RTN:*** 2-0018565 ***Current Status:*** RAO	WNW	0.96 / 5,085.52	25	1021
166	RELEASE	MAIN ST ROTARY	32 MAIN ST HUDSON MA ***RTN:*** 2-0020579 ***Current Status:*** PSNC	W	0.72 / 3,788.60	27	1023
167	RELEASE	NO LOCATION AID	28 WASHINGTON STREET HUDSON MA ***RTN:*** 2-0020026 ***Current Status:*** PSC	W	0.72 / 3,817.14	17	1024
168	RELEASE	STAR ENT FACILITY 11 143 1315	27 WASHINGTON ST HUDSON MA ***RTN:*** 2-0001051 ***Current Status:*** RAO	W	0.74 / 3,917.52	16	1026
168	RELEASE	TEXACO STA FMR	27 WASHINGTON ST HUDSON MA ***RTN:*** 2-0011920 ***Current Status:*** RAO	W	0.74 / 3,917.52	16	1027
169	RELEASE	DFL LAKE STREET LLC	29 & 39 LAKE STREET HUDSON MA ***RTN:*** 2-0020652 ***Current Status:*** PSC	WNW	0.86 / 4,540.98	36	1028
170	RELEASE	CREATIVE HOME FURNISHINGS	32 WASHINGTON ST HUDSON MA ***RTN:*** 2-0000069 ***Current Status:*** RAO	W	0.75 / 3,974.20	15	1029
171	RELEASE	BAKER COMMODITIES	32 36 WASHINGTON ST HUDSON MA ***RTN:*** 2-0012183 ***Current Status:*** RAO	W	0.76 / 3,991.53	16	1032
172	RELEASE	DIESEL FUEL RELEASE	LINCOLN AND APSLEY ST HUDSON MA ***RTN:*** 2-0020422 ***Current Status:*** PSNC	W	0.94 / 4,938.97	54	1033

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
173	RELEASE	INTERSECTION RTE 62	29 RIVER ST HUDSON MA ***RTN:*** 2-0014213 ***Current Status:*** RAO	W	0.89 / 4,709.85	41	1035
174	RELEASE	PLANNED RIVERS EDGE DEVELOPMENT	484-490 BOSTON POST ROAD WAYLAND MA ***RTN:*** 3-0036013 ***Current Status:*** UNCLSS	E	0.91 / 4,786.26	-70	1037
175	RELEASE	NEAR LANDFILL	484 BOSTON POST RD WAYLAND MA ***RTN:*** 3-0027741 ***Current Status:*** RAO	E	0.91 / 4,806.67	-71	1039
175	RELEASE	WAYLAND SAND HILL LANDFILL	484 BOSTON POST RD WAYLAND MA ***RTN:*** 3-0024698 ***Current Status:*** RAO	E	0.91 / 4,806.67	-71	1041
175	RELEASE	NO LOCATION AID	484 BOSTON POST ROAD WAYLAND MA ***RTN:*** 3-0034474 ***Current Status:*** TIERI	E	0.91 / 4,806.67	-71	1042

Executive Summary: Summary by Data Source

Standard

Federal

SEMS - SEMS List 8R Active Site Inventory

A search of the SEMS database, dated Aug 26, 2020 has found that there are 2 SEMS site(s) within approximately 0.50 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
HUDSON LIGHT & POWER GENERATING STATION	77 CHERRY ST HUDSON MA 01749 ***EPA ID**: MAD980671051*	W	0.24 / 1,280.80	115
H LAROSEE AND SONS INC	15 BROAD STREET HUDSON MA 01749-2501 ***EPA ID**: MAD980731624*	W	0.43 / 2,282.87	144

SEMS ARCHIVE - SEMS List 8R Archive Sites

A search of the SEMS ARCHIVE database, dated Aug 26, 2020 has found that there are 3 SEMS ARCHIVE site(s) within approximately 0.50 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
SUDBURY ROD AND GUN	33 BULKLEY ROAD SUDBURY MA 01776-2640 ***EPA ID**: MAN000103316*	E	0.06 / 323.49	10
A & M ADVANCED PROTOTYPES	8 KANE INDUSTRIAL DRIVE HUDSON MA 01749-2906 ***EPA ID**: MA0001296904*	WNW	0.13 / 673.05	27

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
PIERCE ROSE	46 MAPLE AVENUE SUDBURY MA 01776-3441 ***EPA ID**: MA0001094572*	ESE	0.05 / 274.13	91

CERCLIS - Comprehensive Environmental Response, Compensation and Liability Information System - CERCLIS

A search of the CERCLIS database, dated Oct 25, 2013 has found that there are 5 CERCLIS site(s) within approximately 0.50 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
SUDBURY ROD AND GUN	33 BULKLEY ROAD SUDBURY MA 017762640 ***Site EPA ID**: MAN000103316*	E	0.06 / 323.49	10

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
A & M ADVANCED PROTOTYPES	8 KANE INDUSTRIAL DRIVE HUDSON MA 017492906 ***Site EPA ID**: MA0001296904*	WNW	0.13 / 673.05	27
HUDSON LIGHT & POWER	CHERRY ST. STATION HUDSON MA 01749 ***Site EPA ID**: MAD980671051*	W	0.15 / 783.67	101
H LAROSEE AND SONS INC	15 BROAD STREET HUDSON MA 017492501 ***Site EPA ID**: MAD980731624*	W	0.43 / 2,282.87	144

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
PIERCE ROSE	46 MAPLE AVENUE SUDBURY MA 017763441 ***Site EPA ID**: MA0001094572*	ESE	0.05 / 274.13	91

CERCLIS NFRAP - CERCLIS - No Further Remedial Action Planned

A search of the CERCLIS NFRAP database, dated Oct 25, 2013 has found that there are 3 CERCLIS NFRAP site(s) within approximately 0.50 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
SUDBURY ROD AND GUN	33 BULKLEY ROAD SUDBURY MA 17762640 ***Site EPA ID**: MAN000103316*	E	0.06 / 323.49	10
A & M ADVANCED PROTOTYPES	8 KANE INDUSTRIAL DRIVE HUDSON MA 17492906 ***Site EPA ID**: MA0001296904*	WNW	0.13 / 673.05	27

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
PIERCE ROSE	46 MAPLE AVENUE SUDBURY MA 17763441 ***Site EPA ID**: MA0001094572*	ESE	0.05 / 274.13	91

RCRA TSD - RCRA non-CORRACTS TSD Facilities

A search of the RCRA TSD database, dated Jul 27, 2020 has found that there are 1 RCRA TSD site(s) within approximately 0.50 miles of the project property.

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
RAYTHEON COMPANY	528 BOSTON POST RD SUDBURY MA 01776 ***EPA Handler ID**: MAD001410539*	ESE	0.39 / 2,042.35	41

RCRA SQG - RCRA Small Quantity Generators List

A search of the RCRA SQG database, dated Jul 27, 2020 has found that there are 7 RCRA SQG site(s) within approximately 0.25 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
PRECISION COATING CO INC	51 PARMENTER RD HUDSON MA 01749 ***EPA Handler ID**: MAD043399906*	WNW	0.13 / 694.02	5
ANVER CORPORATION	36 PARMENTER RD HUDSON MA 01749 ***EPA Handler ID**: MAC300096161*	WNW	0.09 / 486.70	12
CENTERLINE TECHNOLOGIES LLC	577 MAIN ST HUDSON MA 01749 ***EPA Handler ID**: MAC300005709*	WNW	0.12 / 652.93	15
ALTERNATE FINISHING INC	15 KANE INDUSTRIAL DR HUDSON MA 01749 ***EPA Handler ID**: MAR000505123*	WNW	0.23 / 1,236.50	32
HUDSON LIGHT & POWER DEPT	77 CHERRY ST HUDSON MA 01749 ***EPA Handler ID**: MAD980671051*	W	0.24 / 1,280.80	115
HUDSON LIGHT & POWER DEPT	49 FOREST AVE HUDSON MA 01749 ***EPA Handler ID**: MAD000887180*	W	0.04 / 230.59	118

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
METHODS MACHINE TOOLS INC	65 UNION AVE SUDBURY MA 01776 ***EPA Handler ID**: MAD019659044*	ESE	0.14 / 731.78	55

RCRA CESQG - RCRA Conditionally Exempt and Very Small Quantity Generators List

A search of the RCRA CESQG database, dated Jul 27, 2020 has found that there are 19 RCRA CESQG site(s) within approximately 0.25 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
LINCOLN TOOL & MACHINE CORP.	43 PARMENTER RD HUDSON MA 01749 ***EPA Handler ID**: MAR000545384*	WNW	0.09 / 462.02	7
HUDSON POLY BAG INC	578 MAIN ST HUDSON MA 01749 ***EPA Handler ID**: MAR000577213*	WNW	0.18 / 964.82	16
MACH MACHINE INC	569 MAIN ST HUDSON MA 01749 ***EPA Handler ID**: MAD985297415*	WNW	0.07 / 394.11	18
HYPERTRONICS CORP	16 BRENT DR HUDSON MA 01749	WNW	0.23 / 1,214.14	20

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
	***EPA Handler ID**: MAD980915813*			
A&S DELIVERY SERVICE INC	6 KANE INDUSTRIAL DR HUDSON MA 01749	WNW	0.10 / 521.83	24
	***EPA Handler ID**: MAR000504878*			
PAO CORP	560 MAIN ST HUDSON MA 01749	WNW	0.07 / 355.90	30
	***EPA Handler ID**: MAR000554840*			
KANE PERKINS CO INC	560 MAIN ST HUDSON MA 01749	WNW	0.07 / 355.90	30
	***EPA Handler ID**: MAD981897077*			
KANE PERKINS CO INC	560 MAIN ST HUDSON MA 01749	WNW	0.07 / 355.90	30
	***EPA Handler ID**: MAD981209166*			
CONTRONAUTICS, INCORPORATED	31 WILKINS HUDSON MA 01749	WNW	0.07 / 372.65	63
	***EPA Handler ID**: MAR000526368*			
KUSTOM KREATIONS INC	104 FOREST AVE HUDSONHUDSON MA 01749	W	0.00 / 7.29	106
	***EPA Handler ID**: MAR000573824*			

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
STAPLES CONTRACT AND COMMERCIAL	33 UNION AVE SUDBURY MA 01776	ESE	0.03 / 173.74	51
	***EPA Handler ID**: MAC300093028*			
CHARLES J PRECOURT & SON INC	46 UNION AVE SUDBURY MA 01776	ESE	0.03 / 168.10	53
	***EPA Handler ID**: MAR000535054*			
MOBIL 2477	432 BOSTON POST RD SUDBURY MA 01776	ESE	0.17 / 884.40	64
	***EPA Handler ID**: MAD985296128*			
EXXONMOBIL OIL CORPORATION 01CY7	431 RTE 20 SUDBURY MA 01776	ESE	0.17 / 888.07	65
	***EPA Handler ID**: MAD985296243*			
STATION ROAD AUTO BODY & GARAGE INC	40 STATION RD SUDBURY MA 01776	ESE	0.01 / 57.56	66
	***EPA Handler ID**: MAD982190373*			
COLONIAL AUTO OF SUDBURY	430 BOSTON POST RD SUDBURY MA 01776	ESE	0.14 / 759.70	69
	***EPA Handler ID**: MAD980906911*			

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
MOSHER AUTO BODY INC	34 STATION RD SUDBURY MA 01776 ***EPA Handler ID**: MAD019679059*	ESE	0.01 / 55.22	71
SUDBURY PIZZA	426 BOSTON POST RD SUDBURY MA 01776 ***EPA Handler ID**: MAR000567180*	ESE	0.13 / 709.15	72
TJ MAXX T0281	437 BOSTON POST RD SUDBURY MA 01776 ***EPA Handler ID**: MAR000544221*	ESE	0.20 / 1,042.56	77

RCRA NON GEN - RCRA Non-Generators

A search of the RCRA NON GEN database, dated Jul 27, 2020 has found that there are 24 RCRA NON GEN site(s) within approximately 0.25 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
INSTRUMENTATION LAB INC	577 MAIN ST HUDSON MA 01749 ***EPA Handler ID**: MAD982200099*	WNW	0.12 / 652.93	15
ATLANTIC BUSINESS FORMS	577 MAIN ST HUDSON MA 01749 ***EPA Handler ID**: MAD004461885*	WNW	0.12 / 652.93	15
LUND PRECISION PRODUCTS INC	571 MAIN ST HUDSON MA 01749 ***EPA Handler ID**: MAD981062631*	WNW	0.13 / 688.89	17
NORTHEAST GREAT DANE	17 BRENT DR HUDSON MA 01749 ***EPA Handler ID**: MAD079525242*	WNW	0.23 / 1,238.51	19
RICHS AUTO PARTS INC	566 MAIN ST HUDSON MA 01749 ***EPA Handler ID**: MAD041701699*	WNW	0.01 / 31.29	23
KORO CORP	560 MAIN ST HUDSON MA 01749 ***EPA Handler ID**: MAD001408624*	WNW	0.07 / 355.90	30
RR DONNELLY & SONS CO	555 MAIN ST HUDSON MA 01749 ***EPA Handler ID**: MAD121006241*	WNW	0.08 / 446.08	31
ARROW AUTOMOTIVE IND	555 MAIN ST HUDSON MA 01749 ***EPA Handler ID**: MAD001062942*	WNW	0.08 / 446.08	31
LOWFIELD REALTY GROUP 555 MAIN HUDSON LL	555 MAIN ST HUDSON MA 01749	WNW	0.08 / 446.08	31

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
	***EPA Handler ID**: MAC300013851*			
SANDOZ COLORS & CHEMICALS	16 KANE INDUSTRIAL DR HUDSON MA 01740	WNW	0.24 / 1,245.09	33
	***EPA Handler ID**: MAD075360602*			
ASSABET MACHINE CORP	78 CHERRY ST HUDSON MA 01749	W	0.24 / 1,292.28	116
	***EPA Handler ID**: MAD081567877*			

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
BEACON ROOFING SUPPLY	200 BAY DR SUDBURY MA 01776	ESE	0.23 / 1,227.62	40
	***EPA Handler ID**: MAR000527127*			
I C TESTING INC	31 C UNION AVE SUDBURY MA 01776	ESE	0.02 / 127.73	50
	***EPA Handler ID**: MAD055304604*			
COATINGS ENGR CORP	33 UNION AVE SUDBURY MA 01776	ESE	0.03 / 173.74	51
	***EPA Handler ID**: MAD001063338*			
WORTHINGTON CYLINDERS	65 UNION ST REAR SUDBURY MA 01776	ESE	0.14 / 731.78	55
	***EPA Handler ID**: MAC300102399*			
COMREX CORP	60 UNION AVE SUDBURY MA 01776	ESE	0.11 / 574.57	56
	***EPA Handler ID**: MAD001071083*			
HYCOMP INC	75 UNION AVE SUDBURY MA 01776	ESE	0.18 / 930.42	58
	***EPA Handler ID**: MAD048281240*			
STEVES AUTO BODY	40 STATION RD SUDBURY MA 01776	ESE	0.01 / 57.56	66
	***EPA Handler ID**: MAD019658582*			
SUDBURY CLEANERS	428 BOSTON POST RD SUDBURY MA 01776	ESE	0.15 / 777.52	68
	***EPA Handler ID**: MAD091499897*			
FORMER DBA RITE AID 10106	423 BOSTON POST RD SUDBURY MA 01776	ESE	0.12 / 631.62	73
	***EPA Handler ID**: MAC300021102*			
1 HR INSTANT PHOTO	410 BOSTON POST RD SUDBURY MA 01776	ESE	0.09 / 480.71	79
	***EPA Handler ID**: MAD985307750*			

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
PEIRCE ROSE INC	60 MAPLE AVE SUDBURY MA 01776 ***EPA Handler ID**: MAD066616145*	ESE	0.05 / 253.23	92
SUDBURY AUTOMOTIVE INC	209 BOSTON POST RD SUDBURY MA 01776 ***EPA Handler ID**: MAV000011143*	ESE	0.05 / 283.47	109
PRAXAIR INC	141 BOSTON POST RD SUDBURY MA 01776 ***EPA Handler ID**: MAD001018357*	E	0.23 / 1,195.98	129

State

RELEASE - Waste Site Cleanup Notifications/Reportable Releases

A search of the RELEASE database, dated Sep 8, 2020 has found that there are 159 RELEASE site(s) within approximately 1.00 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
ABANDONED HOUSE	1073 CONCORD RD MARLBOROUGH MA ***RTN**: 2-0018760* ***Current Status**: RAO*	W	0.76 / 4,004.63	3
BOYD COATING RESEARCH CO	51 PARMENTER RD HUDSON MA ***RTN**: 2-0000248* ***Current Status**: RAO*	WNW	0.13 / 694.02	5
FMR BOYD COATINGS RESEARCH CO	51 PARMENTER ROAD HUDSON MA ***RTN**: 2-0020439* ***Current Status**: TIERI*	WNW	0.13 / 694.02	5
MA DFS FIREFIGHTING ACADEMY	664 SUDBURY RD STOW MA ***RTN**: 2-0021045* ***Current Status**: UNCLSS*	N	0.82 / 4,341.24	6
STATE FIRE ACADEMY STOW	1 STATE ROAD STOW MA ***RTN**: 2-0019241* ***Current Status**: PSNC*	NNW	0.75 / 3,984.24	8
FORMER ROD & GUN CLUB	33 BULKLEY RD SUDBURY MA ***RTN**: 3-0024573* ***Current Status**: RAO*	E	0.06 / 323.49	10
LAKE BOON SERVICE STATION	706 MAIN ST HUDSON MA ***RTN**: 2-0000261* ***Current Status**: DEPNDS*	NW	0.35 / 1,834.46	11

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
CITGO STATION	706 MAIN ST HUDSON MA ***RTN**: 2-0014026* ***Current Status**: RAO*	NW	0.35 / 1,834.46	11
CONTINENTAL CITGO	706 MAIN ST HUDSON MA ***RTN**: 2-0015576* ***Current Status**: REMOPS*	NW	0.35 / 1,834.46	11
FORMER CITGO	706 MAIN ST HUDSON MA ***RTN**: 2-0017095* ***Current Status**: RAONR*	NW	0.35 / 1,834.46	11
GELPKE RESIDENCE	53 LAKESIDE AVE HUDSON MA ***RTN**: 2-0015157* ***Current Status**: RAO*	NW	0.54 / 2,837.61	13
GELPKE RESIDENCE	53 LAKESIDE AVE HUDSON MA ***RTN**: 2-0015220* ***Current Status**: RAONR*	NW	0.54 / 2,837.61	13
KLAUK RESIDENCE	40 LAKESIDE AVE HUDSON MA ***RTN**: 2-0015407* ***Current Status**: RAO*	NW	0.46 / 2,437.59	14
JAMES GORIN REALTY TRUST	577 MAIN ST HUDSON MA ***RTN**: 2-0000204* ***Current Status**: WCSPRM*	WNW	0.12 / 652.93	15
SOUTH SIDE MAIN ST WEST OF PARMENTER RD	571 MAIN ST HUDSON MA ***RTN**: 2-0010785* ***Current Status**: RAO*	WNW	0.13 / 688.89	17
COMMERCIAL BUILDING	569 MAIN ST HUDSON MA ***RTN**: 2-0017024* ***Current Status**: RAO*	WNW	0.07 / 394.11	18
NO LOCATION AID	17 BRNT DRIVE HUDSON MA ***RTN**: 2-0017907* ***Current Status**: RAO*	WNW	0.23 / 1,238.51	19
HYPERTRONICS - HYPERTAC	16 BRENT DR. HUDSON MA ***RTN**: 2-0018206* ***Current Status**: RAO*	WNW	0.23 / 1,214.14	20
RESIDENCE	150 NORTH SHORE DR STOW MA ***RTN**: 2-0010012* ***Current Status**: RAO*	NW	0.55 / 2,879.18	21

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
CHESTNUT STREET PFAS	308 CHESTNUT STREET HUDSON MA ***RTN**: 2-0020923* ***Current Status**: UNCLSS*	W	0.83 / 4,393.39	26
M&M DRILLING KANE PERKINS	560 MAIN ST HUDSON MA ***RTN**: 2-0000275* ***Current Status**: RAO*	WNW	0.07 / 355.90	30
HUDSON MAIN 555 LLC	555 MAIN ST HUDSON MA ***RTN**: 2-0016560* ***Current Status**: RAONR*	WNW	0.08 / 446.08	31
ARROW AUTOMOTIVE IND INC	555 MAIN ST HUDSON MA ***RTN**: 2-0000068* ***Current Status**: RAO*	WNW	0.08 / 446.08	31
KANE INDUSTRIAL PARK	15 KANE INDUSTRIAL DR HUDSON MA ***RTN**: 2-0000515* ***Current Status**: DEPNDS*	WNW	0.23 / 1,236.50	32
BARTON ROAD NEIGHBORHOOD	220 AND 216 BARTON ROAD STOW MA ***RTN**: 2-0020337* ***Current Status**: TIER1D*	NW	0.52 / 2,723.67	34
RENTAL PROPERTY	63 BROOK ST HUDSON MA ***RTN**: 2-0013064* ***Current Status**: RAO*	WNW	0.45 / 2,399.08	35
WASTE MANAGEMENT INC	66 FORT MEADOW RD HUDSON MA ***RTN**: 2-0011278* ***Current Status**: RAO*	W	0.88 / 4,657.14	75
MASSACHUSETTS FIREFIGHTING ACADEMY	1 SUDBURY RD STOW MA ***RTN**: 2-0017327* ***Current Status**: RAO*	WNW	0.80 / 4,200.92	78
WASTE SOLUTIONS, INC	420 MAIN ST HUDSON MA ***RTN**: 2-0015477* ***Current Status**: RAO*	WNW	0.43 / 2,251.30	102
POPLINS FURNITURE WAREHOUSE	420 MAIN ST HUDSON MA ***RTN**: 2-0012541* ***Current Status**: RAO*	WNW	0.43 / 2,251.30	102
ZINA FARM	1 ZINA RD HUDSON MA ***RTN**: 2-0016208* ***Current Status**: TIER1D*	WNW	0.61 / 3,206.88	104

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
MOREL FOREIGN AUTO REPAIR	406 MAIN ST HUDSON MA ***RTN**: 2-0000255* ***Current Status**: RAO*	WNW	0.39 / 2,047.25	108
LPM HOLDING INC	90 CHERRY ST HUDSON MA ***RTN**: 2-0015363* ***Current Status**: DPS*	W	0.26 / 1,363.83	112
HUDSON LIGHT & POWER DEPARTMENT	77 CHERRY ST HUDSON MA ***RTN**: 2-0017400* ***Current Status**: RAO*	W	0.24 / 1,280.80	115
PROPERTY	78 CHERRY STREET HUDSON MA ***RTN**: 2-0018467* ***Current Status**: RAO*	W	0.24 / 1,292.28	116
DIGITAL EQUIPMENT CORP	75 REED RD HUDSON MA ***RTN**: 2-0012171* ***Current Status**: RAO*	W	0.50 / 2,661.61	117
DIGITAL EQUIPMENT CORP	75 REED RD HUDSON MA ***RTN**: 2-0001049* ***Current Status**: RAO*	W	0.50 / 2,661.61	117
DIGITAL EQUIPMENT FACILITY	75 REED RD HUDSON MA ***RTN**: 2-0012116* ***Current Status**: RAO*	W	0.50 / 2,661.61	117
INTEL CENTRAL UTILITY BLDG	75 REED RD HUDSON MA ***RTN**: 2-0013852* ***Current Status**: RAO*	W	0.50 / 2,661.61	117
DIGITAL EQUIPMENT CORP	75 REED RD HUDSON MA ***RTN**: 2-0010471* ***Current Status**: RAO*	W	0.50 / 2,661.61	117
INTEL CORP BLDG HD2	75 REED RD HUDSON MA ***RTN**: 2-0014517* ***Current Status**: RAO*	W	0.50 / 2,661.61	117
INTEL CORP.	75 REED RD HUDSON MA ***RTN**: 2-0017100* ***Current Status**: RAO*	W	0.50 / 2,661.61	117
FORMER INTEL CO.	75 REED ROAD HUDSON MA ***RTN**: 2-0020485* ***Current Status**: PSNC*	W	0.50 / 2,661.61	117

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
DIESEL FUEL RELEASE	75 REED ROAD HUDSON MA ***RTN**: 2-0020935* ***Current Status**: PSNC*	W	0.50 / 2,661.61	117
HUDSON LIGHT & POWER	49 FOREST AVE HUDSON MA ***RTN**: 2-0010202* ***Current Status**: RAO*	W	0.04 / 230.59	118
LEVINS PROPERTY	1 HARVEY ST HUDSON MA ***RTN**: 2-0015087* ***Current Status**: RAO*	WNW	0.97 / 5,140.03	121
AFFORDABLE INTERIOR SYSTEMS	54 CHERRY ST HUDSON MA ***RTN**: 2-0015979* ***Current Status**: RAO*	W	0.23 / 1,220.74	122
QUALITY GAS	350 MAIN STREET HUDSON MA ***RTN**: 2-0019282* ***Current Status**: PSNC*	W	0.30 / 1,565.34	124
TOWER ST	350 MAIN ST HUDSON MA ***RTN**: 2-0010717* ***Current Status**: RAO*	W	0.30 / 1,565.34	124
ROADWAY RELEASE	8 STEVENS ROAD HUDSON MA ***RTN**: 2-0021281*	W	0.25 / 1,323.27	125
CARLTON ST	30 TOWER ST HUDSON MA ***RTN**: 2-0013390* ***Current Status**: DPS*	W	0.38 / 1,993.05	126
N E SMALL BUSINESS INVEST CORP	30 TOWER ST HUDSON MA ***RTN**: 2-0010326* ***Current Status**: RAO*	W	0.38 / 1,993.05	126
PARADISE GYM	312 MAIN ST HUDSON MA ***RTN**: 2-0013121* ***Current Status**: RAO*	W	0.30 / 1,588.81	127
MAIN AND TOWER PARTNERS LLC	312 MAIN ST HUDSON MA ***RTN**: 2-0017090* ***Current Status**: RAO*	W	0.30 / 1,588.81	127
LAPOINTE MACHINE TOOL CO FMR	34 TOWER ST HUDSON MA ***RTN**: 2-0013687* ***Current Status**: RAO*	WNW	0.48 / 2,536.97	128

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
L AND S INDUSTRIAL PARK	34 TOWER ST HUDSON MA ***RTN**: 2-0000735* ***Current Status**: WCSPRM*	WNW	0.48 / 2,536.97	128
RESIDENTIAL PROPERTY	292 MAIN STREET HUDSON MA ***RTN**: 2-0019870* ***Current Status**: TIERI*	W	0.32 / 1,694.23	130
MR PROPERTY MANAGEMENT	262 SAWYER LN HUDSON MA ***RTN**: 2-0013741* ***Current Status**: RAO*	W	0.37 / 1,956.47	131
LOWER MAIN ST LLC C-O MR PROPERTY MGMT I	262 SAWYER LN HUDSON MA ***RTN**: 2-0014944* ***Current Status**: RAO*	W	0.37 / 1,956.47	131
MP DEVELOPMENT LLC	262 SAWYER LN HUDSON MA ***RTN**: 2-0015183* ***Current Status**: RAO*	W	0.37 / 1,956.47	131
G BONNAZOLI AND SONS INC	262 SAWYER LN HUDSON MA ***RTN**: 2-0012775* ***Current Status**: RAO*	W	0.37 / 1,956.47	131
HUDSON LAGOONS	12 WHEELER RD HUDSON MA ***RTN**: 2-0010526* ***Current Status**: RAO*	W	0.32 / 1,695.30	132
THORNDIKE PROPERTIES OF MA	12 WHEELER RD HUDSON MA ***RTN**: 2-0016411* ***Current Status**: RAO*	W	0.32 / 1,695.30	132
STOP & SHOP SUPERMARKET	10 TECHNOLOGY DR HUDSON MA ***RTN**: 2-0016344* ***Current Status**: RAO*	W	0.86 / 4,563.02	133
ST MICHAELS PARISH	246 MAIN ST HUDSON MA ***RTN**: 2-0015179* ***Current Status**: RAO*	W	0.40 / 2,137.55	134
TUCKS SERVICE CENTER	244 BROAD ST HUDSON MA ***RTN**: 2-0000938* ***Current Status**: RAO*	W	0.48 / 2,509.36	135
ACT MANUFACTURING CORP	TECHNOLOGY DR AND RTE 85 HUDSON MA ***RTN**: 2-0013377* ***Current Status**: RAO*	W	0.88 / 4,662.48	137

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
TUCKS TRUCKS	242 244 WASHINGTON ST HUDSON MA ***RTN**: 2-0013492* ***Current Status**: RAO*	W	0.79 / 4,191.72	138
INDEPENDENT CABLE	43 BROAD ST HUDSON MA ***RTN**: 2-0010063* ***Current Status**: RAO*	W	0.41 / 2,155.67	141
HUDSON WORSLED CO FORMER	43 BROAD ST HUDSON MA ***RTN**: 2-0012725* ***Current Status**: RAO*	W	0.41 / 2,155.67	141
TEST DEVICES INC	6 LORING ST HUDSON MA ***RTN**: 2-0011703* ***Current Status**: RAO*	W	0.43 / 2,277.42	143
PROPERTY	15 BROAD STREET HUDSON MA ***RTN**: 2-0018830* ***Current Status**: TIER1D*	W	0.43 / 2,282.87	144
SHELL GASOLINE STATION	181 MAIN ST HUDSON MA ***RTN**: 2-0016273* ***Current Status**: RAO*	W	0.45 / 2,386.69	145
KM HIGH STREET LLC	186 MAIN STREET HUDSON MA ***RTN**: 2-0019510* ***Current Status**: PSNC*	W	0.46 / 2,424.31	148
DIESEL FUEL LEAK	133 COX ST HUDSON MA ***RTN**: 2-0013998* ***Current Status**: RAO*	WNW	0.94 / 4,940.34	151
HOUGHTON STREET LLC	50 HOUGHTON ST HUDSON MA ***RTN**: 2-0015202* ***Current Status**: RAO*	W	0.53 / 2,795.82	152
THOMAS TAYLOR & SONS	52-54 HOUGHTON ST HUDSON MA ***RTN**: 2-0000524* ***Current Status**: RAO*	W	0.53 / 2,805.01	153
SHOE FACTORY FMR	1 HOUGHTON ST HUDSON MA ***RTN**: 2-0000922* ***Current Status**: RAO*	W	0.53 / 2,783.96	154
THOMAS TAYLOR & SONS	49 HOUGHTON ST HUDSON MA ***RTN**: 2-0011299* ***Current Status**: RAO*	W	0.53 / 2,790.41	155

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
FORMER LARKIN LUMBER	136 MAIN STREET HUDSON MA ***RTN**: 2-0019349* ***Current Status**: PSNC*	W	0.54 / 2,861.59	156
CUMBERLAND FARMS	200 WASHINGTON ST HUDSON MA ***RTN**: 2-0013611* ***Current Status**: RAO*	W	0.75 / 3,937.61	157
CUMBERLAND FARMS	200 WASHINGTON ST HUDSON MA ***RTN**: 2-0016604* ***Current Status**: RAO*	W	0.75 / 3,937.61	157
CUMBERLAND FARMS	200 WASHINGTON ST HUDSON MA ***RTN**: 2-0011145* ***Current Status**: RAO*	W	0.75 / 3,937.61	157
CUMBERLAND FARMS INC	200 WASHINGTON ST HUDSON MA ***RTN**: 2-0015666* ***Current Status**: RAO*	W	0.75 / 3,937.61	157
PURDY PROPERTY	191A WASHINGTON ST HUDSON MA ***RTN**: 2-0016830* ***Current Status**: RAO*	W	0.74 / 3,884.50	158
COMMERCIAL PROPERTY	173 WASHINGTON STREET HUDSON MA ***RTN**: 2-0018043* ***Current Status**: PSC*	W	0.73 / 3,844.12	160
HUDSON SENIOR CENTER	29 CHURCH ST HUDSON MA ***RTN**: 2-0017550* ***Current Status**: RAO*	W	0.64 / 3,390.22	161
WASTE MANAGEMENT INC	154 WASHINGTON AVE HUDSON MA ***RTN**: 2-0013689* ***Current Status**: RAO*	W	0.72 / 3,816.77	162
CELLUCI HUDSON CORP	153 WASHINGTON ST HUDSON MA ***RTN**: 2-0010317* ***Current Status**: RAO*	W	0.73 / 3,845.20	163
RJ CURLEY & SONS PROPERTY	152 MANNING ST LOT 234 HUDSON MA ***RTN**: 2-0018565* ***Current Status**: RAO*	WNW	0.96 / 5,085.52	165
MAIN ST ROTARY	32 MAIN ST HUDSON MA ***RTN**: 2-0020579* ***Current Status**: PSNC*	W	0.72 / 3,788.60	166

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
NO LOCATION AID	28 WASHINGTON STREET HUDSON MA ***RTN**: 2-0020026* ***Current Status**: PSC*	W	0.72 / 3,817.14	167
STAR ENT FACILITY 11 143 1315	27 WASHINGTON ST HUDSON MA ***RTN**: 2-0001051* ***Current Status**: RAO*	W	0.74 / 3,917.52	168
TEXACO STA FMR	27 WASHINGTON ST HUDSON MA ***RTN**: 2-0011920* ***Current Status**: RAO*	W	0.74 / 3,917.52	168
DFL LAKE STREET LLC	29 & 39 LAKE STREET HUDSON MA ***RTN**: 2-0020652* ***Current Status**: PSC*	WNW	0.86 / 4,540.98	169
CREATIVE HOME FURNISHINGS	32 WASHINGTON ST HUDSON MA ***RTN**: 2-0000069* ***Current Status**: RAO*	W	0.75 / 3,974.20	170
BAKER COMMODITIES	32 36 WASHINGTON ST HUDSON MA ***RTN**: 2-0012183* ***Current Status**: RAO*	W	0.76 / 3,991.53	171
DIESEL FUEL RELEASE	LINCOLN AND APSLEY ST HUDSON MA ***RTN**: 2-0020422* ***Current Status**: PSNC*	W	0.94 / 4,938.97	172
INTERSECTION RTE 62	29 RIVER ST HUDSON MA ***RTN**: 2-0014213* ***Current Status**: RAO*	W	0.89 / 4,709.85	173

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
NO LOCATION AID	161 DUTTON RD SUDBURY MA ***RTN**: 3-0020880* ***Current Status**: RAO*	SE	0.64 / 3,384.85	2
NO LOCATION AID	17 HOWELL ST SUDBURY MA ***RTN**: 3-0025370* ***Current Status**: RAO*	ESE	0.49 / 2,600.97	36
BARTLETTS GREENHOUSE	578 BOSTON POST RD SUDBURY MA ***RTN**: 3-0003267* ***Current Status**: RAO*	ESE	0.48 / 2,539.93	38

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
RESIDENTIAL COMMUNITY	200 BAY DRIVE SUDBURY MA ***RTN**: 3-0035104* ***Current Status**: PSNC*	ESE	0.23 / 1,227.62	40
NO LOCATION AID	528 BOSTON POST RD SUDBURY MA ***RTN**: 3-0027243* ***Current Status**: TIERI*	ESE	0.39 / 2,042.35	41
RAYTHEON EAST DRIVEWAY	528 BOSTON POST RD SUDBURY MA ***RTN**: 3-0017106* ***Current Status**: RAO*	ESE	0.39 / 2,042.35	41
RAYTHEON COMPANY	528 BOSTON POST RD SUDBURY MA ***RTN**: 3-0003037* ***Current Status**: PENNFA*	ESE	0.39 / 2,042.35	41
SUNRISE CLEANERS	523 BOSTON POST RD SUDBURY MA ***RTN**: 3-0015591* ***Current Status**: RAONR*	ESE	0.37 / 1,934.08	43
SUNRISE CLEANERS	523 BOSTON POST RD SUDBURY MA ***RTN**: 3-0004339* ***Current Status**: RAO*	ESE	0.37 / 1,934.08	43
RESIDENCE	47 MARLBOROUGH RD STOW MA ***RTN**: 2-0013499* ***Current Status**: RAO*	WNW	0.17 / 880.39	44
RTE 20	475 BOSTON POST RD SUDBURY MA ***RTN**: 3-0015872* ***Current Status**: RAO*	ESE	0.29 / 1,556.57	45
RTE 20	475 BOSTON POST RD SUDBURY MA ***RTN**: 3-0015951* ***Current Status**: RAO*	ESE	0.29 / 1,556.57	45
SOUSA	477 BOSTON POST RD SUDBURY MA ***RTN**: 3-0000602* ***Current Status**: RAO*	ESE	0.29 / 1,555.93	46
CUMBERLAND FARMS	470 BOSTON POST ROAD SUDBURY MA ***RTN**: 3-0029588* ***Current Status**: RAONR*	ESE	0.26 / 1,370.95	47

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
CUMBERLAND FARMS	470 BOSTON POST RD SUDBURY MA ***RTN**: 3-0023429* ***Current Status**: RAONR*	ESE	0.26 / 1,370.95	47
CUMBERLAND FARMS/GULF	470 BOSTON POST RD SUDBURY MA ***RTN**: 3-0004202* ***Current Status**: RAO*	ESE	0.26 / 1,370.95	47
MOBIL STATION	465 BOSTON POST RD SUDBURY MA ***RTN**: 3-0002341* ***Current Status**: RAO*	ESE	0.26 / 1,390.43	48
NO LOCATION AID	239 NOBSCOT RD SUDBURY MA ***RTN**: 3-0026639* ***Current Status**: RAO*	ESE	0.30 / 1,576.70	49
INTERSTATE GAS & OIL	239 NOBSCOT RD SUDBURY MA ***RTN**: 3-0004668* ***Current Status**: DPS*	ESE	0.30 / 1,576.70	49
COATINGS ENGINEERING	33 UNION RD SUDBURY MA ***RTN**: 3-0000074* ***Current Status**: RAO*	ESE	0.03 / 173.74	51
MULLEN LUMBER	39 UNION AVE SUDBURY MA ***RTN**: 3-0002640* ***Current Status**: RAO*	ESE	0.04 / 201.52	52
FUEL DEPOT FMR	450 BOSTON POST RD SUDBURY MA ***RTN**: 3-0004638* ***Current Status**: RAO*	ESE	0.20 / 1,030.15	57
UNION PALMER REALTY TRUST	80 UNION AVE SUDBURY MA ***RTN**: 3-0003371* ***Current Status**: RAO*	ESE	0.19 / 987.05	59
15 UNION AVENUE	15 UNION AVE SUDBURY MA ***RTN**: 3-0014107* ***Current Status**: RAO*	ESE	0.09 / 452.87	61
MOBIL STATION	432 BOSTON POST RD SUDBURY MA ***RTN**: 3-0028383* ***Current Status**: RAO*	ESE	0.17 / 884.40	64

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
MOBIL STATION	432 BOSTON POST RD SUDBURY MA ***RTN**: 3-0028384* ***Current Status**: RAO*	ESE	0.17 / 884.40	64
MOBIL SERVICE STA #10381 (FRMR 01-474)	432 BOSTON POST RD SUDBURY MA ***RTN**: 3-0026036* ***Current Status**: RAONR*	ESE	0.17 / 884.40	64
MOBIL STATION 01-474	432 BOSTON POST RD SUDBURY MA ***RTN**: 3-0024771* ***Current Status**: RAONR*	ESE	0.17 / 884.40	64
MOBIL SERVICE STATION 01-474	432 BOSTON POST RD SUDBURY MA ***RTN**: 3-0023726* ***Current Status**: RAONR*	ESE	0.17 / 884.40	64
MOBIL STATION	432 BOSTON POST RD SUDBURY MA ***RTN**: 3-0002423* ***Current Status**: RAO*	ESE	0.17 / 884.40	64
CHISWICK PROPERTIES FMR	BOSTON POST ROAD UNION ST SUDBURY MA ***RTN**: 3-0000020* ***Current Status**: RAO*	ESE	0.16 / 834.61	67
SUDBURY CLEANERS	428 BOSTON POST RD SUDBURY MA ***RTN**: 3-0010592* ***Current Status**: REMOPS*	ESE	0.15 / 777.52	68
NO LOCATION AID	425 BOSTON POST ROAD SUDBURY MA ***RTN**: 3-0030065* ***Current Status**: RAO*	ESE	0.14 / 745.84	70
SUDBURY PIZZA	426 BOSTON POST ROAD SUDBURY MA ***RTN**: 3-0035807* ***Current Status**: PSNC*	ESE	0.13 / 709.15	72
FAHEY EXHIBITS BUILDING	501 GLEASONDALE RD STOW MA ***RTN**: 2-0000427* ***Current Status**: RAO*	WNW	0.57 / 3,024.48	74
GLEASONDALE MILL	501 GLEASONDALE ROAD STOW MA ***RTN**: 2-0021116* ***Current Status**: UNCLSS*	WNW	0.57 / 3,024.48	74

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
MIDDLEBORO TRAIN YARD	1 STATION RD MIDDLEBOROUGH MA ***RTN**: 4-0022510* ***Current Status**: RAO*	ESE	0.01 / 43.46	81
BEHIND MACKINNONS LIQUOR	5 CONCORD RD SUDBURY MA ***RTN**: 3-0026018* ***Current Status**: RAO*	ESE	0.13 / 683.06	83
GASOLINE STATION FMR	225 AND 227 BOSTON POST RD SUDBURY MA ***RTN**: 3-0001153* ***Current Status**: RAO*	ESE	0.10 / 506.68	100
NO LOCATION AID	209 BOSTON POST ROAD SUDBURY MA ***RTN**: 3-0033240* ***Current Status**: TIERII*	ESE	0.05 / 283.47	109
NO LOCATION AID	BOSTON POST ROAD AT LANDHAM RD SUDBURY MA ***RTN**: 3-0027224* ***Current Status**: URAM*	ESE	0.05 / 268.70	111
BUDDY DOG ANIMAL HOSPITAL	163 BOSTON POST RD SUDBURY MA ***RTN**: 3-0018895* ***Current Status**: RAO*	E	0.14 / 719.53	123
UNION CARBIDE LINDE DIV	141 BOSTON POST RD SUDBURY MA ***RTN**: 3-0002545* ***Current Status**: WCSPRM*	E	0.23 / 1,195.98	129
RICHEY & CLAPPER LANDSCAPE SUPPLY CO.	33 BOSTON POST ROAD SUDBURY MA ***RTN**: 3-0029754* ***Current Status**: RAO*	E	0.36 / 1,922.68	136
BELL TELL MANHOLE 206	20 BOSTON POST ROAD SUDBURY MA ***RTN**: 3-0029909* ***Current Status**: ADQREG*	E	0.37 / 1,967.39	139
BELL TELL MANHOLE 206	20 BOSTON POST RD SUDBURY MA ***RTN**: 3-0023624* ***Current Status**: ADQREG*	E	0.37 / 1,967.39	139
SUDBURY TRANSFER STATION	20 BOSTON POST ROAD SUDBURY MA ***RTN**: 3-0033503* ***Current Status**: ADQREG*	E	0.37 / 1,967.39	139

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
DPW TRANSFER STATION	20 BOSTON POST RD SUDBURY MA ***RTN**: 3-0017083* ***Current Status**: RAO*	E	0.37 / 1,967.39	139
SUDBURY LANDFILL	20 BOSTON POST ROAD SUDBURY MA ***RTN**: 3-0034148* ***Current Status**: PSNC*	E	0.37 / 1,967.39	139
NO LOCATION AID	83 BOSTON POST RD SUDBURY MA ***RTN**: 3-0021843* ***Current Status**: DPS*	E	0.38 / 1,990.43	140
MA HWY DEPT DEPOT	RT 20 BOSTON POST RD SUDBURY MA ***RTN**: 3-0010426* ***Current Status**: RAO*	E	0.38 / 2,014.85	142
NO LOCATION AID	6 OLD COUNTY RD SUDBURY MA ***RTN**: 3-0025622* ***Current Status**: RAO*	E	0.52 / 2,727.58	147
NO LOCATION AID	19 HAWTHORNE ROAD SUDBURY MA ***RTN**: 3-0030271* ***Current Status**: RAO*	ESE	0.45 / 2,355.26	149
PROPERTY	533 BOSTON POST RD WAYLAND MA ***RTN**: 3-0003351* ***Current Status**: RAO*	E	0.43 / 2,278.26	150
MUNICIPAL ROADWAY	NEARBY 44 RIVER ROAD WAYLAND MA ***RTN**: 3-0031870* ***Current Status**: RAO*	E	0.91 / 4,820.51	159
WATERS MANUFACTURING	522 BOSTON POST RD LONGFELLOW WAYLAND MA ***RTN**: 3-0000059* ***Current Status**: RAO*	E	0.61 / 3,205.91	164
PLANNED RIVERS EDGE DEVELOPMENT	484-490 BOSTON POST ROAD WAYLAND MA ***RTN**: 3-0036013* ***Current Status**: UNCLSS*	E	0.91 / 4,786.26	174
NEAR LANDFILL	484 BOSTON POST RD WAYLAND MA ***RTN**: 3-0027741* ***Current Status**: RAO*	E	0.91 / 4,806.67	175

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
WAYLAND SAND HILL LANDFILL	484 BOSTON POST RD WAYLAND MA ***RTN**: 3-0024698* ***Current Status**: RAO*	E	0.91 / 4,806.67	175
NO LOCATION AID	484 BOSTON POST ROAD WAYLAND MA ***RTN**: 3-0034474* ***Current Status**: TIERI*	E	0.91 / 4,806.67	175

DELISTED REL - Delisted Waste Site Cleanup Notification Sites

A search of the DELISTED REL database, dated Sep 8, 2020 has found that there are 1 DELISTED REL site(s) within approximately 1.00 miles of the project property.

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
CHILDCARE CENTER	522 BOSTON POST ROAD WAYLAND MA 01778-0000	E	0.61 / 3,205.91	164

SWF/LF - Solid Waste Facilities

A search of the SWF/LF database, dated Jan 14, 2020 has found that there are 3 SWF/LF site(s) within approximately 0.50 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
HUDSON TRANSFER STATION	300 COX ST HUDSON, MA 01749 MA	WNW	0.34 / 1,781.68	97

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
SUDBURY TRANSFER & RECYCLING CENTER	20 BOSTON POST RD SUDBURY, MA 01776 MA	E	0.37 / 1,967.39	139
SUDBURY SAND HILL LANDFILL	20 BOSTON POST RD SUDBURY, MA 01776 MA	E	0.37 / 1,967.39	139

LST - Tank Related Leaks and Spills

A search of the LST database, dated Sep 8, 2017 has found that there are 21 LST site(s) within approximately 0.50 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
FORMER CITGO	706 MAIN ST HUDSON MA 01749-0000 ***Site No | Current Date | Status Desc**: 2-0017095 | 9/18/2008 | Release Tracking Number Closed*	NW	0.35 / 1,834.46	11
CONTINENTAL CITGO	706 MAIN ST HUDSON MA 01749-0000	NW	0.35 / 1,834.46	11

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
	Site No* | *Current Date* | *Status Desc: *2-0015576* | *6/1/2010* | *Remedy Operation Status*			
POPLINS FURNITURE WAREHOUSE	420 MAIN ST HUDSON MA 01749-0000	WNW	0.43 / 2,251.30	102
	Site No* | *Current Date* | *Status Desc: *2-0012541* | *5/13/1999* | *Response Action Outcome*			
HUDSON LIGHT & POWER	49 FOREST AVE HUDSON MA 1749	W	0.04 / 230.59	118
	Site No* | *Current Date* | *Status Desc: *2-0010202* | *4/19/1994* | *Response Action Outcome*			
TOWER ST	350 MAIN ST HUDSON MA 01749-0000	W	0.30 / 1,565.34	124
	Site No* | *Current Date* | *Status Desc: *2-0010717* | *6/8/1999* | *Response Action Outcome*			
LAPOINTE MACHINE TOOL CO FMR	34 TOWER ST HUDSON MA 01749-0000	WNW	0.48 / 2,536.97	128
	Site No* | *Current Date* | *Status Desc: *2-0013687* | *2/20/2002* | *Response Action Outcome*			
L & S INDUSTRIAL PARK	34 TOWER ST HUDSON MA 1749	WNW	0.48 / 2,536.97	128
	Site No* | *Current Date* | *Status Desc: *2-0000735* | *6/21/1995* | *Waiver Completion Statement*			
G BONNAZOLI AND SONS INC	262 SAWYER LN HUDSON MA 01749-0000	W	0.37 / 1,956.47	131
	Site No* | *Current Date* | *Status Desc: *2-0012775* | *7/25/2000* | *Response Action Outcome*			
HUDSON WORSLED CO FORMER	43 BROAD ST HUDSON MA 01749-0000	W	0.41 / 2,155.67	141
	Site No* | *Current Date* | *Status Desc: *2-0012725* | *5/28/1999* | *Response Action Outcome*			
SHELL GASOLINE STATION	181 MAIN ST HUDSON MA 01749-0000	W	0.45 / 2,386.69	145
	Site No* | *Current Date* | *Status Desc: *2-0016273* | *5/29/2007* | *Response Action Outcome*			

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
RTE 20	475 BOSTON POST RD SUDBURY MA 01776-0000	ESE	0.29 / 1,556.57	45
	Site No* | *Current Date* | *Status Desc: *3-0015872* | *3/3/1998* | *Response Action Outcome*			
RTE 20	475 BOSTON POST RD SUDBURY MA 01776-0000	ESE	0.29 / 1,556.57	45
	Site No* | *Current Date* | *Status Desc: *3-0015951* | *10/3/2007* | *Response Action Outcome*			
CUMBERLAND FARMS/GULF	470 BOSTON POST RD SUDBURY MA 01776-0000	ESE	0.26 / 1,370.95	47
	Site No* | *Current Date* | *Status Desc: *3-0004202* | *2/5/2009* | *Response Action Outcome*			
MOBIL STATION	465 BOSTON POST RD SUDBURY MA 01776-0000	ESE	0.26 / 1,390.43	48
	Site No* | *Current Date* | *Status Desc: *3-0002341* | *9/20/2006* | *Response Action Outcome*			

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
INTERSTATE GAS & OIL	239 NOBSCOT RD SUDBURY MA 01776-0000	ESE	0.30 / 1,576.70	49
	***Site No | Current Date | Status Desc**: 3-0004668 | 9/24/2001 | Downgradient Property Status*			
15 UNION AVENUE	15 UNION AVE SUDBURY MA 01776-0000	ESE	0.09 / 452.87	61
	***Site No | Current Date | Status Desc**: 3-0014107 | 4/3/2002 | Response Action Outcome*			
MOBIL STATION	432 BOSTON POST RD SUDBURY MA 01776-0000	ESE	0.17 / 884.40	64
	***Site No | Current Date | Status Desc**: 3-0002423 | 9/13/2006 | Response Action Outcome*			
NO LOCATION AID	425 BOSTON POST ROAD SUDBURY MA 01776-3011	ESE	0.14 / 745.84	70
	***Site No | Current Date | Status Desc**: 3-0030065 | 8/4/2011 | Response Action Outcome*			
NO LOCATION AID	209 BOSTON POST ROAD SUDBURY MA 01776-0000	ESE	0.05 / 283.47	109
	***Site No | Current Date | Status Desc**: 3-0033240 | 11/8/2016 | Tier 2*			
UNION CARBIDE LINDE DIV	141 BOSTON POST RD SUDBURY MA 1776	E	0.23 / 1,195.98	129
	***Site No | Current Date | Status Desc**: 3-0002545 | 3/11/1996 | Waiver Completion Statement*			
MA HWY DEPT DEPOT	RT 20 BOSTON POST RD SUDBURY MA 01776-0000	E	0.37 / 1,967.39	139
	***Site No | Current Date | Status Desc**: 3-0010426 | 7/27/1995 | Response Action Outcome*			

LUST - Leaking Underground Storage Tanks (LUST)

A search of the LUST database, dated Sep 8, 2020 has found that there are 23 LUST site(s) within approximately 0.50 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
CONTINENTAL CITGO	706 MAIN ST HUDSON MA	NW	0.35 / 1,834.46	11
	***RTN**: 2-0015576*			
FORMER CITGO	706 MAIN ST HUDSON MA	NW	0.35 / 1,834.46	11
	***RTN**: 2-0017095*			
ARROW AUTOMOTIVE IND INC	555 MAIN ST HUDSON MA	WNW	0.08 / 446.08	31
	***RTN**: 2-0000068*			
POPLINS FURNITURE WAREHOUSE	420 MAIN ST HUDSON MA	WNW	0.43 / 2,251.30	102
	***RTN**: 2-0012541*			
HUDSON LIGHT & POWER	49 FOREST AVE HUDSON MA	W	0.04 / 230.59	118

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
	***RTN**: 2-0010202*			
TOWER ST	350 MAIN ST HUDSON MA	W	0.30 / 1,565.34	124
	***RTN**: 2-0010717*			
LAPOINTE MACHINE TOOL CO FMR	34 TOWER ST HUDSON MA	WNW	0.48 / 2,536.97	128
	***RTN**: 2-0013687*			
L AND S INDUSTRIAL PARK	34 TOWER ST HUDSON MA	WNW	0.48 / 2,536.97	128
	***RTN**: 2-0000735*			
G BONNAZOLI AND SONS INC	262 SAWYER LN HUDSON MA	W	0.37 / 1,956.47	131
	***RTN**: 2-0012775*			
HUDSON WORSLED CO FORMER	43 BROAD ST HUDSON MA	W	0.41 / 2,155.67	141
	***RTN**: 2-0012725*			
SHELL GASOLINE STATION	181 MAIN ST HUDSON MA	W	0.45 / 2,386.69	145
	***RTN**: 2-0016273*			

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
RTE 20	475 BOSTON POST RD SUDBURY MA	ESE	0.29 / 1,556.57	45
	***RTN**: 3-0015951*			
RTE 20	475 BOSTON POST RD SUDBURY MA	ESE	0.29 / 1,556.57	45
	***RTN**: 3-0015872*			
CUMBERLAND FARMS/GULF	470 BOSTON POST RD SUDBURY MA	ESE	0.26 / 1,370.95	47
	***RTN**: 3-0004202*			
MOBIL STATION	465 BOSTON POST RD SUDBURY MA	ESE	0.26 / 1,390.43	48
	***RTN**: 3-0002341*			
INTERSTATE GAS & OIL	239 NOBSCOT RD SUDBURY MA	ESE	0.30 / 1,576.70	49
	***RTN**: 3-0004668*			
15 UNION AVENUE	15 UNION AVE SUDBURY MA	ESE	0.09 / 452.87	61
	***RTN**: 3-0014107*			

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
MOBIL STATION	432 BOSTON POST RD SUDBURY MA ***RTN**: 3-0002423*	ESE	0.17 / 884.40	64
NO LOCATION AID	425 BOSTON POST ROAD SUDBURY MA ***RTN**: 3-0030065*	ESE	0.14 / 745.84	70
SUDBURY PIZZA	426 BOSTON POST ROAD SUDBURY MA ***RTN**: 3-0035807*	ESE	0.13 / 709.15	72
NO LOCATION AID	209 BOSTON POST ROAD SUDBURY MA ***RTN**: 3-0033240*	ESE	0.05 / 283.47	109
UNION CARBIDE LINDE DIV	141 BOSTON POST RD SUDBURY MA ***RTN**: 3-0002545*	E	0.23 / 1,195.98	129
MA HWY DEPT DEPOT	RT 20 BOSTON POST RD SUDBURY MA ***RTN**: 3-0010426*	E	0.38 / 2,014.85	142

LAST - Leaking Aboveground Storage Tanks (LAST)

A search of the LAST database, dated Sep 8, 2020 has found that there are 10 LAST site(s) within approximately 0.50 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
KLAUK RESIDENCE	40 LAKESIDE AVE HUDSON MA ***RTN**: 2-0015407*	NW	0.46 / 2,437.59	14
ARROW AUTOMOTIVE IND INC	555 MAIN ST HUDSON MA ***RTN**: 2-0000068*	WNW	0.08 / 446.08	31
RENTAL PROPERTY	63 BROOK ST HUDSON MA ***RTN**: 2-0013064*	WNW	0.45 / 2,399.08	35
HUDSON LIGHT & POWER DEPARTMENT	77 CHERRY ST HUDSON MA ***RTN**: 2-0017400*	W	0.24 / 1,280.80	115
TEST DEVICES INC	6 LORING ST HUDSON MA ***RTN**: 2-0011703*	W	0.43 / 2,277.42	143

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
NO LOCATION AID	17 HOWELL ST SUDBURY MA ***RTN**: 3-0025370*	ESE	0.49 / 2,600.97	36
RESIDENCE	47 MARLBOROUGH RD STOW MA ***RTN**: 2-0013499*	WNW	0.17 / 880.39	44
UNION PALMER REALTY TRUST	80 UNION AVE SUDBURY MA ***RTN**: 3-0003371*	ESE	0.19 / 987.05	59
BEHIND MACKINNONS LIQUOR	5 CONCORD RD SUDBURY MA ***RTN**: 3-0026018*	ESE	0.13 / 683.06	83
DPW TRANSFER STATION	20 BOSTON POST RD SUDBURY MA ***RTN**: 3-0017083*	E	0.37 / 1,967.39	139

HIST LUST - Historic Leaking Underground Storage Tanks that occurred prior to October 1st 1993

A search of the HIST LUST database, dated Prior to Oct 1, 1993 has found that there are 10 HIST LUST site(s) within approximately 0.50 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
	457N MAIN STREET HUDSON MA ***Spill ID**	**Case Closed**: C88-0102 | YES*	WNW	0.02 / 127.79	88
BELOW GND TANK REMOVAL	422 MAIN ST. HUDSON MA ***Spill ID**	**Case Closed**: C89-0213 | YES*	WNW	0.39 / 2,083.56	99
CONTAM. SOIL	34 TOWER STREET HUDSON MA ***Spill ID**	**Case Closed**: C90-0012 | YES*	WNW	0.48 / 2,536.97	128
TANK REMOVAL	43 BROAD ST. HUDSON MA ***Spill ID**	**Case Closed**: C92-0247 | YES*	W	0.41 / 2,155.67	141
TUCK'S SERVICE CENTER	WASHINGTON ST. AND BROAD ST. HUDSON MA ***Spill ID**	**Case Closed**: C92-0095 | YES*	W	0.45 / 2,357.30	146

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
	578 BOSTON POST RD; RTE 20 SUDBURY MA ***Spill ID**	**Case Closed**: N88-1159 | YES*	ESE	0.48 / 2,539.93	38

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
STORM DRAIN OUTFALL	239 NOBSCOT RD SUDBURY MA	ESE	0.30 / 1,576.70	49
	Spill ID* | *Case Closed: *N93-0018* | *YES*			
SUDBURY MOBIL	423 BOSTON POST RD SUDBURY MA	ESE	0.12 / 631.62	73
	Spill ID* | *Case Closed: *N92-1121* | *YES*			
SUDBURY AUTOMOTIVE	RTE 20 @ LANHAM RD SUDBURY MA	ESE	0.05 / 268.70	111
	Spill ID* | *Case Closed: *N91-1290* | *YES*			
	141 BOSTON POST RD SUDBURY MA	E	0.23 / 1,195.98	129
	Spill ID* | *Case Closed: *N88-0430* | *YES*			

HIST LAST - Historic Leaking Aboveground Storage Tanks that occurred prior to October 1st 1993

A search of the HIST LAST database, dated Prior to Oct 1, 1993 has found that there are 2 HIST LAST site(s) within approximately 0.50 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
WARMER FUEL OIL CO.	BROAD & WASHINGTON ST. HUDSON MA	W	0.45 / 2,357.30	146
	Spill ID* | *Case Closed: *C85-0179* | *YES*			

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
UNION & PALMER REALTY TRUST	80 UNION STREET SUDBURY MA	ESE	0.19 / 987.05	59
	Spill ID* | *Case Closed: *N89-1502* | *YES*			

UST - Underground Storage Tanks (UST)

A search of the UST database, dated Sep 30, 2020 has found that there are 16 UST site(s) within approximately 0.25 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
WVJV-TV TRANSMITTER SITE	111 PARMENTER RD HUDSON MA 01749	WNW	0.23 / 1,228.11	4
	Facility ID: *9936* ***Tank ID* | *Status* | *Status Date***: *1* | *Tank Removed* | *19-Mar-1990*			
SILVER KING BROADCASTING OF MA	71 PARMENTER RD HUDSON MA 01749	WNW	0.04 / 207.98	9
	Facility ID: *19417* ***Tank ID* | *Status* | *Status Date***: *1* | *Tank Removed* | *10-Jan-1990*			
E H PERKINS CONSTRUCTION INC	560 MAIN ST HUDSON MA 01749	WNW	0.07 / 355.90	30
	Facility ID: *9946* ***Tank ID* | *Status* | *Status Date***: *3* | *Tank Removed* | *24-Jan-1999, 2* | *Tank Removed* | *24-Jan-1999, 1* | *Tank Removed* | *24-Jan-1999*			

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
MOBIL LUBE AND OIL	457 MAIN ST HUDSON MA 01749	WNW	0.06 / 320.80	90
	***Facility ID**: 19415* ***Tank ID | Status | Status Date**: 3 | In Use | , 1 | In Use | , 2 | In Use |*			
TOWN OF HUDSON LIGHT & POWER	49 FOREST AVE HUDSON MA 01749	W	0.04 / 230.59	118
	***Facility ID**: 9934* ***Tank ID | Status | Status Date**: 1 | Tank Removed | 20-Oct-1997*			
STOCKROOM (OLD)	CHERRY ST HUDSON MA 01749	W	0.23 / 1,208.65	120
	***Facility ID**: 9933* ***Tank ID | Status | Status Date**: 1 | Tank Removed | 01-Apr-1989*			

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
COATINGS ENGINEERING CORP	33 UNION AVE SUDBURY MA 01776	ESE	0.03 / 173.74	51
	***Facility ID**: 11009* ***Tank ID | Status | Status Date**: 4 | Tank Removed | 10-Jun-1987, 7 | Tank Removed | 10-Jun-1987, 2 | Tank Removed | 10-Jun-1987, 6 | Tank Removed | 10-Jun-1987, 3 | Tank Removed | 10-Jun-1987, 8 | Tank Removed | 10-Jun-1987, 1 | Tank Removed | 10-Jun-1987, 9 | Tank Removed | 10-Jun-1987, 5 | Tank Removed | 10-Jun-1987, 10 | Tank Removed | 10-Jun-1987*			
UNION AVE REALTY	46 UNION AVE SUDBURY MA 01776	ESE	0.03 / 168.10	53
	***Facility ID**: 10992* ***Tank ID | Status | Status Date**: 1 | Tank Closure In-Place | 22-Sep-2010*			
E H PERKINS CONSTRUCTION INC	50 UNION AVE SUDBURY MA 01776	ESE	0.06 / 315.40	54
	***Facility ID**: 10995* ***Tank ID | Status | Status Date**: 1 | Tank Removed | 10-Jun-1987, 2 | Tank Removed | 10-Jun-1987*			
ERNEST SCHOFIELD	80 UNION AVE SUDBURY MA 01776	ESE	0.19 / 987.05	59
	***Facility ID**: 10999* ***Tank ID | Status | Status Date**: 3 | Tank Removed | 01-Jan-1985, 1 | Tank Removed | 01-Jan-1985, 2 | Tank Removed | 01-Jan-1985*			
MULLEN LUMBER CO INC	28 UNION AVE SUDBURY MA 01776	ESE	0.07 / 355.76	60
	***Facility ID**: 10991* ***Tank ID | Status | Status Date**: 1 | Tank Removed | 05-May-1993*			
SUDBURY MOBIL	432 BOSTON POST RD SUDBURY MA 01776	ESE	0.17 / 884.40	64
	***Facility ID**: 11006* ***Tank ID | Status | Status Date**: 5 | Tank Removed | 14-Jun-1989, 3 | Tank Removed | 05-May-1993, 4 | Tank Removed | 14-Jun-1989, 9 | Tank Removed | 05-Nov-2008, 6 | In Use | , 10 | Tank Removed | 05-Nov-2008, 1 | Tank Removed | 14-Jun-1989, 8 | Tank Closure In-Place | 05-Apr-2019, 7 | In Use | , 2 | Tank Removed | 14-Jun-1989*			
VERIZON MASSACHUSETTS #568506	351 BOSTON POST RD SUDBURY MA 01776	ESE	0.12 / 659.51	89

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
	***Facility ID**: 10996*			
SUDBURY GETTY	227 BOSTON POST RD SUDBURY MA 01776	ESE	0.09 / 459.18	105
	***Facility ID**: 11002* ***Tank ID | Status | Status Date**: 2 | Tank Removed | 05-May-1992, 3 | Tank Removed | 05-May-1992, 1 | Tank Removed | 05-May-1992*			
SUDBURY AUTOMOTIVE	209 BOSTON POST RD SUDBURY MA 01776	ESE	0.05 / 283.47	109
	***Facility ID**: 11003* ***Tank ID | Status | Status Date**: 1 | Tank Removed | 03-Nov-2015, 3 | Tank Removed | 03-Nov-2015, 2 | Tank Removed | 03-Nov-2015, 6 | In Use | 22-Jan-2016, 5 | In Use | 22-Jan-2016, 4 | Tank Removed | 01-Jan-2002*			
LINDE GASES OF NEW ENGLAND INC	141 BOSTON POST RD SUDBURY MA 01776	E	0.23 / 1,195.98	129
	***Facility ID**: 20615* ***Tank ID | Status | Status Date**: 1 | Tank Removed | 01-Dec-1988, 2 | Tank Removed | 01-Dec-1988, 3 | Tank Removed | 04-Apr-1988*			

AST - Aboveground Storage Tanks

A search of the AST database, dated Aug 4, 2020 has found that there are 4 AST site(s) within approximately 0.25 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
HUDSON LIGHT & POWER DEPT - CHERRY ST	77 CHERRY ST HUDSON MA 01749	W	0.24 / 1,280.80	115
	***License No**: OSFM-00783* ***License Status**: Tank Removed*			
HUDSON LIGHT & POWER DEPT - CHERRY ST	77 CHERRY ST HUDSON MA 01749	W	0.24 / 1,280.80	115
	***License No**: OSFM-00741* ***License Status**: Tank Removed*			
HUDSON LIGHT & POWER DEPT - STOW CT	49 Forest St Hudson MA 01749	W	0.04 / 230.59	118
	***License No**: OSFM-00740* ***License Status**: Active*			
HUDSON LIGHT & POWER DEPT - STOW CT	49 Forest St Hudson MA 01749	W	0.04 / 230.59	118
	***License No**: OSFM-00784* ***License Status**: Tank Removed*			

AUL - Sites with Activity and Use Limitations

A search of the AUL database, dated Sep 8, 2020 has found that there are 6 AUL site(s) within approximately 0.50 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
NO LOCATION AID	17 BRNT DRIVE HUDSON MA	WNW	0.23 / 1,238.51	19

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
HUDSON LAGOONS	12 WHEELER RD HUDSON MA	W	0.32 / 1,695.30	132
THORNDIKE PROPERTIES OF MA	12 WHEELER RD HUDSON MA	W	0.32 / 1,695.30	132
TUCKS SERVICE CENTER	244 BROAD ST HUDSON MA	W	0.48 / 2,509.36	135

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
BARTLETTS GREENHOUSE	578 BOSTON POST RD SUDBURY MA	ESE	0.48 / 2,539.93	38
GASOLINE STATION FMR	225 AND 227 BOSTON POST RD SUDBURY MA	ESE	0.10 / 506.68	100

BROWNFIELDS - Massachusetts Brownfield Tracking

A search of the BROWNFIELDS database, dated Dec 31, 2018 has found that there are 4 BROWNFIELDS site(s) within approximately 0.50 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
Blank Industrial Realty	17 Brent Drive Hudson MA	WNW	0.23 / 1,238.51	19
Arrow Automotive Ind Inc	555 Main St Hudson MA	WNW	0.08 / 446.08	31
Hudson Lagoons	12 Wheeler Rd Hudson MA	W	0.32 / 1,695.30	132
H. LaRosee & Sons, Inc.	15 Broad Street Hudson MA	W	0.43 / 2,282.87	144

Non Standard

Federal

FINDS/FRS - Facility Registry Service/Facility Index

A search of the FINDS/FRS database, dated Jun 15, 2020 has found that there are 8 FINDS/FRS site(s) within approximately 0.02 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
RICHS AUTO PARTS INC	566 MAIN ST HUDSON MA 017490000	WNW	0.01 / 31.29	23
FOREST AVENUE ELEMENTARY SCHOOL	138 FOREST AVENUE HUDSON MA 01749-2840	W	0.00 / 3.52	93
FAMILY ORTHODONTICS OF HUDSON	118 FOREST AVE HUDSON MA 017490000	W	0.00 / 10.64	98
KUSTOM KREATIONS INC	104 FOREST ST HUDSON MA 017490000	W	0.00 / 7.29	106

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
STEVES AUTO BODY	40 STATION RD SUDBURY MA 01776	ESE	0.01 / 57.56	66
STATION ROAD AUTO BODY & GARAG	40 STATION RD SUDBURY MA 01776	ESE	0.01 / 57.56	66
MOSHER AUTO BODY INC	34 STATION RD SUDBURY MA 01776	ESE	0.01 / 55.22	71
MOSHER AUTOBODY	34 STATION RD SUDBURY MA 01776	ESE	0.01 / 55.22	71

ICIS - Integrated Compliance Information System (ICIS)

A search of the ICIS database, dated Nov 18, 2016 has found that there are 1 ICIS site(s) within approximately 0.02 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
RICHS AUTO PARTS INC	566 MAIN ST HUDSON MA 01749	WNW	0.01 / 31.29	23

PCB - Polychlorinated Biphenyl (PCB) Notifiers

A search of the PCB database, dated Oct 9, 2019 has found that there are 1 PCB site(s) within approximately 0.50 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
HUDSON LIGHT AND POWER	49 FOREST AVE HUDSON MA 01749	W	0.04 / 230.59	118

State

SPILLS - Oil Spill Program

A search of the SPILLS database, dated Nov 27, 2017 has found that there are 15 SPILLS site(s) within approximately 0.12 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
FORMER ROD & GUN CLUB	33 BULKLEY RD SUDBURY MA 01776-0000	E	0.06 / 323.49	10
JAMES GORIN REALTY TRUST	577 MAIN ST HUDSON MA 01749	WNW	0.12 / 652.93	15
COMMERCIAL BUILDING	569 MAIN ST HUDSON MA 01749-0000	WNW	0.07 / 394.11	18
M&M DRILLING KANE PERKINS	560 MAIN ST HUDSON MA 01749	WNW	0.07 / 355.90	30
ARROW AUTOMOTIVE IND INC	555 MAIN ST HUDSON MA 01749-0000	WNW	0.08 / 446.08	31
HUDSON MAIN 555 LLC	555 MAIN ST HUDSON MA 01749-0000	WNW	0.08 / 446.08	31
HUDSON LIGHT & POWER	49 FOREST AVE HUDSON MA 01749	W	0.04 / 230.59	118

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
NO LOCATION AID	PARMENTER RD AND WHITE POND RD HUDSON MA 01749-0000	NW	0.11 / 600.75	1
COATINGS ENGINEERING	33 UNION RD SUDBURY MA 01776-0000	ESE	0.03 / 173.74	51
MULLEN LUMBER	39 UNION AVE SUDBURY MA 01776	ESE	0.04 / 201.52	52

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
15 UNION AVENUE	15 UNION AVE SUDBURY MA 01776-0000	ESE	0.09 / 452.87	61
MIDDLEBORO TRAIN YARD	1 STATION RD MIDDLEBOROUGH MA	ESE	0.01 / 43.46	81
GASOLINE STATION FMR	225 AND 227 BOSTON POST RD SUDBURY MA 01776	ESE	0.09 / 459.18	105
NO LOCATION AID	209 BOSTON POST ROAD SUDBURY MA 01776-0000	ESE	0.05 / 283.47	109
NO LOCATION AID	BOSTON POST ROAD AT LANDHAM RD SUDBURY MA 01776-0000	ESE	0.05 / 268.70	111

HIS SPILLS - Historic Spills that occurred prior to October 1st 1993

A search of the HIS SPILLS database, dated Prior to Oct 1, 1993 has found that there are 2 HIS SPILLS site(s) within approximately 0.12 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
WASTE OIL AND LUBRICANTS	1 KANE INDUSTRIAL DR. HUDSON MA ***Spill ID*	*Case Closed**: C93-0030	YES*	WNW	0.06 / 312.01	22
ENGINE CLEANING	1 KANE INDUSTRIAL PARK HUDSON MA ***Spill ID*	*Case Closed**: C92-0122	YES*	WNW	0.06 / 312.01	22

OIL & HAZ MAT - Tier Classified Oil and/or Hazardous Material Sites

A search of the OIL & HAZ MAT database, dated Apr 6, 2020 has found that there are 3 OIL & HAZ MAT site(s) within approximately 0.25 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
FMR BOYD COATINGS RESEARCH CO	51 PARMENTER ROAD HUDSON MA	WNW	0.13 / 694.02	5
CHESTNUT STREET WELL	CHESTNUT STREET HUDSON MA	WNW	0.23 / 1,216.26	39

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
NO LOCATION AID	209 BOSTON POST ROAD SUDBURY MA	ESE	0.05 / 283.47	109

GEN - Hazardous Waste and Waste Oil Generators

A search of the GEN database, dated Sep 25, 2020 has found that there are 21 GEN site(s) within approximately 0.12 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
LINCOLN TOOL & MACHINE CORP	43 PARMENTER RD HUDSON MA 01749	WNW	0.09 / 462.02	7
ANVER CORPORATION	36 PARMENTER RD HUDSON MA 01749	WNW	0.09 / 486.70	12
JET MAIL SERVICES	577 MAIN ST HUDSON MA 01749	WNW	0.12 / 652.93	15
CENTERLINE TECHNOLOGIES LLC	577 MAIN ST HUDSON MA 01749	WNW	0.12 / 652.93	15
ADAPTIVE WIRELESS SOLUTIONS	577 MAIN ST HUDSON MA 01749	WNW	0.12 / 652.93	15
MACH MACHINE INC	569 MAIN ST HUDSON MA 01749	WNW	0.07 / 394.11	18
A&S DELIVERY SERVICE INC	6 KANE INDUSTRIAL DR HUDSON MA 01749	WNW	0.10 / 521.83	24
JEKTEK SCREENPRINTING & EMBROIDERY LLC	5 KANE INDUSTRIAL DR HUDSON MA 01749	WNW	0.12 / 649.78	25
R&L AUTOMOTIVE	561 MAIN ST HUDSON MA 01749	WNW	0.05 / 269.50	28
PAO CORP	560 MAIN ST HUDSON MA 01749	WNW	0.07 / 355.90	30
GRAND IMAGE	560 MAIN ST HUDSON MA 01749	WNW	0.07 / 355.90	30

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
KANE PERKINS CO INC	560 MAIN ST HUDSON MA 01749	WNW	0.07 / 355.90	30
CONTRONAUTICS INCORPORATED	31 WILKINS HUDSON MA 01749	WNW	0.07 / 372.65	63
MOPBIL LUBE & OIL	457 MAIN ST HUDSON MA 01749	WNW	0.06 / 320.80	90
KUSTOM KREATIONS INC	104 FOREST AVE HUDSON MA 01749	W	0.00 / 7.29	106
HUDSON LIGHT & POWER DEPT	49 FOREST AVE HUDSON MA 01749	W	0.04 / 230.59	118

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
STAPLES CONTRACT AND COMMERCIAL	33 UNION AVE SUDBURY MA 01776	ESE	0.03 / 173.74	51
CHARLES J PERCOURT & SONS INC	46 UNION AVE SUDBURY MA 01776	ESE	0.03 / 168.10	53
STATION ROAD AUTO BODY & GARAGE INC	40 STATION RD SUDBURY MA 01776	ESE	0.01 / 57.56	66
MOSHER AUTO BODY INC	34 STATION RD SUDBURY MA 01776	ESE	0.01 / 55.22	71
SUDBURY AUTOMOTIVE INC	209 BOSTON POST RD SUDBURY MA 01776	ESE	0.05 / 283.47	109

ASBESTOS PROJECT - Asbestos Projects

A search of the ASBESTOS PROJECT database, dated Sep 9, 2020 has found that there are 44 ASBESTOS PROJECT site(s) within approximately 0.12 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
COMMERCIAL	569 MAIN STREET HUDSON MA	WNW	0.07 / 394.11	18

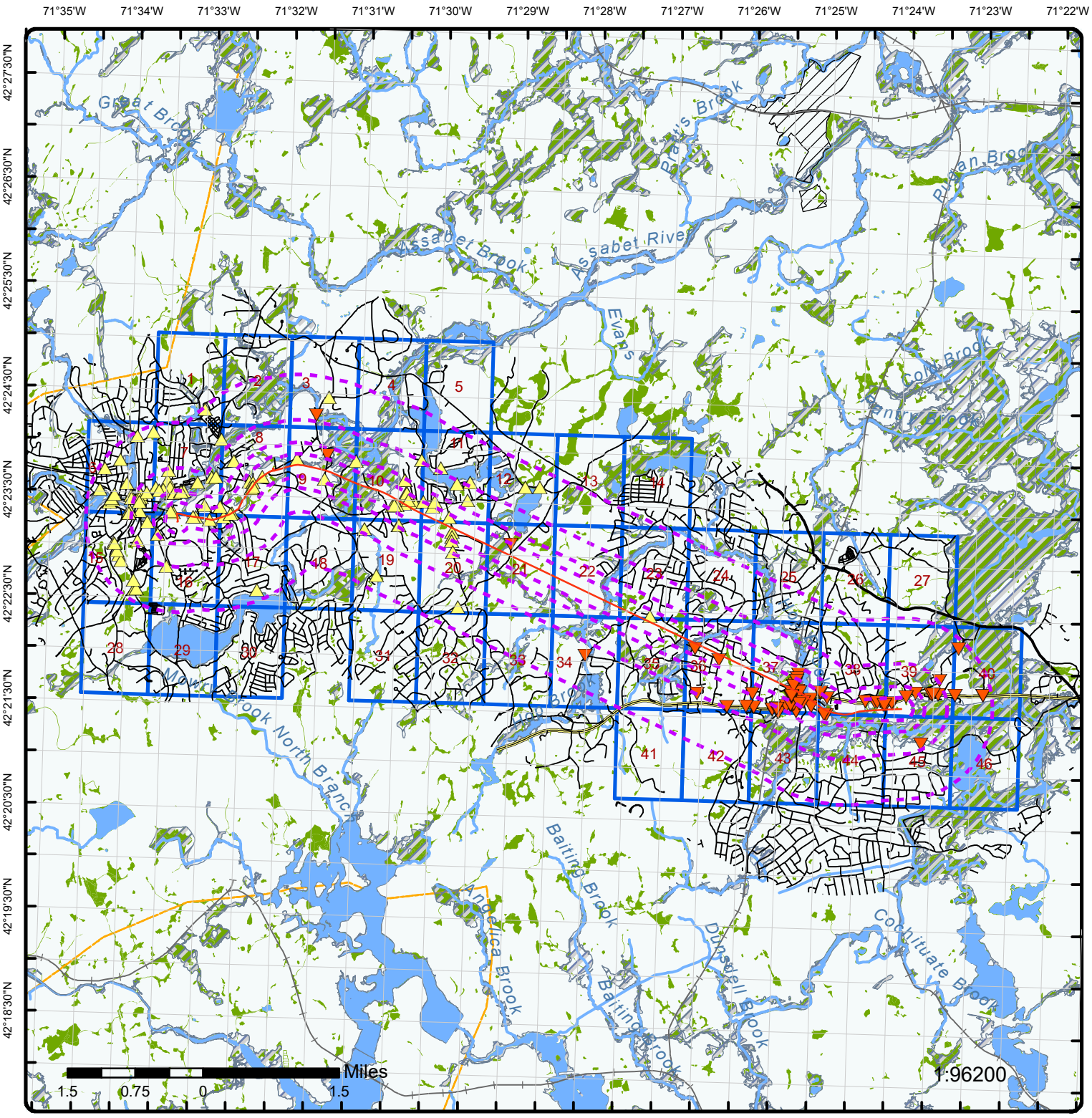
Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
COMMERCIAL	569 MAIN STREET HUDSON MA	WNW	0.07 / 394.11	18
COMMERCIAL	569 MAIN STREET HUDSON MA	WNW	0.07 / 394.11	18
E H PERKINS CONSTRUCTION	560 MAIN ST HUDSON MA	WNW	0.07 / 355.90	30
YLK REALTY TRUST	40 CHESTNUT STREET HUDSON MA	WNW	0.10 / 502.87	42
PAUL MCGUIRE	31 WILKINS ST HUDSON MA	WNW	0.07 / 372.65	63
CHICKEN COOPS	6 WILKINS ST HUDSON MA	WNW	0.00 / 11.90	84
WOLFE RESIDENCE	159-61 FORREST ST HUDSON MA	WNW	0.00 / 9.89	86
RESIDENTIAL	156 FOREST AVENUE HUDSON MA	WNW	0.00 / 9.92	87
RESIDENTIAL	156 FOREST AVENUE HUDSON MA	WNW	0.00 / 9.92	87
FOREST AVENUE SCHOOL	136 FOREST AVE HUDSON MA	W	0.00 / 3.75	94
FOREST AVE. SCHOOL	136 FOREST AVENUE HUDSON MA	W	0.00 / 3.75	94
HUDSON PUBLIC SCHOOLS	136 FOREST AVE HUDSON MA	W	0.00 / 3.75	94
FOREST AVE. SCHOOL	136 FOREST AVENUE HUDSON MA	W	0.00 / 3.75	94

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
FOREST AVE ELEMENTARY SCHOOL	136 FOREST AVE HUDSON MA	W	0.00 / 3.75	94
FOREST AVE. SCHOOL	136 FOREST AVENUE HUDSON MA	W	0.00 / 3.75	94
FOREST AVE. SCHOOL	136 FOREST AVENUE HUDSON MA	W	0.00 / 3.75	94
FORREST AVE SCHOOL	136 FORREST AVE HUDSON MA	W	0.00 / 3.75	94
FOREST AVE ELEMENTARY SCHOOL	136 FOREST AVE HUDSON MA	W	0.00 / 3.75	94
FOREST AVE. SCHOOL	136 FOREST AVENUE HUDSON MA	W	0.00 / 3.75	94
CHILDRENS AFTER SCHOOL PROGRAMS INC	127 FOREST AVE HUDSON MA	W	0.00 / 14.33	95
CHILDRENS AFTER SCHOOL PROGRAMS INC	127 FOREST AVE HUDSON MA	W	0.00 / 14.33	95
MARY AKINS	39 WOODROW STREET HUDSON MA	W	0.12 / 615.60	96
TRACY FACILE	106 FOREST AVENUE HUDSON MA	W	0.00 / 7.55	103
KENNETH LAVACHE	44 FOREST AVE HUDSON MA	W	0.07 / 390.47	119

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
C/O FLAVIO BRITO	66 JARMAN RD SUDBURY MA	ESE	0.05 / 265.76	29

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
SUDBURY WATER DEPARTMENT	1 JARMAN ROAD SUDBURY MA	ESE	0.05 / 289.13	37
SUDBURY POST OFFICE	18 UNION AVE SUDBURY MA	ESE	0.08 / 433.37	62
us post office	18 union avenue SUDBURY MA	ESE	0.08 / 433.37	62
POST OFFICE	18 UNION ST SUDBURY MA	ESE	0.08 / 433.37	62
USPS SUDBURY	18 UNION AVE. SUDBURY MA	ESE	0.08 / 433.37	62
SUDBURY POST OFFICE	18 UNION AVE SUDBURY MA	ESE	0.08 / 433.37	62
US POST OFFICE	18 UNION AVE SUDBURY MA	ESE	0.08 / 433.37	62
OLD SUDBURY POLICE STATION	415 BOSTON POST ROAD SUDBURY MA	ESE	0.10 / 542.21	76
415 BOSTON POST ROAD	415 BOSTON POST ROAD SUDBURY MA	ESE	0.10 / 542.21	76
VACANT BUILDING	400 BOSTON POST ROAD SUDBURY MA	ESE	0.07 / 348.96	80
CHERYL SALATINO	14 MAPLE AVENUE SUDBURY MA	ESE	0.06 / 301.33	82
CITI GROUP	5-10 CONCORD RD SUDBURY MA	ESE	0.12 / 638.79	85
VERIZON	351 BOSTON POST ROAD SUDBURY MA	ESE	0.12 / 659.51	89

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
BARRETT RESIDENCE	222 BOSTON POST ROAD SUDBURY MA	ESE	0.08 / 432.13	107
PATRICK DELANEY	206 BOSTON POST ROAD SUDBURY MA	ESE	0.05 / 286.16	110
TED SHYLOUSKY	192 BOSTON POST ROAD SUDBURY MA	ESE	0.07 / 354.42	113
HOUSE	192 BOSTON POST RD SUDBURY MA	ESE	0.07 / 354.42	113
KEITH CONSTRUCTION	189 BOSTON POST ROAD SUDBURY MA	ESE	0.06 / 337.15	114



Map : 1.0 Mile Radius

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

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- State Brownfield Areas
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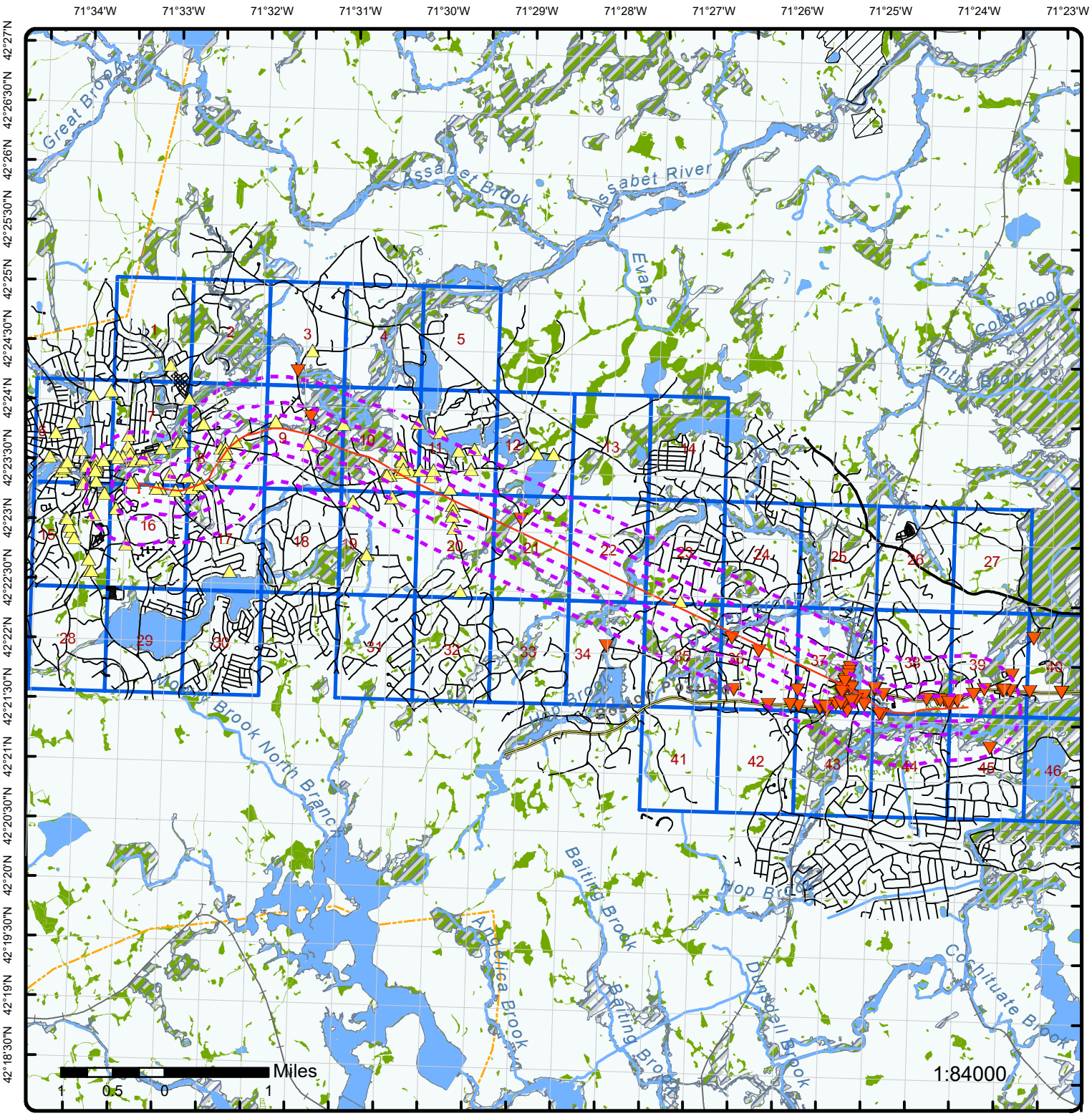
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Map : 0.5 Mile Radius

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

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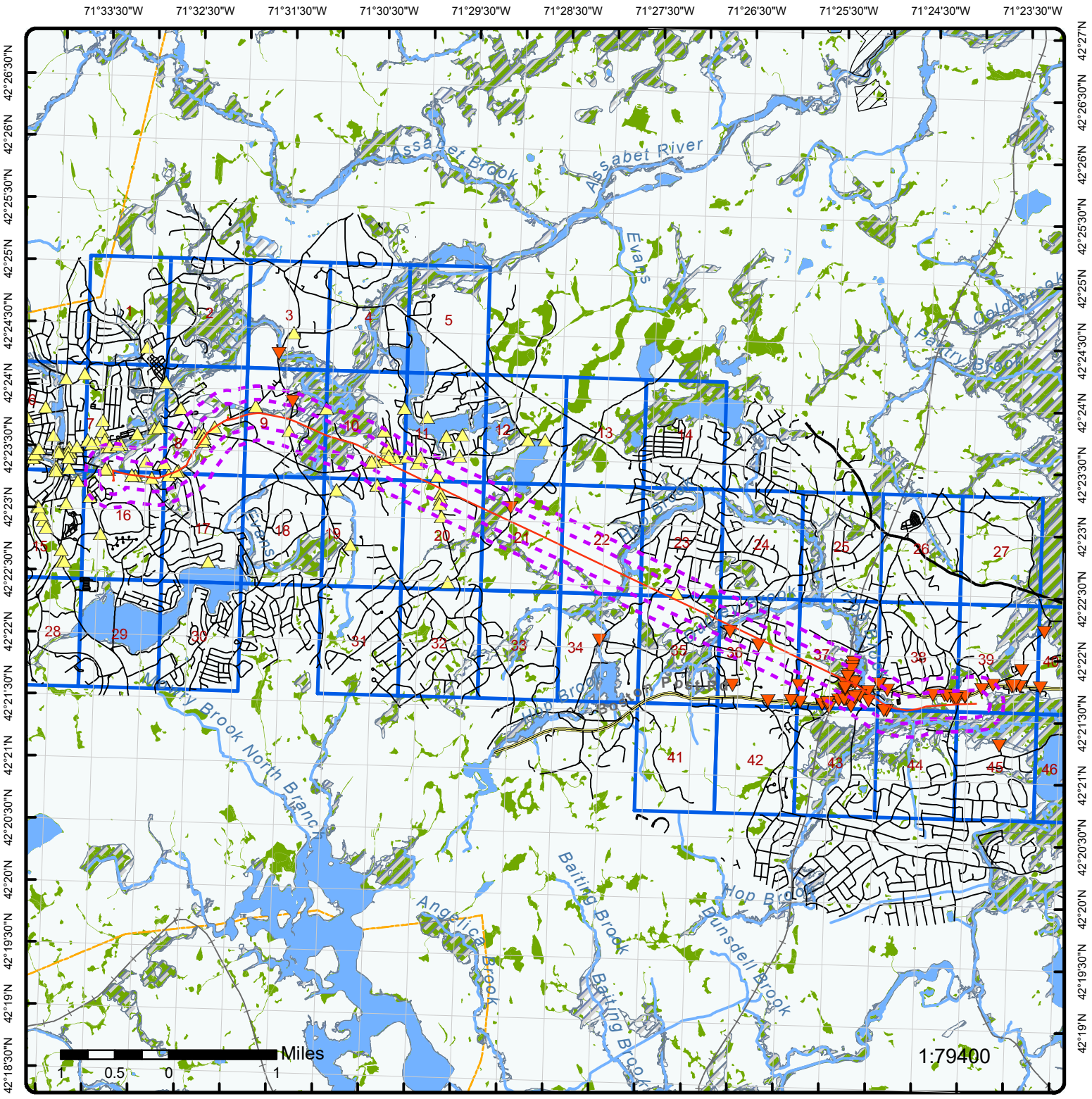

Map : 0.25 Mile Radius

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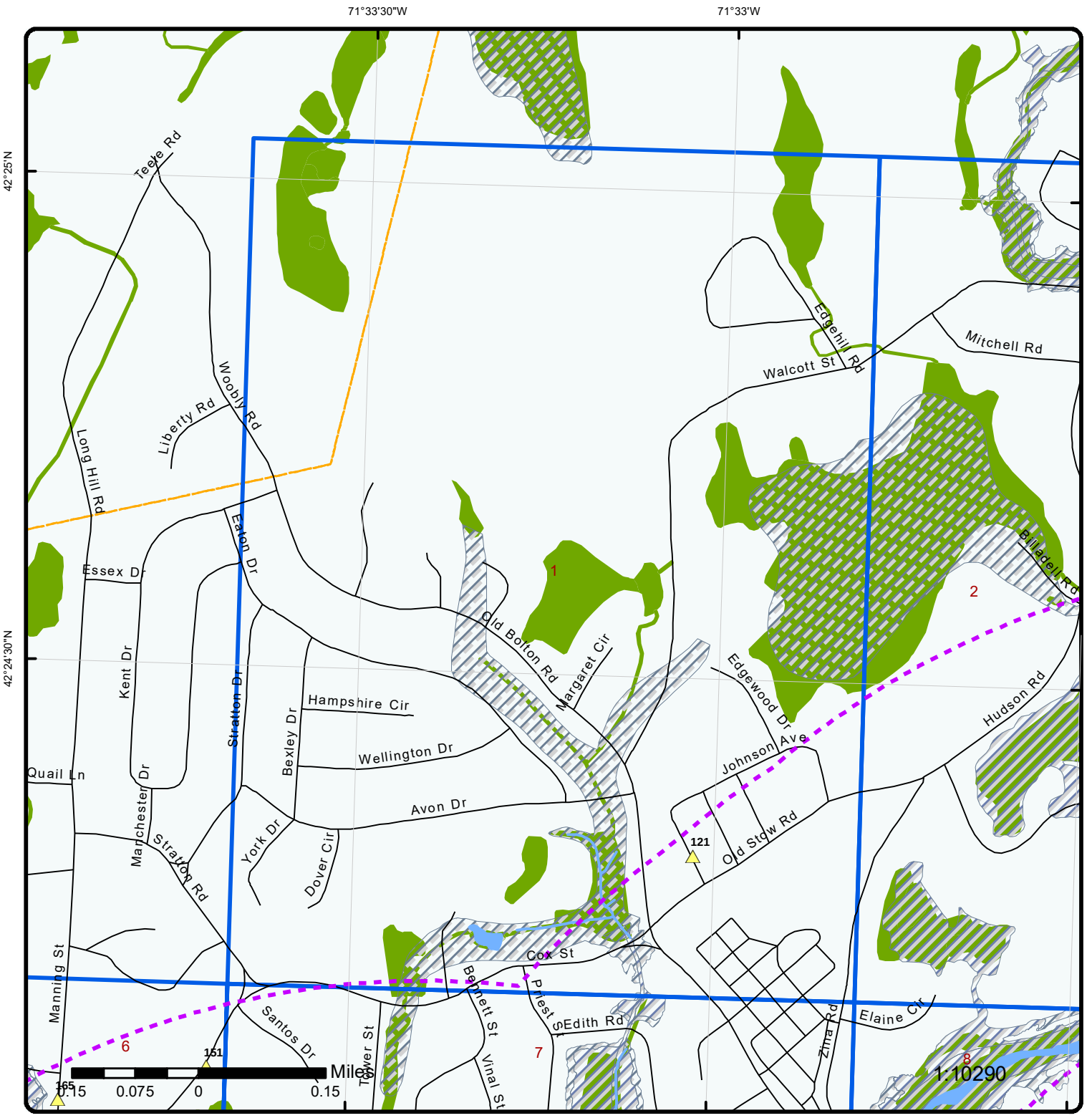

Grid : 1

Order Number: 20302700358

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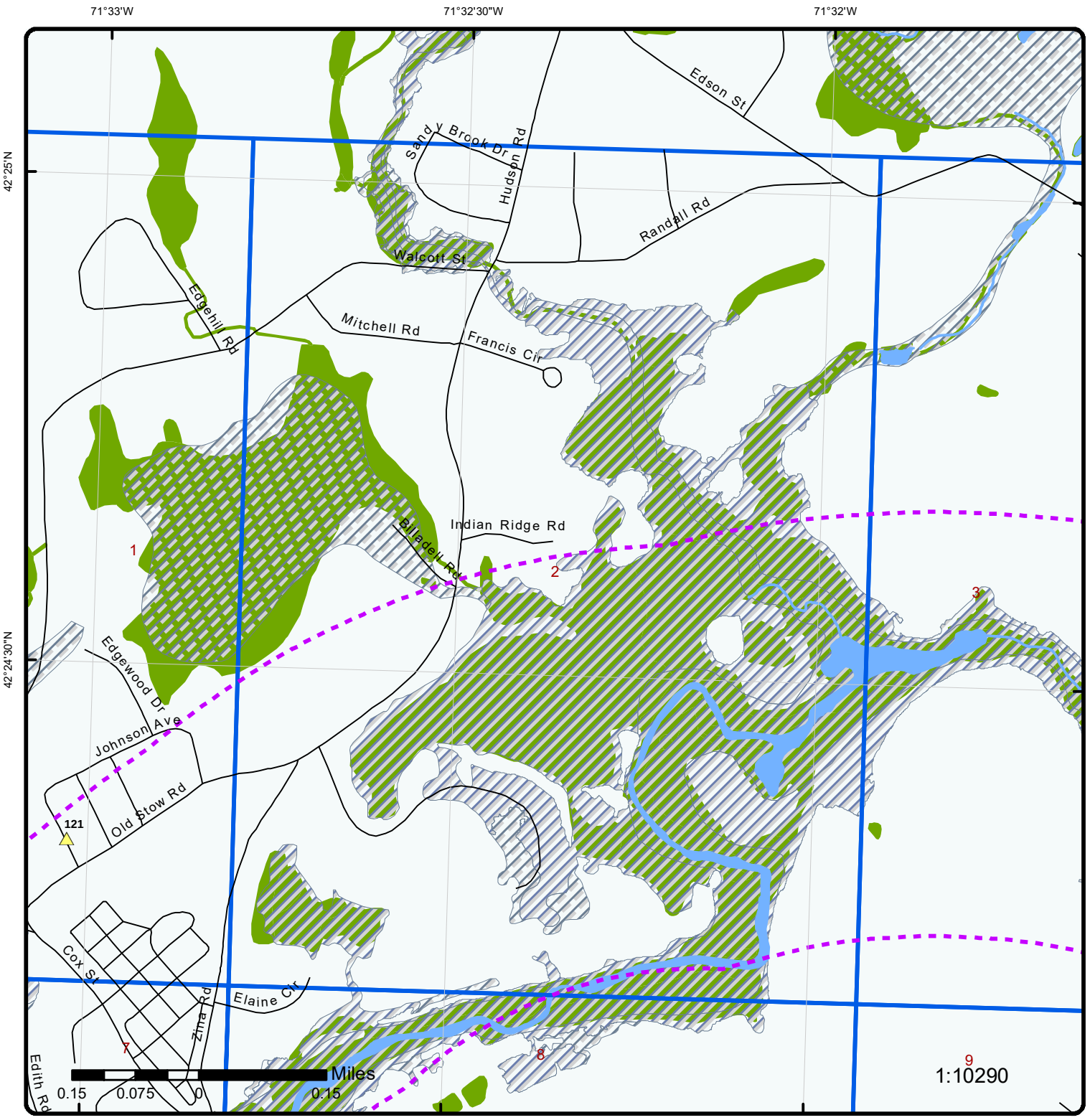

Grid : 2

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

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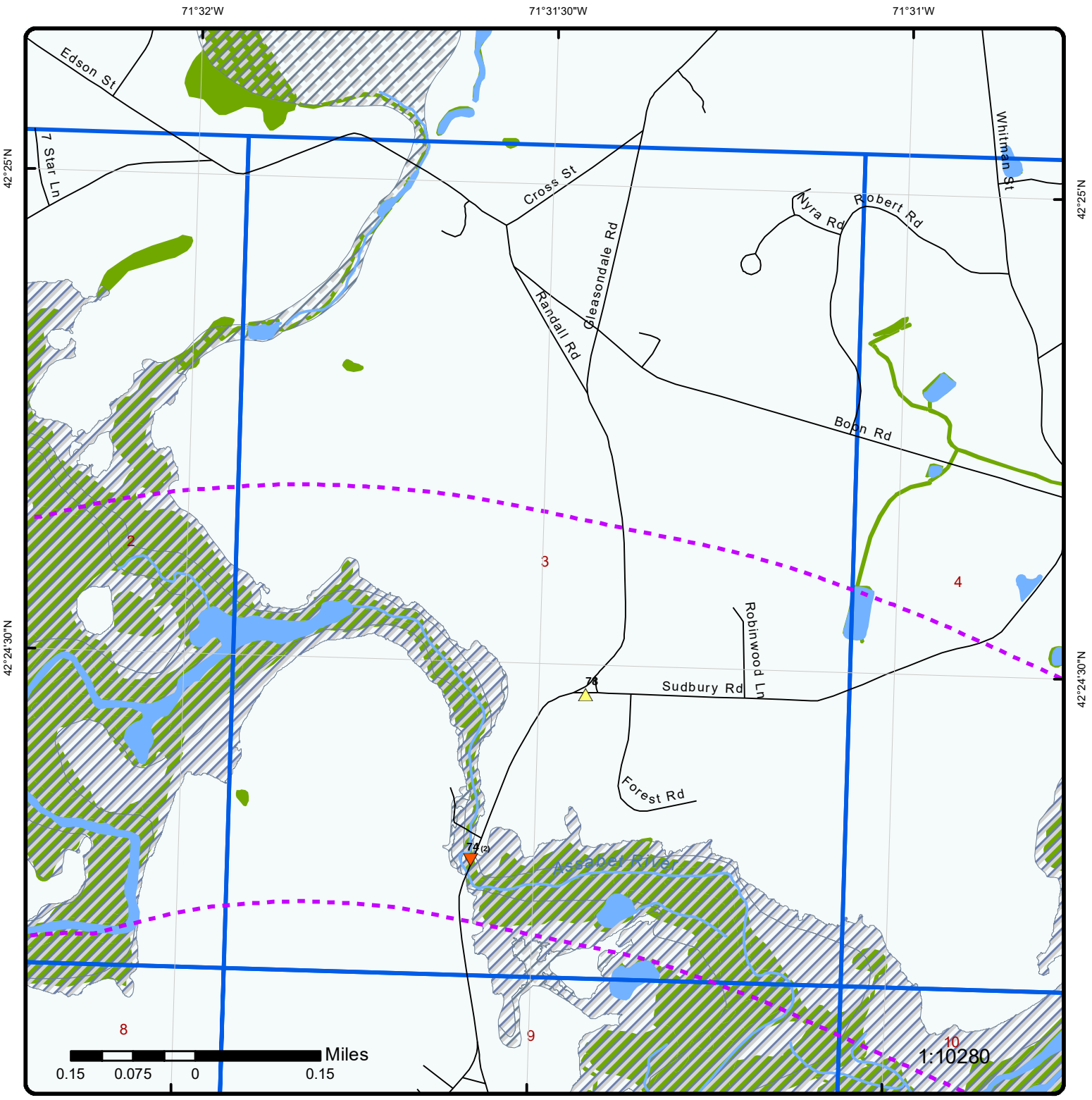

Grid : 3

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

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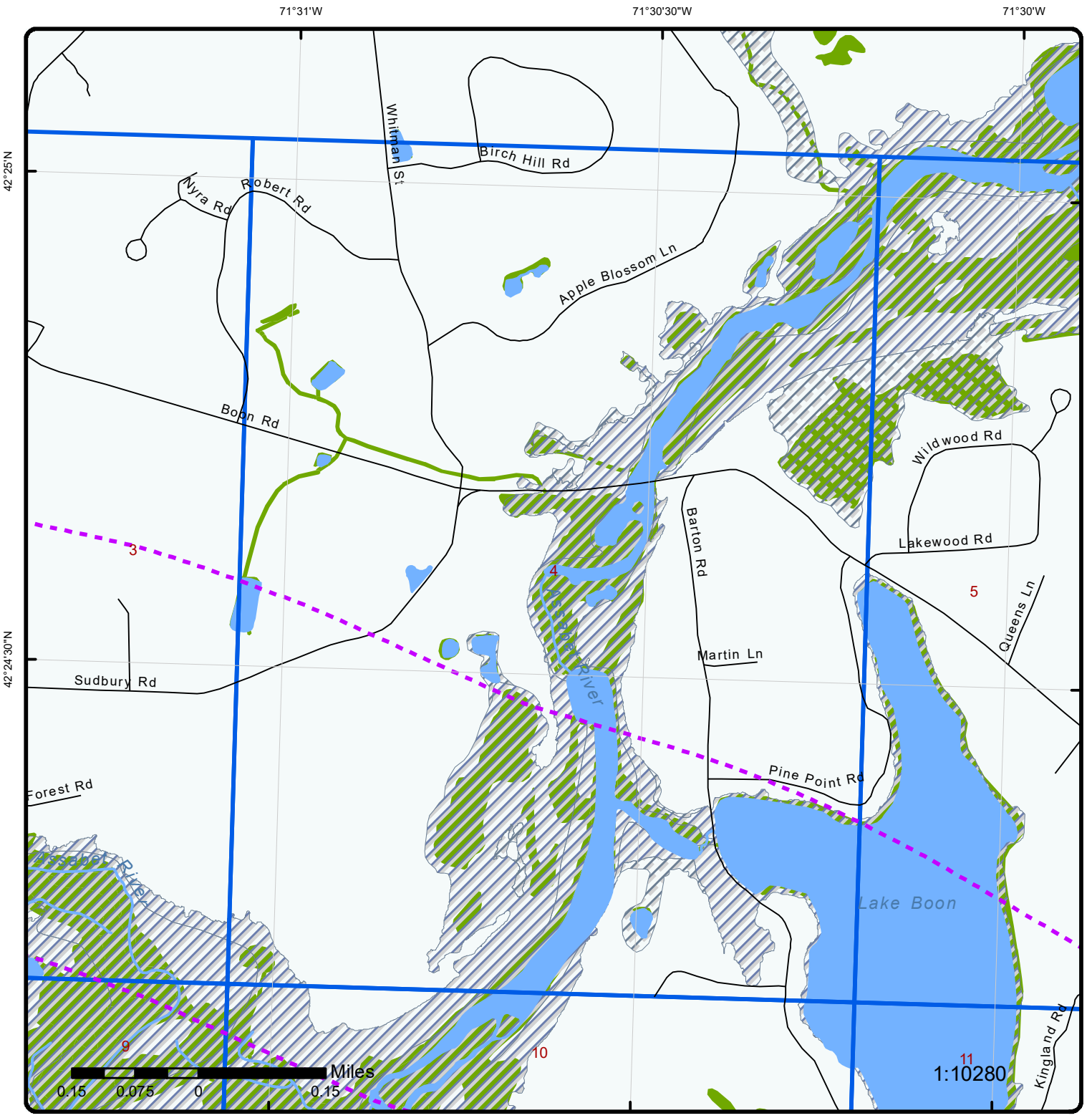

Grid : 4

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

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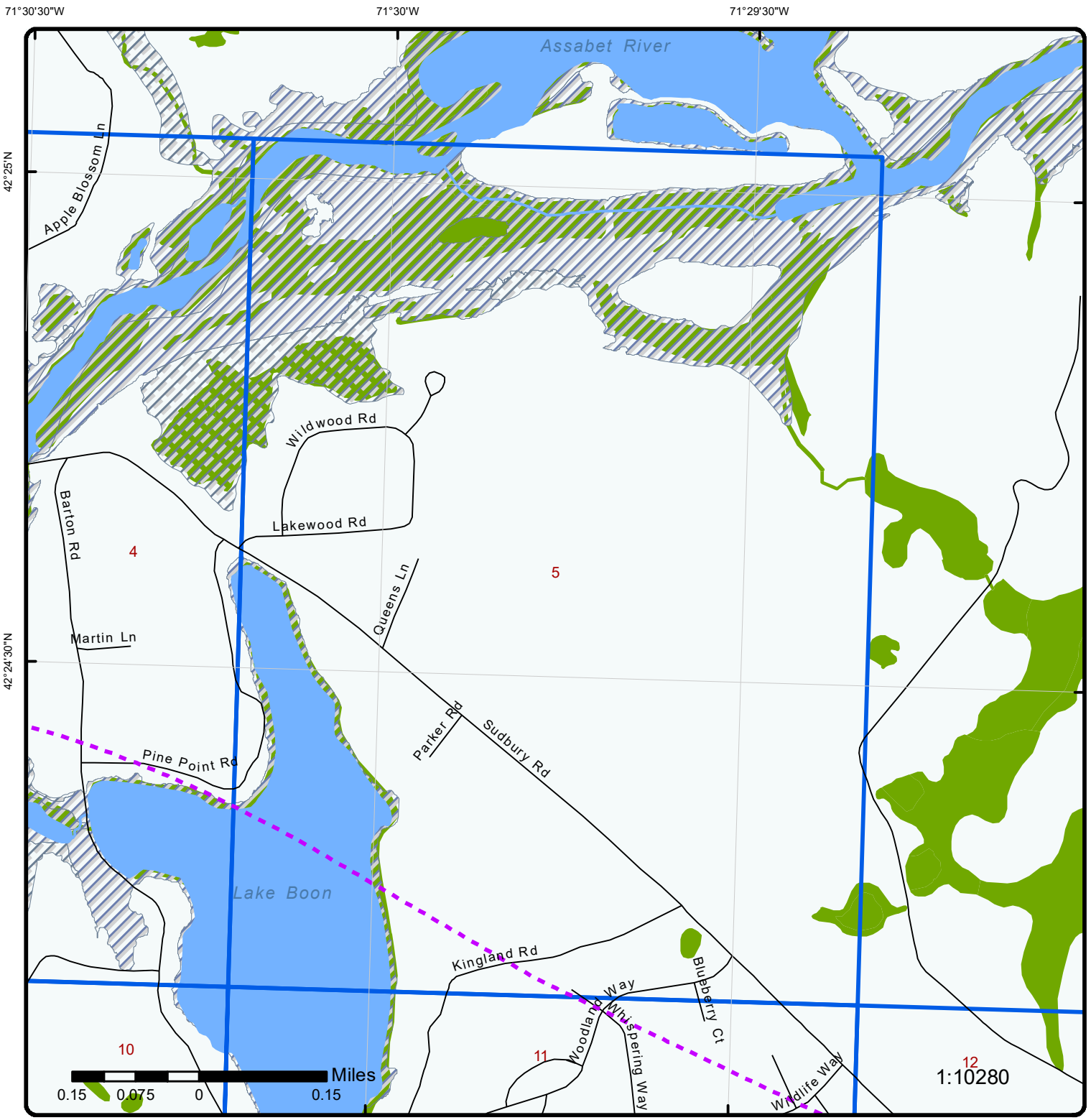

Grid : 5

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

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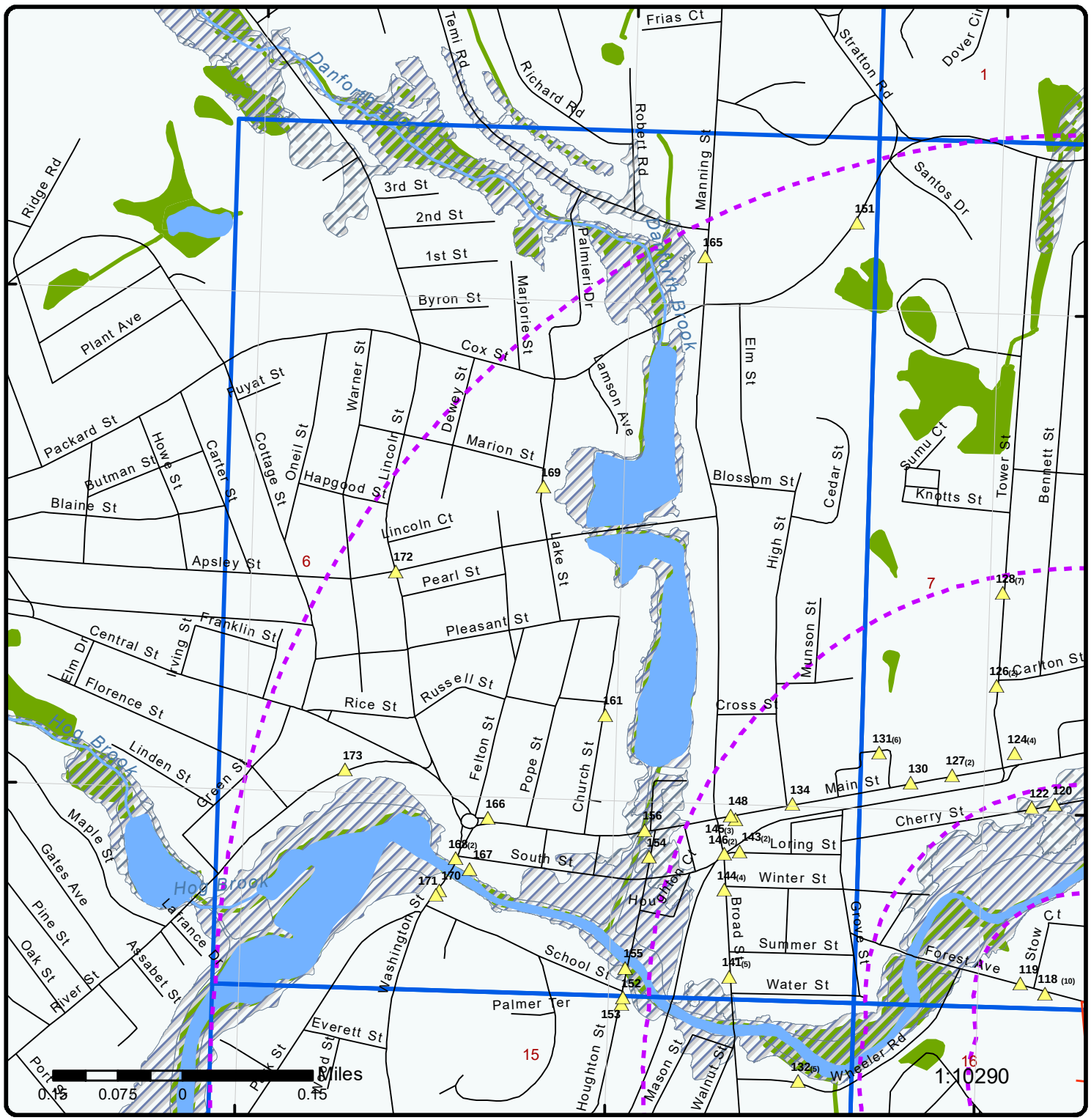


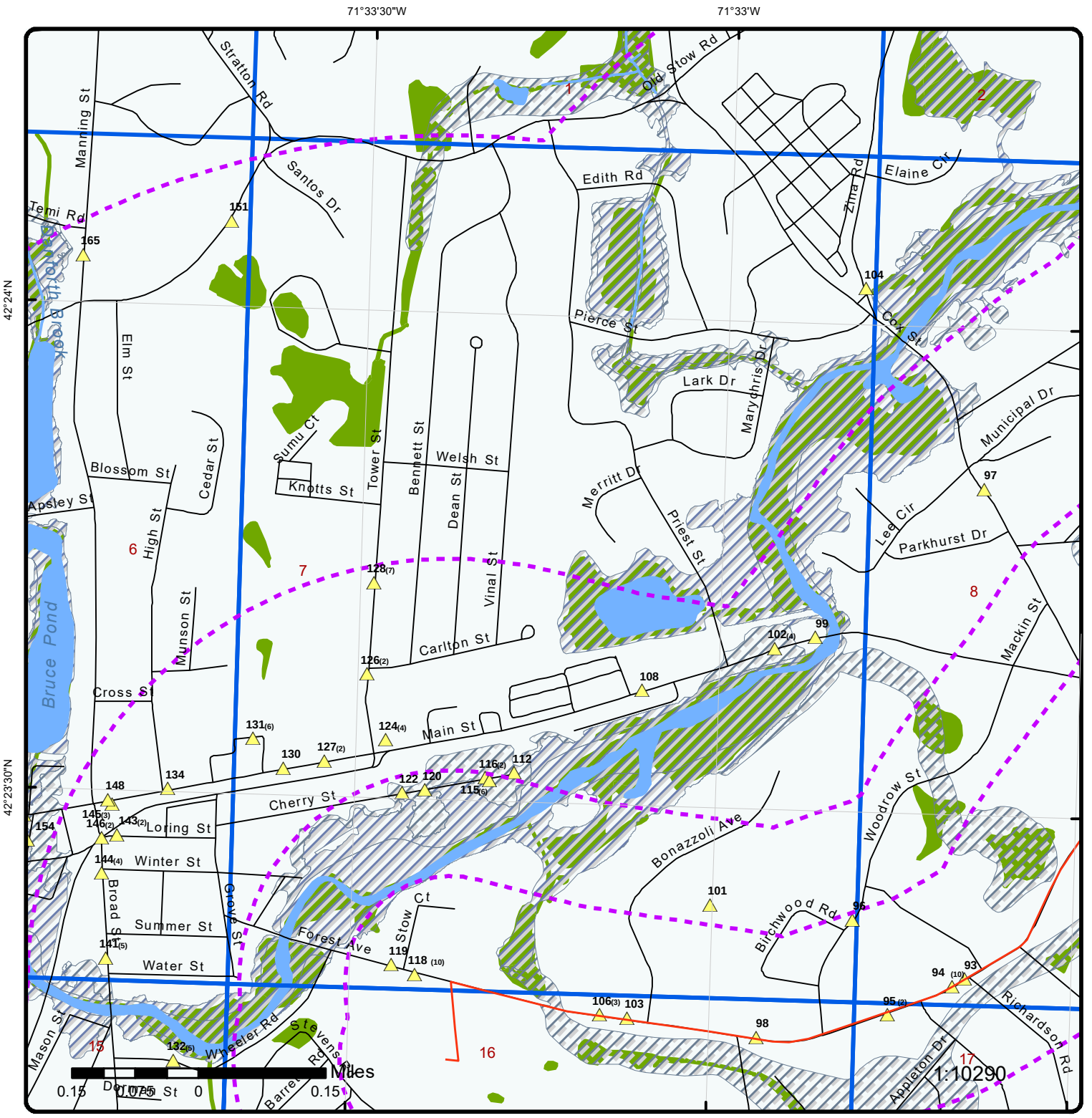
Grid : 6

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Project Property	Rails	State Boundary	FWS Special Designation Areas
Buffer Outline	Major Highways	National Priority List Sites	State Brownfield Sites
Eris Sites with Higher Elevation	Major Highways Ramps	National Wetland	State Brownfield Areas
Eris Sites with Same Elevation	Major Roads	Indian Reserve Land	State Superfund Areas:Dept. of Defense
Eris Sites with Lower Elevation	Major Roads Ramps	Historic Fill	State Superfund Areas:NPL
Eris Sites with Unknown Elevation	Secondary Roads	100 Year Flood Zone	WQARF Areas
County Boundary	Secondary Roads Ramps	500 Year Flood Zone	Federal Lands: Dept. of Defense (owned/administered areas)
	Local Roads and Ramps		



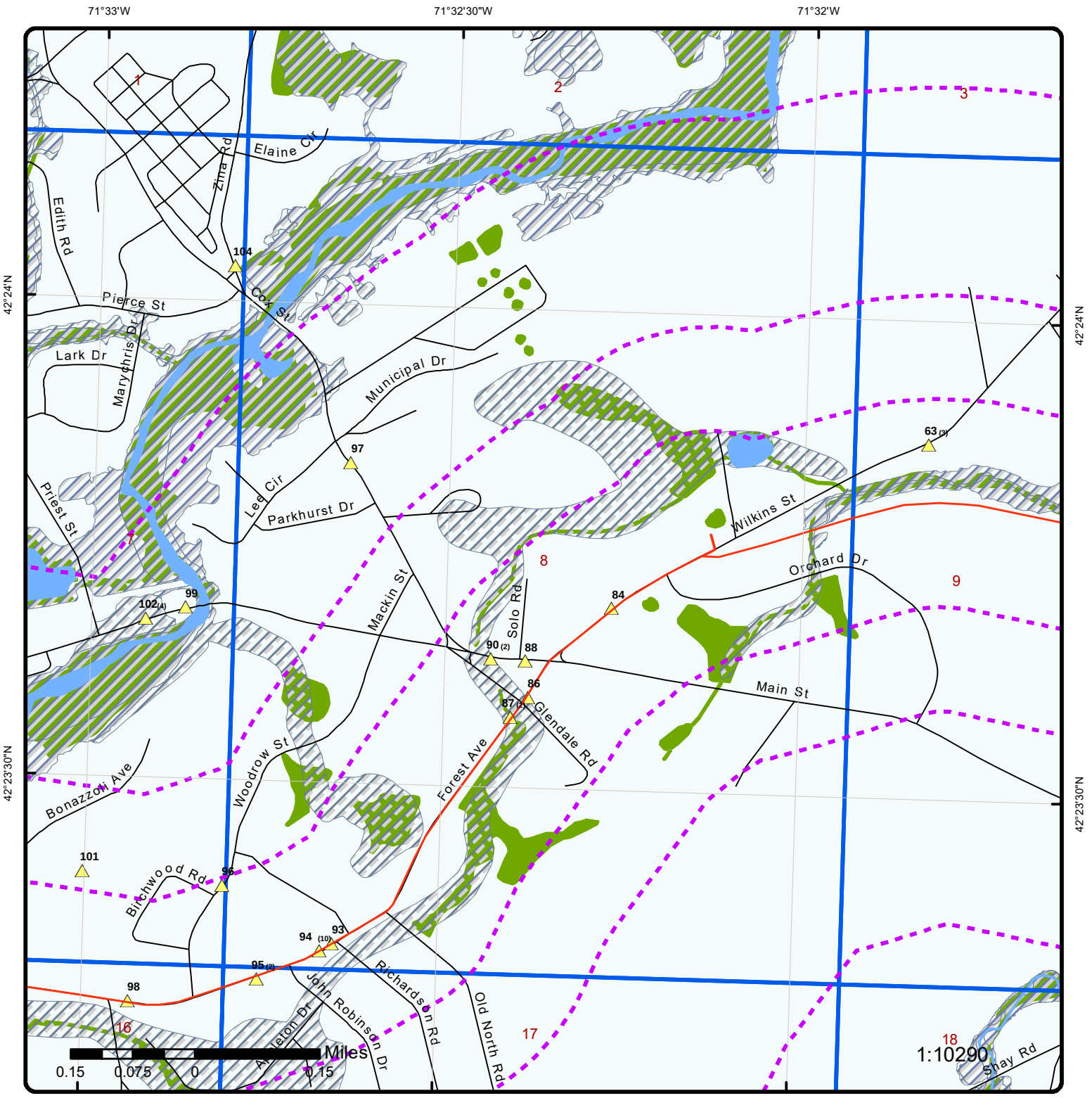
Grid : 7

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
- Local Roads and Ramps
- State Boundary
- National Priority List Sites
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Grid : 8

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
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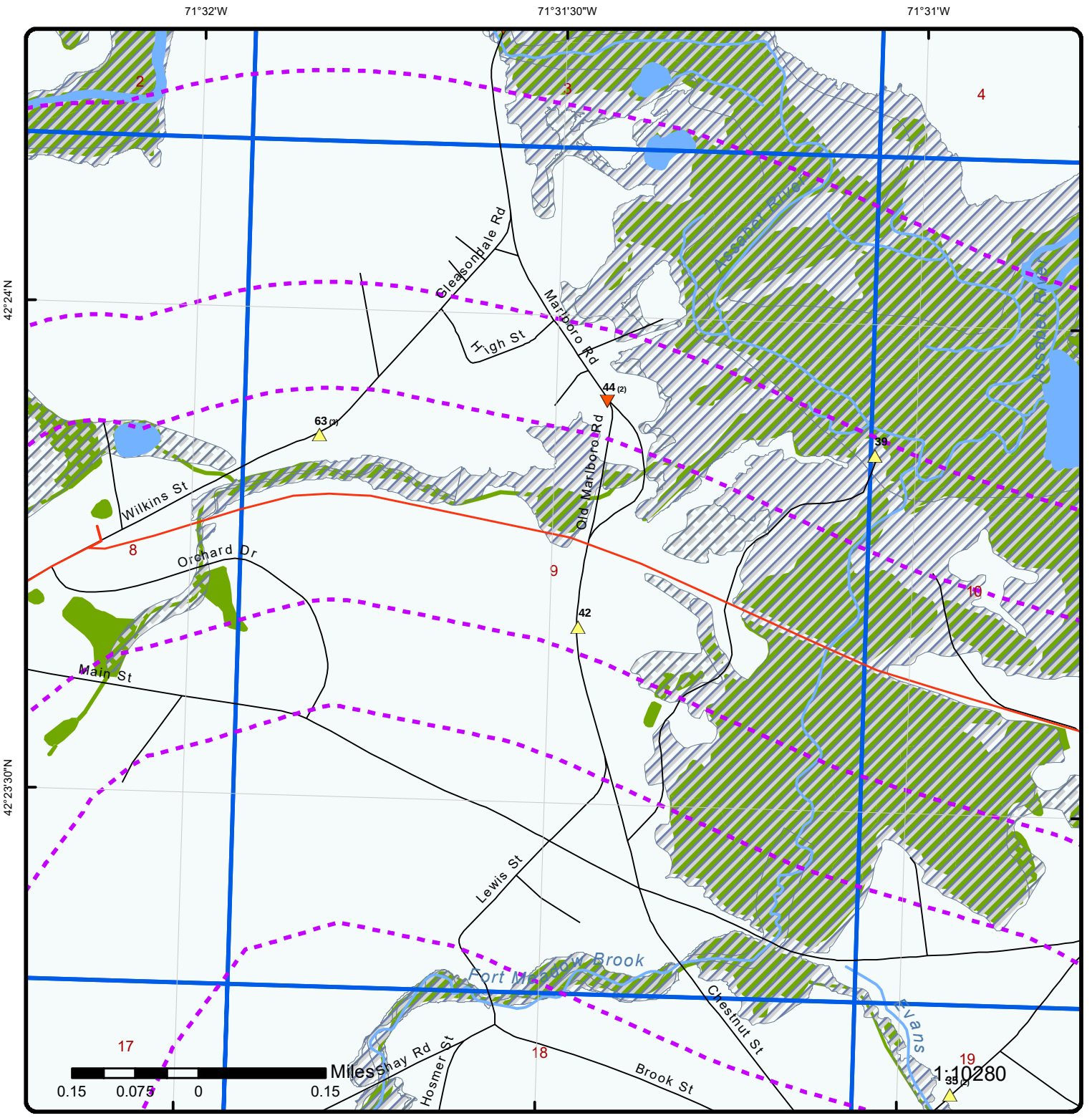
- State Boundary
- National Priority List Sites
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Grid : 9

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
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- Major Roads Ramps
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- National Wetland
- Indian Reserve Land
- Historic Fill
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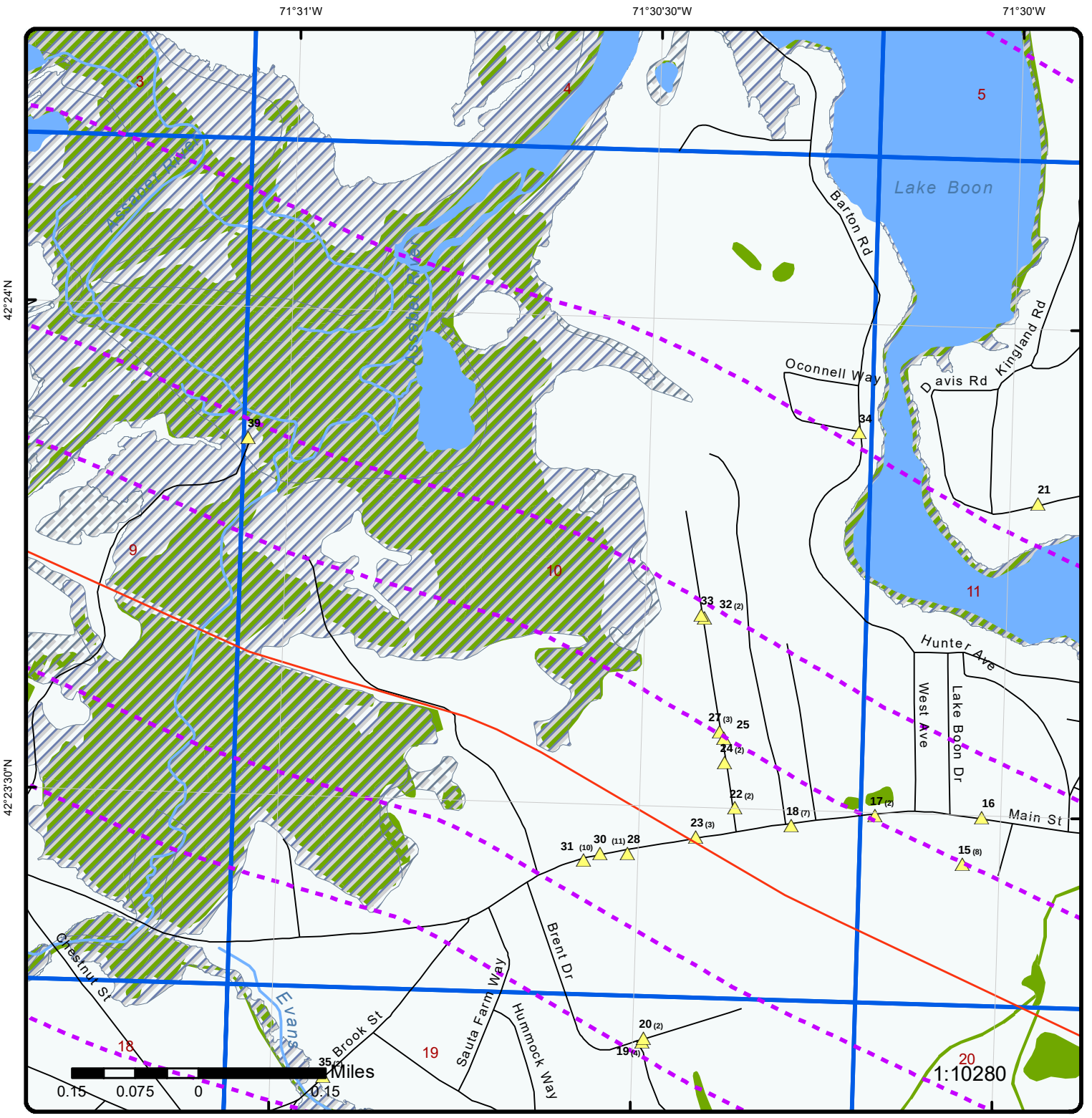
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



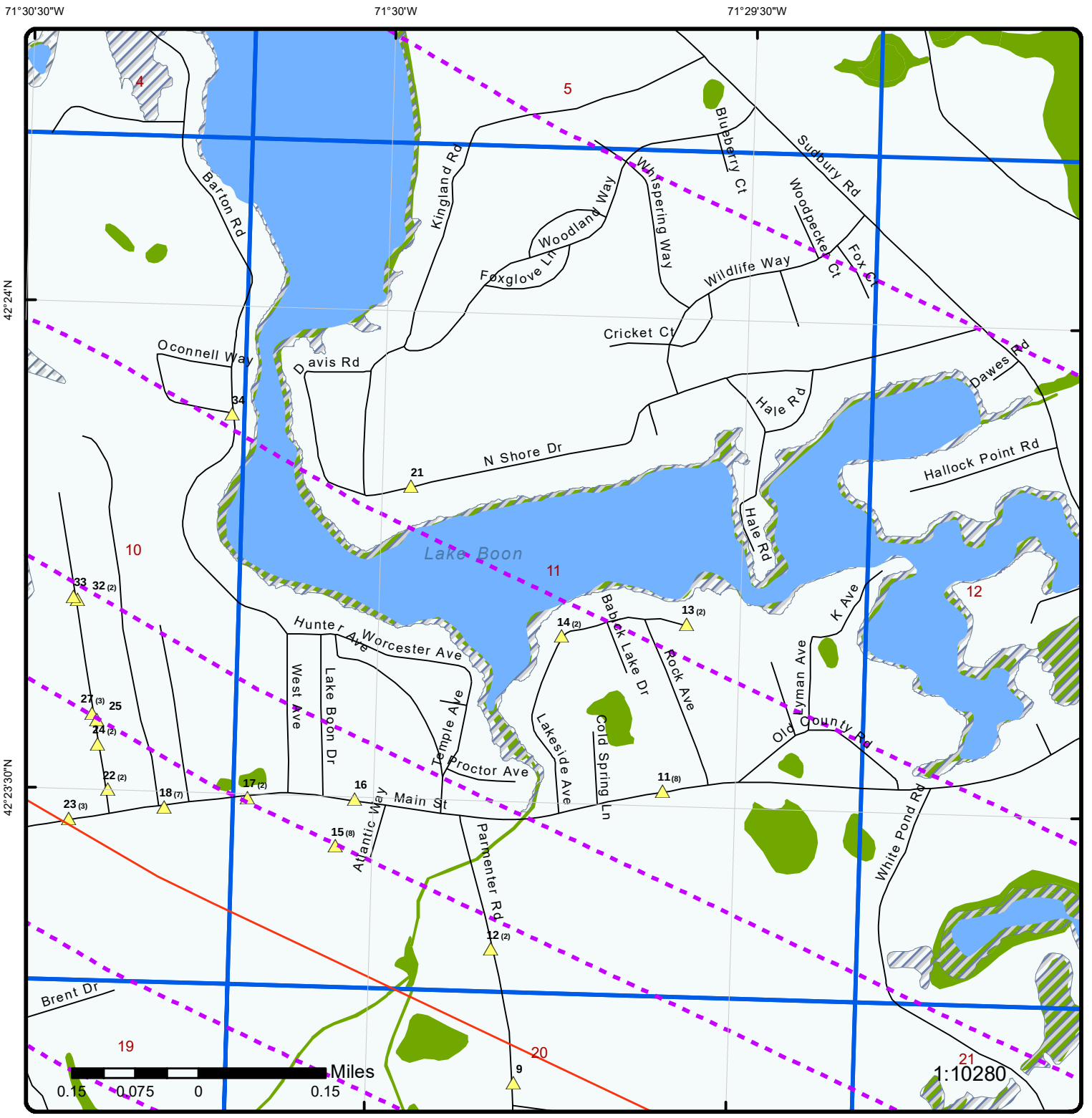
Grid : 10

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
- Local Roads and Ramps
- State Boundary
- National Priority List Sites
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Grid : 11

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
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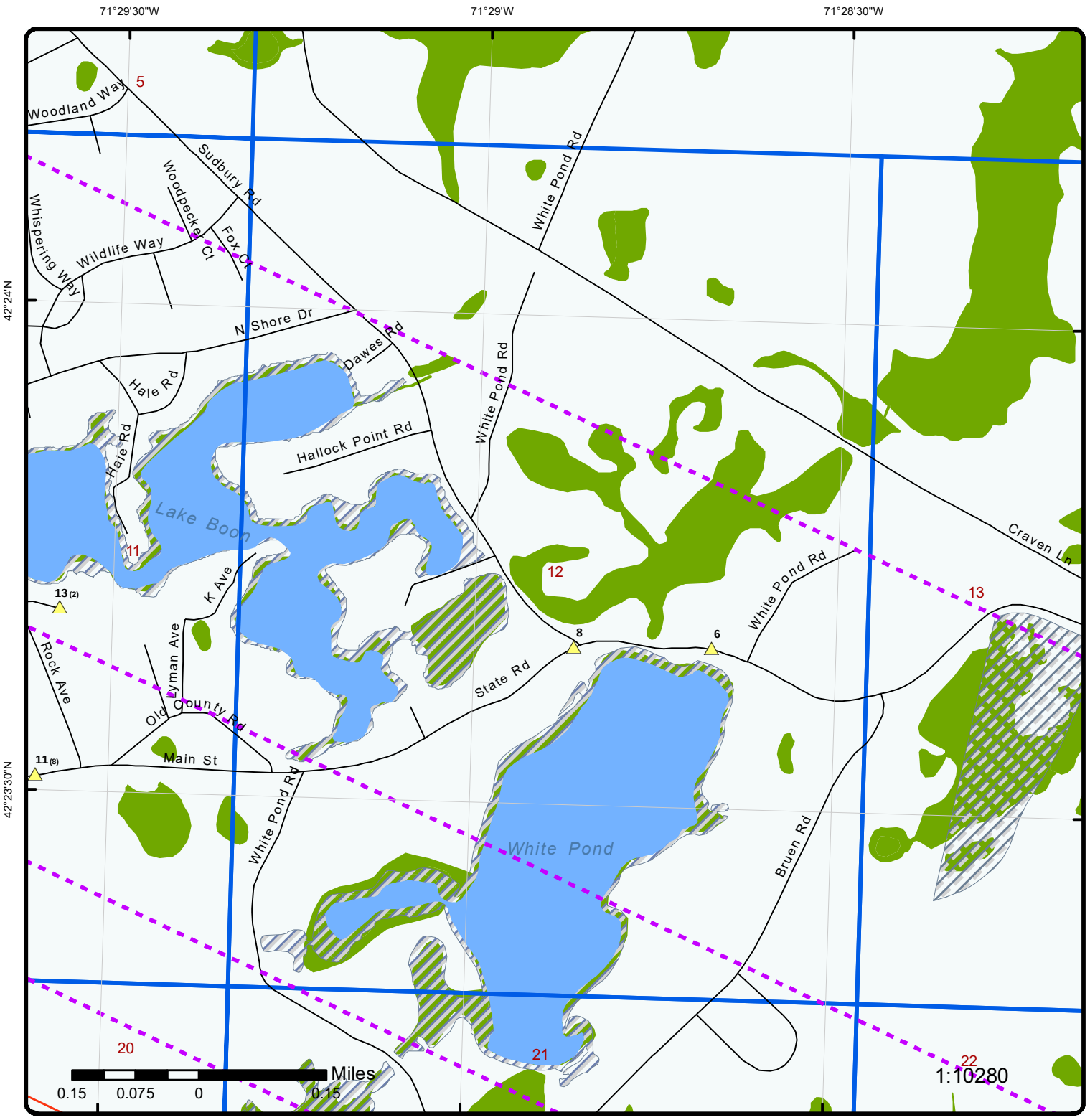
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



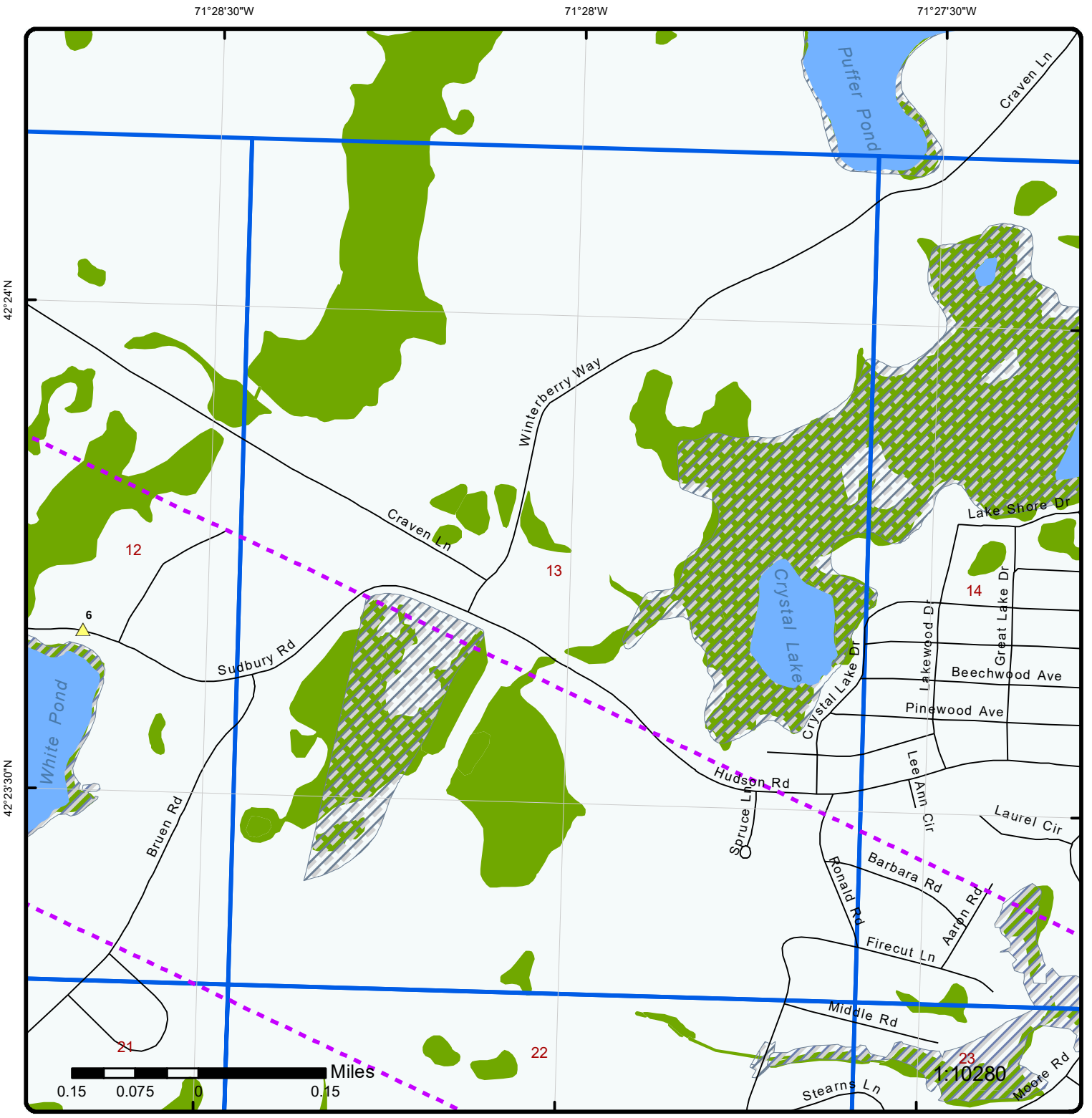
Grid : 12

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
- Local Roads and Ramps
- State Boundary
- National Priority List Sites
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Grid : 13

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
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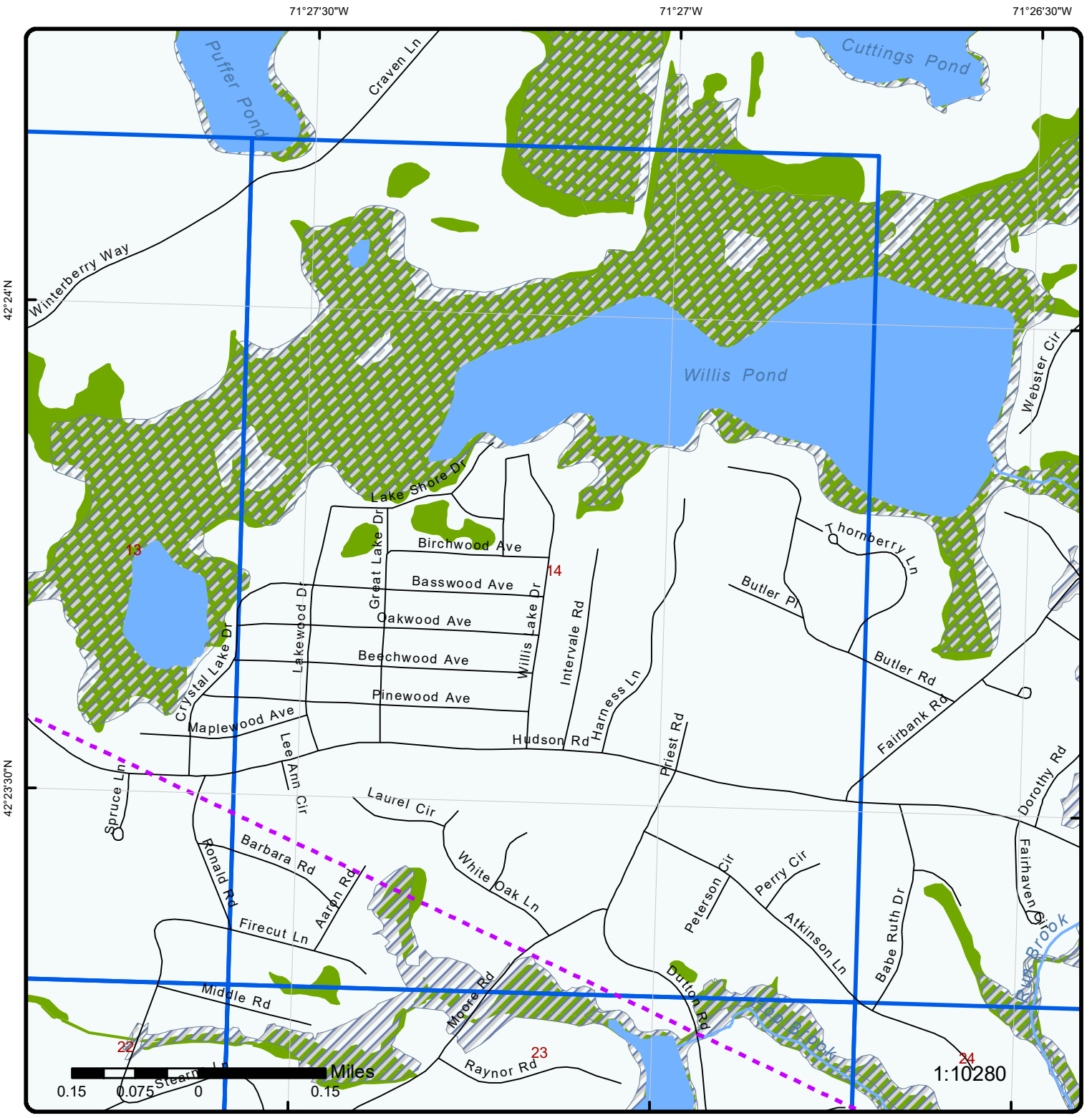
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



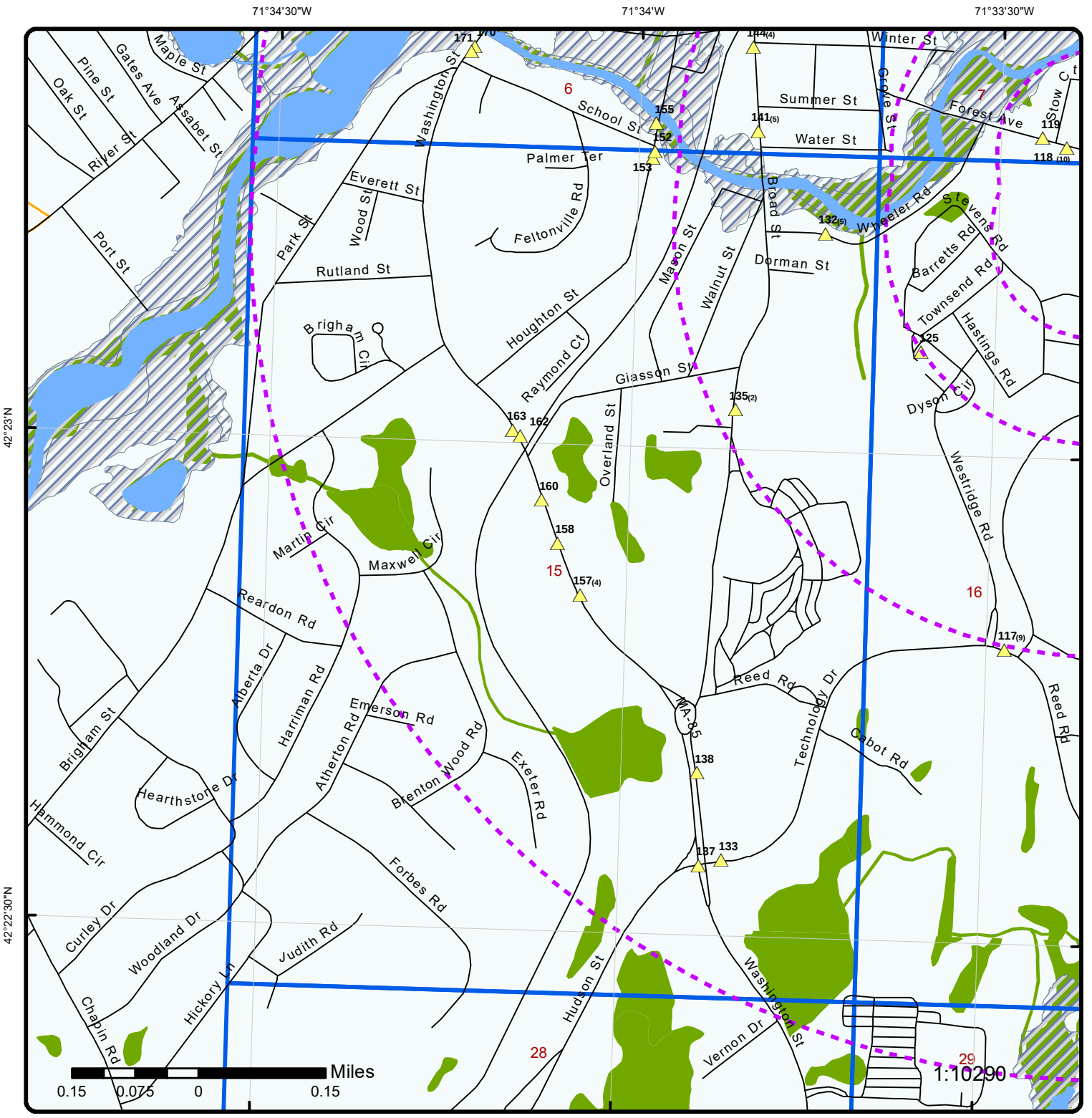
Grid : 14

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Project Property	Rails	State Boundary	FWS Special Designation Areas
Buffer Outline	Major Highways	National Priority List Sites	State Brownfield Sites
Eris Sites with Higher Elevation	Major Highways Ramps	National Wetland	State Brownfield Areas
Eris Sites with Same Elevation	Major Roads	Indian Reserve Land	State Superfund Areas:Dept. of Defense
Eris Sites with Lower Elevation	Major Roads Ramps	Historic Fill	State Superfund Areas:NPL
Eris Sites with Unknown Elevation	Secondary Roads	100 Year Flood Zone	WQARF Areas
County Boundary	Secondary Roads Ramps	500 Year Flood Zone	Federal Lands: Dept. of Defense (owned/administered areas)
	Local Roads and Ramps		



Grid : 15

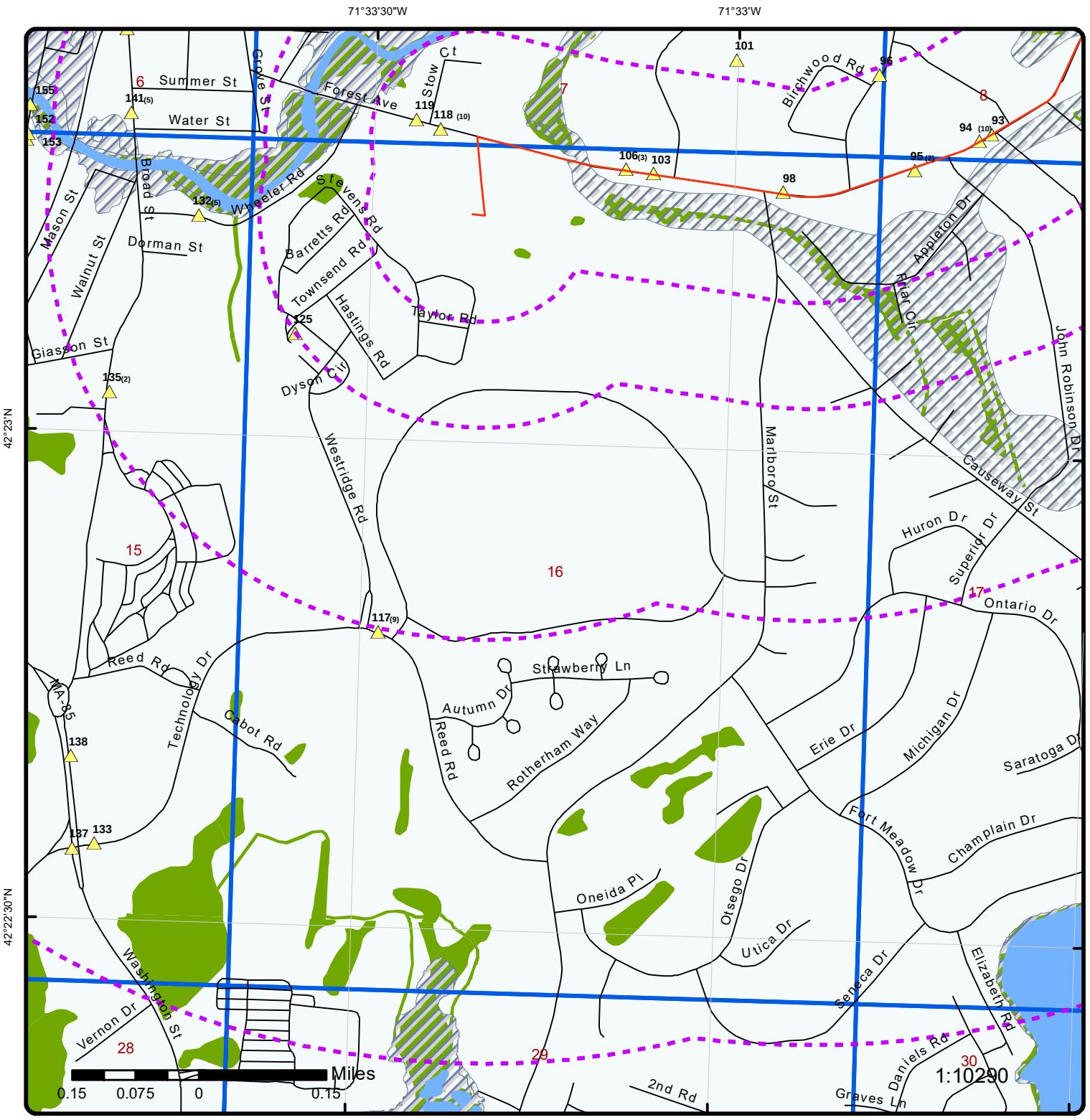
Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Project Property	Rails	State Boundary	FWS Special Designation Areas
Buffer Outline	Major Highways	National Priority List Sites	State Brownfield Sites
Eris Sites with Higher Elevation	Major Highways Ramps	National Wetland	State Brownfield Areas
Eris Sites with Same Elevation	Major Roads	Indian Reserve Land	State Superfund Areas:Dept. of Defense
Eris Sites with Lower Elevation	Major Roads Ramps	Historic Fill	State Superfund Areas:NPL
Eris Sites with Unknown Elevation	Secondary Roads	100 Year Flood Zone	WQARF Areas
County Boundary	Secondary Roads Ramps	500 Year Flood Zone	Federal Lands: Dept. of Defense (owned/administered areas)
	Local Roads and Ramps		

Source: © 2016 ESRI



Grid : 16

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
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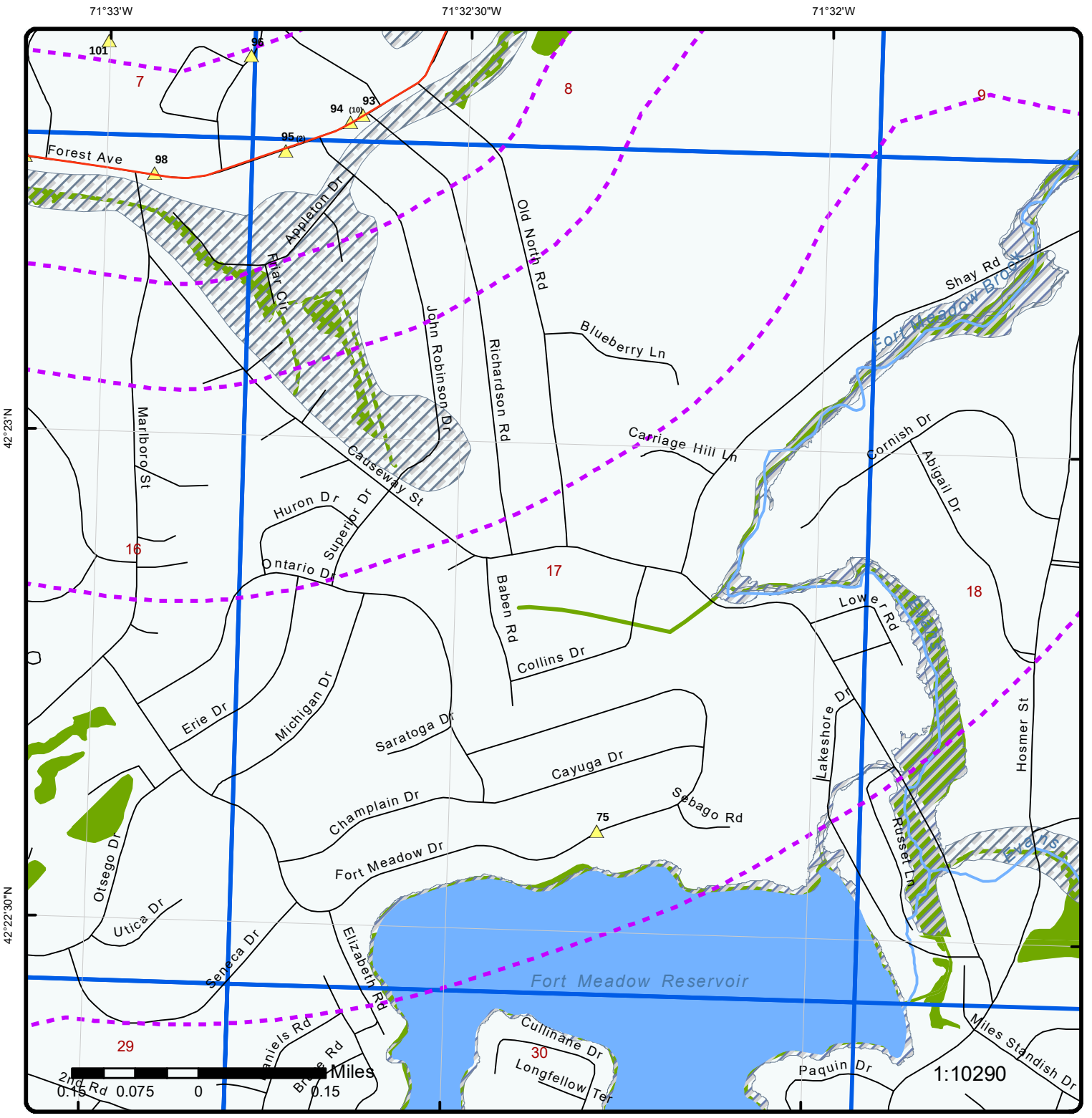
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



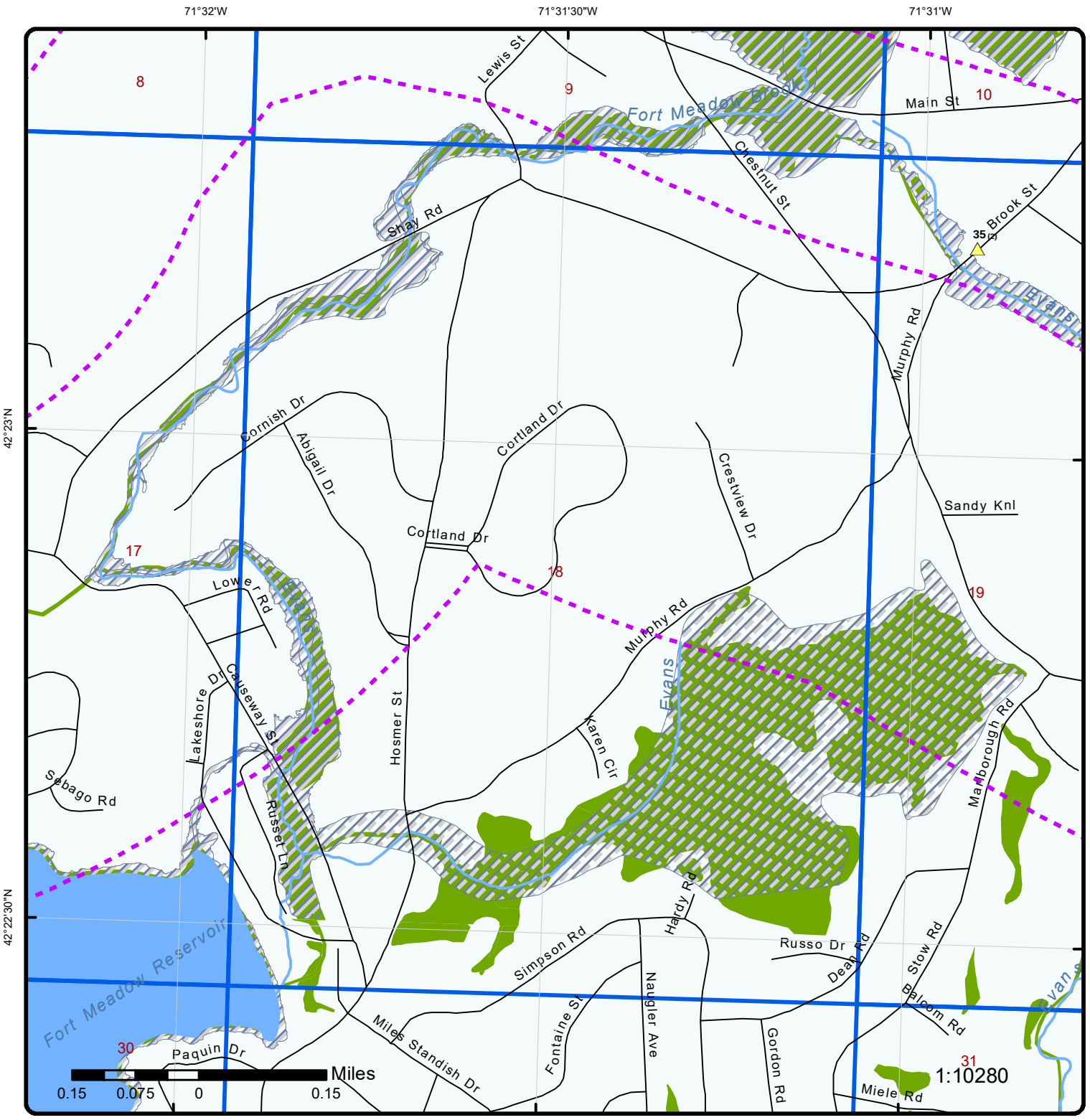
Grid : 17

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Project Property	Rails	State Boundary	FWS Special Designation Areas
Buffer Outline	Major Highways	National Priority List Sites	State Brownfield Sites
Eris Sites with Higher Elevation	Major Highways Ramps	National Wetland	State Brownfield Areas
Eris Sites with Same Elevation	Major Roads	Indian Reserve Land	State Superfund Areas:Dept. of Defense
Eris Sites with Lower Elevation	Major Roads Ramps	Historic Fill	State Superfund Areas:NPL
Eris Sites with Unknown Elevation	Secondary Roads	100 Year Flood Zone	WQARF Areas
County Boundary	Secondary Roads Ramps	500 Year Flood Zone	Federal Lands: Dept. of Defense (owned/administered areas)
	Local Roads and Ramps		



Grid : 18

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
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- FWS Special Designation Areas
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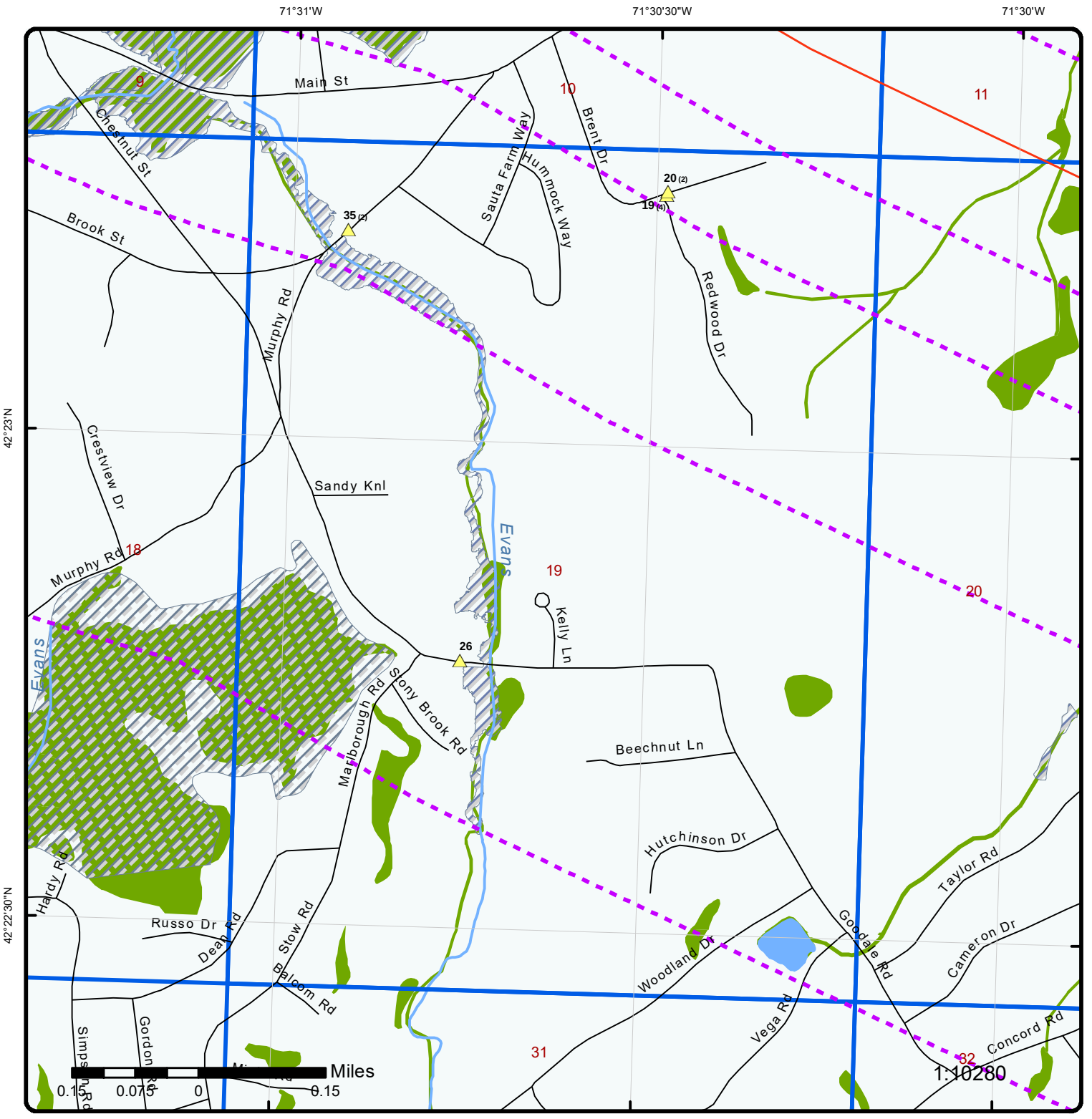
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



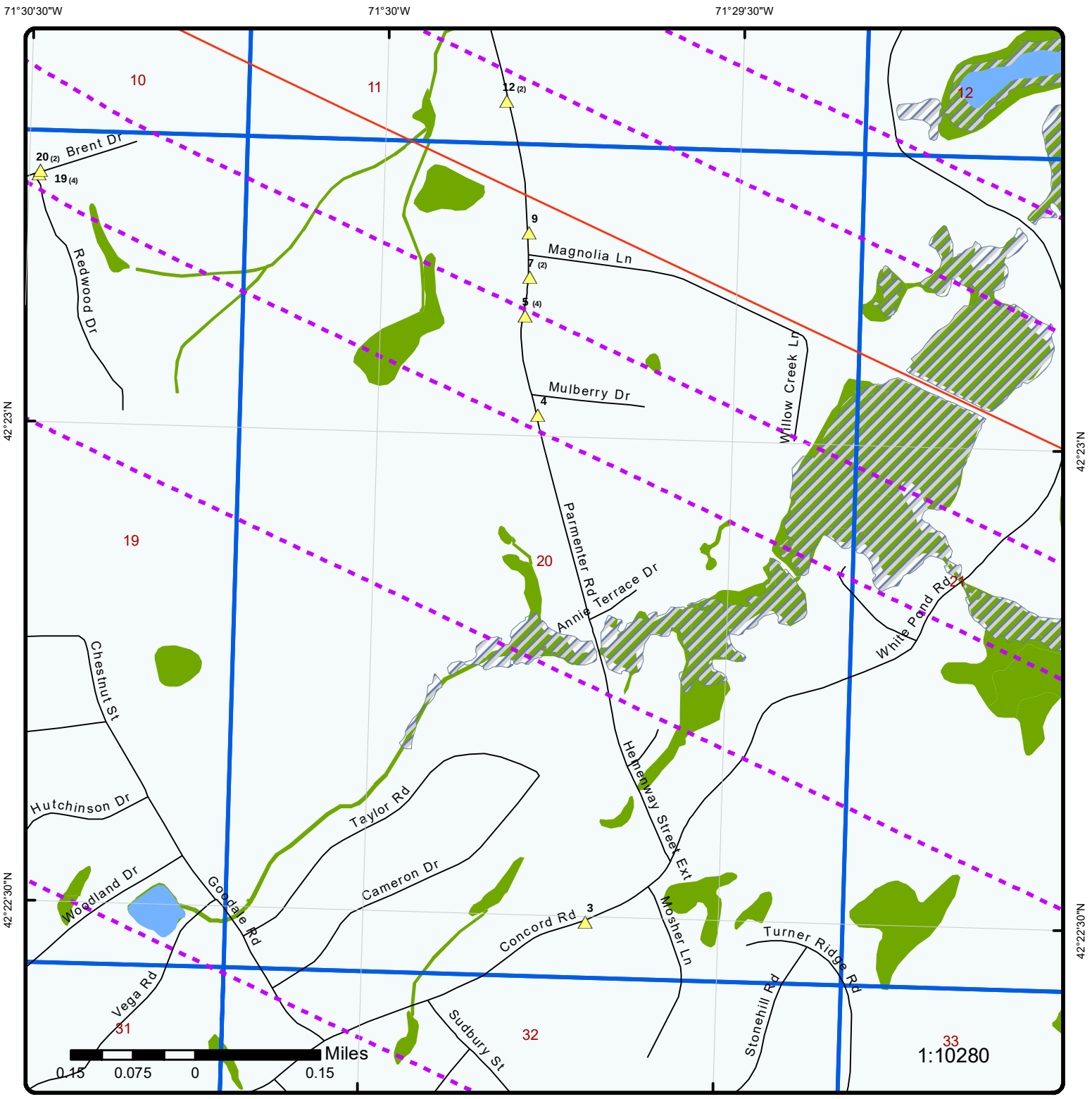
Grid : 19

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Project Property	Rails	State Boundary	FWS Special Designation Areas
Buffer Outline	Major Highways	National Priority List Sites	State Brownfield Sites
Eris Sites with Higher Elevation	Major Highways Ramps	National Wetland	State Brownfield Areas
Eris Sites with Same Elevation	Major Roads	Indian Reserve Land	State Superfund Areas:Dept. of Defense
Eris Sites with Lower Elevation	Major Roads Ramps	Historic Fill	State Superfund Areas:NPL
Eris Sites with Unknown Elevation	Secondary Roads	100 Year Flood Zone	WQARF Areas
County Boundary	Secondary Roads Ramps	500 Year Flood Zone	Federal Lands: Dept. of Defense (owned/administered areas)
	Local Roads and Ramps		



Grid : 20

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
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- Major Roads Ramps
- Secondary Roads
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- State Brownfield Areas
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- State Superfund Areas:NPL
- WQARF Areas
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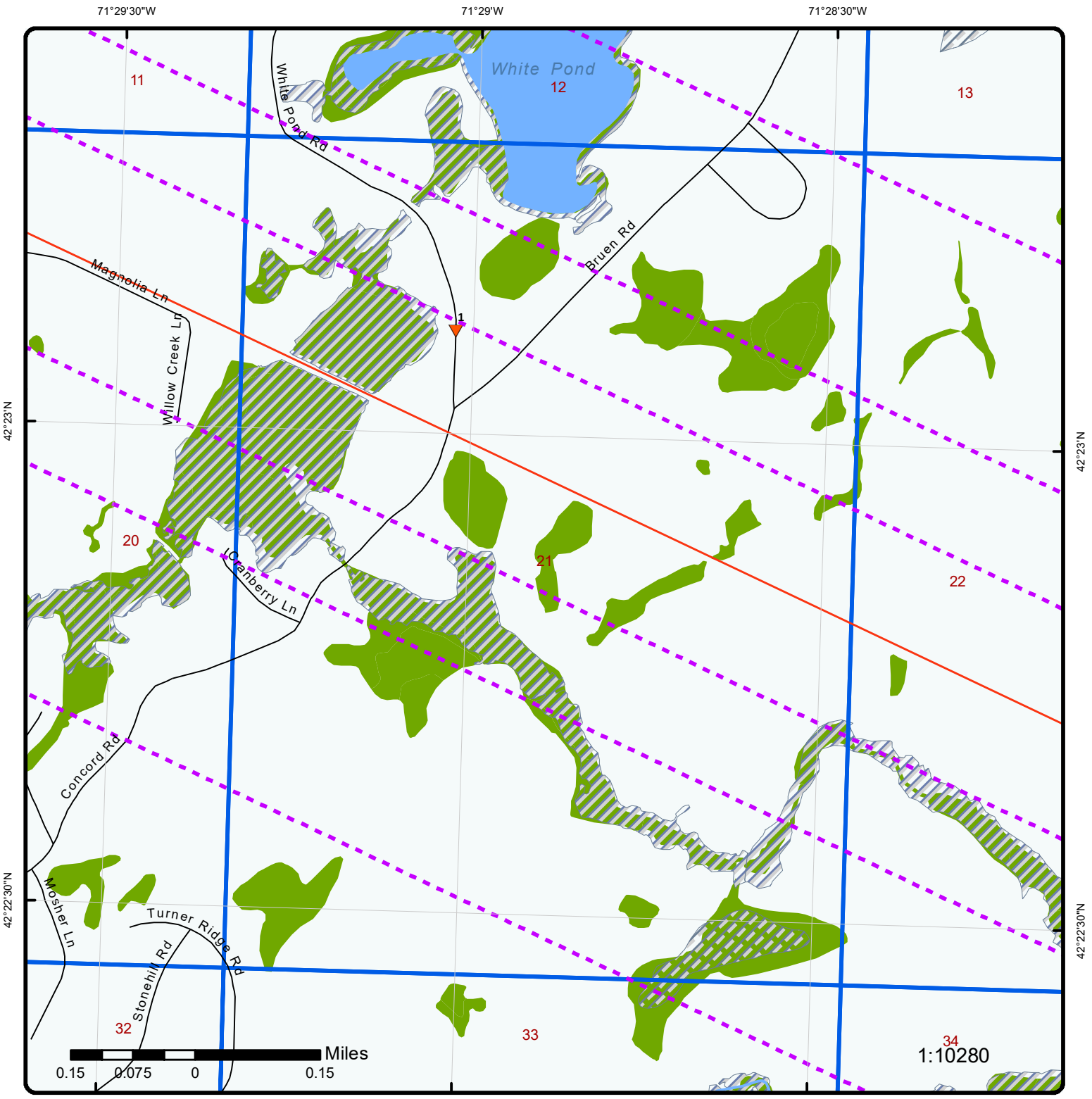

Grid : 21

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
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- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
- Local Roads and Ramps
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- National Wetland
- Indian Reserve Land
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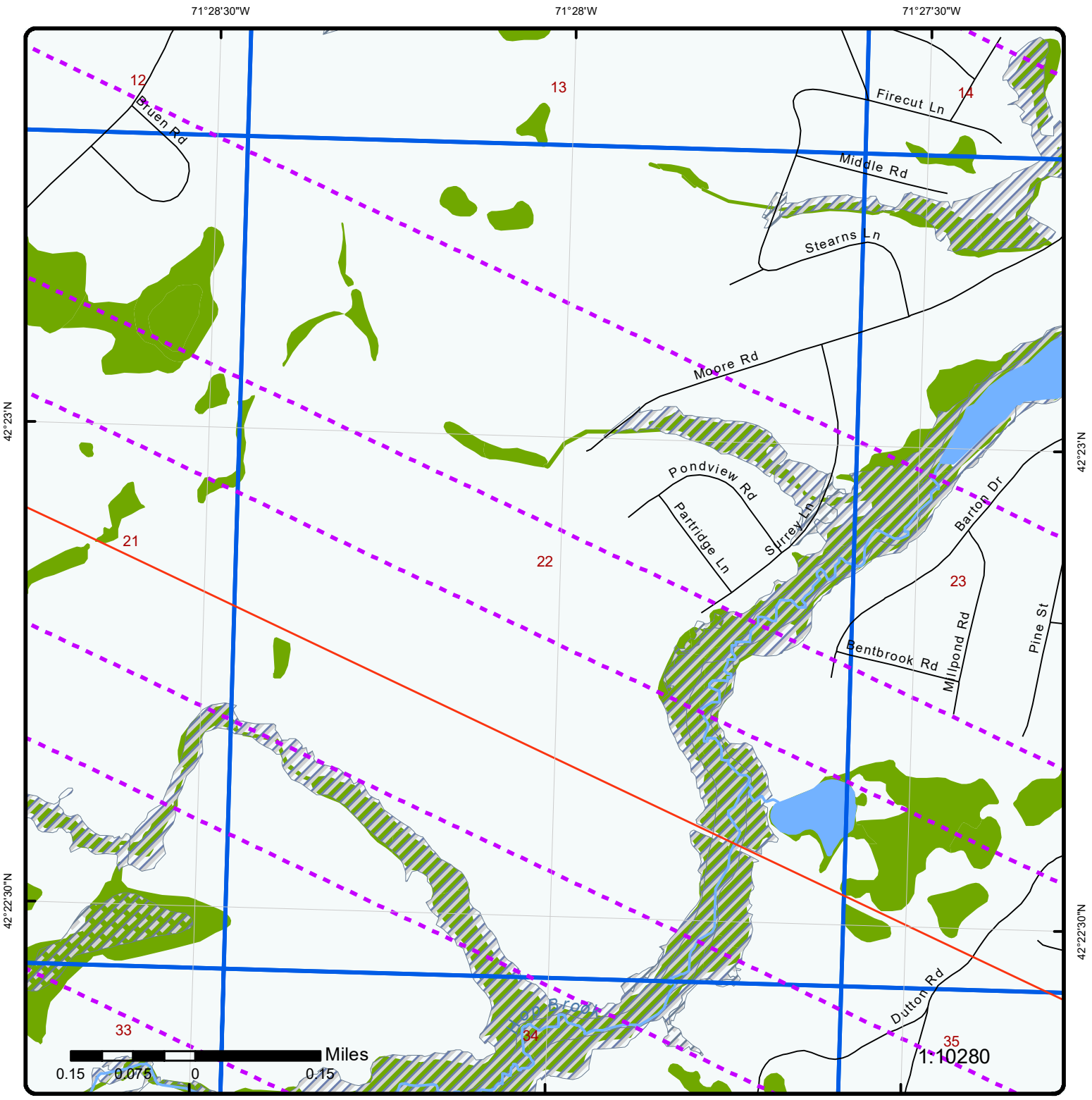
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Grid : 22

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
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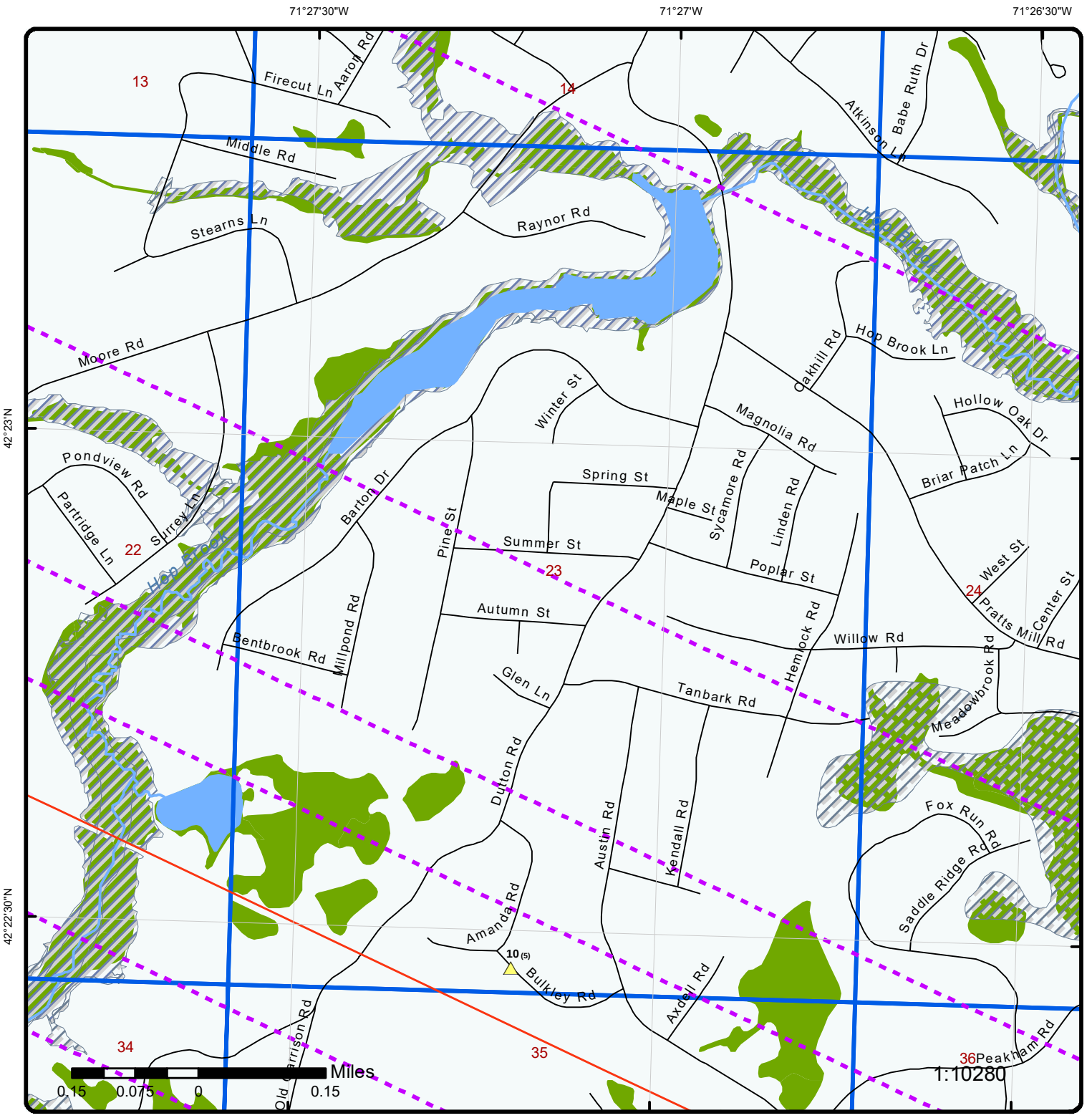

Grid : 23

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
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- Major Highways
- Major Highways Ramps
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- National Wetland
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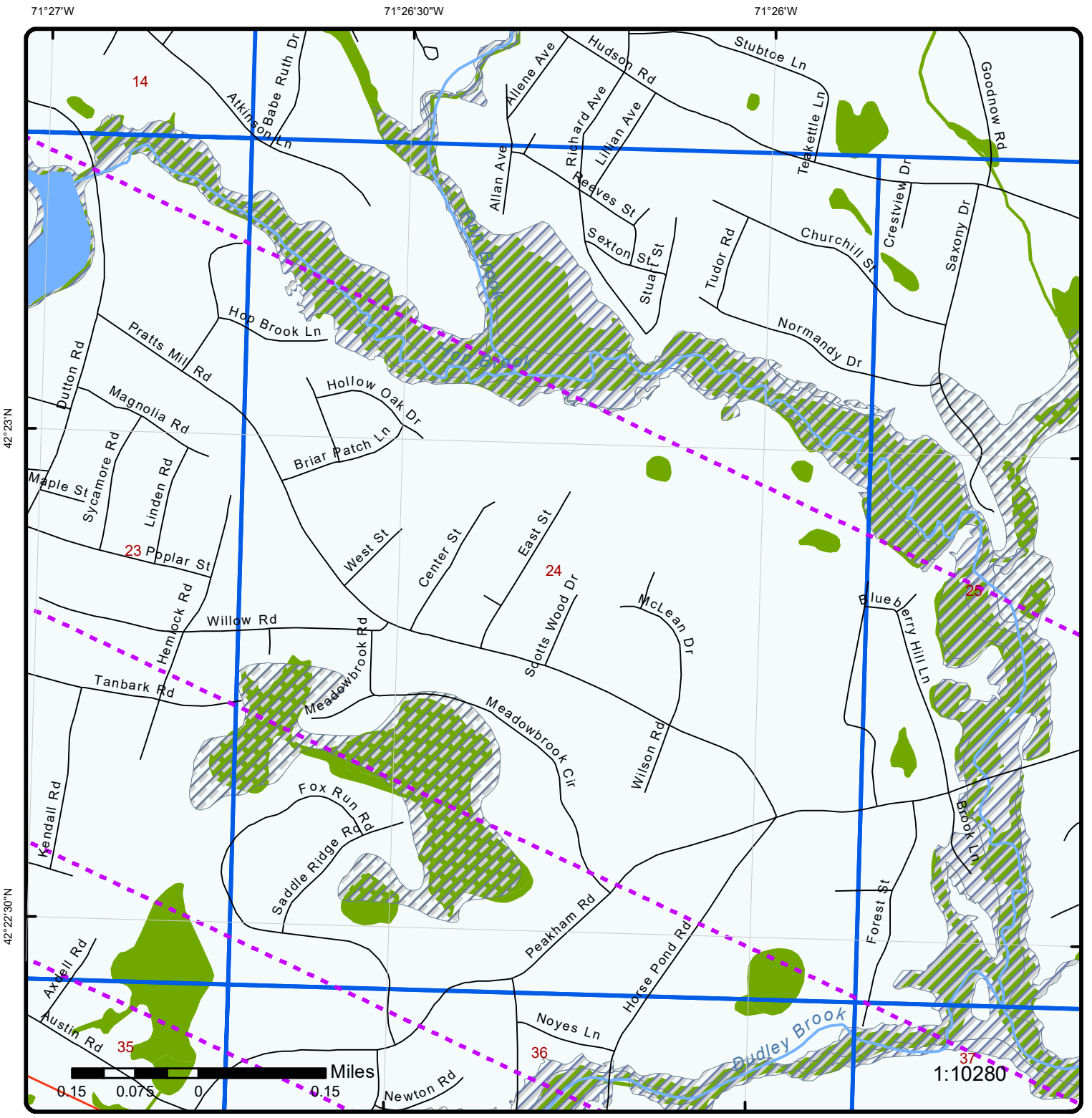
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Grid : 24

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
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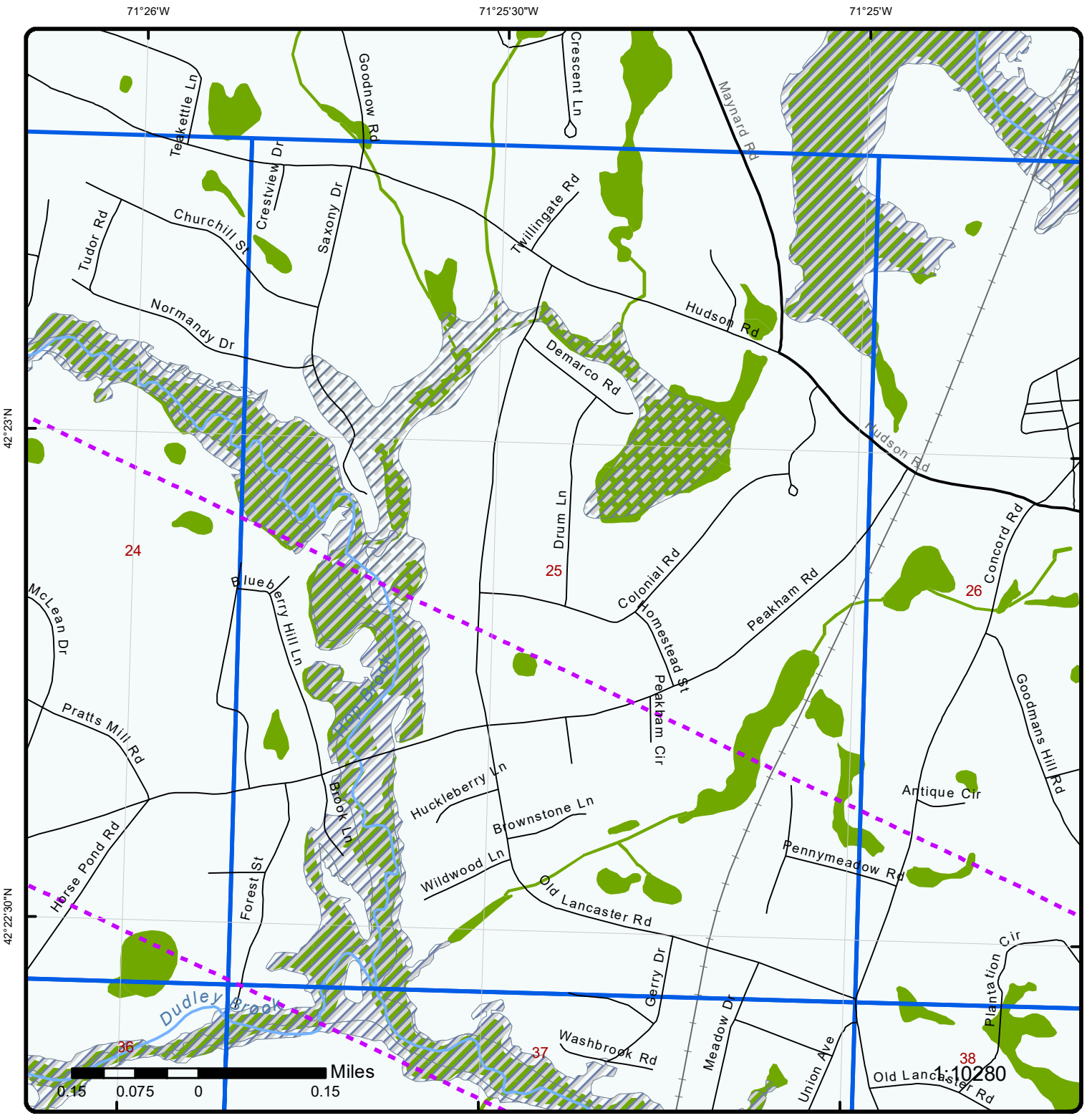
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Grid : 25

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
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- State Brownfield Sites
- State Brownfield Areas
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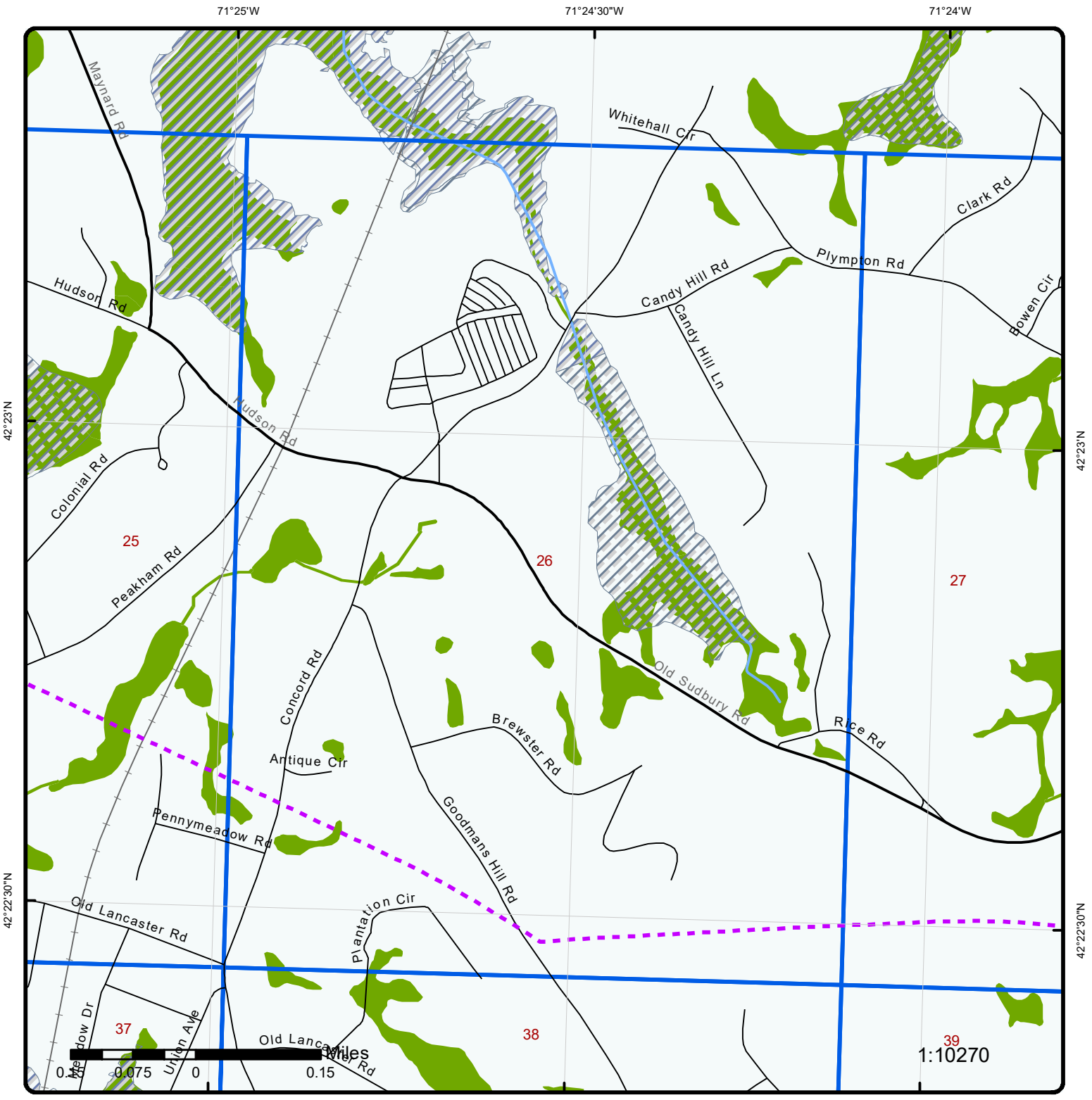
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Grid : 26

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
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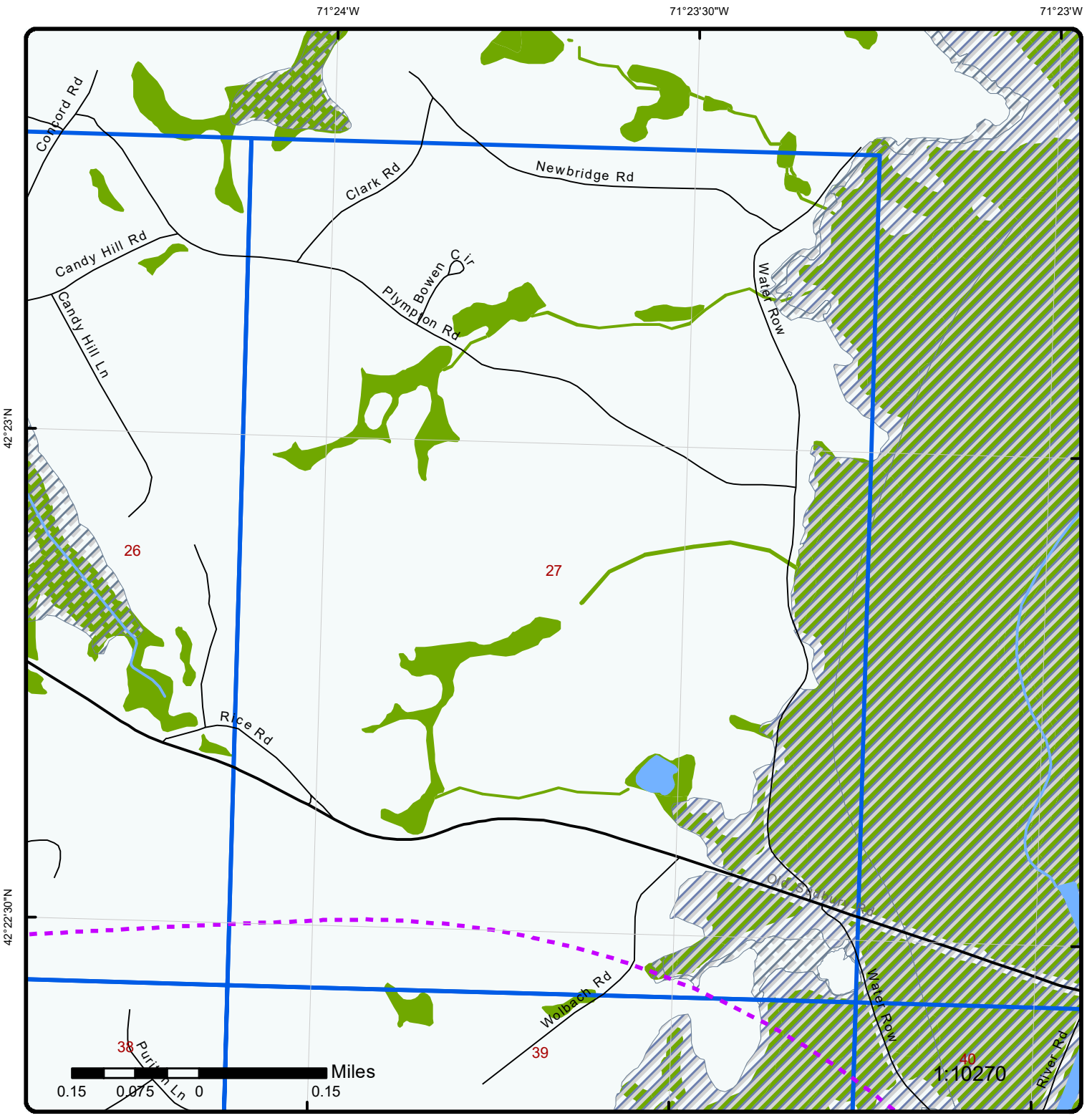
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



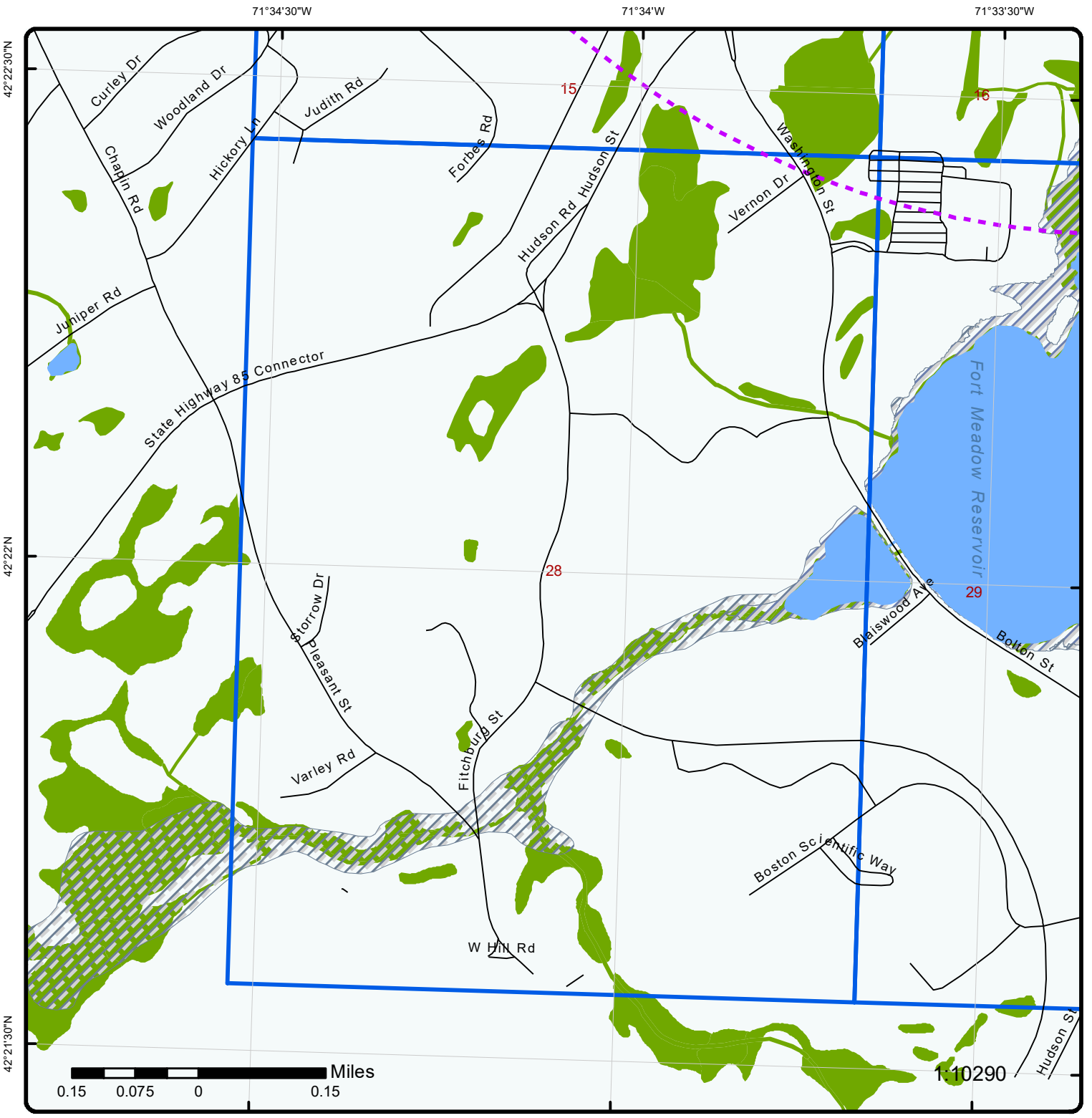
Grid : 27

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
- Local Roads and Ramps
- State Boundary
- National Priority List Sites
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



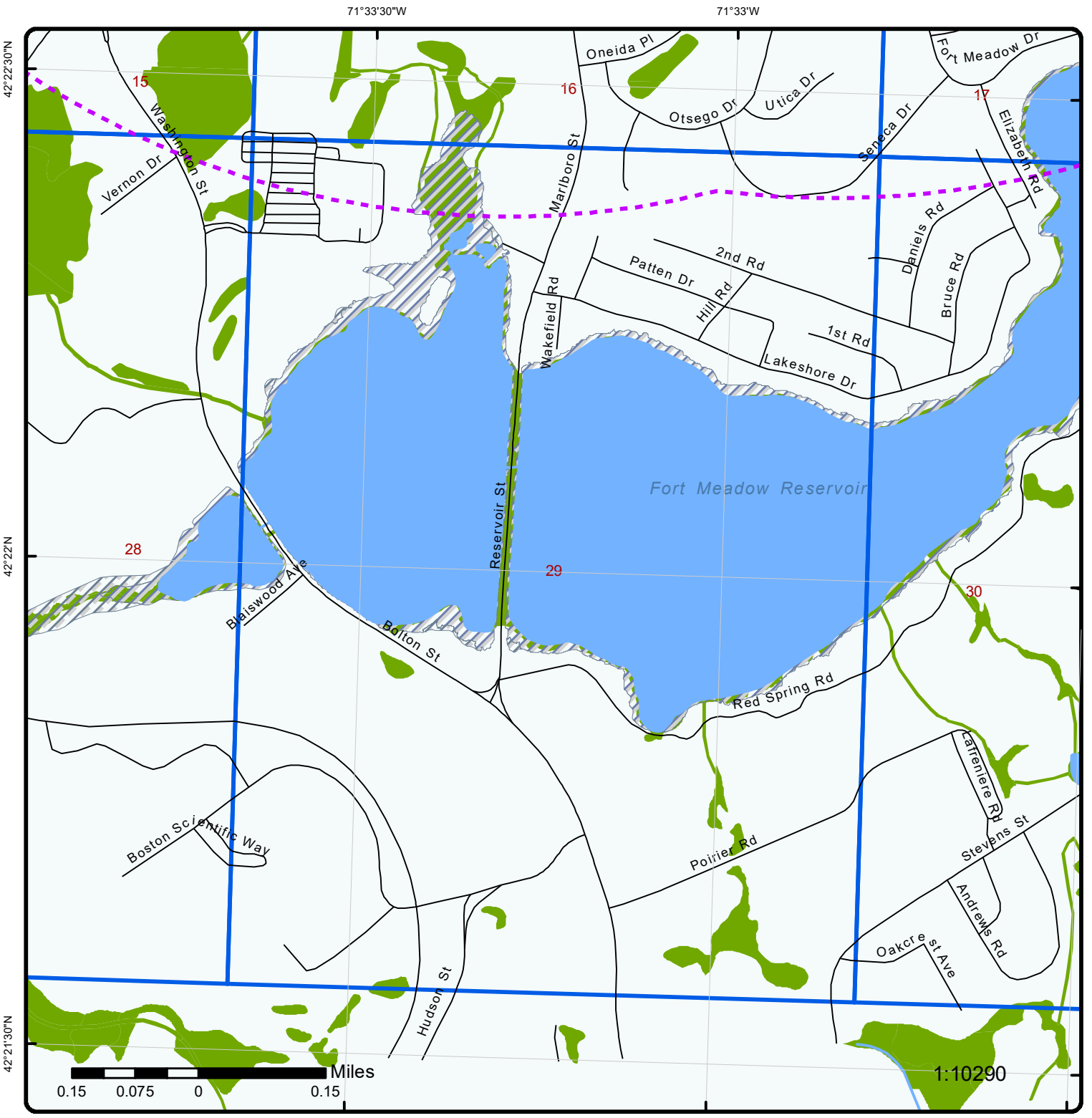
Grid : 28

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
- Local Roads and Ramps
- State Boundary
- National Priority List Sites
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Grid : 29

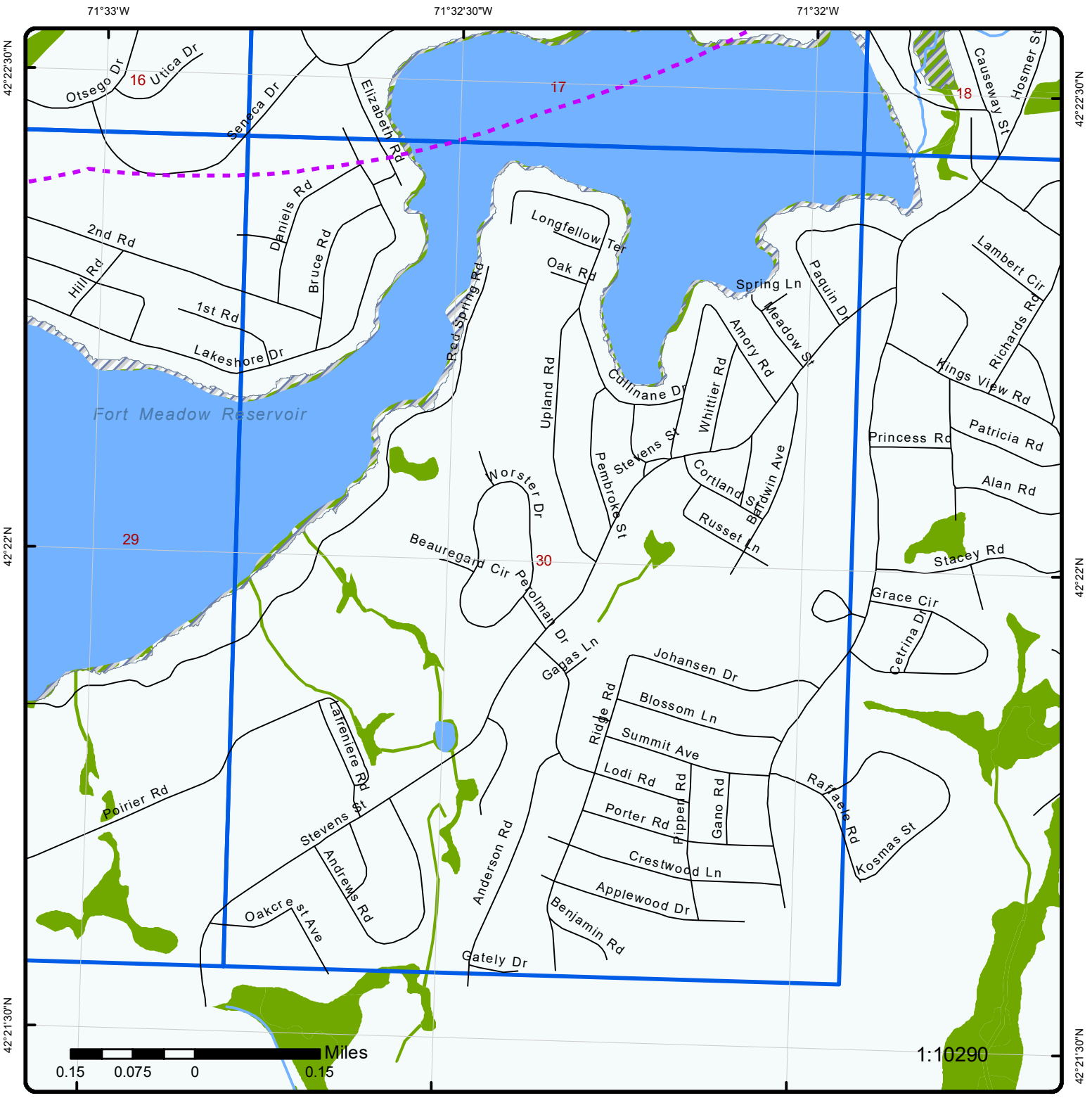
Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Project Property	Rails	State Boundary	FWS Special Designation Areas
Buffer Outline	Major Highways	National Priority List Sites	State Brownfield Sites
Eris Sites with Higher Elevation	Major Highways Ramps	National Wetland	State Brownfield Areas
Eris Sites with Same Elevation	Major Roads	Indian Reserve Land	State Superfund Areas:Dept. of Defense
Eris Sites with Lower Elevation	Major Roads Ramps	Historic Fill	State Superfund Areas:NPL
Eris Sites with Unknown Elevation	Secondary Roads	100 Year Flood Zone	WQARF Areas
County Boundary	Secondary Roads Ramps	500 Year Flood Zone	Federal Lands: Dept. of Defense (owned/administered areas)
	Local Roads and Ramps		

Source: © 2016 ESRI



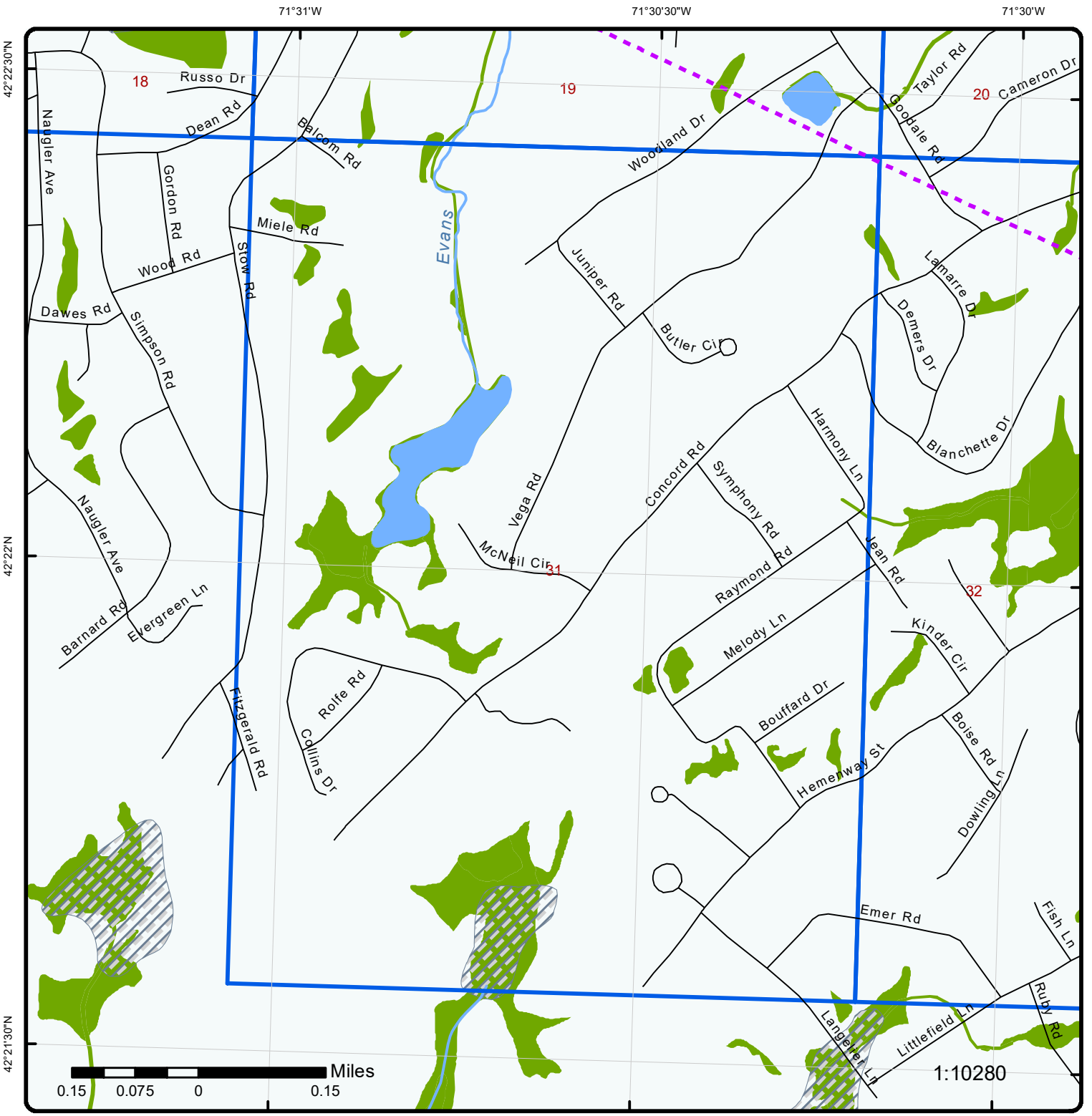
Grid : 30

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
- Local Roads and Ramps
- State Boundary
- National Priority List Sites
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Grid : 31

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
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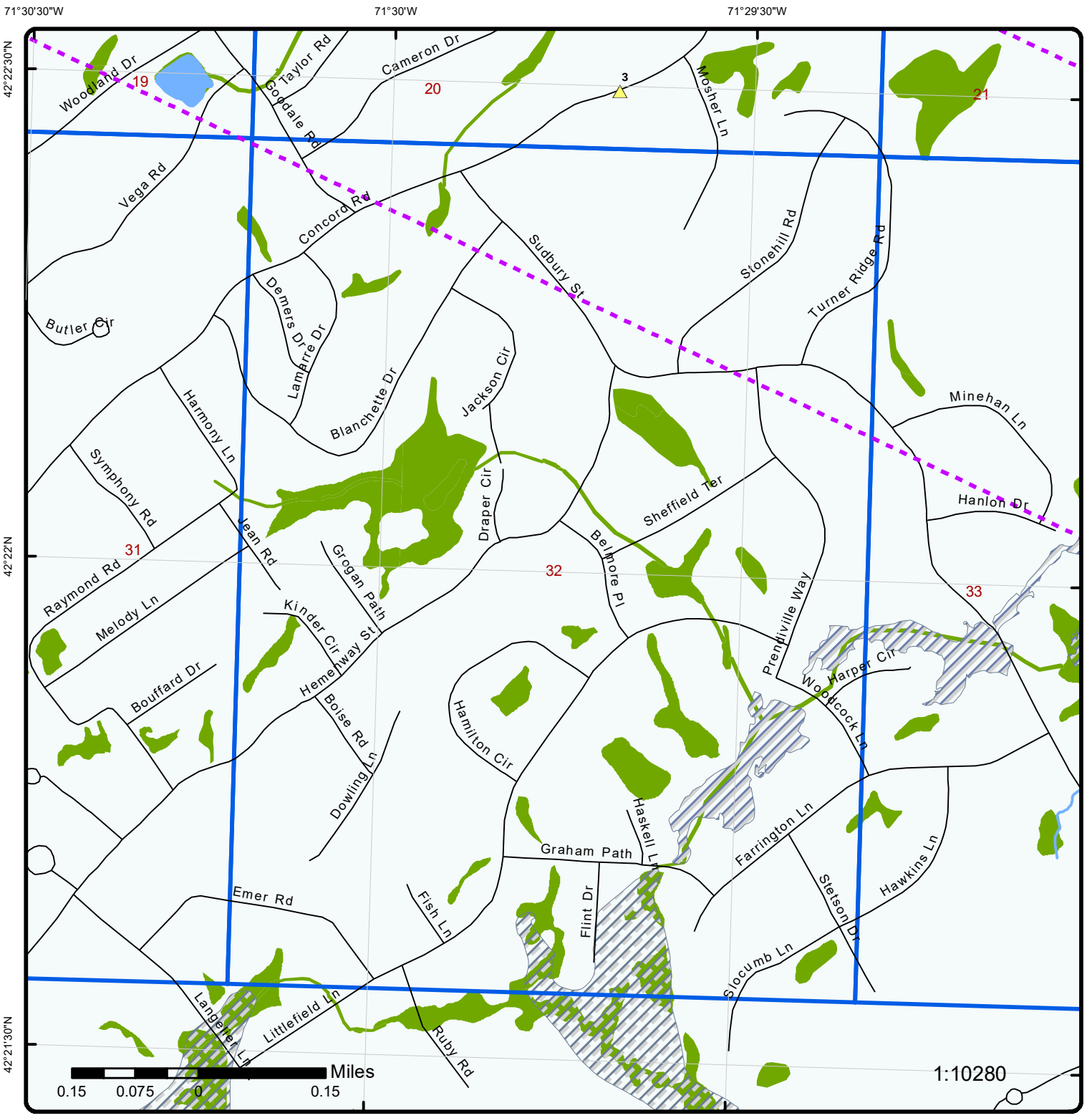
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



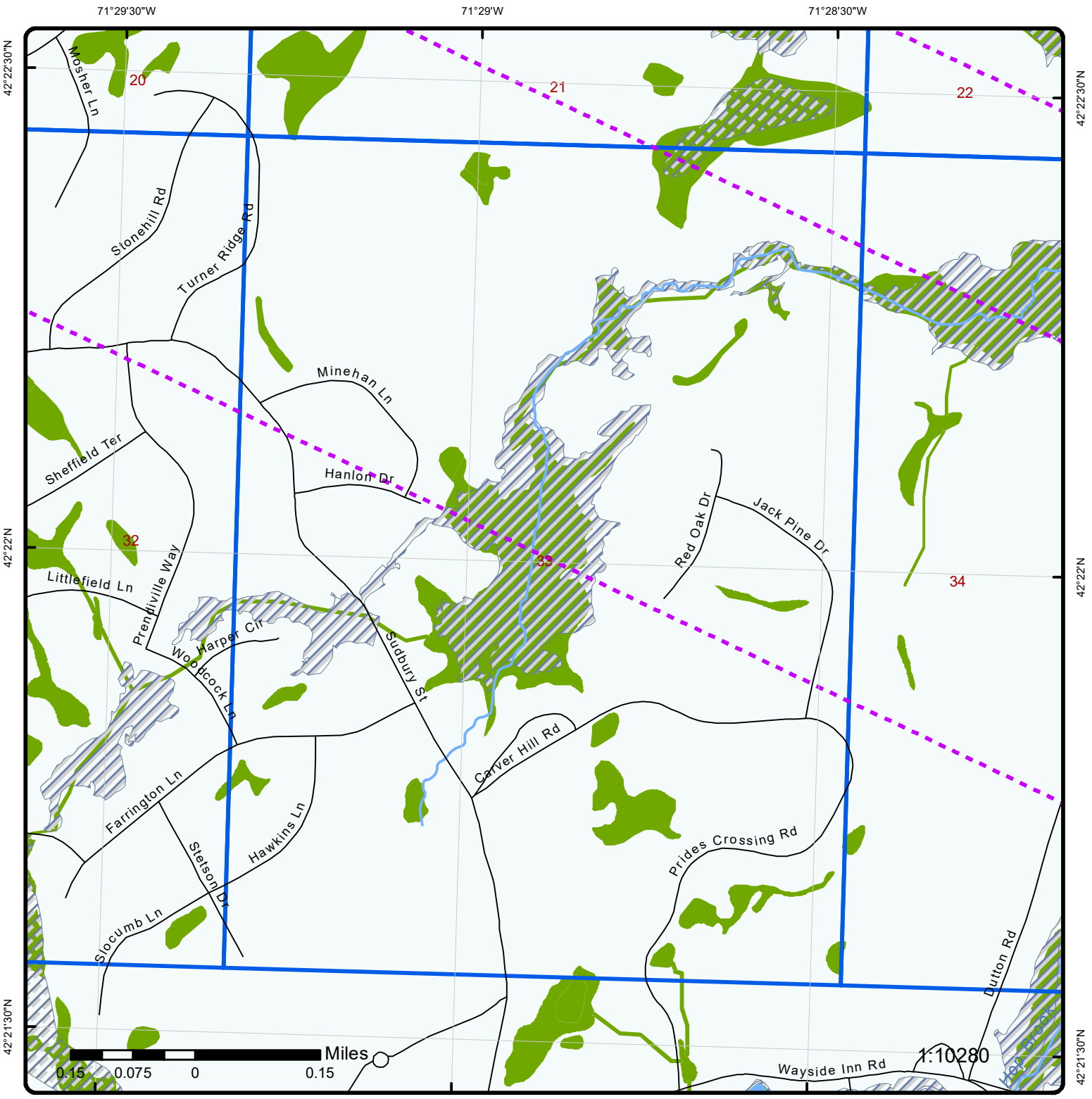
Grid : 32

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Project Property	Rails	State Boundary	FWS Special Designation Areas
Buffer Outline	Major Highways	National Priority List Sites	State Brownfield Sites
Eris Sites with Higher Elevation	Major Highways Ramps	National Wetland	State Brownfield Areas
Eris Sites with Same Elevation	Major Roads	Indian Reserve Land	State Superfund Areas:Dept. of Defense
Eris Sites with Lower Elevation	Major Roads Ramps	Historic Fill	State Superfund Areas:NPL
Eris Sites with Unknown Elevation	Secondary Roads	100 Year Flood Zone	WQARF Areas
County Boundary	Secondary Roads Ramps	500 Year Flood Zone	Federal Lands: Dept. of Defense (owned/administered areas)
	Local Roads and Ramps		



Grid : 33

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
- Local Roads and Ramps
- State Boundary
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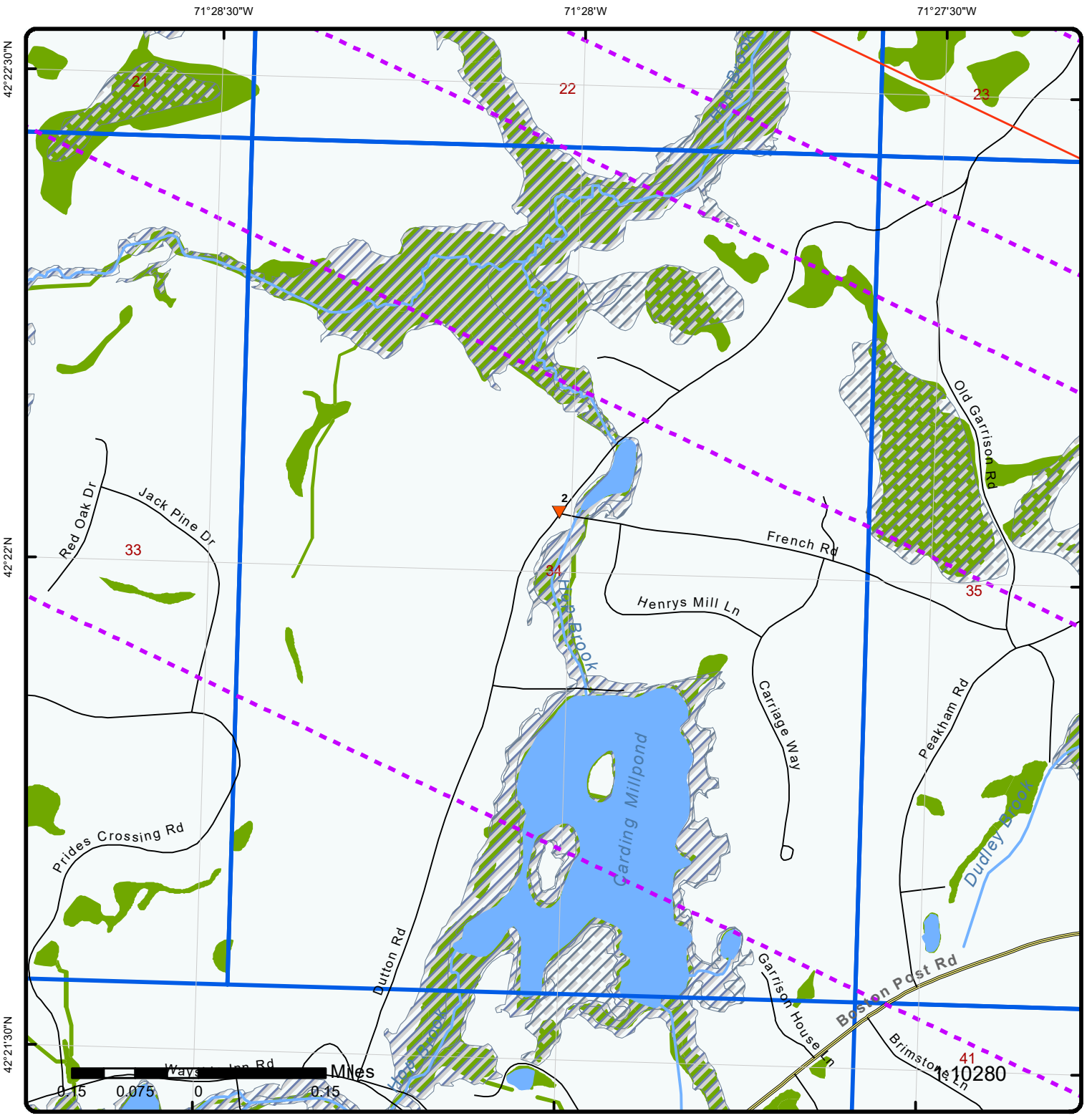
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Grid : 34

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
- Local Roads and Ramps
- State Boundary
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- National Wetland
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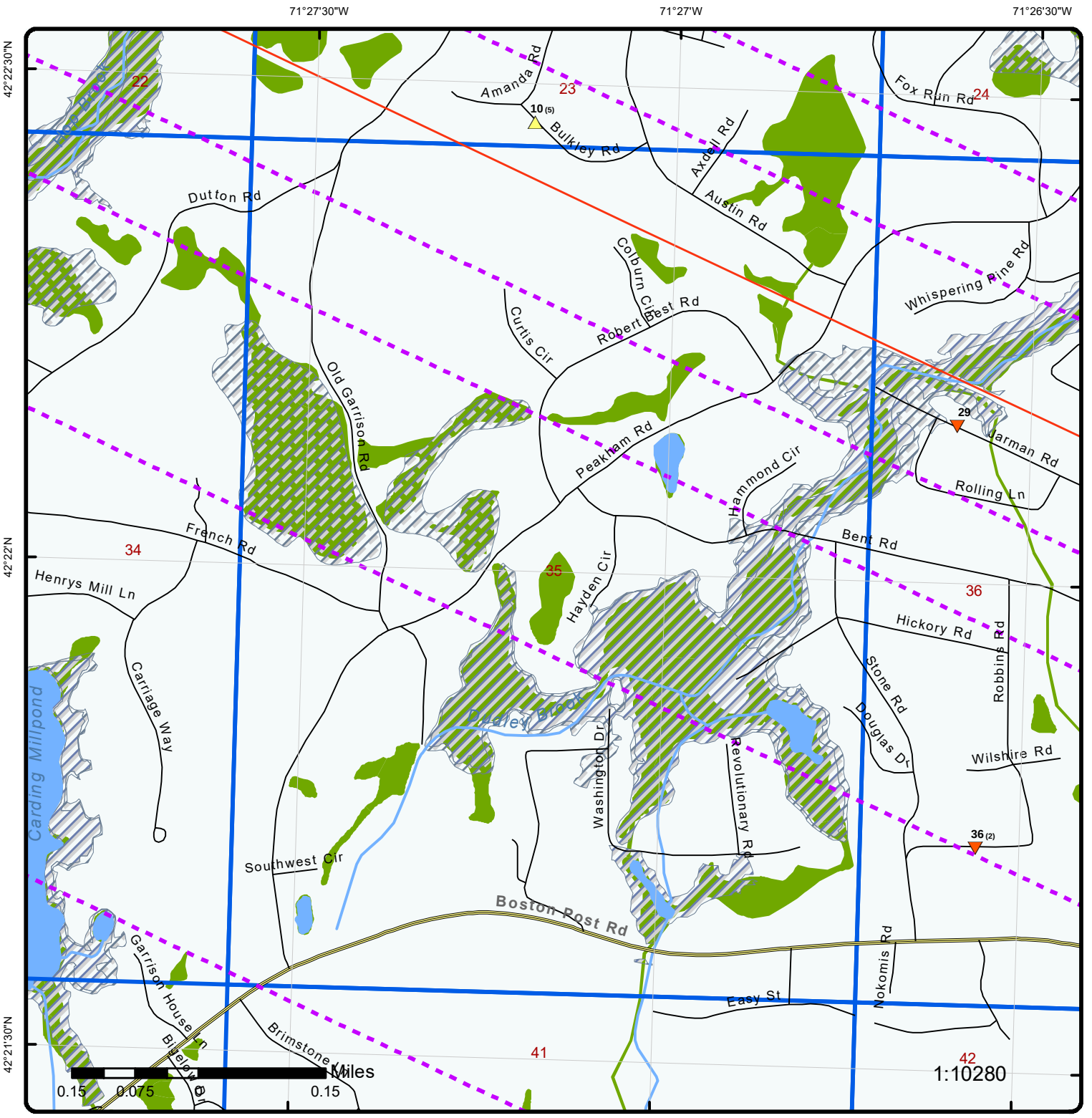
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



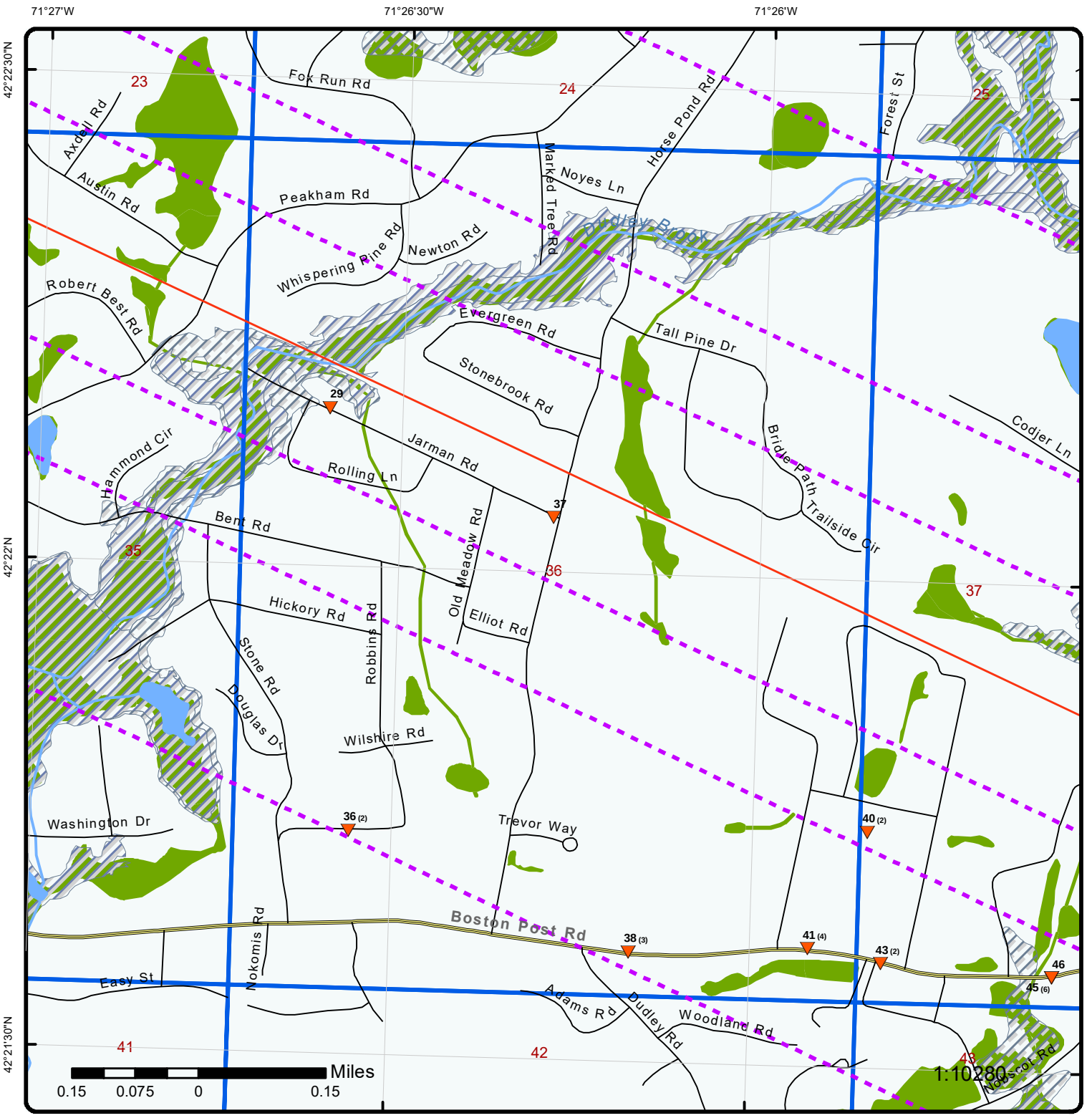
Grid : 35

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Project Property	Rails	State Boundary	FWS Special Designation Areas
Buffer Outline	Major Highways	National Priority List Sites	State Brownfield Sites
Eris Sites with Higher Elevation	Major Highways Ramps	National Wetland	State Brownfield Areas
Eris Sites with Same Elevation	Major Roads	Indian Reserve Land	State Superfund Areas:Dept. of Defense
Eris Sites with Lower Elevation	Major Roads Ramps	Historic Fill	State Superfund Areas:NPL
Eris Sites with Unknown Elevation	Secondary Roads	100 Year Flood Zone	WQARF Areas
County Boundary	Secondary Roads Ramps	500 Year Flood Zone	Federal Lands: Dept. of Defense (owned/administered areas)
	Local Roads and Ramps		



Grid : 36

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
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- Secondary Roads Ramps
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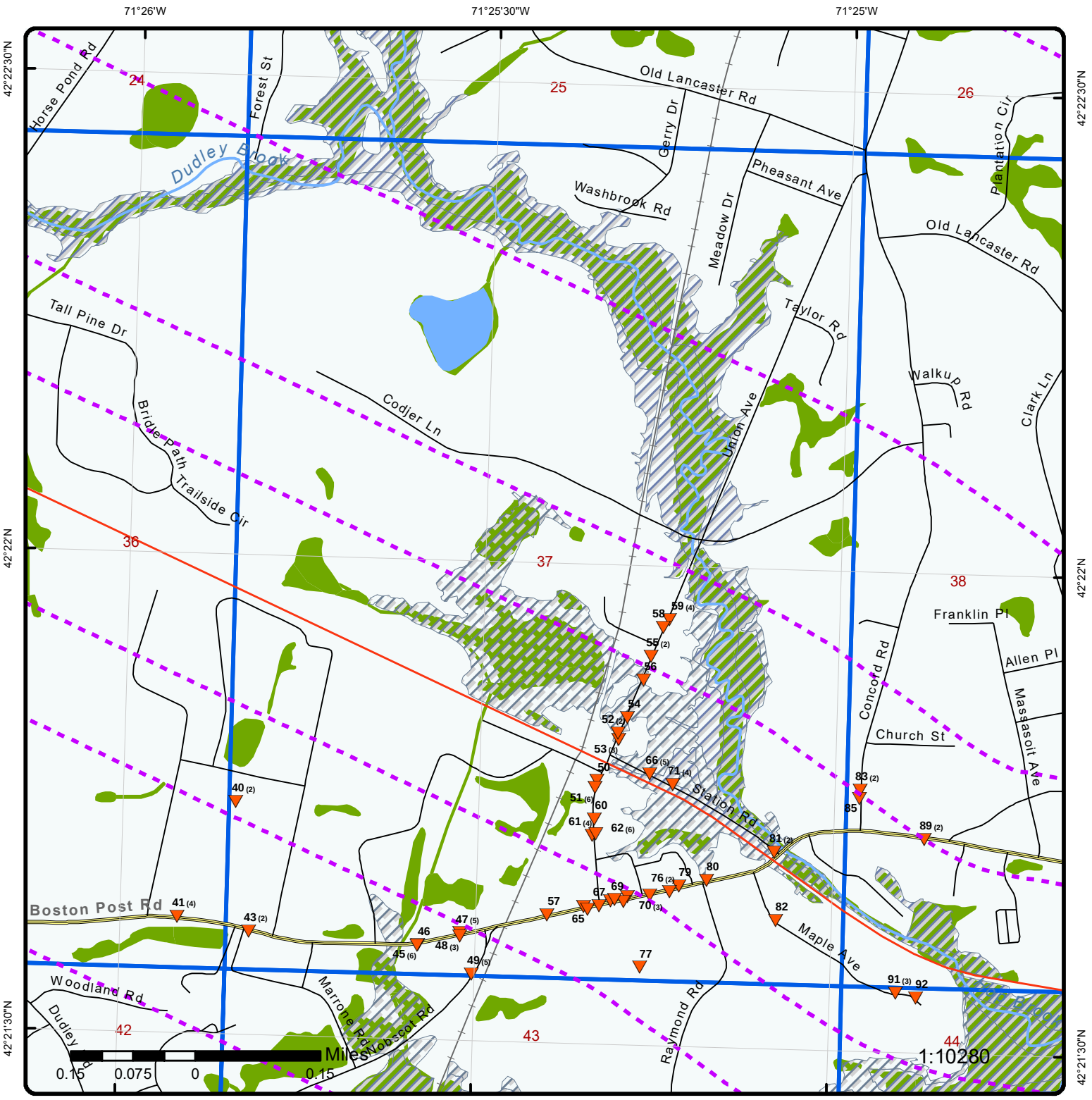
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Grid : 37

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
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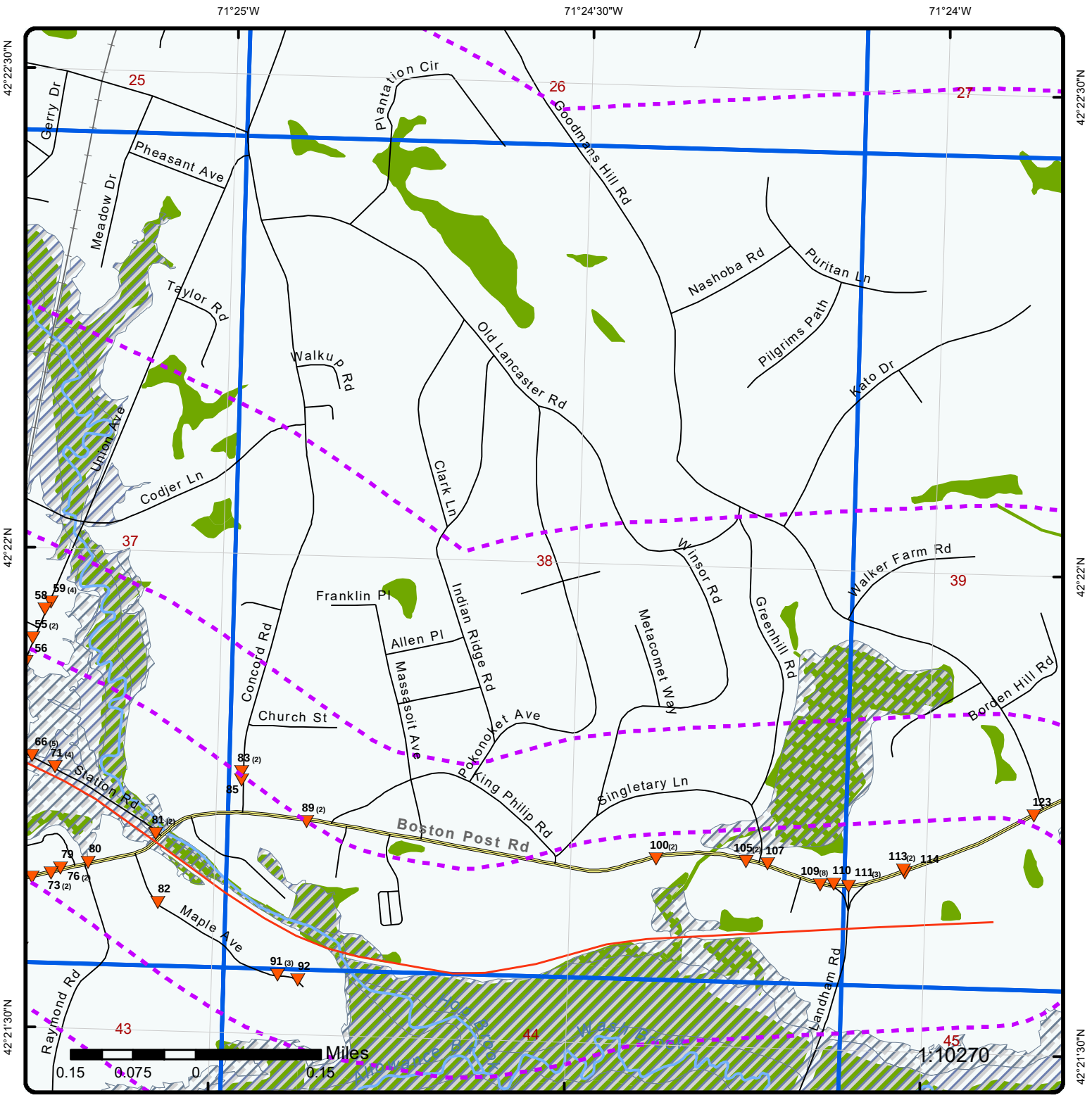
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



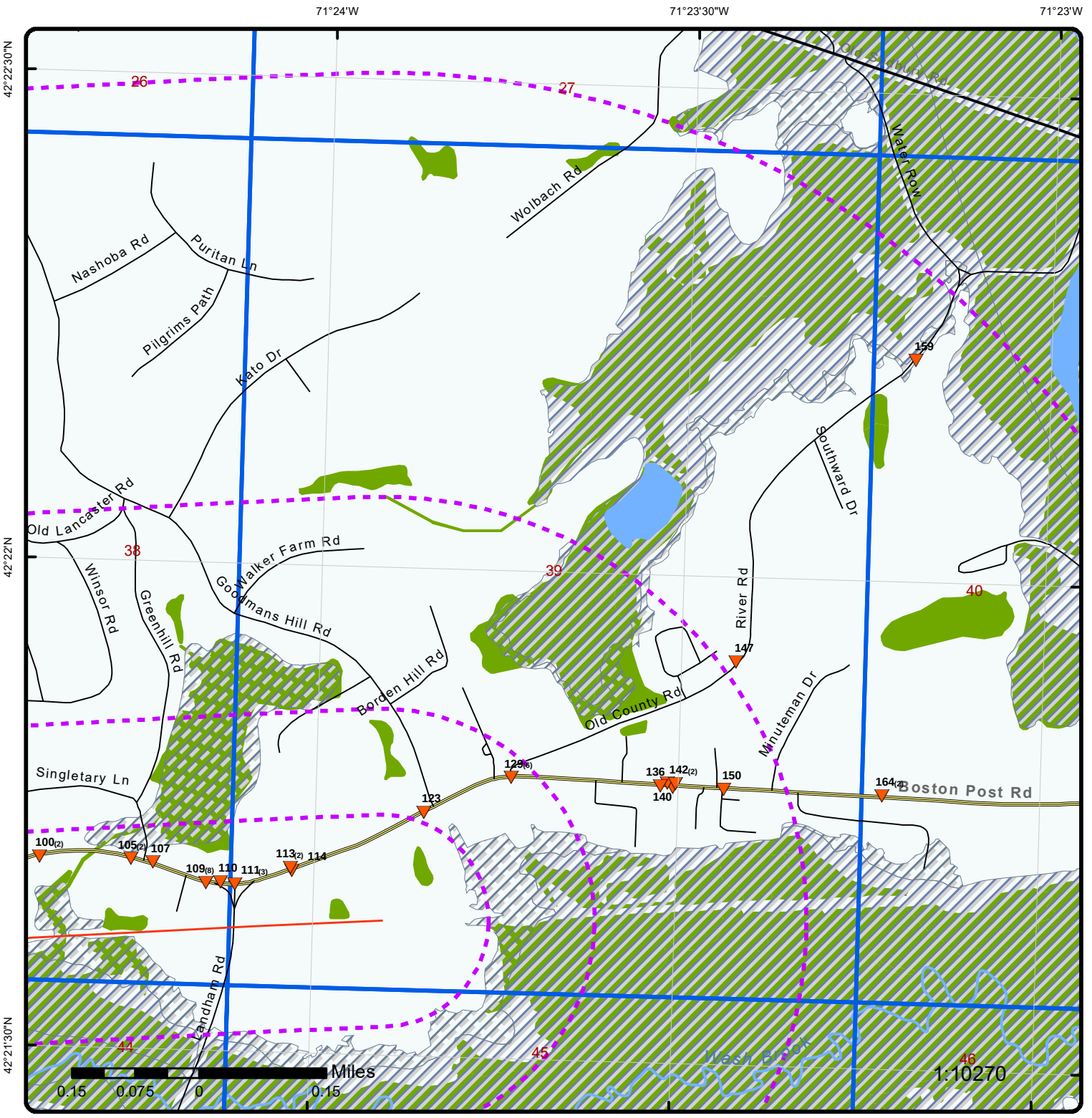
Grid : 38

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Project Property	Rails	State Boundary	FWS Special Designation Areas
Buffer Outline	Major Highways	National Priority List Sites	State Brownfield Sites
Eris Sites with Higher Elevation	Major Highways Ramps	National Wetland	State Brownfield Areas
Eris Sites with Same Elevation	Major Roads	Indian Reserve Land	State Superfund Areas:Dept. of Defense
Eris Sites with Lower Elevation	Major Roads Ramps	Historic Fill	State Superfund Areas:NPL
Eris Sites with Unknown Elevation	Secondary Roads	100 Year Flood Zone	WQARF Areas
County Boundary	Secondary Roads Ramps	500 Year Flood Zone	Federal Lands: Dept. of Defense (owned/administered areas)
	Local Roads and Ramps		



Grid : 39

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
- Local Roads and Ramps
- State Boundary
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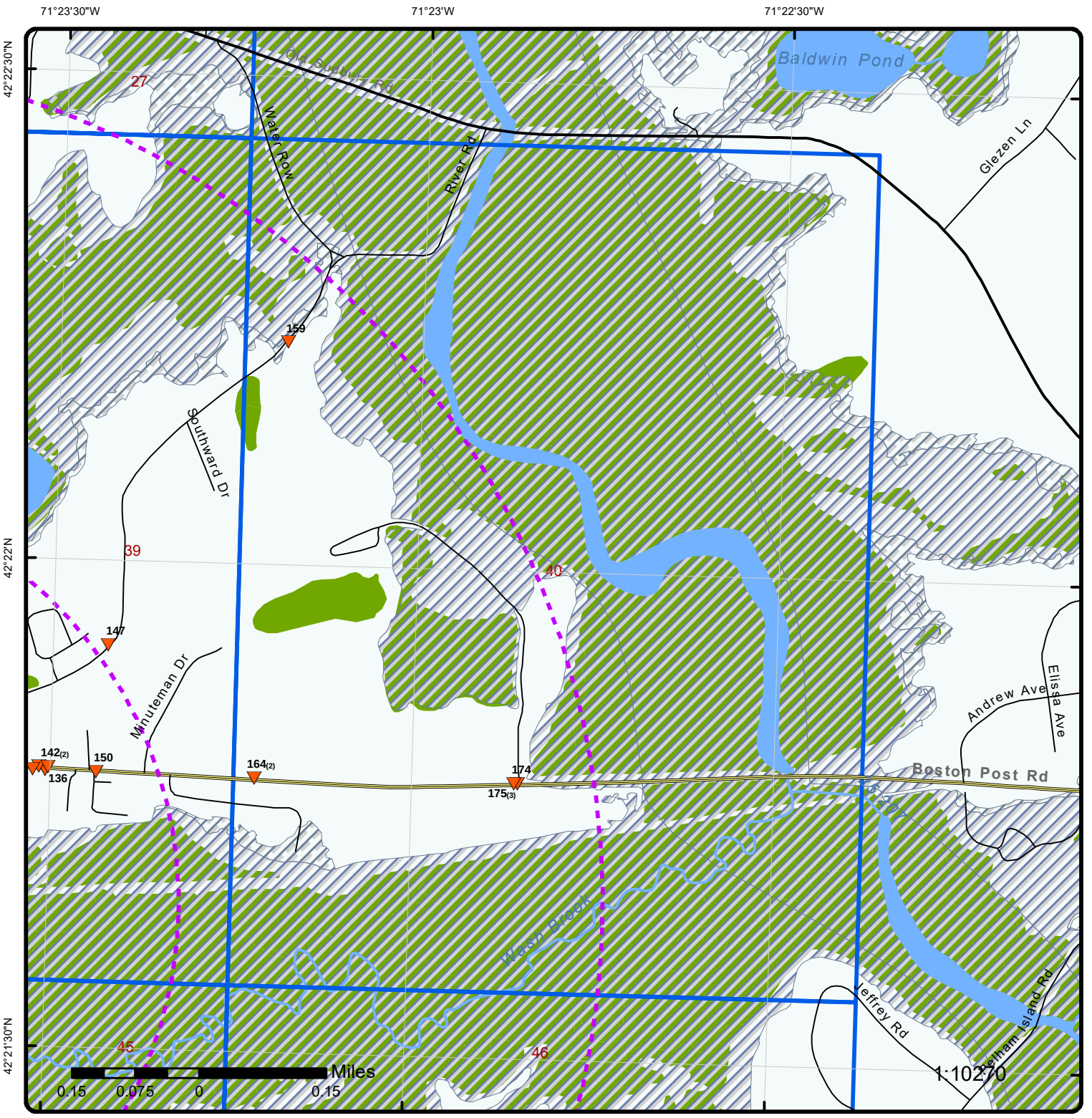
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Grid : 40

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
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- National Wetland
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- 100 Year Flood Zone
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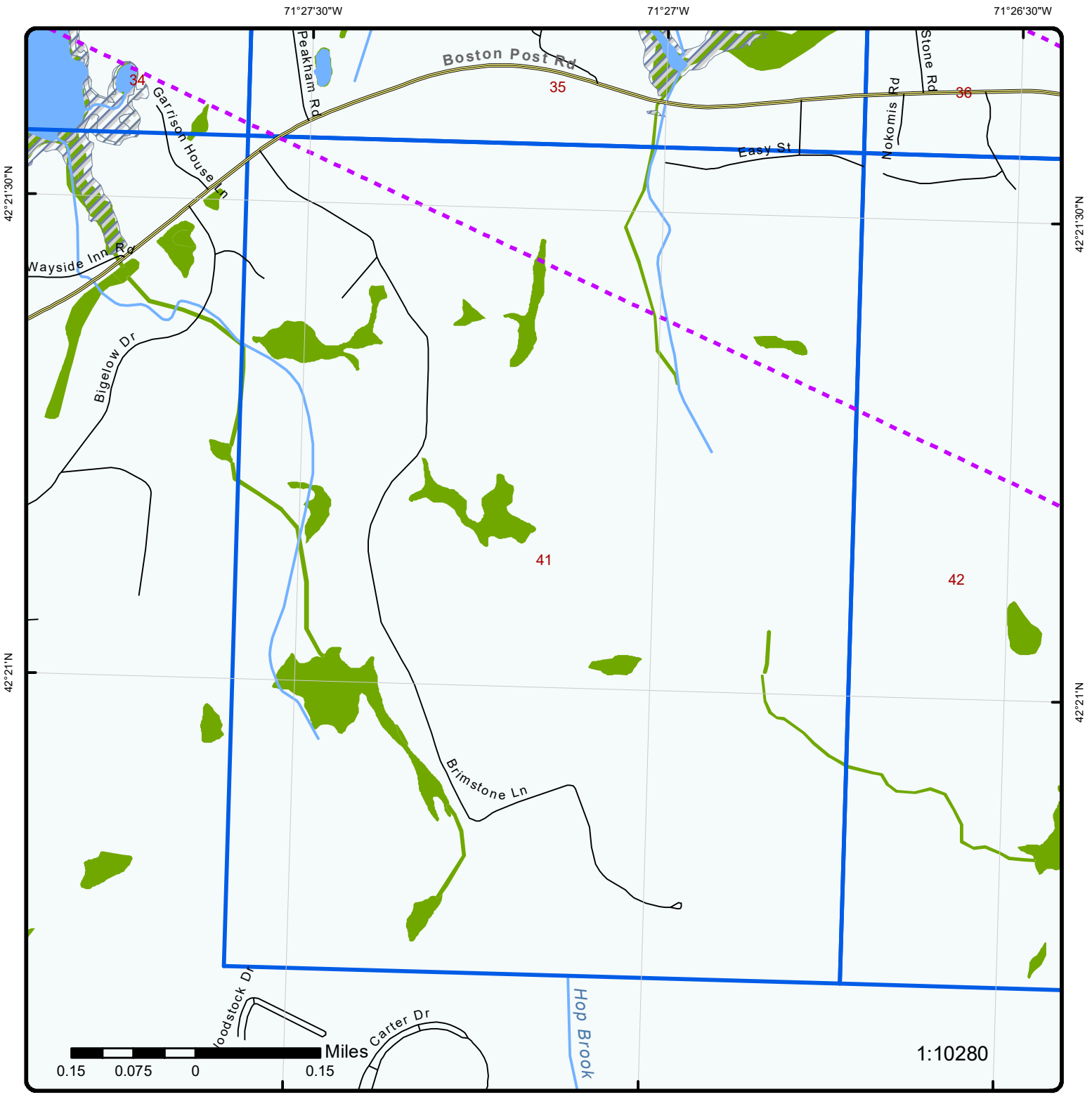
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Grid : 41

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
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- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
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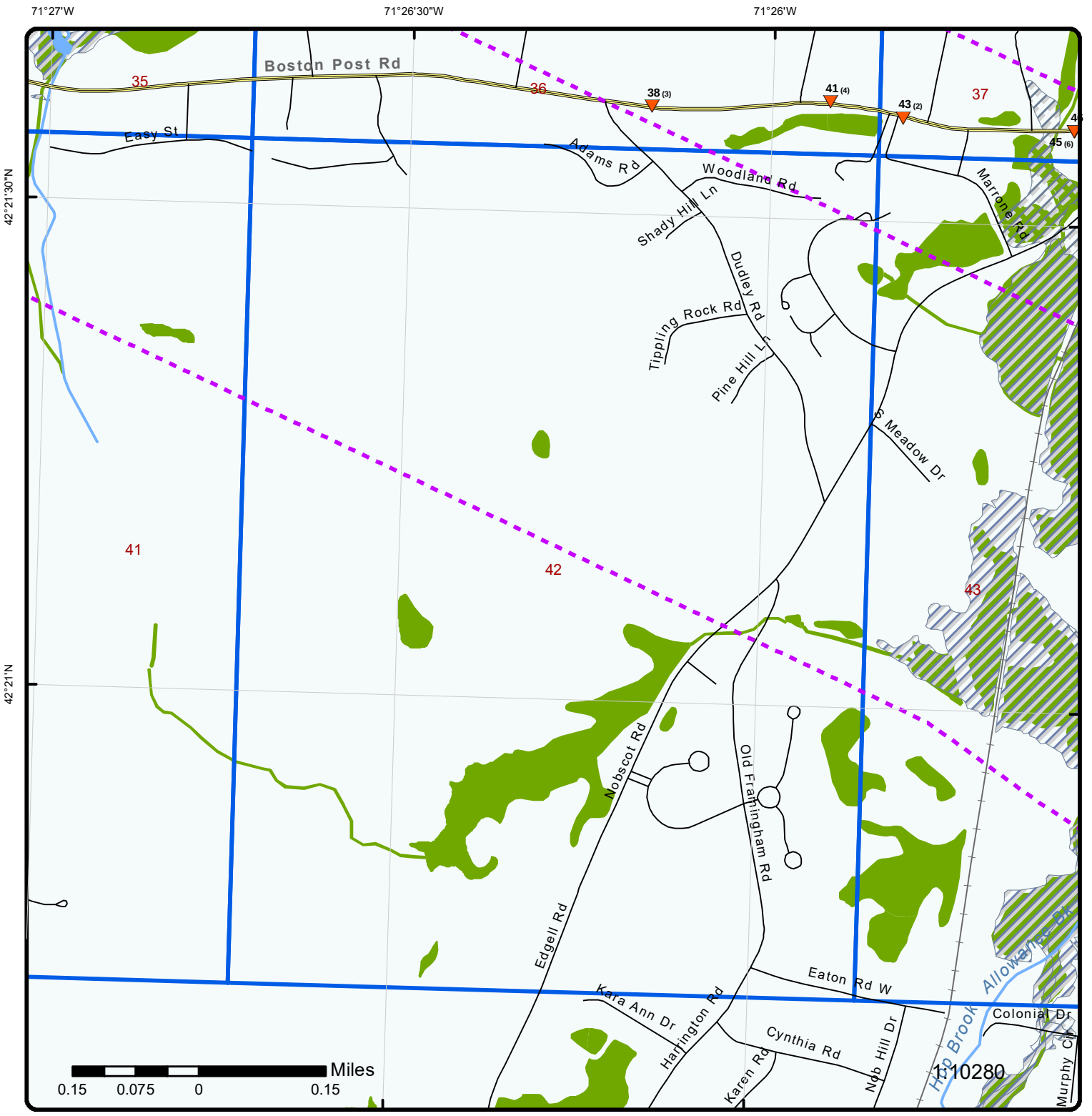
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Grid : 42

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
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- Major Roads Ramps
- Secondary Roads
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- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
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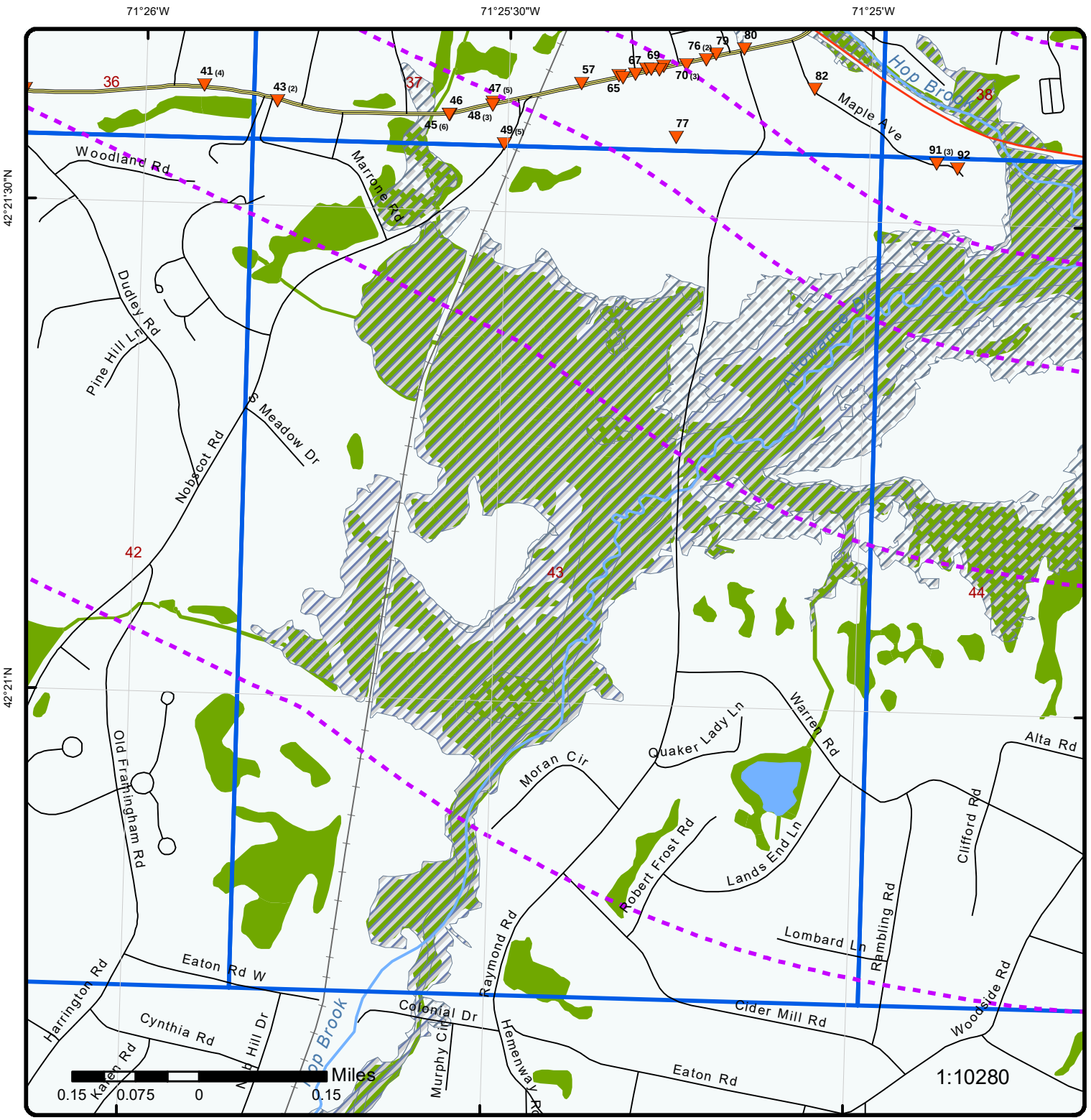
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Grid : 43

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
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- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
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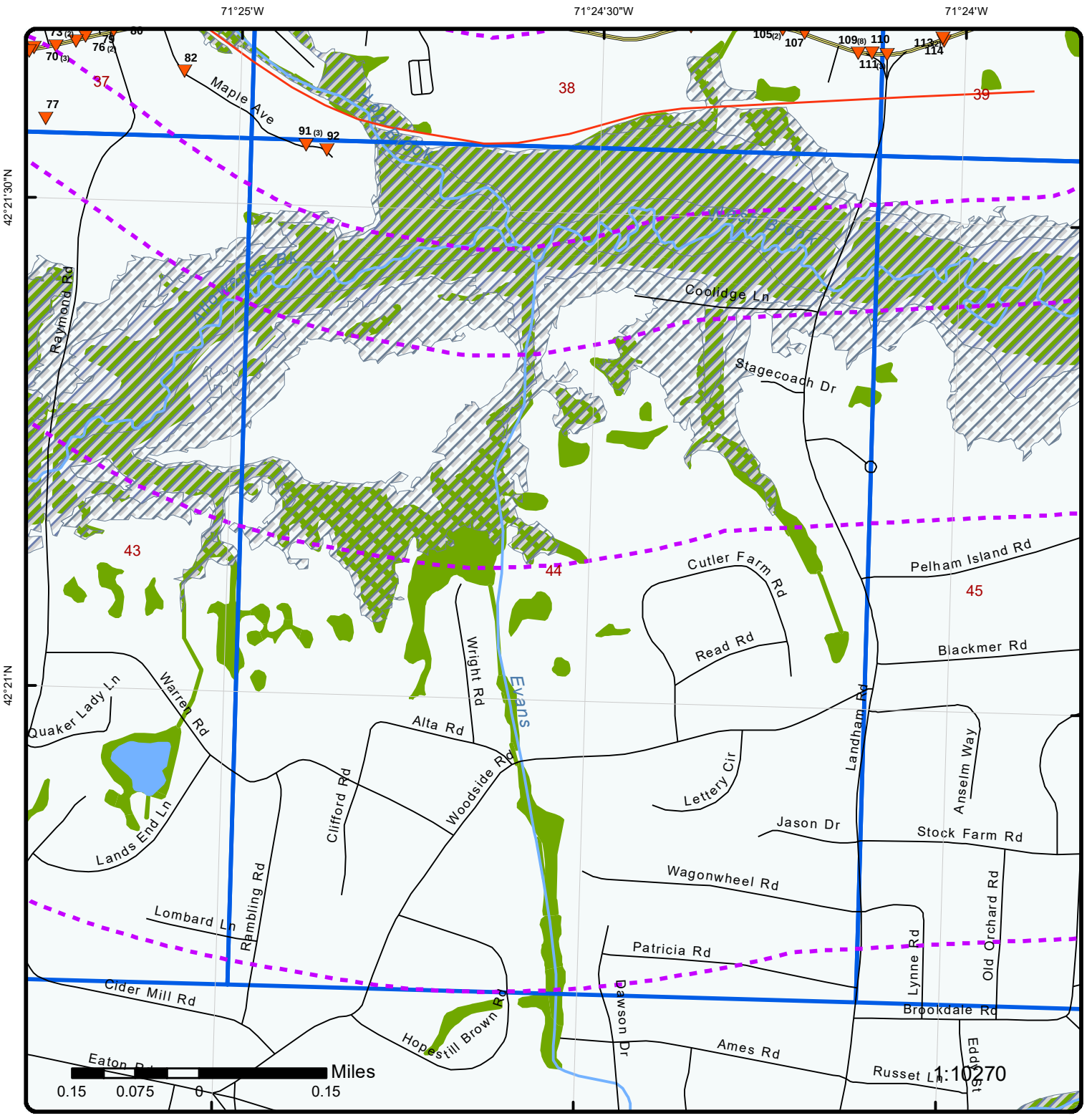
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



Grid : 44

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
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- National Wetland
- Indian Reserve Land
- Historic Fill
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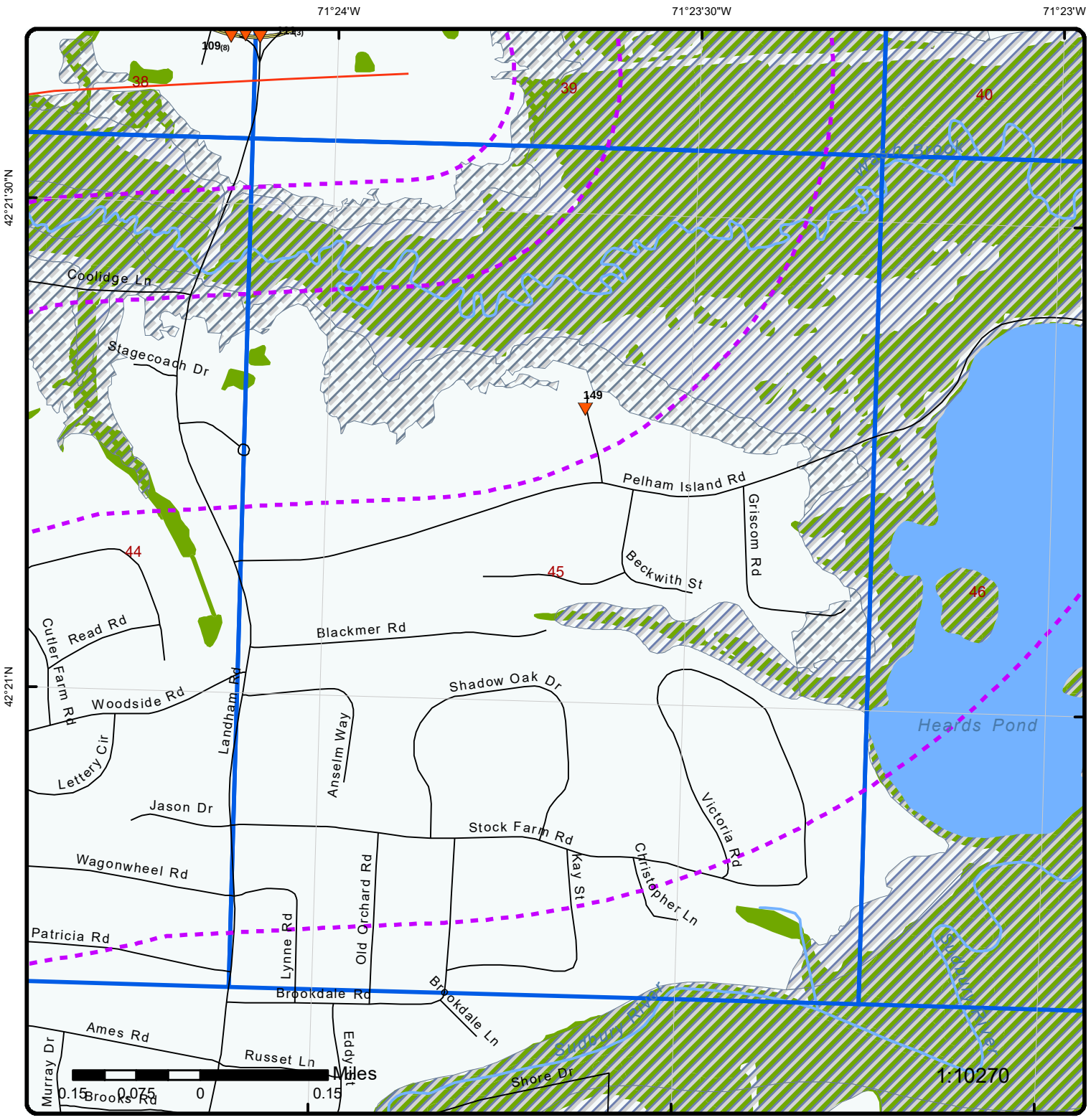
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



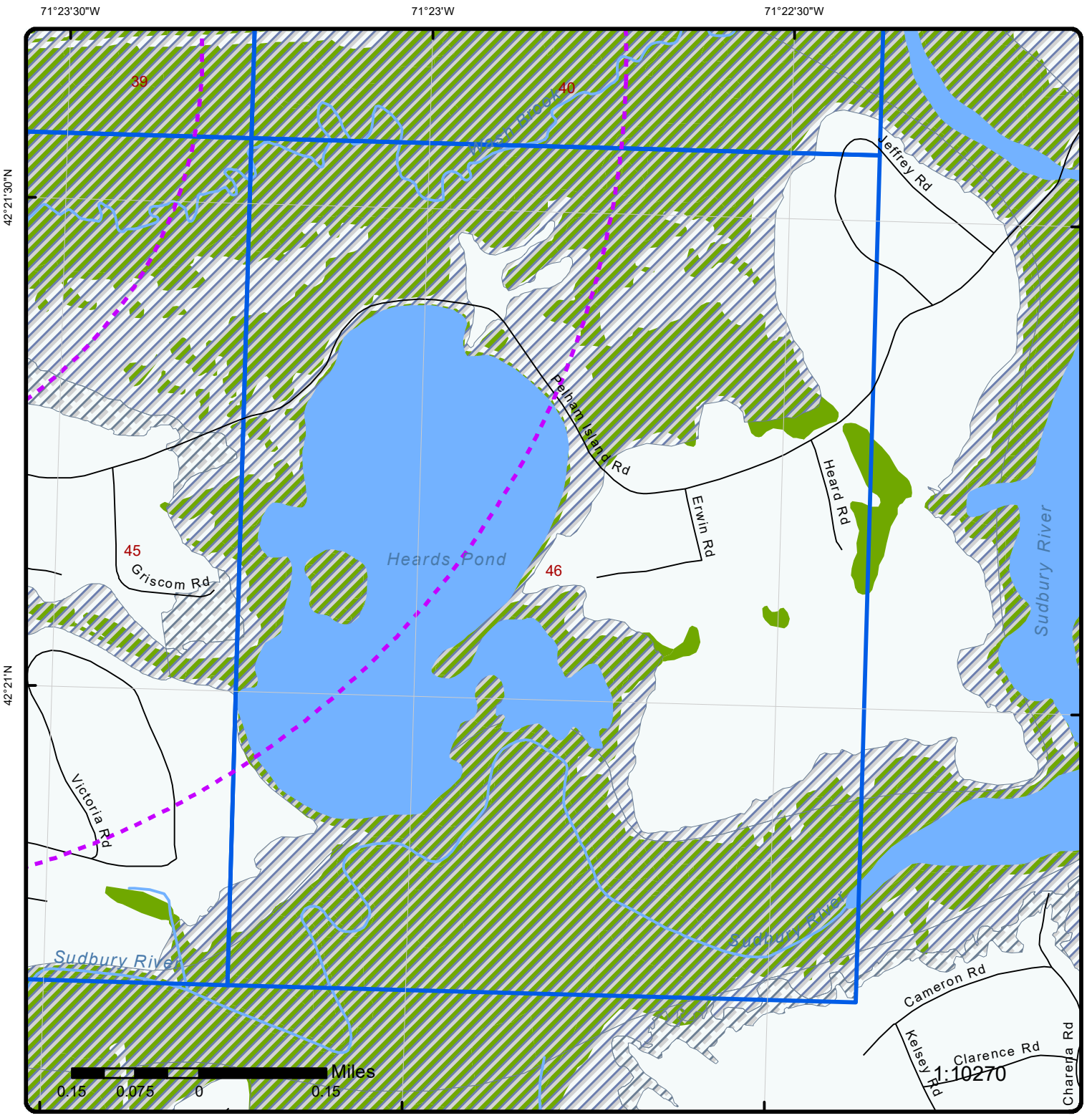
Grid : 45

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ENVIRONMENTAL RISK INFORMATION SERVICES

Project Property	Rails	State Boundary	FWS Special Designation Areas
Buffer Outline	Major Highways	National Priority List Sites	State Brownfield Sites
Eris Sites with Higher Elevation	Major Highways Ramps	National Wetland	State Brownfield Areas
Eris Sites with Same Elevation	Major Roads	Indian Reserve Land	State Superfund Areas:Dept. of Defense
Eris Sites with Lower Elevation	Major Roads Ramps	Historic Fill	State Superfund Areas:NPL
Eris Sites with Unknown Elevation	Secondary Roads	100 Year Flood Zone	WQARF Areas
County Boundary	Secondary Roads Ramps	500 Year Flood Zone	Federal Lands: Dept. of Defense (owned/administered areas)
	Local Roads and Ramps		



Grid : 46

Order Number: 20302700358

Address: Middlesex County, Sudbury/Hudson, MA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
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- State Boundary
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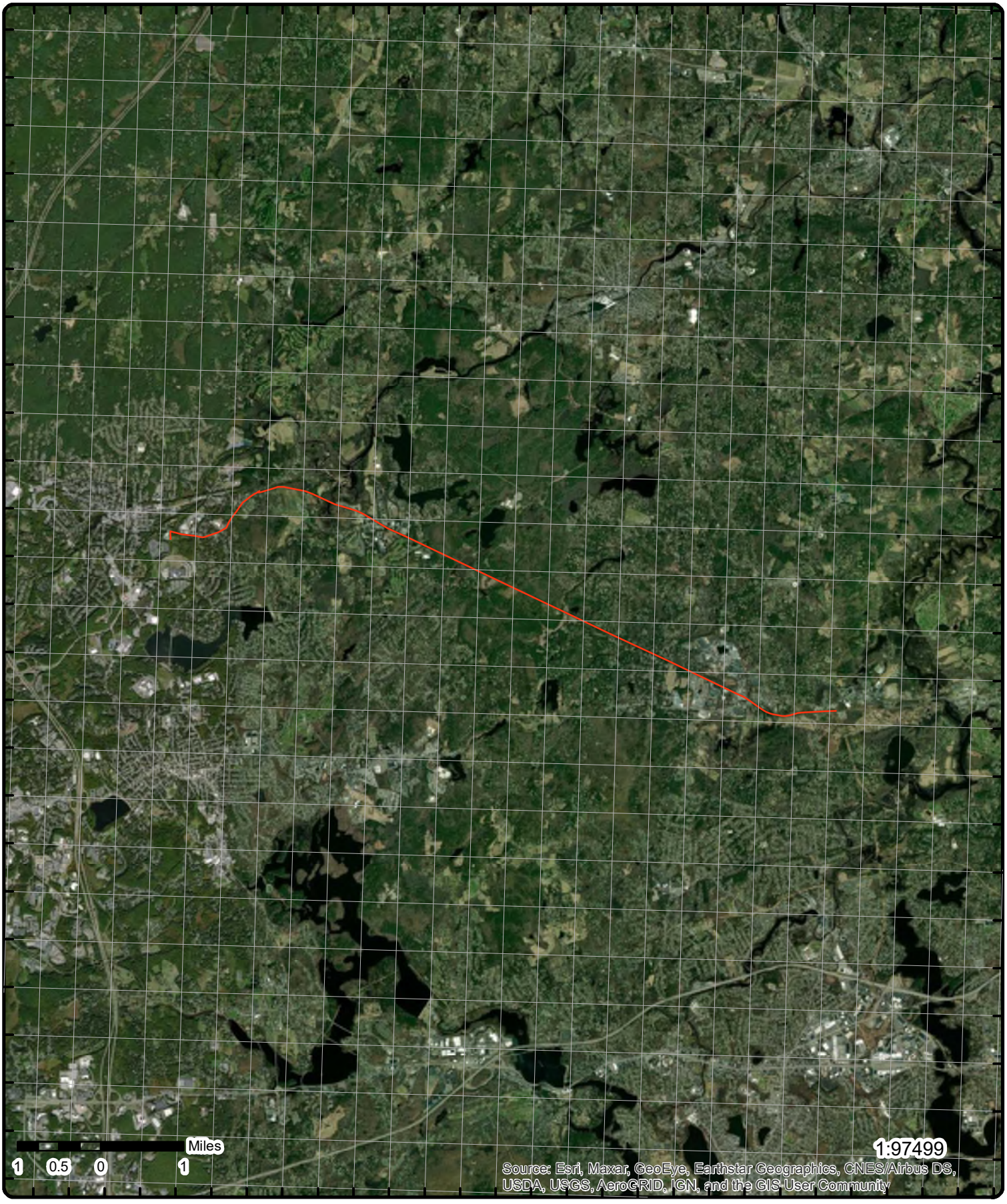
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)



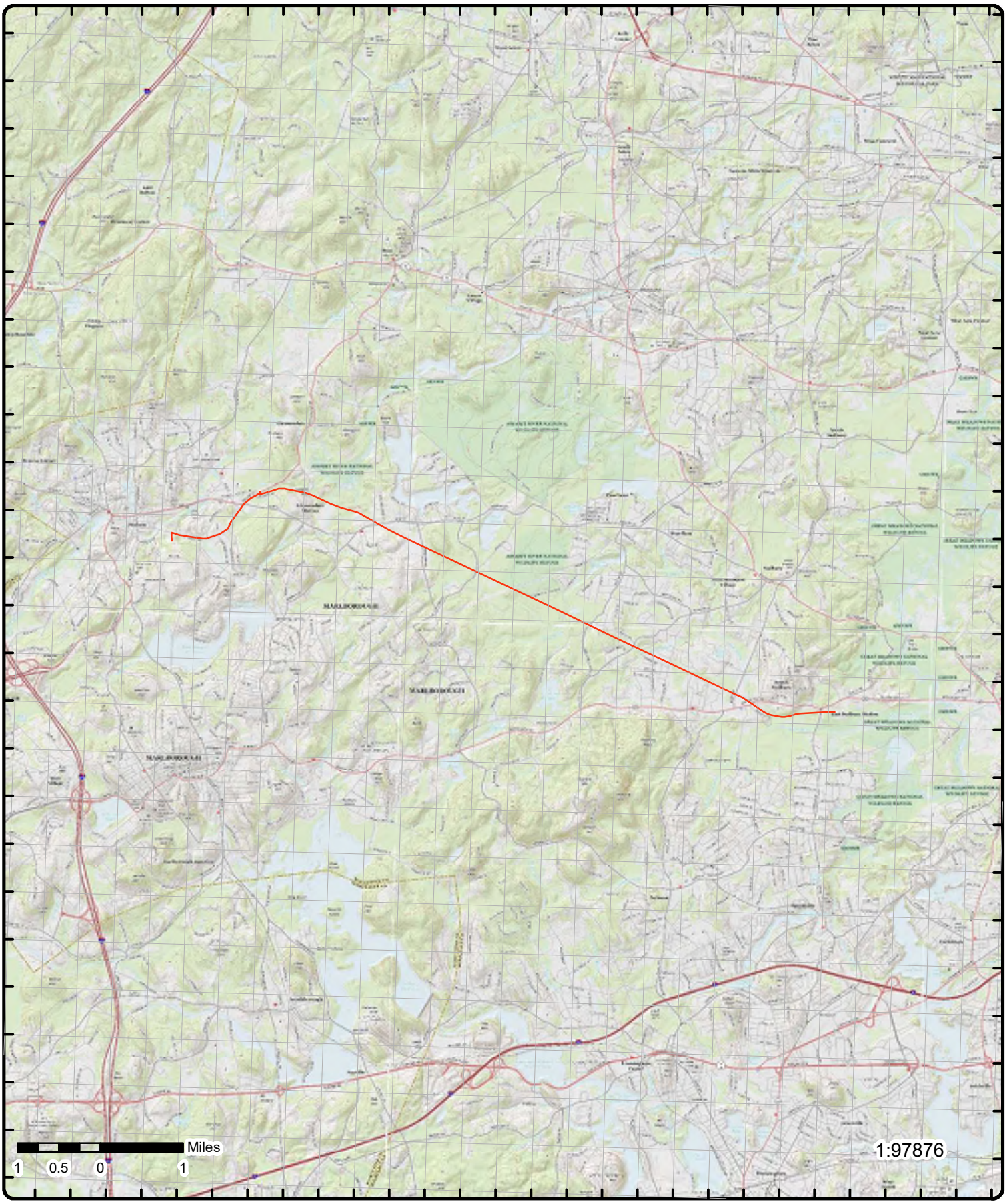
Aerial **Year: 2003**

Address: Middlesex County, Sudbury/Hudson, MA

Source: ESRI World Imagery

Order Number: 20302700358

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES



Topographic Map

Year: 2015

Order Number: 20302700358

Address: Middlesex County, MA

Quadrangle(s): Framingham,MA; Hudson,MA; Maynard,MA; Concord,MA; Marlborough,MA; Natick,MA

Source: USGS Topographic Map

APPENDIX C

Pre-characterization Sampling Locations

Summary of Properties of Concern
MBTA ROW
Transmission Line Project
Sudbury to Hudson, Massachusetts

Release Tracking Number (RTN)	Town	Address	Location Aid	Initial Notification Date	Current Regulatory Status	RAO Class	Contaminants	Proximity To Project	Sampling Recommended per MassDEP Rail Trail BMP	Segment
-	HUDSON	7 LEWIS STREET	ORCHARDS	-	-	-	Possible Pesticide Use	Abutting	No	Segment 1
-	HUDSON	CHESTNUT STREET	GLEASONDALE STATION	-	-	-	Coal Slag	On-Site	Yes	
-	HUDSON	CHESTNUT STREET	FORMER GRAVEL PITS	-	-	-	Hazardous Material	Abutting	No	
-	HUDSON	556 MAIN STREET	DRUM STORAGE	-	-	-	Oil and Hazardous Material	Abutting	Yes	Segment 2
-	HUDSON	556 MAIN STREET	CHEMICAL STORAGE	-	-	-	Oil and Hazardous Material	Abutting	Yes	
-	HUDSON	556 MAIN STREET	CONCRETE PLANT	-	-	-	Oil and Hazardous Material	Abutting	Yes	
2-68	HUDSON	555 MAIN STREET	ARROW AUTOMOTIVE IND INC	1/15/1987	RAO	C1	Oil	Abutting*	Yes	
2-16560	HUDSON	555 MAIN STREET	HUDSON MAIN 555 LLC	1/24/2007	RTN CLOSED	N/A	Hazardous Material	Abutting*	Yes	
-	HUDSON	566 MAIN STREET	AUTOMOTIVE SCRAP YARD	-	-	-	Oil and Hazardous Material	Abutting	Yes	
2-275	HUDSON	560 MAIN ST	M&M DRILLING KANE PERKINS	7/15/1987	RAO	A2	Oil	On-Site	Yes	
-	HUDSON	560 MAIN STREET	COMMERCIAL PRINTING	-	-	-	Hazardous Material	Abutting	Yes	
-	HUDSON	567 MAIN STREET	PLASTICS MANUFACTURER	-	-	-	Hazardous Material	Abutting	Yes	
2-10785	HUDSON	571 MAIN ST	SOUTH SIDE MAIN ST WEST OF PARMENTER RD	5/18/1995	RAO	B1	Hazardous Material	Abutting*	No	
2-204	HUDSON	577 MAIN ST	JAMES GORIN REALTY TRUST	1/15/1987	WCSPRM	N/A	Oil	Abutting*	No	
-	HUDSON	PARMENTER RD	ORDWAY STATION	-	-	-	Hazardous Material	On-Site	No	
-	HUDSON	43 PARMENTER RD	TOOL AND MACHINING COMPANY	-	-	-	Oil and Hazardous Material	Abutting	Yes	
2-248	HUDSON	51 PARMENTER RD	BOYD COATING RESEARCH CO	5/7/1987	RAO	B1	Oil	Abutting*	Yes	
2-722	STOW	FT DEVONS	FORT DEVENS TRAINING ANNEX	1/15/1990	ADEQUATE REG	N/A	Oil	On-site	Yes	Segment 3
-	SUDBURY	DUTTON RD	WAYSIDE INN STATION	-	-	-	Hazardous Material	On-Site	No	
3-24573	SUDBURY	33 BULKLEY RD	FORMER ROD & GUN CLUB	1/19/2005	RAO	A1	Hazardous Material	On-site	No	
3-27243	SUDBURY	528 BOSTON POST RD	NO LOCATION AID	11/6/2007	RAO	C1	Hazardous Material	Abutting*	Yes	Segment 4
3-3037	SUDBURY	528 BOSTON POST RD	RAYTHEON COMPANY	4/15/1990	PENNFA	N/A	Oil and Hazardous Material	Abutting*	Yes	
-	SUDBURY	526-528 BOSTON POST ROAD	RAYTHEON COMPANY	-	-	-	Hazardous Material	Abutting	Yes	
3-74	SUDBURY	33 UNION AVE	COATINGS ENGINEERING	2/11/1986	RAO	C2	Oil and Hazardous Material	On-site*	Yes	
-	SUDBURY	SOUTH SUDBURY STATION	97 UNION ROAD	-	-	-	Hazardous Material	On-Site	No	
3-2640	SUDBURY	39 UNION AVE	MULLEN LUMBER	1/15/1990	RAO	C1	Hazardous Material	On-site	Yes	
-	SUDBURY	46 UNION AVENUE	FORMER UST	-	-	-	Oil	Abutting	No	
-	SUDBURY	38-40 STATION ROAD	AUTOMOTIVE REPAIR	-	-	-	Oil	Abutting	Yes	
3-15581	SUDBURY	BOSTON POST RD (RTE 20)	CONCORD ST	9/29/1997	RAO	B1	Hazardous Material	Abutting*	No	
-	SUDBURY	46 MAPLE AVENUE	SEMS DATABASE	-	-	-	Hazardous Material	Abutting	No	
	SUDBURY	ROUTE 20 AT LANDHAM ROAD	SUDBURY AUTOMOTIVE	-	-	-	Oil and Hazardous Material	Abutting	Yes	
-	SUDBURY	LANDHAM ROAD	EAST SUDBURY STATION	-	-	-	Hazardous Material	On-Site	No	
3-33240	SUDBURY	209 BOSTON POST RD	GASOLINE SERVICE STATION	11/3/2015	TIER II	N/A	Oil	Abutting*	Yes	
-	SUDBURY	163 BOSTON POST ROAD	ELECTRICAL SUBSTATION	-	-	-	Oil and Hazardous Material	Abutting	No	
								TOTAL NUMBER OF SITES		34

Notes:

N/A - Not Applicable
PENNFA - Pending DEP No Further Action
RAO - Response Action Outcome
RTN - Release Tracking Number
UNCLASSIFIED - New Site Pending Initial Response Actions
WCSPRM - Waiver Completion Statement Submitted
* - Disposal site boundary not provided in available reports and has been approximated.

Active MassDEP Disposal Site
MassDEP Disposal Site: Regulatory Closure Achieved
Other Environmental Concerns Identified During Assessment

The table above is a summary of disposal sites where a documented release of oil and/or hazardous materials has been reported. The information is taken from the MassDEP Bureau of Waste Site Cleanup online database and may be subject to inaccuracies. Other environmental concerns such as nearby underground storage tanks, environmentally-sensitive industries (gas stations, drycleaners, automotive repair), hazardous waste generators, etc. may have the potential to impact the Project. In addition, the Project is located partially within a former railroad right-of-way, which are typically sources of oil and/or hazardous materials due to pesticide application associated with vegetation management, train exhaust, non-native fill used to bring tracks to grade, and other vehicle releases.

APPENDIX D

Geotechnical Investigation Report

LGCI
Lahlaf Geotechnical Consulting, Inc.

December 7, 2018

Ms. Paige Cornell
Vanasse Hangen Brustlin, Inc.
101 Walnut Street
Watertown, MA 02472
Phone: (617) 607-2956
Fax: (617) 924-2286
E-mail: PCornell@VHB.com

Re: **Geotechnical Report**
Proposed Transmission Power Line Borings
Sudbury, Massachusetts
LGCI Project No. 1836

Dear Ms. Cornell:

Lahlaf Geotechnical Consulting, Inc. (LGCI) has completed a geotechnical study for the proposed Transmission Power Line Borings in Sudbury, Massachusetts. We are submitting this report electronically, please notify us if you need a hard copy.

The soil samples from our explorations are currently stored at LGCI for further analysis, if requested. Unless notified otherwise, we will dispose of the soil samples after three months.

Thank you for choosing LGCI as your geotechnical engineer.

Very truly yours,

Lahlaf Geotechnical Consulting, Inc.

Jennifer F. Todd, P.E.
Geotechnical Engineer

Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

LGCI
Lahlaf Geotechnical Consulting, Inc.

GEOTECHNICAL REPORT
PROPOSED TRANSMISSION POWER LINE BORINGS
SUDBURY, MASSACHUSETTS

LGCI Project No. 1836
December 7, 2018

Prepared for:

VANASSE HANGEN BRUSTLIN, INC.
101 Walnut Street
Watertown, MA 02472
Phone: (617) 607-2956
Fax: (617) 924-2286

GEOTECHNICAL REPORT
PROPOSED TRANSMISSION POWER LINE BORINGS
SUDBURY, MASSACHUSETTS
LGCI Project No. 1836
December 7, 2018

Prepared for:

VANASSE HANGEN BRUSTLIN, INC.
101 Walnut Street
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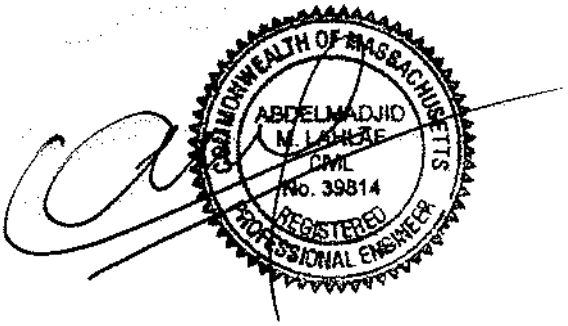
Prepared by:

LAHLAF GEOTECHNICAL CONSULTING, INC.
100 Chelmsford Road, Suite 2
Billerica, Massachusetts 01867
Phone: (978) 330-5912
Fax: (978) 330-5056



Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

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1. PROJECT INFORMATION

1.1 Project Authorization

This report presents the results of subsurface explorations and a geotechnical evaluation performed by Lahlaf Geotechnical Consulting, Inc. (LGCI) for the proposed transmission power line in Sudbury, Massachusetts. We performed our services in general accordance with our proposal No. 16006-Rev. 3 dated January 23, 2016 and revised June 19, 2018.

1.2 Purpose and Scope of Services

The purpose of this geotechnical study was to obtain subsurface information at the site and to provide foundation design and construction recommendations for the utility vaults along the proposed transmission power line. LGCI performed the following services:

- Provided a geotechnical senior and field engineer to attend a site meeting with VHB representatives and the drilling subcontractor's crew on May 22, 2018.
- Provided a geotechnical field engineer at the site. The engineer coordinated and observed the borings, described the soil samples, and prepared field logs.
- Submitted six (6) stream bed samples for laboratory testing.
- Performed one (1) borehole permeability test.
- Prepared this geotechnical report containing the results of our subsurface explorations and our recommendations for foundation design and construction related to the proposed transmission power line.

A report presenting the results of our geotechnical services for the Hudson portion of this project was submitted on August 16, 2018. That report was reviewed and comments from Vanasse Hangen Brustlin, Inc. (VHB) were addressed in a revised report submitted on September 14, 2018.

This report presents the results of our geotechnical services for the Sudbury portion of this project.

Our scope did not include attending meetings, preparing specifications, reviewing contract documents and shop drawings, or providing construction services. LGCI would be pleased to perform these services when needed. Recommendations for stormwater management, erosion control, pavement design, subgrade preparation for roadways and other paved areas, slope stability analyses, and detailed cost or quantity estimates are not included in our scope of work.

Our scope does not include performing environmental services for this project. LGCI did not perform an environmental assessment to evaluate the presence or absence of wetlands or analytical testing for hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below this site, or mold in the soil or any structure at this site. Any statement about the color, odor, or the presence of suspicious materials included in our boring logs or report were made by LGCI for information only and to support our geotechnical services. No environmental recommendations and/or opinions are included in this report.

1.3 Site Description

Our understanding of the existing conditions is based on field observations, our discussions with VHB, and on the following drawing:

- "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," (NOI Plans) prepared by VHB and dated February 5, 2018.

The site extends along an abandoned Massachusetts Bay Transit Authority (MBTA) railroad. The abandoned railroad extends along the MBTA right-of-way (ROW) through the town of Sudbury. Sections of the abandoned railroad tracks are built on an embankment, other sections are below the surrounding ground surface, and a few sections are at grade with the surrounding ground surface. The embankment is typically about 2 to 6 feet high, 10 feet to 25 feet wide at the top, and 30 to 40 feet wide at the bottom. In a few areas, the sides of the embankment are part of a slope that is up to about 20 feet tall and continues out beyond the MBTA ROW. The sections of the abandoned railroad tracks below the surrounding ground surface were between about 2 feet and 6 feet below the surrounding ground surface.

The abandoned railroad extends through wooded areas and wetlands. The abandoned railroad crosses the Hop Brook over an existing steel bridge. Private properties border the MBTA ROW on either side. The railroad intersects with Dutton Road, Horse Pond Road, Union Avenue, Boston Post Road, and Landham Road. Figure 1 shows the approximate extent of the project site.

The ground surface elevations of this portion of the project range between El. 200 on the western side and El. 135 on the eastern side, with a local low of El. 124 near the easternmost crossing of Hop Brook.

1.4 Project Description

Our understanding of the proposed transmission power line is based on our discussions with VHB, the NOI Plans listed in Section 1.3, and the following drawings:

- "Line 1151 South End Glenbrook, 115-kV Underground Transmission Line, Splice Vault Detail, Stamford, Connecticut," prepared by Northeast Utilities Service Co. and dated May 10, 2013.

- "Cross Sections, Sudbury Hudson Transmission Line Reliability Project, Hudson, Stow, Marlborough, & Sudbury, Massachusetts," (Cross Sections) prepared by VHB for Eversource Energy and dated July 2, 2018.

- "Typical Sections, Sudbury Hudson Transmission Line Reliability Project, Hudson, Stow, Marlborough, & Sudbury, Massachusetts," (Typical Sections) prepared by VHB for Eversource Energy and dated July 2, 2018.

We understand that Eversource Energy (Eversource) engaged VHB to coordinate and observe a subsurface exploration for its proposed transmission power line. The transmission power line will be a 115-kV underground transmission power line connecting a substation in Hudson to a substation in Sudbury and will extend along a proposed bike path that will be constructed along the abandoned railroad bed.

We understand that the construction of the proposed transmission power line will include twenty-eight (28) vaults, three (3) bridges, and two (2) retaining walls as follows:

- Fourteen (14) vaults in Hudson and fourteen (14) vaults in Sudbury;
- Two (2) bridges (Chestnut Street Bridge and Fort Meadow Brook Bridge) in Hudson, and one (1) bridge (Hop Brook Bridge No. 127) in Sudbury.
- One (1) retaining wall in Hudson and Stow and one (1) retaining wall in Sudbury.

This report focuses on the portion of the proposed transmission power line in Sudbury. Recommendations for the portion of the line in Hudson and Stow were contained in a separate report listed in Section 1.2.

The Sudbury portion of the transmission power line extends approximately 4.5 miles. The proposed transmission power line will be installed within a trench that will generally extend to depths of about 5 feet beneath the ground surface. We understand that the proposed transmission power line will be encased in concrete.

We understand that the proposed vaults will be spaced 1,500 to 1,900 feet apart. We also understand that the proposed vaults will have a length of 24 feet, a width of 8 feet, and a height of 8 feet. VHB indicated to us that the vaults will likely have a wall thickness of 6 inches. The vaults will be designed with two (2) 3-foot manholes per vault. The vaults are generally placed at a depth of 11 feet. This is to provide 2 feet between the top of the vault and the proposed finished grade for manhole brick work.

Based on the Cross Sections, the proposed retaining wall will extend from about Sta. 724+00 to Sta. 735+00, i.e., and will be about 1100 feet long. The current design includes sheet piles for

the proposed wall with a concrete cap on top. Information about the height of the proposed retaining wall was not available at the time of this report.

1.5 Elevation Datum

We understand that elevations shown in the NOI Plans are referenced with respect to the North American Vertical Datum (NAVD) of 1988 and are in feet.

2. SITE AND SUBSURFACE CONDITIONS

2.1 Surficial Geology

LGCI reviewed the surficial geological map titled: "Surficial Geologic Map of the Clinton-Concord-Grafton-Medfield 12-Quadrangle Area in East Central Massachusetts," compiled by Bryon D. Stone and Janet R. Stone for U.S. Geological Survey, Open-File report (2006).

The geologic map indicates that a variety of surficial deposits exist along the alignment of the proposed power line. The deposits covering the most area, as shown on the geologic map, are coarse deposits consisting of a mixture of gravel- and sand-sized material. The deposits covering the next largest area shown on the geologic map are fine deposits consisting of very fine sand, silt, and clay occurring in well sorted layers. Also present in the general vicinity of the site, are swamp deposits, till, floodplain alluvium, artificial fill, and bedrock outcrops. The surficial geologic maps of the site are shown in Figures 2A and 2B.

2.2 LGCI's Borings

VHB engaged Geosearch, Inc. (Geosearch) of Sterling, Massachusetts to advance forty (40) borings for the Sudbury portion of the project between September 5 and November 14, 2018 as follows:

- Two (2) borings (B-BB-5 and B-BB-6) for the proposed bridge, the results of which are included in a separate report;
- Five (5) borings (B-GB-17 to B-GB-21) for the proposed retaining wall; and
- Thirty-three (33) borings, B-28 to B-42, B-51, B-GB-1 to B-GB-3, B-GB-5, and B-MP-27 to B-MP-39, for the proposed transmission power line.

The bridge borings, B-BB-5 and B-BB-6, extended to depths of 54 and 51 feet beneath the ground surface respectively. The retaining wall borings, B-GB-17 to B-GB-21, extended to depths ranging between 20 and 23 feet beneath the ground surface. The power line borings, B-28 to B-42, B-51, B-GB-1 to B-GB-3, B-GB-5, and B-MP-27 to B-MP-39, extended to depths ranging between 2.5 and 17 feet beneath the ground surface. An LGCI engineer observed and logged the borings in the field. A representative from VHB was on site to collect soil samples from the borings along the proposed transmission power line for laboratory testing, including thermal resistivity, oil and/or hazardous materials, proctor, and grain-size analysis. The results of the tests performed by VHB are not included in our report.

The borings were advanced in grass areas along the abandoned MBTA railroad and were advanced with a CME 55 LC rubber track ATV rig by employing 4 ¼-inch hollow stem augers, except for the bridge borings, B-BB-5 and B-BB-6, which were advanced with a 3- and 4-inch casing using drive and wash techniques. Boring B-39, where a borehole permeability test was performed, was also advanced with a 3-inch casing using drive and wash techniques.

The drillers performed Standard Penetration Tests (SPT) and obtained split spoon samples with an automatic hammer typically at depth intervals of 2 feet or 5 feet, as noted on the boring logs, in general accordance with ASTM D-1586. We understand that the samples will be transmitted to VHB. Unless notified otherwise, we will dispose of the soil samples after three months.

Figures 3A to 3Z, and 3AA to 3AC show the boring locations, and Appendix A contains LGCI's boring logs. The ground surface elevations noted on the boring logs were interpolated to the nearest foot from the NOI Plans.

2.3 Subsurface Conditions

2.3.1 General

The subsurface description in this report is based on a limited number of borings and is intended to highlight the major soil strata encountered during our borings. The subsurface conditions are known only at the actual boring locations. Variations may occur and should be expected between boring locations. The boring logs represent conditions that we observed at the time of our explorations and were edited, as appropriate, based on inspection of the soil samples in the laboratory. The strata boundaries shown in our boring logs are based on our interpretations and the actual transition may be gradual. Graphic soil symbols are for illustration only.

Our subsurface descriptions were broken down into two sections: proposed transmission power line borings and retaining wall borings.

2.3.2 Proposed Transmission Power Line Borings

This section describes the subsurface conditions encountered in the borings along or near the alignment of the proposed transmission power line, including borings B-28 to B-42, B-51, B-GB-1 to B-GB-3, B-GB-5, and B-MP-27 to B-MP-39.

The soil strata encountered in the borings were as follows, starting at the ground surface:

Surficial Organic Soil – A surficial layer of forest mat and organic topsoil was encountered in borings B-28 to B-34, B-37 to B-39, B-41 to B-42, B-MP-27 to B-MP-39, and B-GB-5. This layer generally consisted of silty sand with organic fines, roots, leaves, grass, and wood. This layer had a thickness ranging between 0.1 and 2 feet but was generally less than 0.5 feet thick.

Fill – A layer of fill was encountered underneath the surficial organic layer, except in borings B-30 to B-32, and B-MP-27 to B-MP-29. The fill extended to depths ranging up to 11 feet. Borings B-37, B-38, and B-MP-37 terminated in the fill at depths of 10, 16, and 10 feet, beneath the ground surface, respectively.

The fill was mostly described as silty sand and less frequently as poorly graded sand or well graded sand. There were three (3) samples in boring B-MP-34 that were described as silty gravel or poorly graded gravel. One (1) sample in boring B-51 was described as silt. The fines content in the fill ranged up to 45 percent, but generally ranged between 5 and 30 percent. The gravel content in the fill ranged up to 40 percent, but generally ranged between 5 and 15 percent. The fill contained traces of organic fines, coal ash, roots, coal, and wood.

The Standard Penetration Test (SPT) N-values in this layer ranged between 3 and greater than 120 blows per foot (bpf), with most values lower than 20 bpf indicating very loose to medium dense material.

Buried Organic Soil and Swamp Deposits – A layer of buried organic soil and swamp deposits was encountered beneath the fill in borings B-GB-5, B-GB-18, B-GB-20, B-MP-32, B-MP-36 and extended to depths of up to 11.1 feet beneath the ground surface. The buried organics contained fibrous peat, organic fines, and roots.

Sand – A layer of sand was encountered beneath the surficial organic soil, fill, or buried organic soil in all the borings and extended to the boring termination depths except in borings B-36, B-37, B-38, and B-MP-37. The sand layer was mostly described as silty sand and less frequently as poorly graded sand. The sand layer also contained samples described as well graded sand, silty gravel, and silt. The fines content in the sand ranged up to 45 percent, but generally ranged between 5 and 35 percent. The gravel content in the sand ranged up to 35 percent, but generally ranged between 5 and 15 percent.

The SPT N-values in the sand ranged between 6 and greater than 120 bpf, with most values between 10 and 50 bpf indicating medium dense to dense sand.

Bedrock – Bedrock was confirmed by using coring techniques in boring B-36. The top of the bedrock was at a depth of 6.0 feet beneath the ground surface. The bedrock was described as hard, slightly weathered, slightly fractured, fine-grained, gray with black mottles Granite. The rock recovery values ranged between 61.1 and 87.5 percent and the rock quality designation (RQD) values ranged between 72.7 and 85.7 percent.

2.3.3 Proposed Retaining Wall Borings

This section describes the subsurface conditions encountered in the borings along or near the alignment of the proposed retaining wall, including borings B-GB-17 to B-GB-21.

The soil strata encountered within the borings were as follows, starting at the ground surface:

Forest Mat – A layer of forest mat was encountered at the ground surface of all five (5) borings. The forest mat thickness ranged between 1 and 4 inches.

Fill – A layer of fill was encountered beneath the forest mat in all the borings advanced along or near the alignment of the proposed retaining wall. The fill extended to depths ranging between 6.4 and 12.0 feet beneath the ground surface. The fill was mostly described as silty sand. One (1) sample was described as well graded sand with silt and one (1) sample was described as silt. The fines content in the fill ranged between 5 and 35 percent. The gravel content in the fill ranged between 5 and 30 percent. The fill contained traces of angular stone fragments, organic fines, coal ash, coal, and roots.

The SPT N-values of the fill ranged between 5 and 106 bpf, with most values lower than 24 bpf, indicating loose to medium dense material. The relatively high SPT N-Values recorded in the fill may be caused by cobbles and boulders in the fill and may not represent the true density.

Swamp Deposits – A layer of swamp deposits was encountered beneath the fill in borings B-GB-18 and B-GB-20. The buried organics extended to depths ranging between 10 and 11.1 feet beneath the ground surface. The buried organics consisted of silty sand with traces of organic fines, peat fibers, and roots. Two (2) samples from boring B-GB-18 were described as organic silt.

Sand – A layer of sand was encountered beneath the fill or buried organics in all borings advanced near the alignment of the proposed retaining wall. The sand layer extended to the termination depth of the borings except in boring B-GB-20. The sand was mostly described as silty sand. Two (2) samples were described as well graded sand with silt, two (2) samples were described as silt, and one (1) sample was described as silty gravel. The fines content in the sand ranged between 15 percent and 45 percent. The gravel content in the sand ranged between 15 and 40.

The SPT N-values in the sand ranged between 4 and over 120 bpf, with most values between 14 and 50 bpf, indicating mostly medium dense to dense sand.

Bedrock – Bedrock was confirmed by using coring techniques in boring B-GB-20. The top of the bedrock was at a depth of 18.0 feet beneath the ground surface. The bedrock was described as hard, slightly weathered, slightly fractured, fine-grained, gray with white and green mottles Granite. The rock recovery value was 100 percent and the RQD value was 85 percent.

2.4 Groundwater

2.4.1 General

The groundwater data obtained during drilling and reported in this report is based on observations made during or shortly after completion of our explorations and may not represent the actual groundwater levels, as additional time may be required for the

groundwater to stabilize. The groundwater levels presented in this report only represent the conditions encountered at the time and location of our explorations. Seasonal fluctuation should be anticipated.

Please note that our groundwater measurements were performed during the period between September and November 2018. Seasonal fluctuation should be anticipated. The groundwater levels are anticipated to be higher during the months of the wet season in early spring.

2.4.2 Proposed Transmission Power Line

Groundwater was encountered in all the borings advanced along or near the alignment of the proposed transmission power line, except in borings B-32, B-34, B-35, B-37, B-GB-1 to B-GB-3 and B-MP-28. Groundwater was encountered at depths of up to 15 feet beneath the ground surface, but generally ranged between 4 and 10 feet beneath ground surface.

2.4.3 Proposed Retaining Wall

Groundwater was encountered in all the borings along or near the alignment of the proposed retaining wall at depths of up to 6.8 feet beneath the ground surface, but generally ranged between 3.5 and 6.0 feet beneath ground surface.

2.5 Borehole Permeability Tests

LGCI performed one (1) falling head borehole permeability test in boring B-39. The test was performed by filling the drill casing with water and measuring the drop in water level inside the casing. The test was performed at a depth range of 12 feet to 14 feet below ground surface.

The results of the borehole permeability test is included in Appendix C. The results indicate that permeability of the soil at a depth of 12 to 14 feet in boring B-39 is about 2.7×10^{-4} cm/sec.

2.6 Laboratory Test Data

LGCI submitted six (6) stream bed samples from Hop Brook near the northern and southern sides of the existing steel bridge. The stream bed samples were obtained either in the middle of the stream or near the shore, and approximately 5 to 10 inches underwater. The results are summarized in the table below. The laboratory data sheets are included in Appendix B.

Results of Grain-size Analyses

Location	Sample No.	Stratum	Sample depth (ft.)	Percent Gravel	Percent Sand	Percent Fines
Southern Side of Existing Hop Brook bridge, Western Bank	S1	Topsoil	0.0 – 0.3	0.0	61.0	39.0
Southern Side of Existing Hop Brook Bridge, Eastern Bank	S2	Topsoil	0.0 – 0.3	20.6	60.0	19.4
Southern side of Existing Hop Brook Bridge, Middle of Stream	S3	Stream Bed	0.0 – 0.4	3.9	73.8	22.3
Southern side of Existing Hop Brook Bridge, Middle of Stream	S4	Stream Bed	0.4 – 0.9	0.0	84.8	15.2
Northern Side of Existing Hop Brook Bridge, Middle of Stream	S5	Stream Bed	0.0 – 0.4	0.0	73.7	26.3
Northern Side of Existing Hop Brook Bridge, Middle of Stream	S6	Stream Bed	0.4 – 0.9	0.5	76.9	22.6

3. EVALUATION AND RECOMMENDATIONS

3.1 General

Based on our understanding of the proposed transmission power line, our observation of the borings, and the results of our laboratory testing, there are a few issues that we would like to highlight for consideration and discussion.

- Buried organic soil was encountered in many borings. The depth to the bottom of the organic soil was generally less than 10 feet. The proposed vaults should be supported on Structural Fill placed directly on top of the natural sand. Our recommendations for bearing resistance for the proposed vaults are presented in Section 3.2.

- The sheet pile retaining wall is well suited for the subsurface conditions encountered in our borings, as it will not require the removal of the existing fill and the buried organic soil. The presence of the organic soil may result in longer sheet piles. Also, fill placed to raise the grades near the proposed retaining wall will result in settlement induced by the compression of the buried organic soil. This settlement will not affect the proposed vaults, transmission power lines, or sheet pile retaining wall. The contractor should be prepared to pre-trench to remove boulders at locations where boulders are encountered ahead of the sheet pile driving operations.

- The subsurface conditions encountered in our borings are in general suitable to support the proposed duct bank encasement of the proposed transmission power line as the trench for the proposed transmission power line will terminate in existing fill or natural soil. In a few locations, the proposed transmission power line trench will terminate in the organic soil or at the bottom of the existing fill, just above the organic soil. At these locations, we recommend over-excavating the organic soil and backfilling the trench to the bottom of the proposed transmission power line using suitable backfill. Where the organic soil is more than 2 feet from the bottom of the proposed transmission power line trench, the organic soil should not be removed. Additional recommendations for supporting the proposed transmission power line are presented in Section 4.1.

- Drill chattering was observed in several borings along the MBTA railroad. The contractor should be prepared to encounter boulders during excavation and should be prepared to remove the boulders from the site including possibly performing pre-trenching for the sheet piles.

- Rock was encountered in one of the proposed wall borings, B-GB-20 at a depth of 18 feet beneath the ground surface. We do not anticipate that the depth to rock will interfere with the proposed sheet pile walls, unless the proposed wall has heights such that the required embedment is more than 18 feet. Rock was also encountered in boring B-36. The excavation for the proposed vault and power line trench will require rock excavation at this location.

- The existing fill along the MBTA railroad contained varying amounts of organic matter and coal. Due to the presence of coal ash, these materials will have to be pre-characterized before disposal offsite. To reduce the quantity of material to be disposed of offsite, the contractor should be prepared to segregate the inorganic portion of the existing fill and amend it as needed to improve its gradation for reuse as backfill. Our recommendations for fill materials and for reuse of onsite materials are presented in Sections 4.3 and 4.4, respectively.

- We anticipate that groundwater control will be required to construct the proposed vaults. The design and the construction sequence should be performed so as to allow for the construction of the proposed vaults in a dry excavation and to reduce the potential for uplift of the vault at the end of dewatering operations. Groundwater control will also be required along portions of the transmission power line trenches. Our recommendations for groundwater control are presented in Section 4.7.

- Foundations should be designed in accordance with the requirements of the Massachusetts State Building Code, Ninth Edition (MSBC 9th edition).

3.2 Vault Recommendations

- We recommend supporting the proposed vaults on a minimum of 12 inches of Structural Fill bearing on natural sand. In areas where the proposed transmission power line trench terminates in the buried organic soil or less than 2 feet from the top of the organic soil, the organic soil should be removed at least 2 feet beneath the bottom of the trench or to the natural sand, whichever occurs first.

- We recommend an allowable bearing pressure of 3 kips per square foot (ksf) for vaults bearing on natural sand.

- The vaults should be designed with slabs and walls thick enough such that the weight of the vault resists uplift pressure. We recommend a minimum factor of safety of 1.1 against uplift.

- We recommend that the vault walls be designed using at-rest pressure and to resist the hydrostatic pressure as described in section 3.4.

3.3 Seismic Design

In accordance with Section 1613 of MSBC 9th Edition, the seismic criteria for the site are as follows:

Site Class:	D
Spectral Response Acceleration at short period (S_S):	0.203g
Spectral Response Acceleration at 1 sec. (S_1):	0.069g
Site Coefficient F_a (Table 1613.2.3(1)):	1.6
Site Coefficient F_v (Table 1613.2.3(2)):	2.4
Adjusted spectral response S_{MS}:	0.325 g
Adjusted spectral responses S_{M1}:	0.166g

Based on our observations of the borings, the natural soil layer at the site is not susceptible to liquefaction during a seismic event.

3.4 Lateral Pressures for Wall Design

Lateral earth pressures recommended for design of the proposed retaining wall and vault walls are provided in the section below.

We recommend using the following values for retaining wall design:

Coefficient of Active Earth Pressure, K_A:	0.31
Coefficient of Active Earth Pressure, K_P in Top 5 feet	2.0
Coefficient of Active Earth Pressure, K_P at depths greater than 5 feet:	4.1
Coefficient of At-Rest Earth Pressure, K_o:	0.50
Friction Angle between Backfill and Back of Wall, δ:	10 degrees
Total Unit Weight, γ:	120 pcf
Buoyant Unit Weight γ':	57.4 pcf

Note: The coefficient of active pressure value is based on Coulomb's equation using an internal friction angle for the backfill, ϕ, of 30 degrees and a friction angle between the backfill and the structure, δ, of 10 degrees. The coefficients of active and at-rest earth pressure are provided for wall backfill with a horizontal surface (non-sloping backfill) on the active side for the retaining wall. The coefficient of passive earth pressure is provided for a sloping ground with a slope of 3H:1V in the top 5 feet.

- The proposed vault walls should be designed using the "at-rest" pressure coefficient.
- The length of the proposed sheet pile wall obtained using the design parameters recommended above should be increased by the thickness of the buried topsoil.
- We recommend placing free-draining material consisting of Structural Fill or crushed stone within the 3 feet immediately behind retaining walls. The sheet pile wall should be provided with weep hole near the bottom of the wall to promote drainage.
- The design of the sheet pile wall should include a traffic surcharge equivalent to 200 pounds per square foot.

3.5 Seismic Pressure

In accordance with the MSBC 9th Edition, Section 1610, a lateral earthquake force equal to $0.100*(S_s)*(F_a)*\gamma*H^2$ should be included in the design of walls (for horizontal backfill), where S_s is the maximum considered earthquake spectral response acceleration (defined in Section 3.3), F_a is the site coefficient (defined in Section 3.3), γ is the total unit weight of the soil backfill, and H is the height of the wall.

The earthquake force should be distributed as an inverted triangle over the height of the wall. In accordance with MSBC 9th Edition, Section 1610.2, a load factor of 1.43 shall be applied to the earthquake force for wall strength design.

Temporary surcharges should not be included when designing for earthquake loads. Surcharge loads applied for extended periods of time shall be included in the total static lateral soil pressure and their earthquake lateral force shall be computed and added to the force determined above.

4. CONSTRUCTION CONSIDERATIONS

4.1 Subgrade Preparation

- Existing fill, organic soil, abandoned utilities, and other below-ground structures should be entirely removed from within an area extending at least 2 feet beyond the limits of the proposed vaults.

- The proposed vault excavations should extend to 12 inches below the proposed bottom of vaults. Should existing fill, organic soil, or other deleterious material be present at these depths, it should be removed and replaced with compacted Structural Fill to the top of the natural sand or 2 feet beneath the bottom of the proposed vault, whichever occurs first.

- The subgrade of the vaults in the natural sand, should be compacted with a dynamic vibratory compactor imparting a minimum of 10 kips of force to the subgrade.

- Should boulders be encountered at the vault subgrade, the boulders should be removed, and the resulting excavation should be backfilled with compacted Structural Fill meeting the gradation requirements in Section 4.3.

- Loose or soft soils identified during the compaction of the foundation subgrades that cannot be compacted in place should be excavated to a suitable bearing stratum as determined by the representative of LGCI. Grades should be restored by backfilling with Structural Fill.

- When crushed stone is required in the drawings or it is used for the convenience of the contractor, it should be wrapped in a geotextile fabric for separation except where introduction of the geotextile promotes sliding. A geotextile should not be placed between the bottoms of the foundations and crushed stone.

- The proposed transmission power line trench should extend to at least 12 inches beneath the bottom of the transmission power line. Where the excavation terminates in organic soil or less than 2 feet from the top of the organic soil, the excavation should be continued to the natural sand layer or 2 feet beneath the bottom of the transmission power line, whichever occurs first. The over-excavation should be backfilled with Ordinary Fill meeting the gradation requirements in Section 4.3.

- An LGCI representative should observe the exposed foundation subgrades prior to fill and concrete placement to verify that the exposed bearing materials are suitable for the design soil bearing pressure. If soft or loose pockets are encountered in the foundation excavations, the soft or loose materials that cannot be compacted in place should be removed, and the bottom of the foundation should be placed at a lower elevation on firm soil, or the resulting excavation should be backfilled with Gravel Borrow, or crushed stone wrapped in a filter fabric.

4.2 Subgrade Protection

The onsite natural sand is frost susceptible. If construction takes place during freezing weather, special measures should be taken to prevent the subgrade from freezing. Such measures should include the use of heat blankets or excavating the final six inches of soil just before pouring concrete. Soil used as backfill should be free of frozen material, as should the ground on which it is placed. Filling operations should be halted during freezing weather.

Materials with high fines content are typically difficult to handle when wet as they are sensitive to moisture content variations. Subgrade support capacities may deteriorate when such soils become wet and/or disturbed. The contractor should keep exposed subgrades properly drained and free of ponded water. Subgrades should be protected from machine and foot traffic to reduce disturbance.

4.3 Fill Materials

Structural Fill and Ordinary Fill should consist of inert, hard, durable sand and gravel, free from organic matter, clay, surface coatings and deleterious materials, and should conform to the gradation requirements shown below.

4.3.1 Structural Fill

The Structural Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Structural Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of optimum moisture content.

Sieve Size	Percent Passing by Weight
3 inches	100
1 ½ inch	80 - 100
½ inch	50 – 100
No. 4	30 – 85
No. 20	15 – 60
No. 60	5 – 35
No. 200*	0 – 10

4.3.2 Ordinary Fill

Ordinary Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Ordinary Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of optimum moisture content.

Sieve Size	Percent Passing by Weight
6 inches	100
1 inch	50 - 100
No. 4	20 – 100
No. 20	10 - 70
No. 60	5 – 45
No. 200	0 – 20

4.4 Reuse of Onsite Materials

Based on our field observations and the results of the grain-size analyses, we do not anticipate that the site soils will meet the gradation requirements of Structural Fill. Some of the existing fill meets the gradation requirements of Ordinary Fill. Some of the poorly graded sand that could be reused as Ordinary Fill may become difficult to compact, due to the fines content, when exposed to moisture and should be kept under strict moisture control.

Should the contractor encounter materials potentially suitable for reuse during earthwork operations, the contractor should avoid mixing the reusable soils with unsuitable soils. The soils to be reused should be excavated and stockpiled separately for compliance testing. The contractor should be prepared to amend the existing fill free of organics to meet the gradation requirements for Ordinary Fill for reuse as trench backfill.

Soils with 20 percent or greater fines content are generally very sensitive to moisture content variations and are susceptible to frost. Such soils are very difficult to compact at moisture contents that are much higher or much lower than the optimum moisture content determined from the laboratory compaction test. Therefore, strict moisture control should be implemented during compaction of onsite soils with fines contents of 20 percent or greater. The contractor should be prepared to remove and replace such soils if pumping occurs.

4.5 Contractor Submittals

The contractor should submit details about the construction procedures, including:

- The proposed construction sequence;
- Temporary earth support system for the proposed vaults if any; and
- Groundwater control system.

Contractor submittals should be prepared and sealed by a professional engineer registered in the Commonwealth of Massachusetts and should be submitted for review at least two weeks before the start of the work.

4.6 Temporary Excavations

All excavations to receive human traffic should be constructed in accordance with the OSHA guidelines.

The site soils should generally be considered Type "C" and should have a maximum allowable slope of 1.5 Horizontal to 1 Vertical (1.5H:1V) for excavations less than 20 feet deep. Deeper excavations, if needed, should have shoring designed by a professional engineer.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of the excavation sides and bottom.

4.7 Groundwater Control Procedures and Flow Rate Estimates

4.7.1 General

We anticipate that groundwater control procedures will be needed during the excavation for the proposed vaults to handle the groundwater. We recommend that the contractor design and submit a plan to collect and remove groundwater prior to the start of the excavations. Such a plan should include, at a minimum, multiple sump pump pits extending at least 3 feet beneath the bottom of the excavation.

Groundwater levels should be maintained at a minimum of 1-foot below the bottom of excavations during construction. The contractor should be permitted to employ whatever commonly accepted means and practices are available to dewater.

To reduce the potential for sinkholes developing over sump pump pits after the sump pumps are removed, the crushed stone placed in the sump pump pits should be wrapped in a geotextile fabric. Alternatively, the crushed stone should be entirely removed after the sump pump is no longer in use and the sump pump pit should be restored with suitable backfill.

Groundwater collected from excavations should be filtered for fines in sedimentation basins before being discharged. At a minimum, the sedimentation basins should be constructed of hay bales wrapped in a geotextile fabric.

The contractor should discharge groundwater from the dewatering system in accordance with permits and local and state regulations.

4.7.2 Flow Rate Estimates

We estimated the anticipated quantity of flow in the proposed vault excavations and the proposed utility trench. We assumed a groundwater depth of 3 feet, vault excavation dimensions of 30 feet by 10 feet with an excavation depth of 12 feet, and a utility trench depth of 6 feet.

Using the coefficient of permeability values listed in Section 2.5, we estimate a quantity of flow ranging between 1,000 and 4,000 gal/day for the proposed vaults and between 10 and 30 gal/day per foot of excavation for the proposed transmission line.

5. RECOMMENDATIONS FOR FUTURE WORK

We recommend engaging LGCI to perform the following services:

- Assist VHB during the design of the proposed sheet pile retaining wall.
- Review the geotechnical aspects of contractor submittals.
- Provide a field representative to observe the subgrades of foundations during construction.

6. REPORT LIMITATIONS

Our analysis and recommendations are based on project information provided to us at the time of this report. If changes to the type, size, and location of the proposed structures or to the site grading are made, the recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions and recommendations modified in writing by LGCI. LGCI cannot accept responsibility for designs based on our recommendations unless we are engaged to review the final plans and specifications to determine whether any changes in the project affect the validity of our recommendations and whether our recommendations have been properly implemented in the design.

It is not part of our scope to perform a more detailed site history; therefore, we have not explored for or researched the locations of buried utilities or other structures in the area of the proposed construction. Our scope did not include environmental services or services related to moisture, mold, or other biological contaminants in or around the site.

The recommendations in this report are based in part on the data obtained from the subsurface explorations. The nature and extent of variations between explorations may not become evident until construction. If variations from anticipated conditions are encountered, it may be necessary to revise the recommendations in this report. We cannot accept responsibility for designs based on recommendations in this report unless we are engaged to 1) make site visits during construction to check that the subsurface conditions exposed during construction are in general conformance with our design assumptions and 2) ascertain that, in general, the work is being performed in compliance with the contract documents.

Our report has been prepared in accordance with generally accepted engineering practices and in accordance with the terms and conditions set forth in our agreement. No other warranty, expressed or implied, is made. This report has been prepared for the exclusive use of Vanasse Hangen Brustlin, Inc. for the specific application to the proposed transmission power line borings in Sudbury, Massachusetts as conceived at this time.

7. REFERENCES

In addition to the references included in the text of the report, we used the following references:

The Commonwealth of Massachusetts (2010), "The Massachusetts State Building Code, Eighth Edition," comprised of the International Building Code (IBC-2009) and 780 CMR: Massachusetts Amendments to IBC-2009.

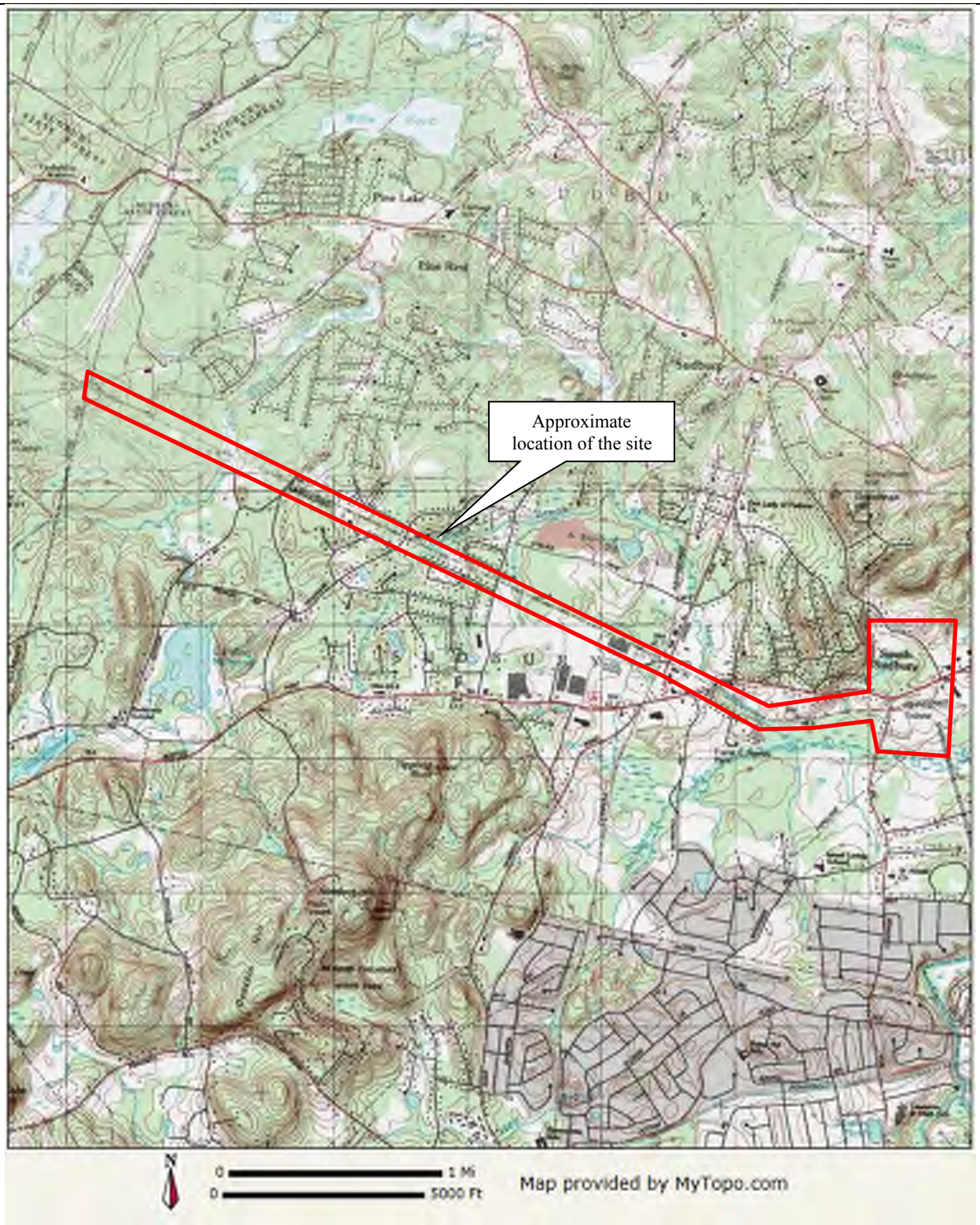
The Department of Labor, Occupational Safety and Health Administration (1989), "Occupational Safety and Health Standards - Excavations; Final Rule," 20 CFR Part 1926, Subpart P.

US Geological Survey Sudbury, MA Topo Map from http://mapserver.mytopo.com.

Table 1 - Summary of LGCI's Borings
Proposed Transmission Power Line Borings
Sudbury, MA
LGCI Project No. 1836

Boring No.	Ground Surface Elevation (ft.)[1]	Groundwater Depth / El. (ft.)[2]	Bottom of Topsoil/Subsoil/ Forest Mat Depth / El. (ft.)	Bottom of Fill Depth / El. (ft.)	Bottom of Buried Organics Depth / El. (ft.)	Top of Bedrock Depth / El. (ft.)	Bottom of Boring Depth / El. (ft.)
B-28	198.0	5.4 / 192.6	0.2 / 197.8	2.0 / 196.0	- / -	- / -	10.0 / 188.0
B-29	192.0	9.5 / 182.5	0.3 / 191.7	4.0 / 188.0	- / -	- / -	15.0 / 177.0
B-30	188.0	7.3 / 180.8	0.5 / 187.5	- / -	- / -	- / -	10.0 / 178.0
B-31	178.0	8.0 / 170.0	0.5 / 177.5	- / -	- / -	- / -	16.0 / 162.0
B-32	172.0	- / -	0.6 / 171.4	- / -	- / -	- / -	10.0 / 162.0
B-33	170.0	12.5 / 157.5	0.5 / 169.5	4.9 / 165.1	- / -	- / -	17.0 / 153.0
B-34	176.0	- / -	0.6 / 175.4	8.0 / 168.0	- / -	- / -	10.0 / 166.0
B-35	182.0	- / -	- / -	1.3 / 180.7	- / -	- / -	8.0 / 174.0
B-36	184.0	4.0 / 180.0	- / -	1.1 / 182.9	- / -	6.0 / 178.0	10.5 / 173.5
B-37[3]	192.0	- / -	1.0 / 191.0	- / -	- / -	- / -	10.0 / 182.0
B-38[3]	196.0	15.0 / 181.0	0.7 / 195.3	- / -	- / -	- / -	16.0 / 180.0
B-39	158.0	9.5 / 148.5	0.8 / 157.2	6.0 / 152.0	- / -	- / -	15.0 / 143.0
B-40	162.0	9.0 / 153.0	- / -	1.5 / 160.5	- / -	- / -	10.0 / 152.0
B-41	168.0	9.0 / 159.0	0.1 / 167.9	1.1 / 166.9	- / -	- / -	17.0 / 151.0
B-42	162.0	9.3 / 152.7	0.1 / 161.9	7.0 / 155.0	- / -	- / -	10.0 / 152.0
B-51	128.0	6.0 / 122.0	- / -	8.4 / 119.6	- / -	- / -	16.0 / 112.0
B-BB-5	125.0	3.2 / 121.8	0.1 / 124.9	2.0 / 123.0	15.0 / 110.0	- / -	54.0 / 71.0
B-BB-6	124.0	3.3 / 120.7	0.1 / 123.9	6.0 / 118.0	11.6 / 112.4	- / -	51.0 / 73.0
B-GB-1	180.0	- / -	- / -	0.8 / 179.2	- / -	- / -	6.0 / 174.0
B-GB-2	180.0	- / -	- / -	0.6 / 179.4	- / -	- / -	3.0 / 177.0
B-GB-3	182.0	- / -	- / -	0.5 / 181.5	- / -	- / -	2.5 / 179.5
B-GB-5	136.0	3.5 / 132.5	0.6 / 135.4	2.5 / 133.5	6.0 / 130.0	- / -	12.0 / 124.0
B-GB-17	128.0	6.8 / 121.2	0.3 / 127.7	6.4 / 121.6	- / -	- / -	20.0 / 108.0
B-GB-18	126.0	6.0 / 120.0	0.3 / 125.7	8.0 / 118.0	11.1 / 114.9	- / -	21.0 / 105.0
B-GB-19	126.0	3.6 / 122.4	0.1 / 125.9	12.0 / 114.0	- / -	- / -	21.0 / 105.0
B-GB-20	131.0	5.0 / 126.0	0.3 / 130.7	8.0 / 123.0	10.0 / 121.0	18.0 / 113.0	23.0 / 108.0
B-GB-21	132.0	3.0 / 129.0	0.3 / 131.7	10.0 / 122.0	- / -	- / -	20.0 / 112.0
B-MP-27	162.0	10.5 / 151.5	0.6 / 161.4	- / -	- / -	- / -	15.0 / 147.0
B-MP-28	158.0	6.0 / 152.0	0.6 / 157.4	- / -	- / -	- / -	10.0 / 148.0
B-MP-29	150.0	11.6 / 138.4	0.6 / 149.4	- / -	- / -	- / -	16.0 / 134.0
B-MP-30	140.0	6.8 / 133.2	0.5 / 139.5	8.0 / 132.0	- / -	- / -	10.0 / 130.0
B-MP-31	136.0	7.8 / 128.2	0.5 / 135.5	4.6 / 131.4	- / -	- / -	16.0 / 120.0
B-MP-32	136.0	8.0 / 128.0	2.0 / 134.0	4.6 / 131.4	8.0 / 128.0	- / -	12.0 / 124.0
B-MP-33	136.0	8.0 / 128.0	0.8 / 135.2	6.6 / 129.4	- / -	- / -	10.0 / 126.0
B-MP-34	133.0	6.8 / 126.2	0.4 / 132.6	6.3 / 126.7	- / -	- / -	12.0 / 121.0
B-MP-35	130.0	8.5 / 121.5	0.5 / 129.5	11.0 / 119.0	- / -	- / -	15.0 / 115.0
B-MP-36	126.0	4.3 / 121.7	0.1 / 125.9	5.1 / 120.9	8.5 / 117.5	- / -	10.0 / 116.0
B-MP-37[3]	128.0	4.9 / 123.1	0.1 / 127.9	- / -	- / -	- / -	10.0 / 118.0
B-MP-38	136.0	5.0 / 131.0	0.1 / 135.9	6.4 / 129.6	- / -	- / -	16.5 / 119.5
B-MP-39	140.0	4.3 / 135.7	0.1 / 139.9	8.4 / 131.6	- / -	- / -	10.0 / 130.0

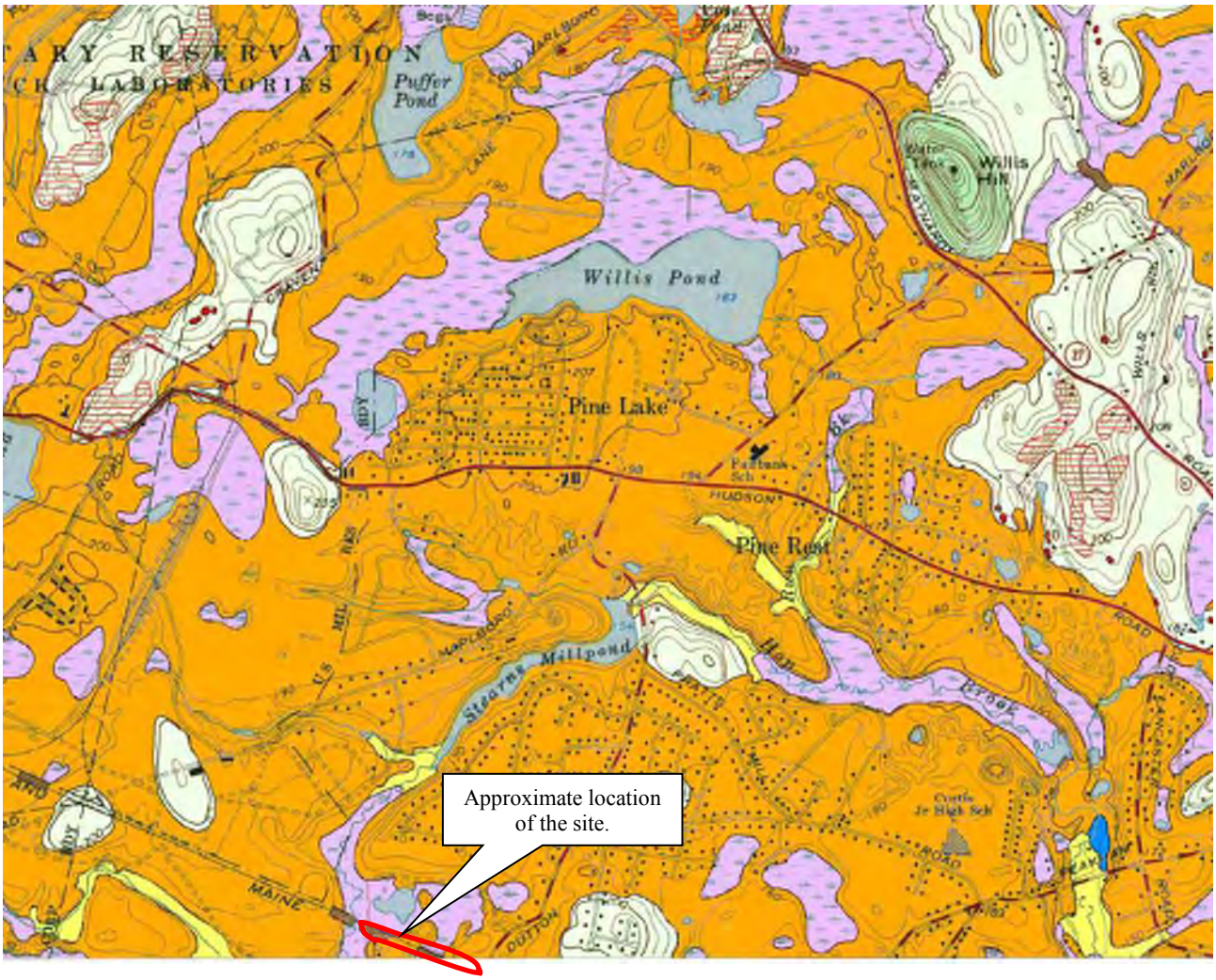
1. The ground surface elevations was interpolated to the nearest foot from a plan titled: "Proposed Conditions Plan for Notice of Intent Submittal, Sudbury-Hudson Trasmission Reliabailty Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc. and dated February 5, 2018.
2. Groundwater observed at the end of drilling or based on sample moisture, whichever was measured last, as indicated on the boring logs.
3. Borings B-37, B-38, and B-MP-37 terminated in fill.
4. "-" means layer not encountered.



Contour Intervals: 3 meters

Figure based on USGS topographic map of Sudbury, MA obtained from www.mytopo.com/maps

Client:	Project:		
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings	Figure 1 – Site Location Map	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



1 0.5 0 1 2 Miles

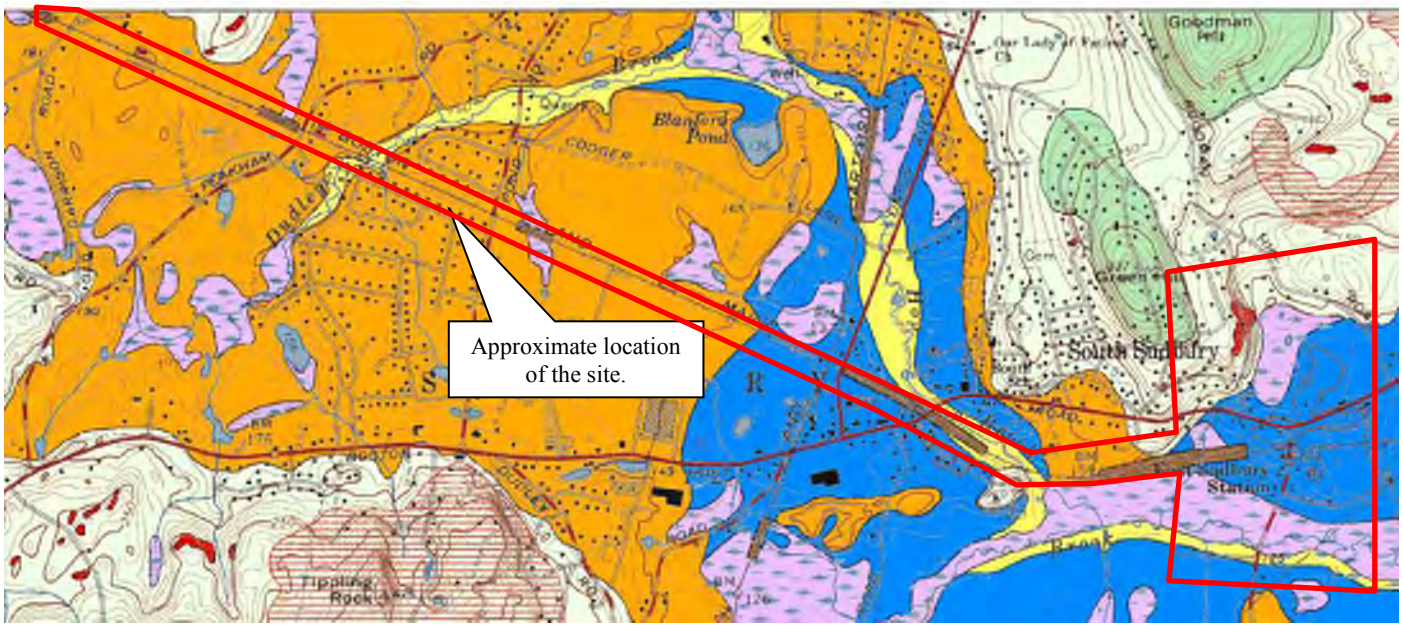
Coarse deposits include: *Gravel deposits* composed mainly of gravel-sized clasts; cobbles and boulders predominate; minor amounts of sand within gravel beds, and sand comprises few separate layers. Gravel layers generally are poorly sorted and bedding commonly is distorted and faulted due to postdepositional collapse related to melting of ice. *Sand and gravel deposits* composed of mixtures of gravel and sand within individual layers and as alternating layers. Sand and gravel layers generally range from 25 to 50 percent gravel particles and from 50 to 75 percent sand particles. Layers are well to poorly sorted; bedding may be distorted and faulted due to postdepositional collapse. *Sand deposits* composed mainly of very coarse to fine sand, commonly in well-sorted layers. Coarser layers may contain up to 25 percent gravel particles, generally granules and pebbles; finer layers may contain some very fine sand, silt, and clay.

Swamp deposits—Organic muck and peat that contain minor amounts of sand, silt, and clay, stratified and poorly sorted, in kettle depressions or poorly drained areas. Most swamp deposits are less than about 10 ft thick. Swamp deposits overlie glacial deposits or bedrock. They locally overlie glacial till even where they occur within thin glacial meltwater deposits.

N

Figure based on map titled: "Surficial Geologic Map of the Clinton-Concord-Grafton-Medfield 12-Quadrangle Area in East Central Massachusetts," prepared by Stone, B.D. and Stone, J.R. for U.S. Geological Survey, Open-File Report 2006-1260-A, 2006.

Client:	Project:	Figure 2A – Surficial Geologic Map	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



Bedrock outcrops and areas of abundant outcrop or shallow bedrock— Solid color shows extent of individual bedrock outcrops; line pattern indicates areas of shallow bedrock or areas where small outcrops are too numerous to map individually; in areas of shallow bedrock, surficial materials are less than 5-10 ft thick.

Coarse deposits include: *Gravel deposits* composed mainly of gravel-sized clasts; cobbles and boulders predominate; minor amounts of sand within gravel beds, and sand comprises few separate layers. Gravel layers generally are poorly sorted and bedding commonly is distorted and faulted due to postdepositional collapse related to melting of ice. *Sand and gravel deposits* composed of mixtures of gravel and sand within individual layers and as alternating layers. Sand and gravel layers generally range from 25 to 50 percent gravel particles and from 50 to 75 percent sand particles. Layers are well to poorly sorted; bedding may be distorted and faulted due to postdepositional collapse. *Sand deposits* composed mainly of very coarse to fine sand, commonly in well-sorted layers. Coarser layers may contain up to 25 percent gravel particles, generally granules and pebbles; finer layers may contain some very fine sand, silt, and clay.

Fine deposits include very fine sand, silt, and clay that occurs as well-sorted, thin layers of alternating silt and clay, or thicker layers of very fine sand and silt. Very fine sand commonly occurs at the surface and grades downward into rhythmically bedded silt and clay varves. Locally, this map unit may include areas underlain by fine sand.

Thin till—Nonsorted, nonstratified matrix of sand, some silt, and little clay containing scattered gravel clasts and few large boulders; in areas where till is generally less than 10-15 ft thick and including areas of bedrock outcrop where till is absent. Predominantly upper till of the last glaciation; loose to moderately compact, generally sandy, commonly stony. Two facies are present in some places; a looser, coarser-grained ablation facies, melted out from supraglacial position; and an underlying more compact, finer-grained lodgement facies deposited subglacially. In general, both ablation and lodgement facies of upper till derived from fine-grained bedrock are finer grained, more compact, less stony and have fewer surface boulders than upper till derived from coarser grained crystalline rocks. Fine-grained bedrock sources include the red Mesozoic sedimentary rocks of the Connecticut River lowland, marble in the western river valleys, and fine-grained schists in upland areas.

Thick till—Nonsorted, nonstratified matrix of sand, some silt, and little clay containing scattered gravel clasts and few large boulders at the surface; in the shallow subsurface, compact, nonsorted matrix of silt, very fine sand, and some clay containing scattered small gravel clasts in areas where till is greater than 10-15 ft thick, chiefly in drumlin landforms in which till thickness commonly exceeds 100 ft (maximum recorded thickness is 230 ft). Although upper till is the surface deposit, the lower till constitutes the bulk of the material in these areas. Lower till is moderately to very compact, and is commonly finer grained and less stony than upper till. An oxidized zone, the lower part of a soil profile formed during a period of interglacial weathering, is generally present in the upper part of the lower till. This zone commonly shows closely spaced joints that are stained with iron and manganese oxides.

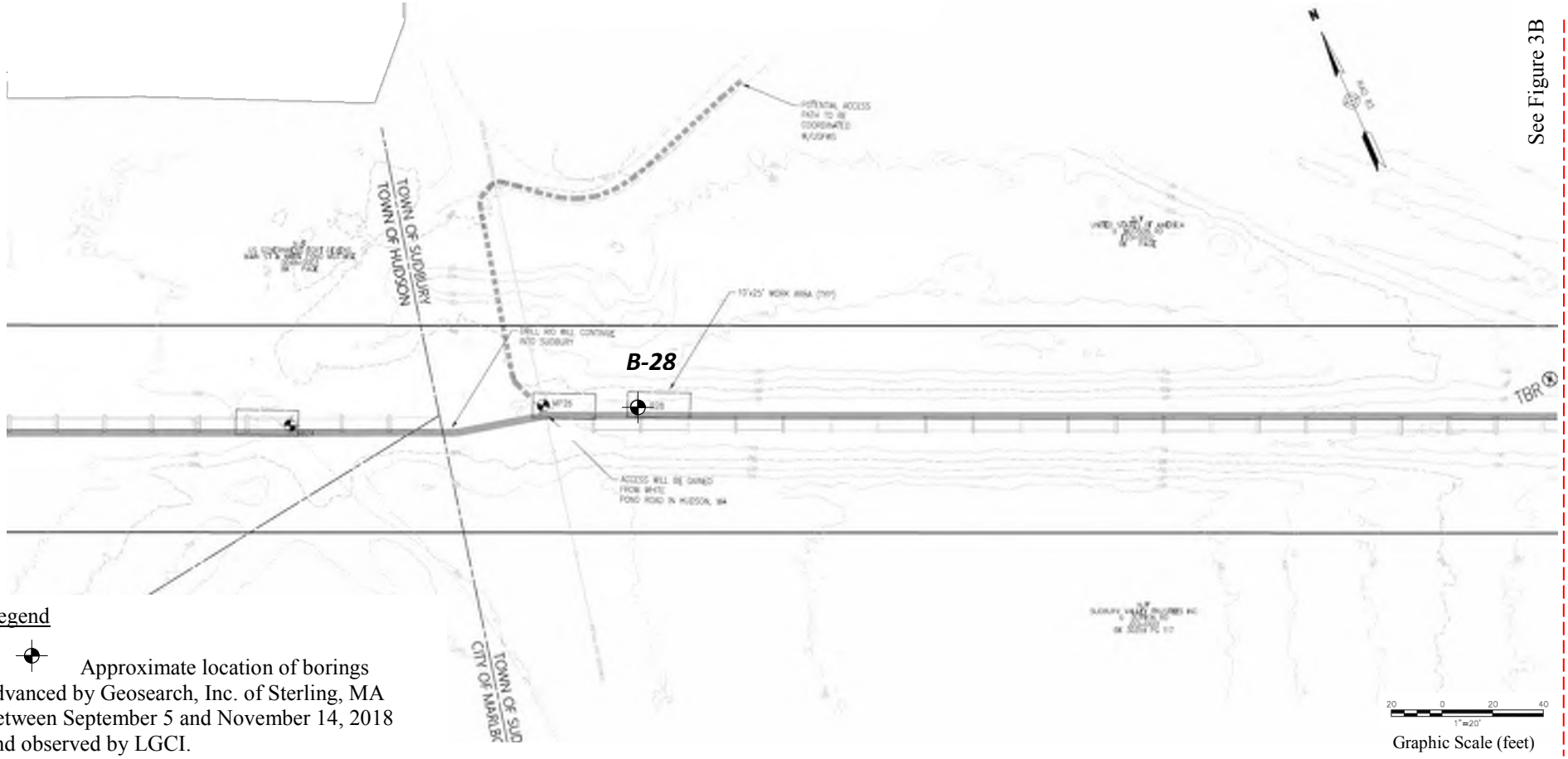
Artificial fill—Earth materials and manmade materials that have been artificially emplaced, primarily in highway and railroad embankments, and in dams; may also include landfills, urban development areas, and filled coastal wetlands.

Floodplain alluvium—Sand, gravel, silt, and some organic material, stratified and well sorted to poorly sorted, beneath the floodplains of modern streams. The texture of alluvium commonly varies over short distances both laterally and vertically, and generally is similar to the texture of adjacent glacial deposits. Along smaller streams, alluvium is commonly less than 5 ft thick. The most extensive deposit of alluvium on the map is along the Charles, Assabet, and Concord Rivers where the texture is predominantly sand, fine gravel, and silt, and total thickness is as much as 25 ft. Alluvium typically overlies thicker glacial stratified deposits.

Swamp deposits—Organic muck and peat that contain minor amounts of sand, silt, and clay, stratified and poorly sorted, in kettle depressions or poorly drained areas. Most swamp deposits are less than about 10 ft thick. Swamp deposits overlie glacial deposits or bedrock. They locally overlie glacial till even where they occur within thin glacial meltwater deposits.

Figure based on map titled: "Surficial Geologic Map of the Clinton-Concord-Grafton-Medfield 12-Quadrangle Area in East Central Massachusetts," prepared by Stone, B.D. and Stone, J.R. for U.S. Geological Survey, Open-File Report 2006-1260-A, 2006.

Client:	Project:	Figure 2B – Surficial Geologic Map	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: December 2018



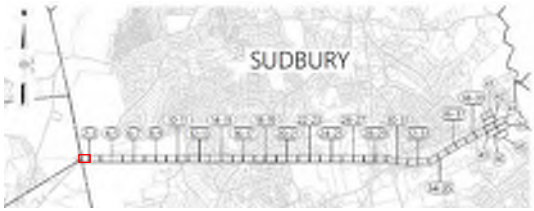
Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

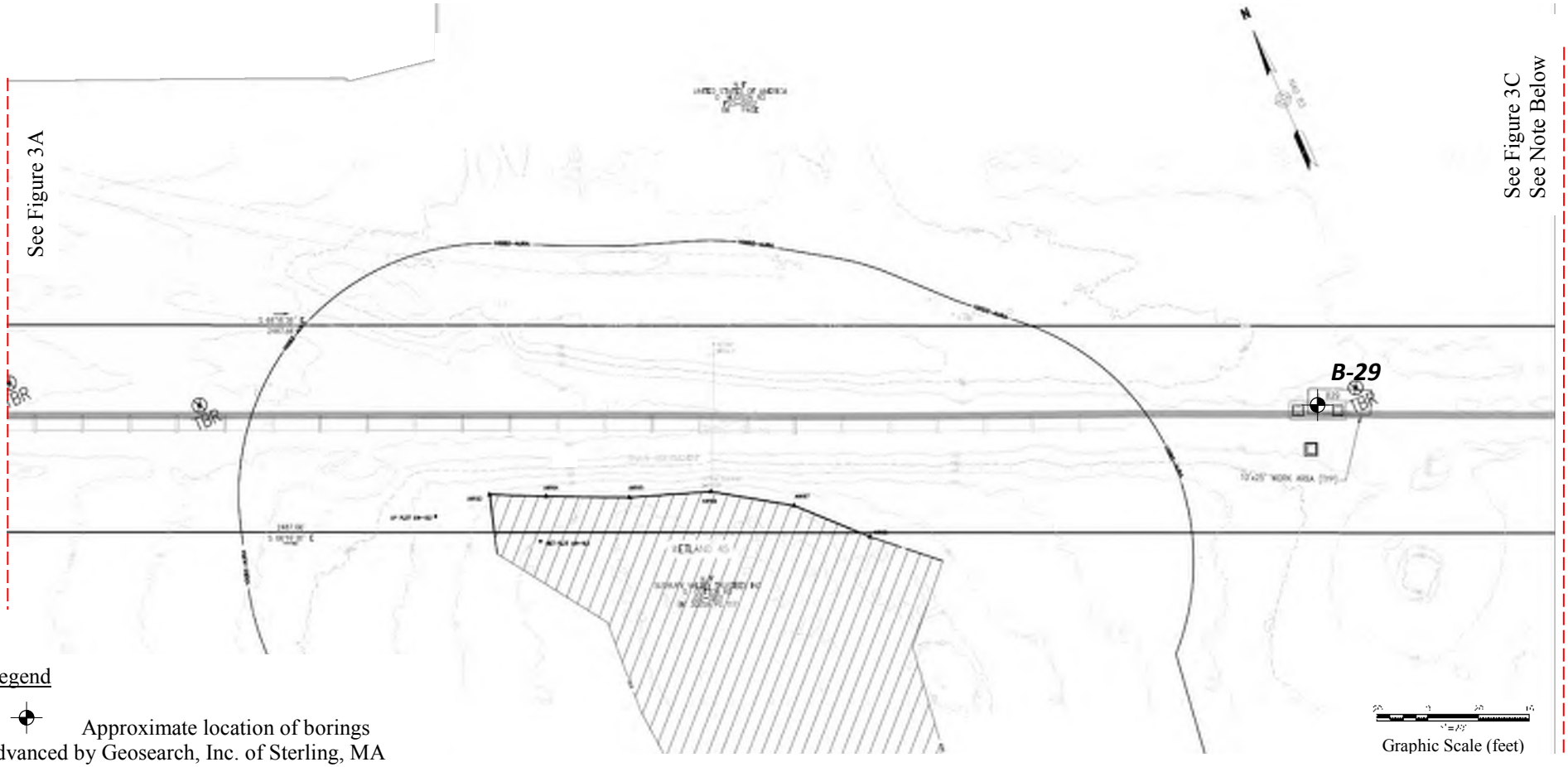
Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines.

Key Plan



Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3A – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



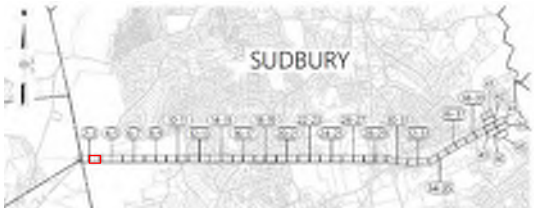
Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

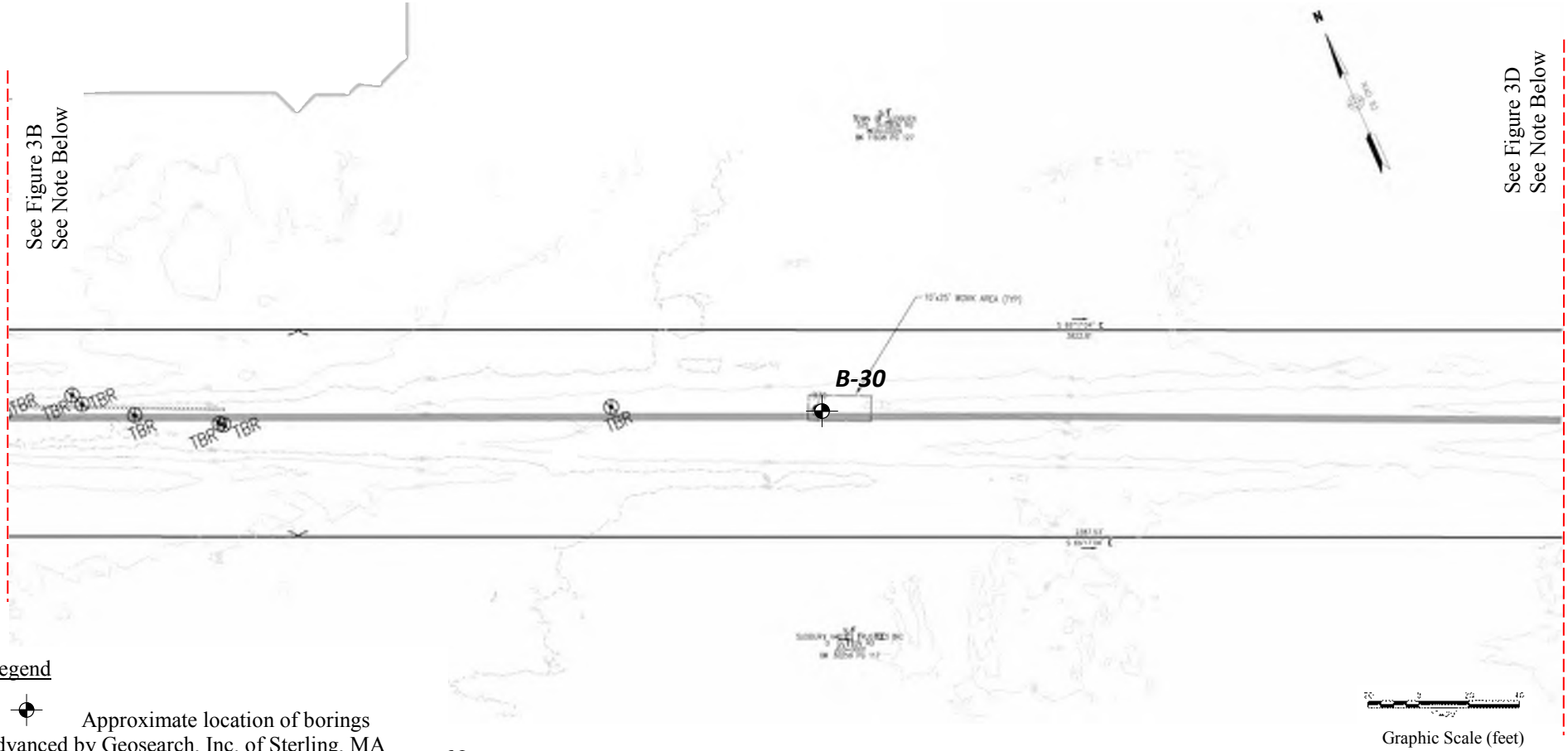
Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines. The subsequent sheet (Sheet 4) was skipped because no geotechnical borings are located within the area shown on Sheet 4.

Key Plan



Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3B – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



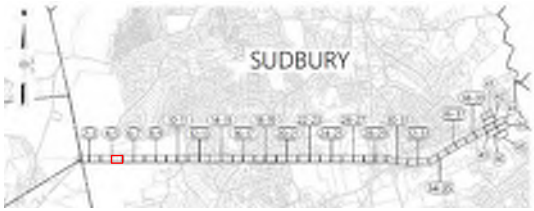
Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

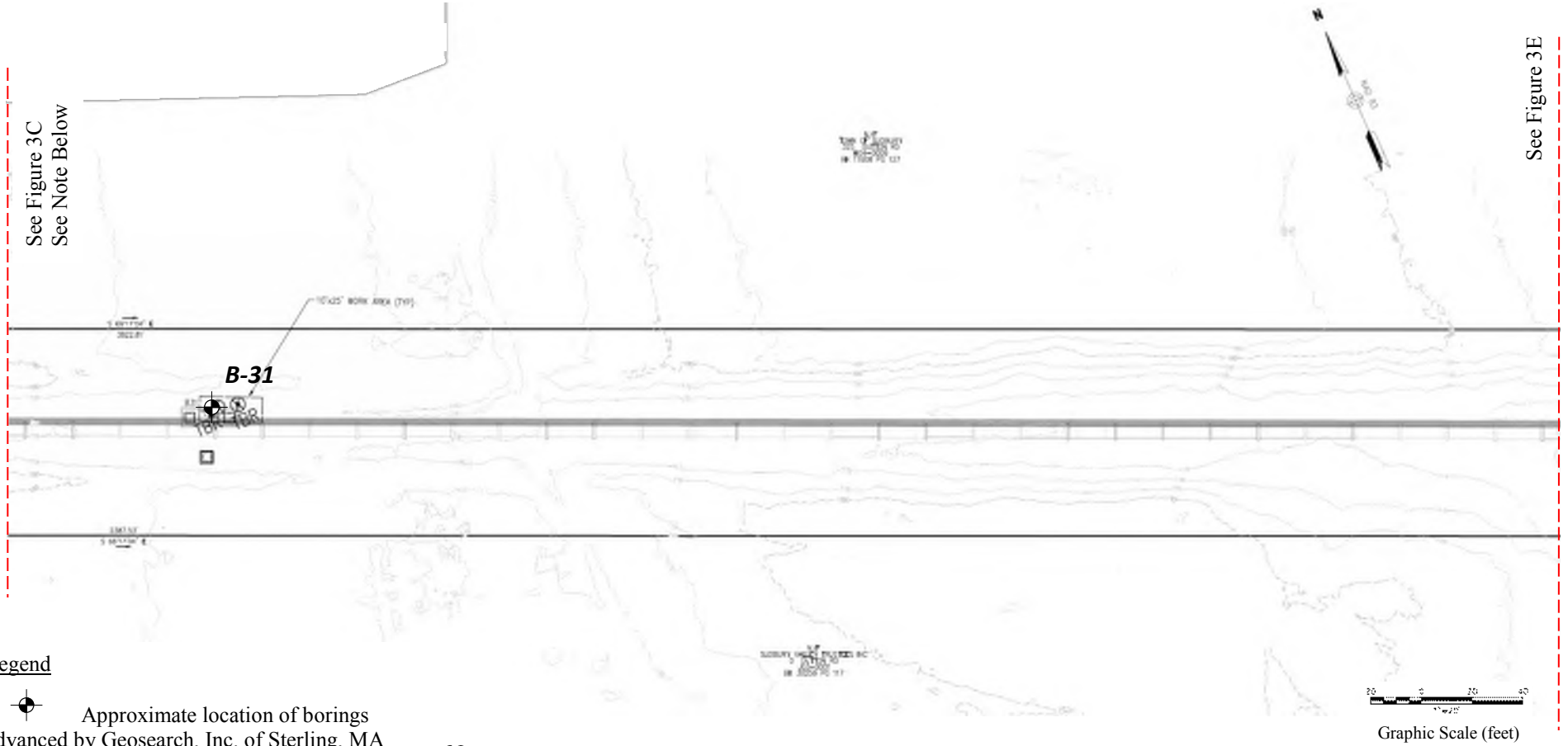
Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines. The previous sheet (Sheet 4) and subsequent sheet (Sheet 6) were skipped because no geotechnical borings are located within the area shown on Sheets 4 and 6.

Key Plan



Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3C – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



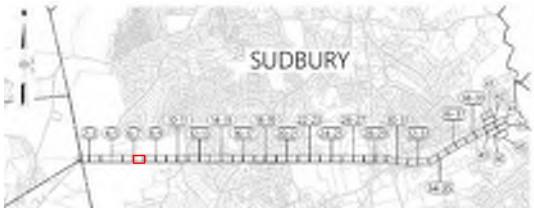
Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

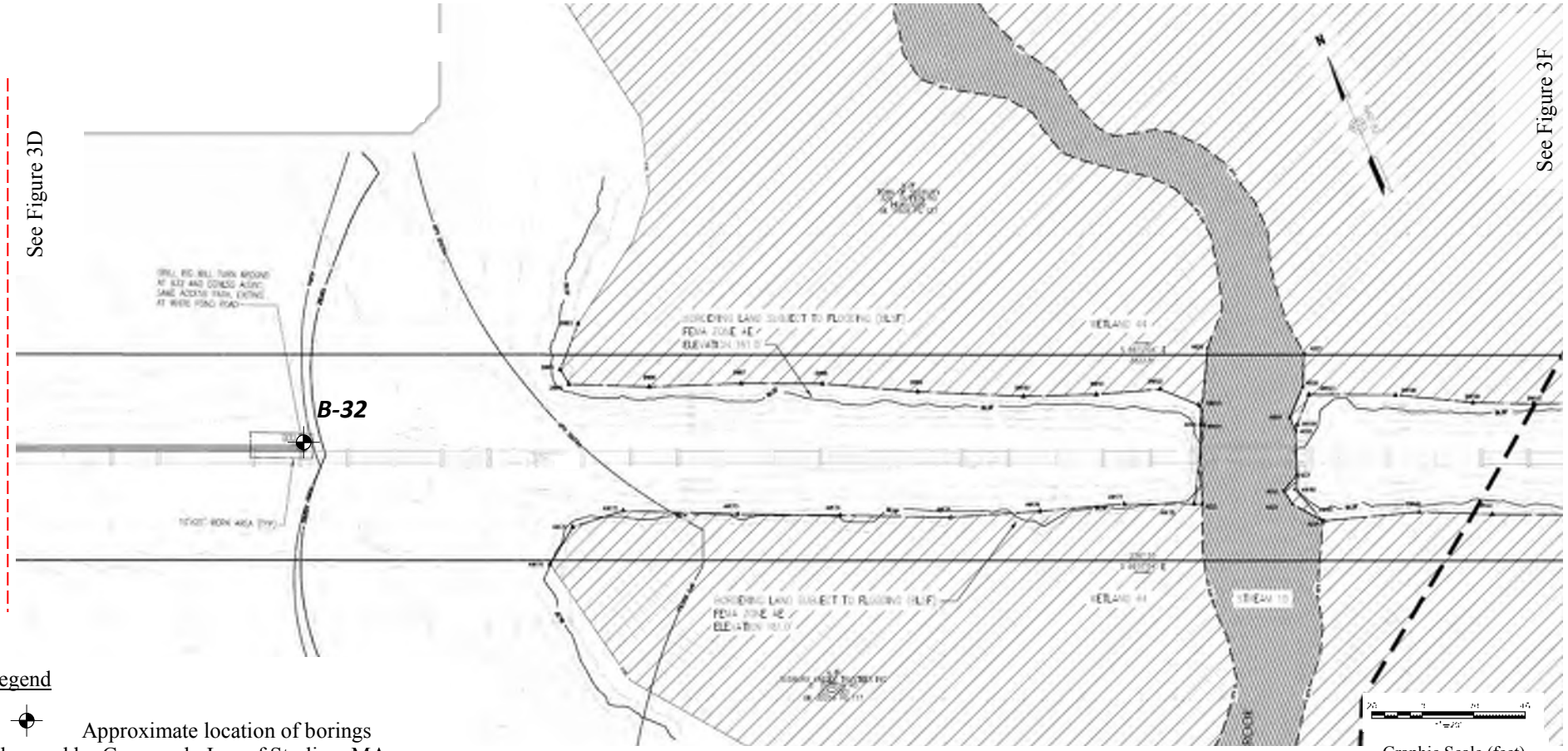
Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines. The previous sheet (Sheet 6) was skipped because no geotechnical borings are located within the area shown on Sheet 6.

Key Plan



Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3D – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



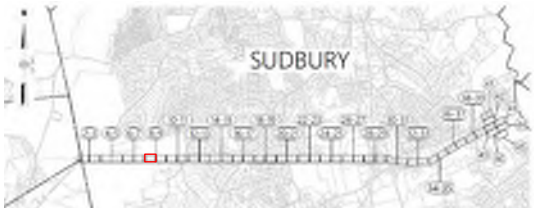
Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

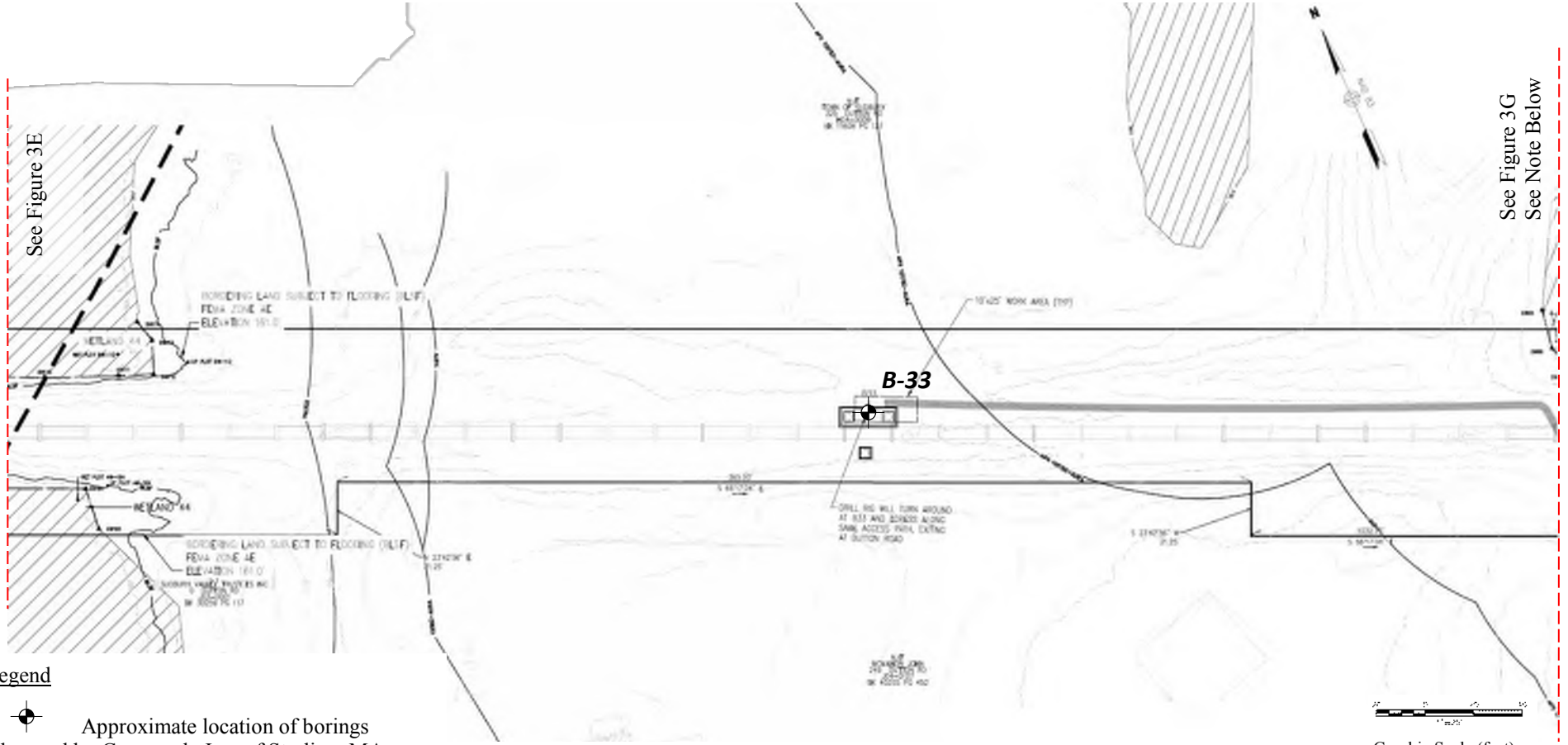
Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines.

Key Plan



Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3E – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



Graphic Scale (feet)

Legend

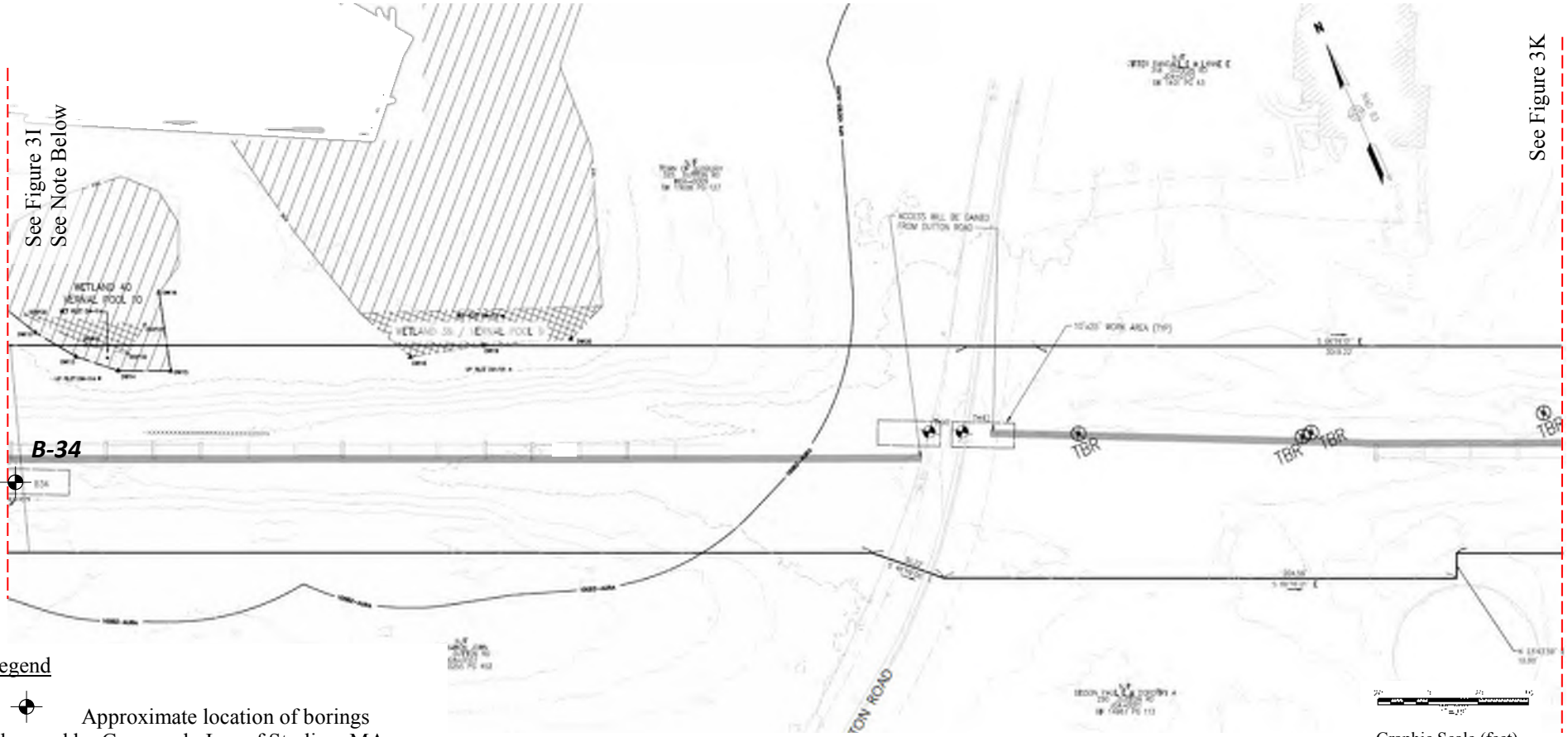
Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines. The subsequent sheet (Sheet 10) was skipped because the geotechnical boring shown on it is also shown within the area shown on Sheet 11.

Key Plan

Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3F – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



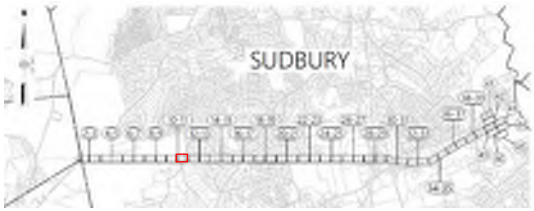
Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

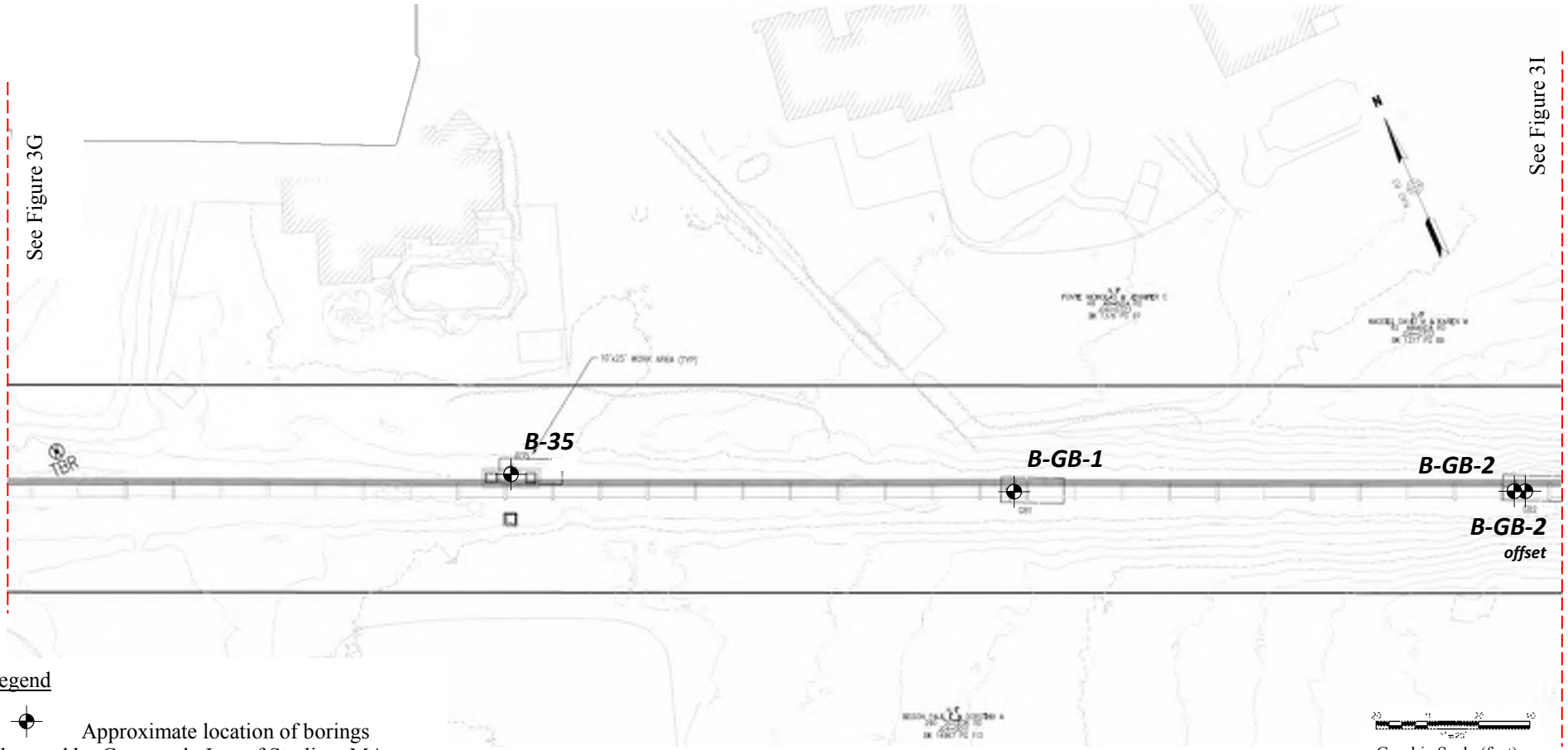
Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines. The previous sheet (Sheet 10) was skipped because the geotechnical boring shown on it is also shown within the area shown on this sheet (Sheet 11).

Key Plan



Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3G – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



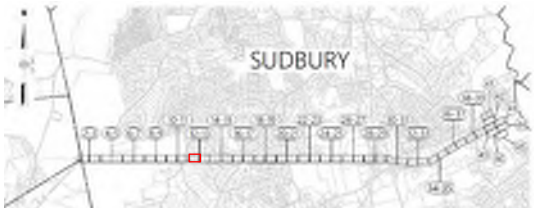
Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

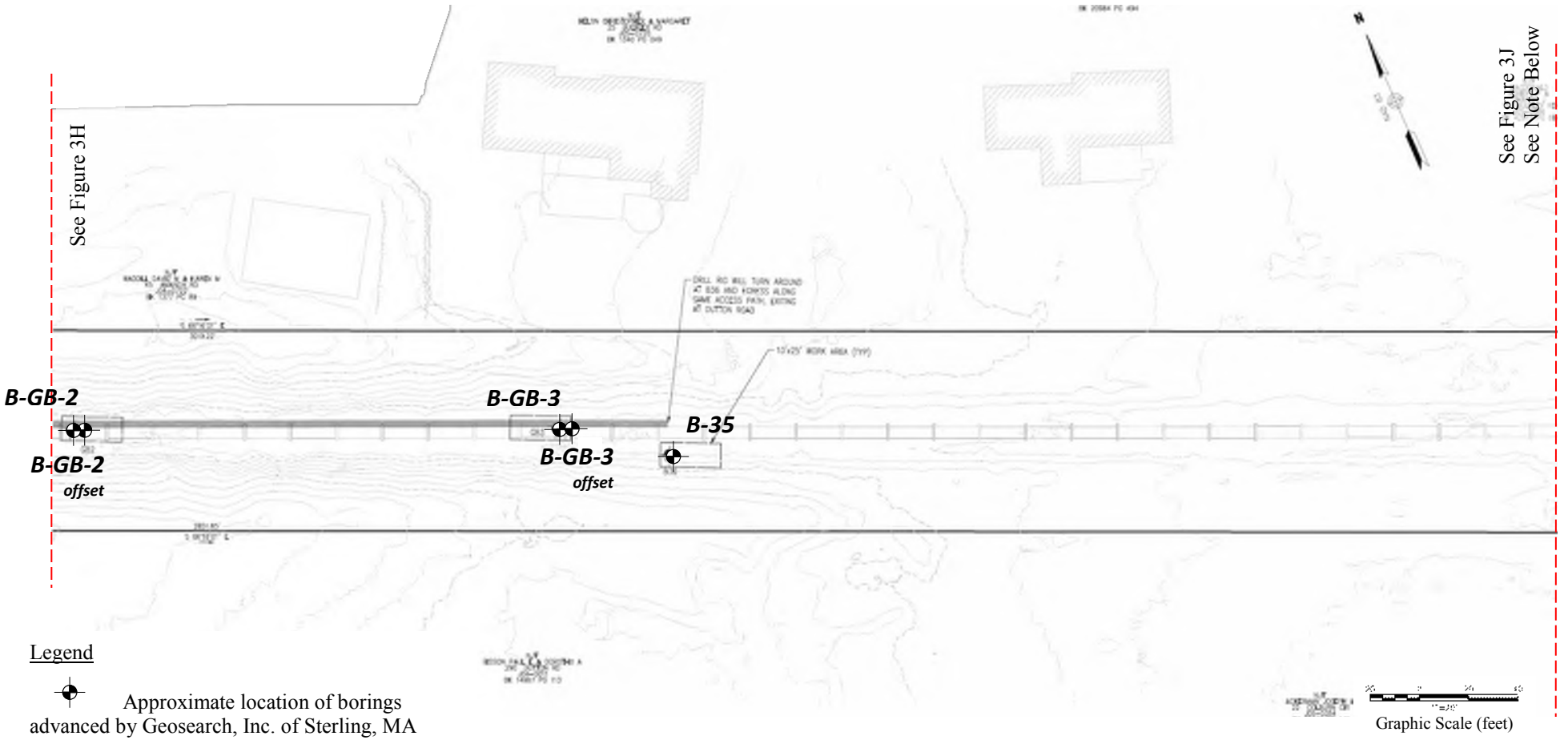
Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines.

Key Plan



Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3H – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



Legend

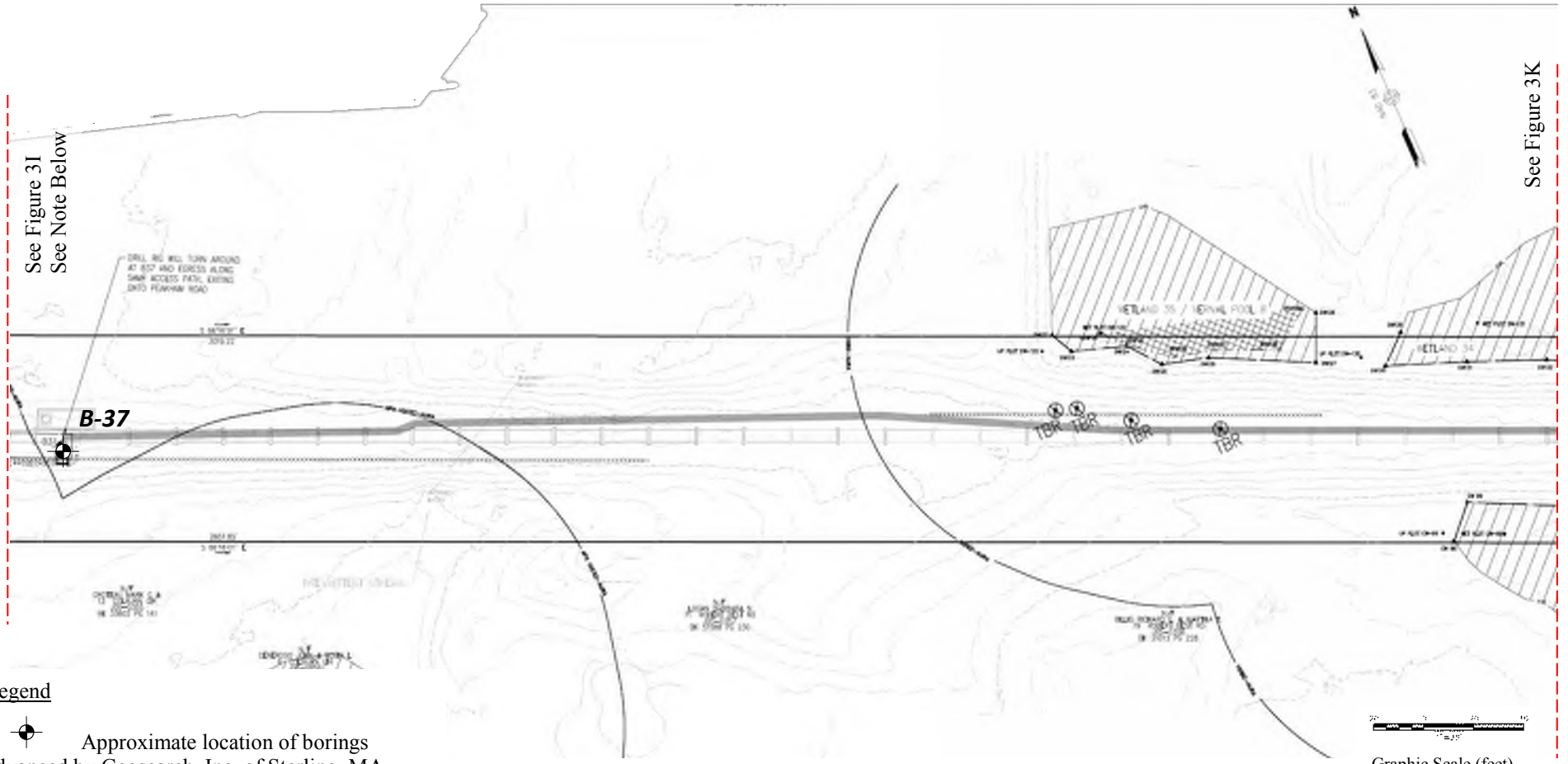
Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

Key Plan

Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines. The subsequent sheet (Sheet 14) was skipped because the geotechnical boring shown on it is also shown within the area shown on Sheet 15.

Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3I – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



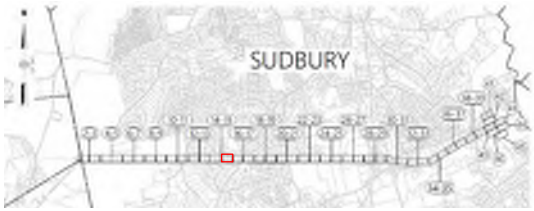
Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

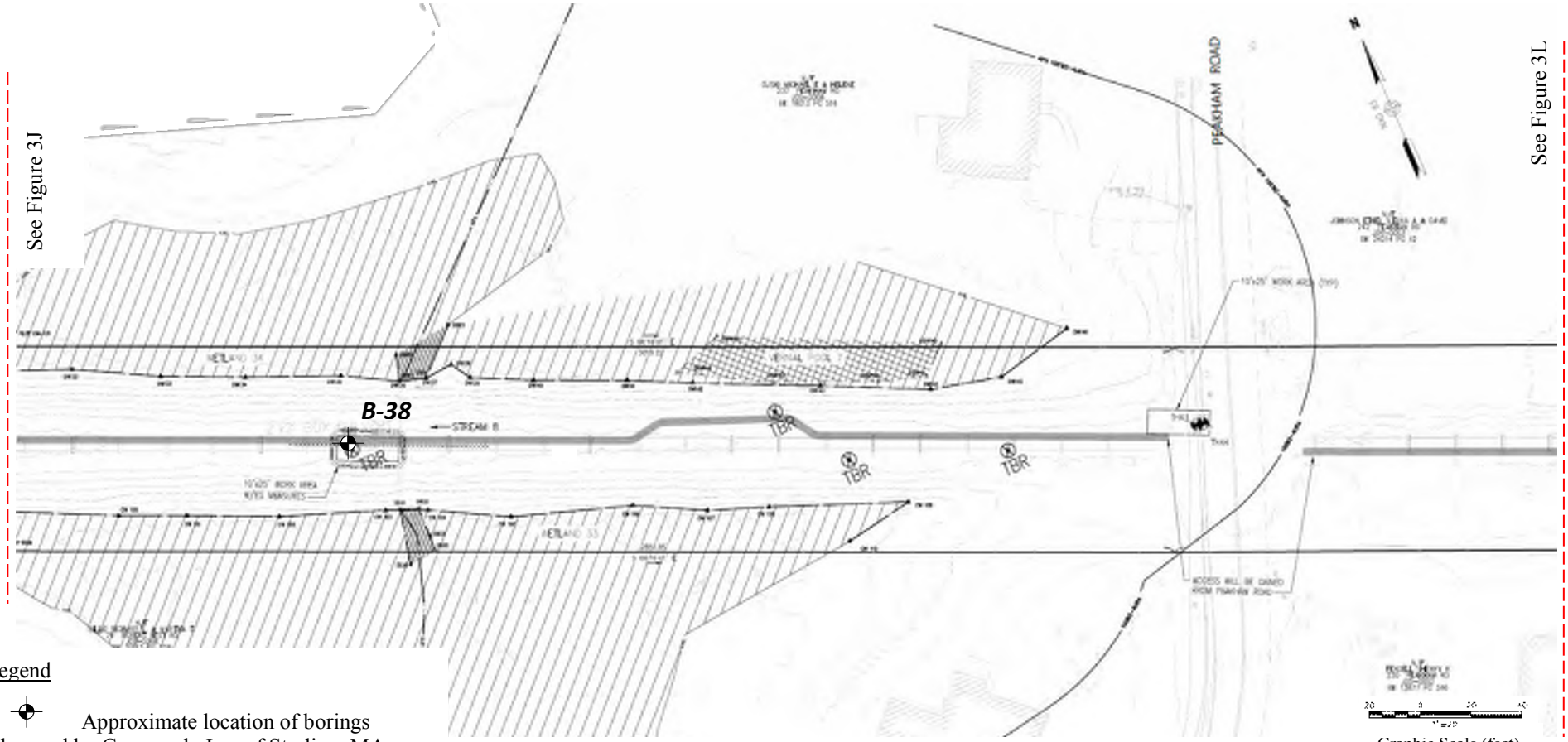
Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines. The previous sheet (Sheet 14) was skipped because the geotechnical boring shown on it is also shown within the area shown on this sheet (Sheet 15).

Key Plan



Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3J – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



Legend

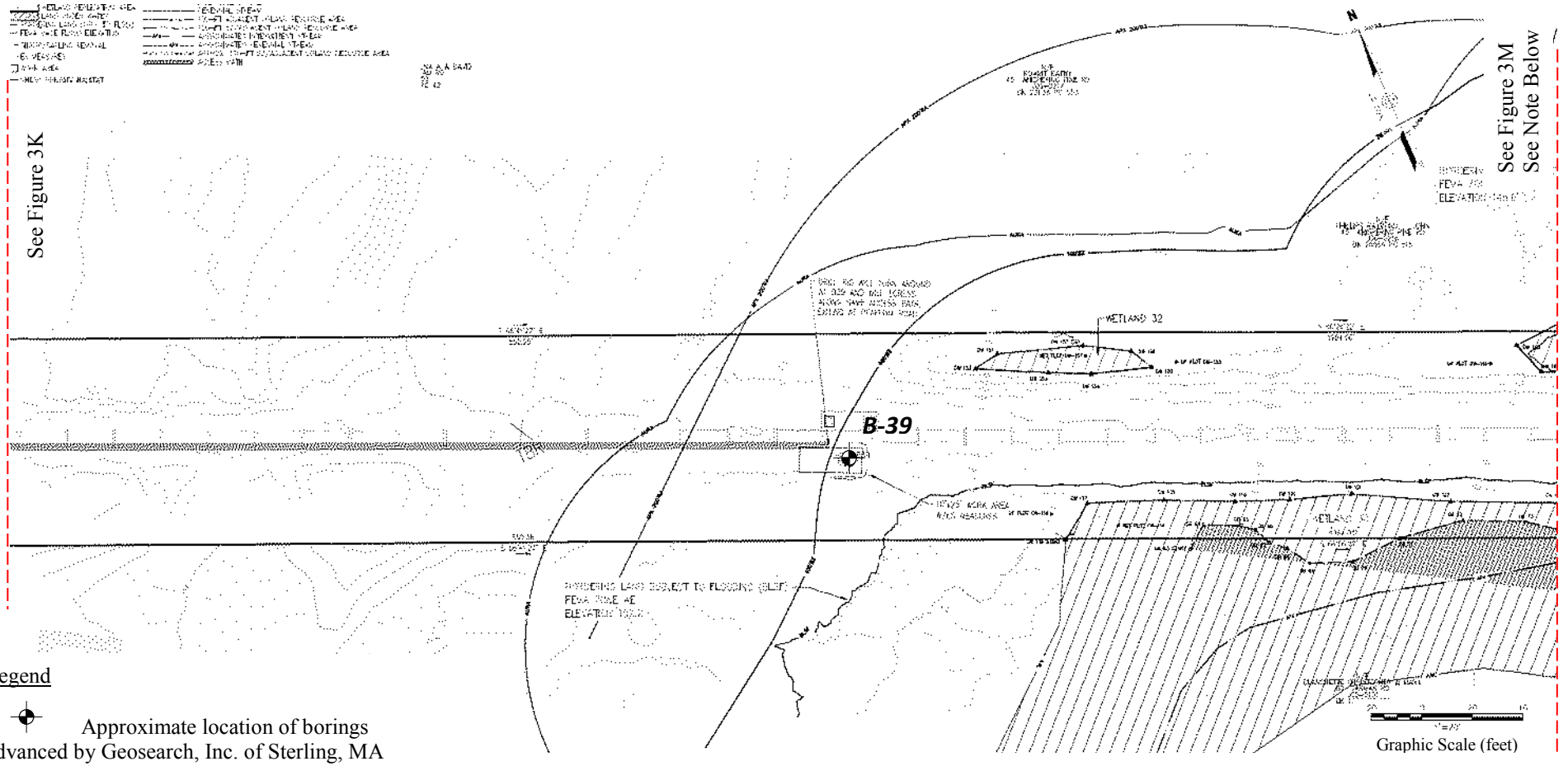
Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines.

Key Plan

Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3K – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



Legend

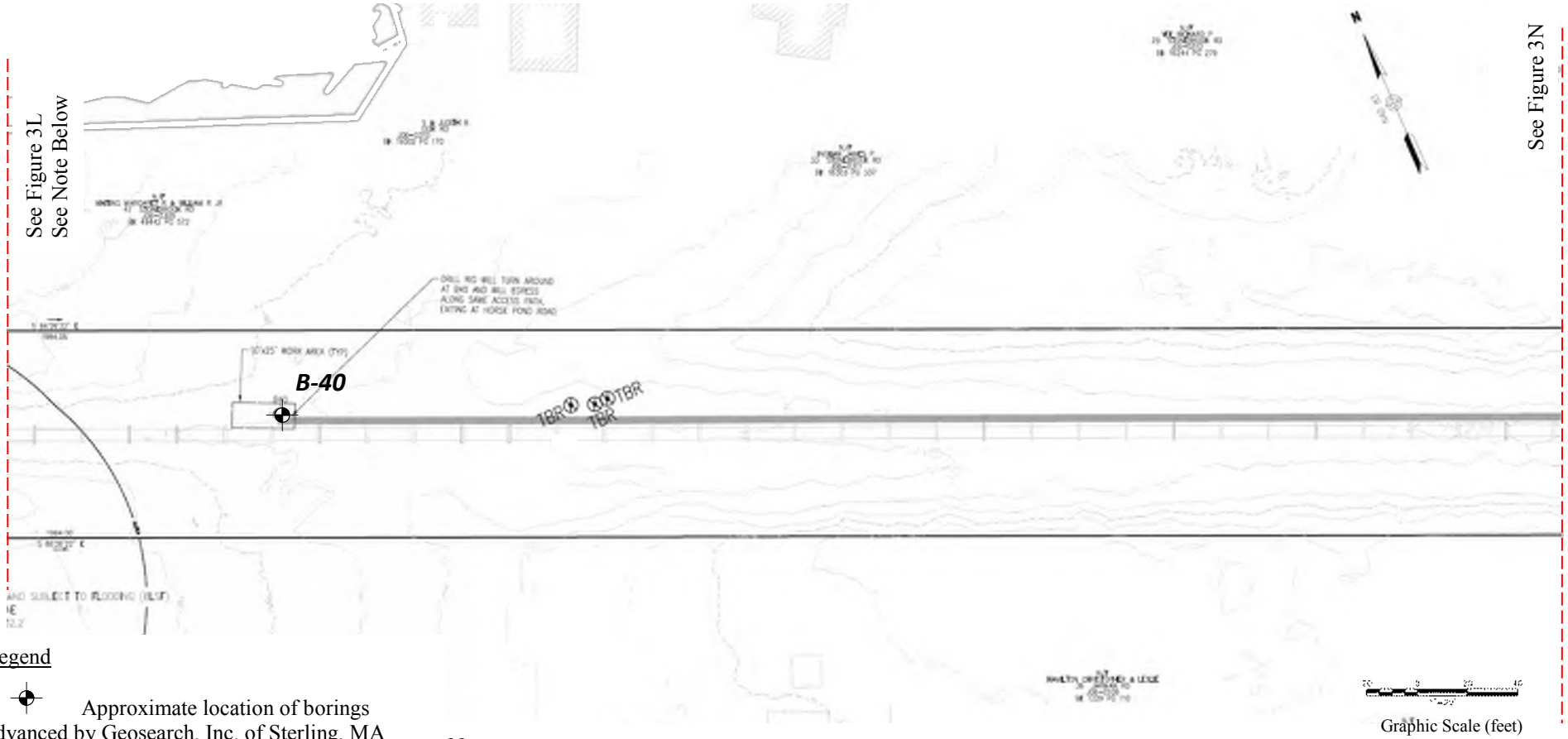
Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines. The subsequent sheet (Sheet 18) was skipped because no geotechnical borings are located within the area shown on Sheet 18.

Key Plan

Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3L – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



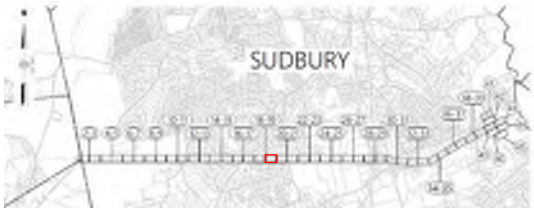
Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

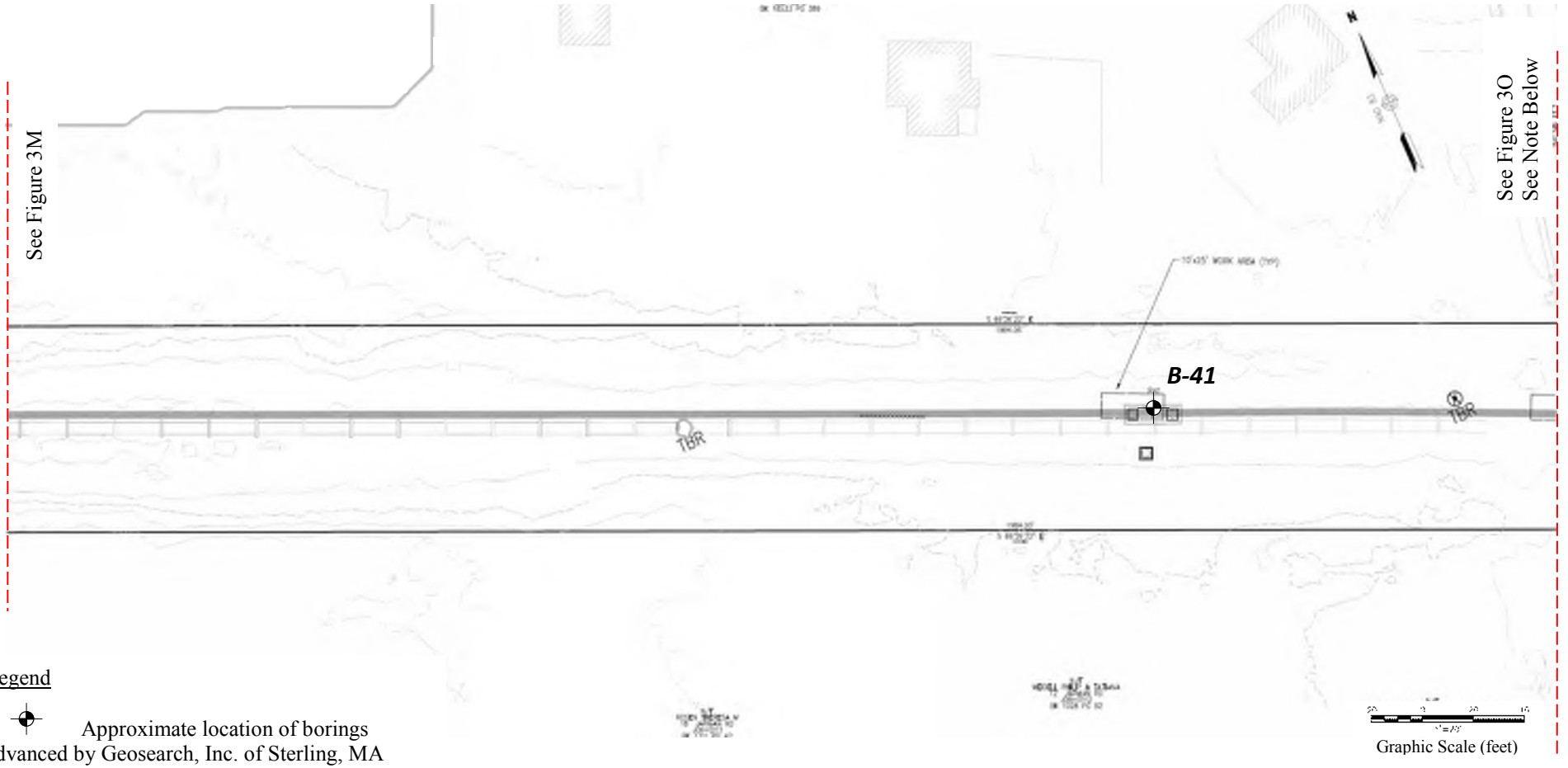
Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines. The previous sheet (Sheet 18) were skipped because no geotechnical borings are located within the area shown on Sheet 18.

Key Plan



Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3M – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



Legend

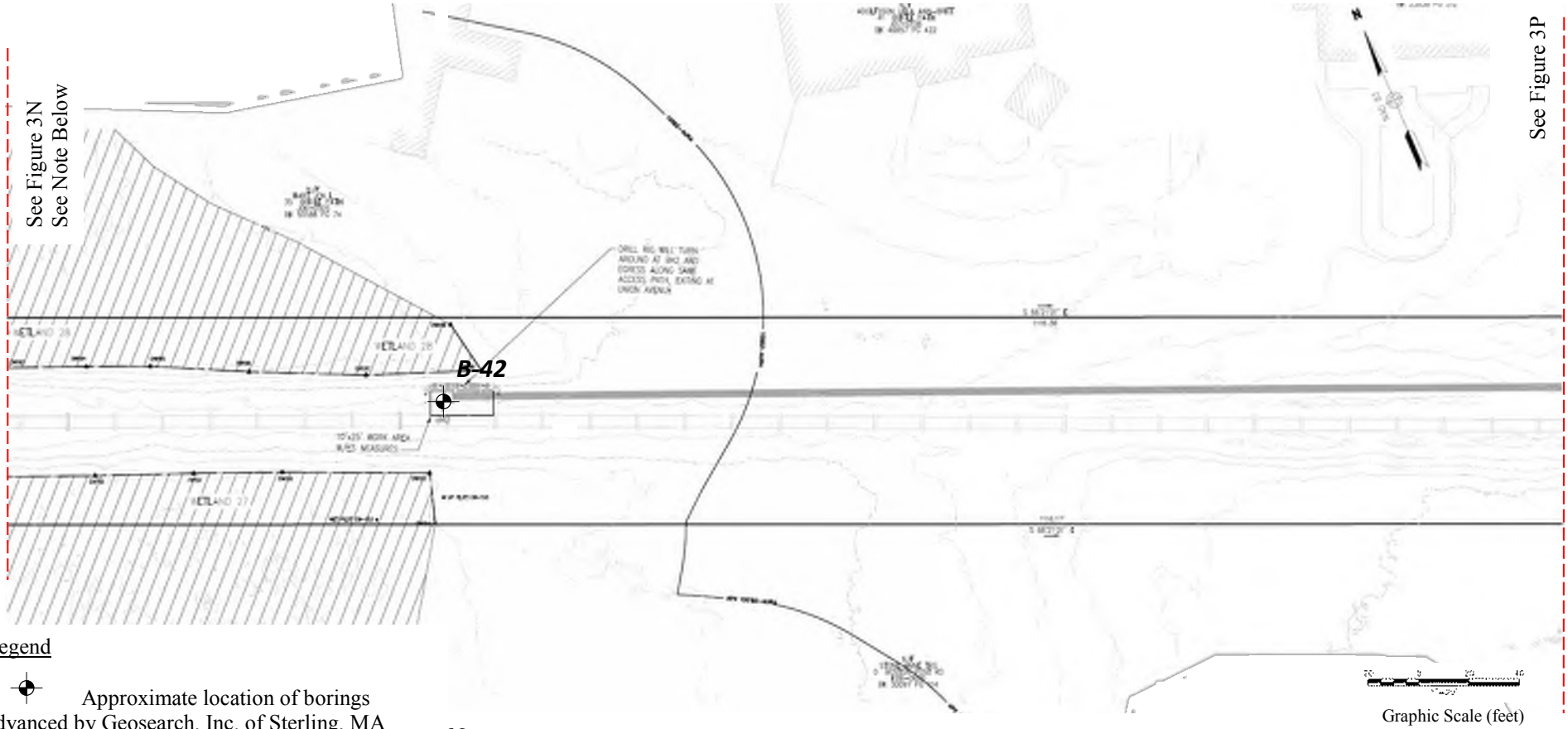
Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

Key Plan

Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines. The subsequent sheet (Sheet 21) was skipped because no geotechnical borings are located within the area shown on Sheet 21.

Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3N – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



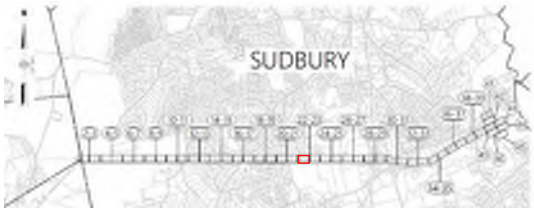
Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

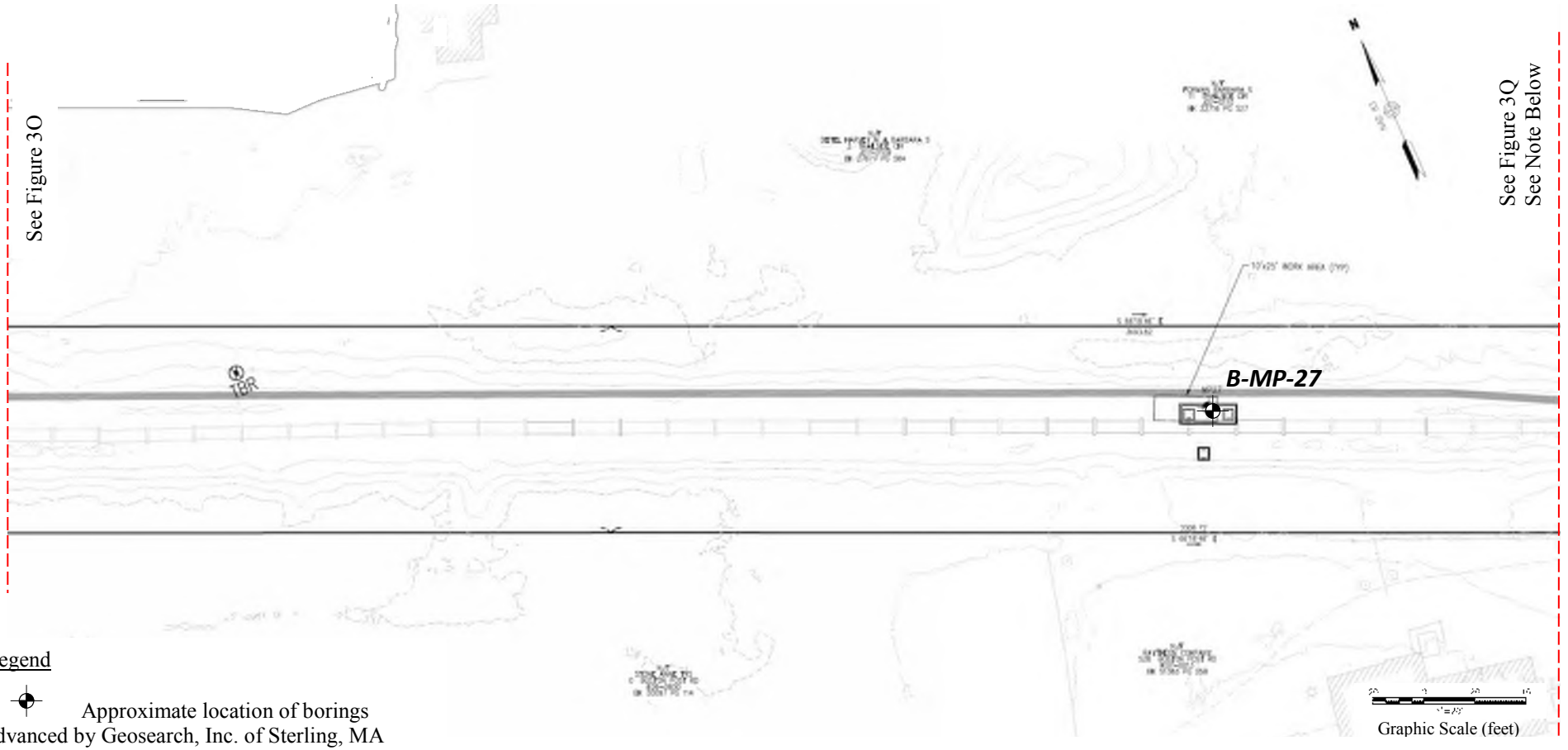
Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines. The previous sheet (Sheet 21) were skipped because no geotechnical borings are located within the area shown on Sheet 21.

Key Plan



Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3O – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



Legend

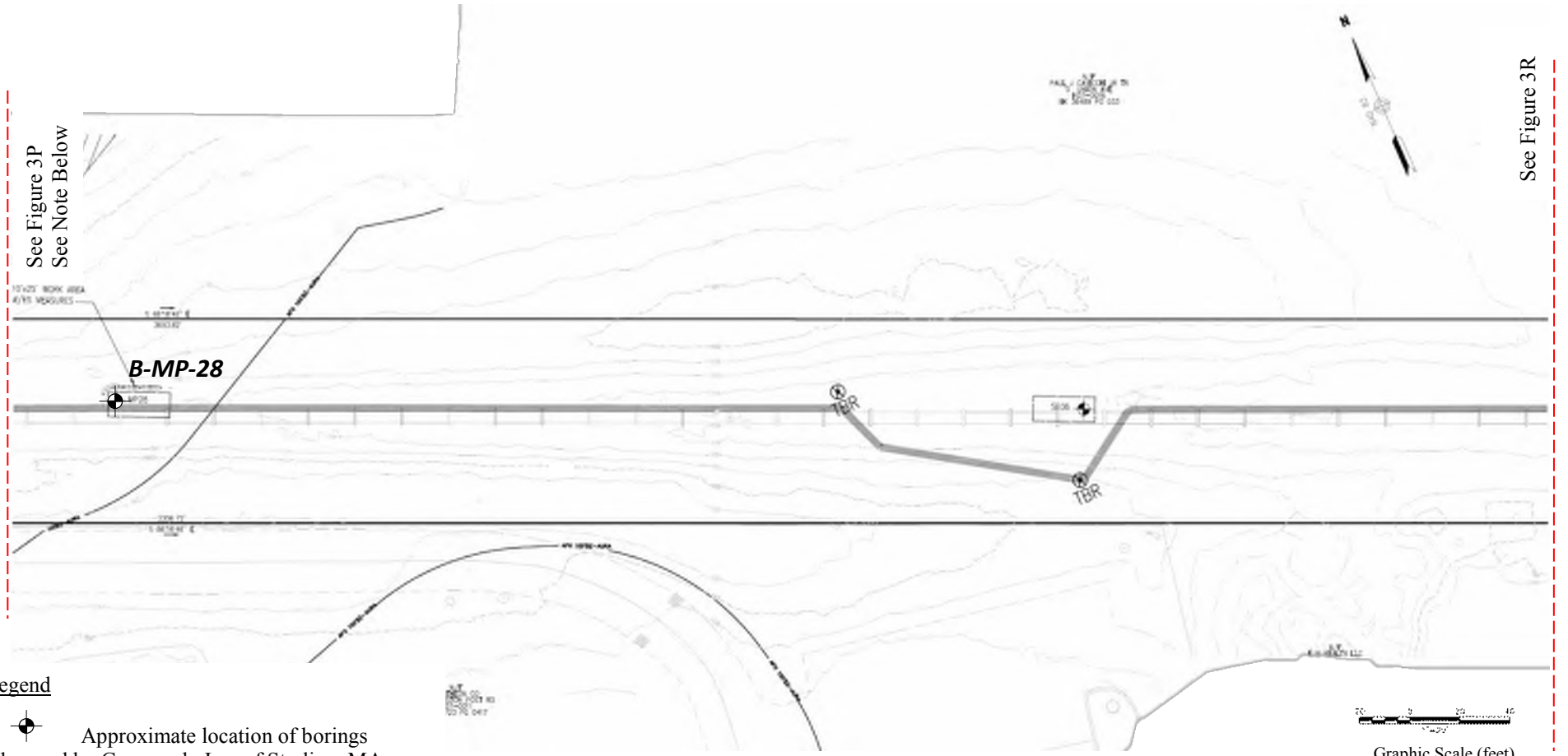
Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines. The subsequent sheet (Sheet 24) was skipped because no geotechnical borings are located within the area shown on Sheet 24.

Key Plan

Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3P – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



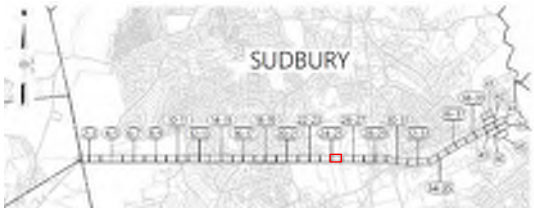
Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

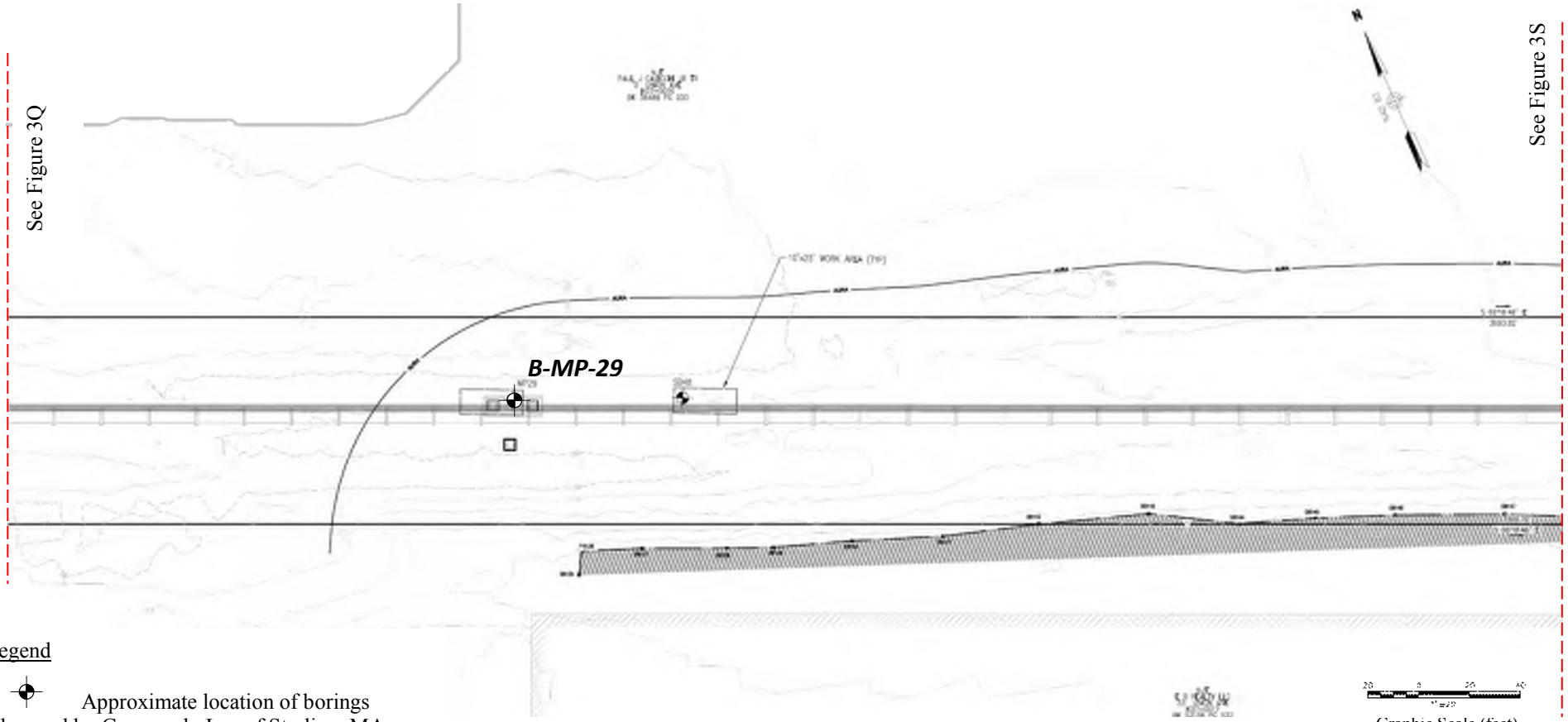
Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines. The previous sheet (Sheet 24) were skipped because no geotechnical borings are located within the area shown on Sheet 24.

Key Plan



Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3Q – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



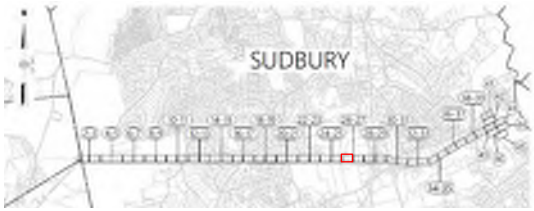
Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

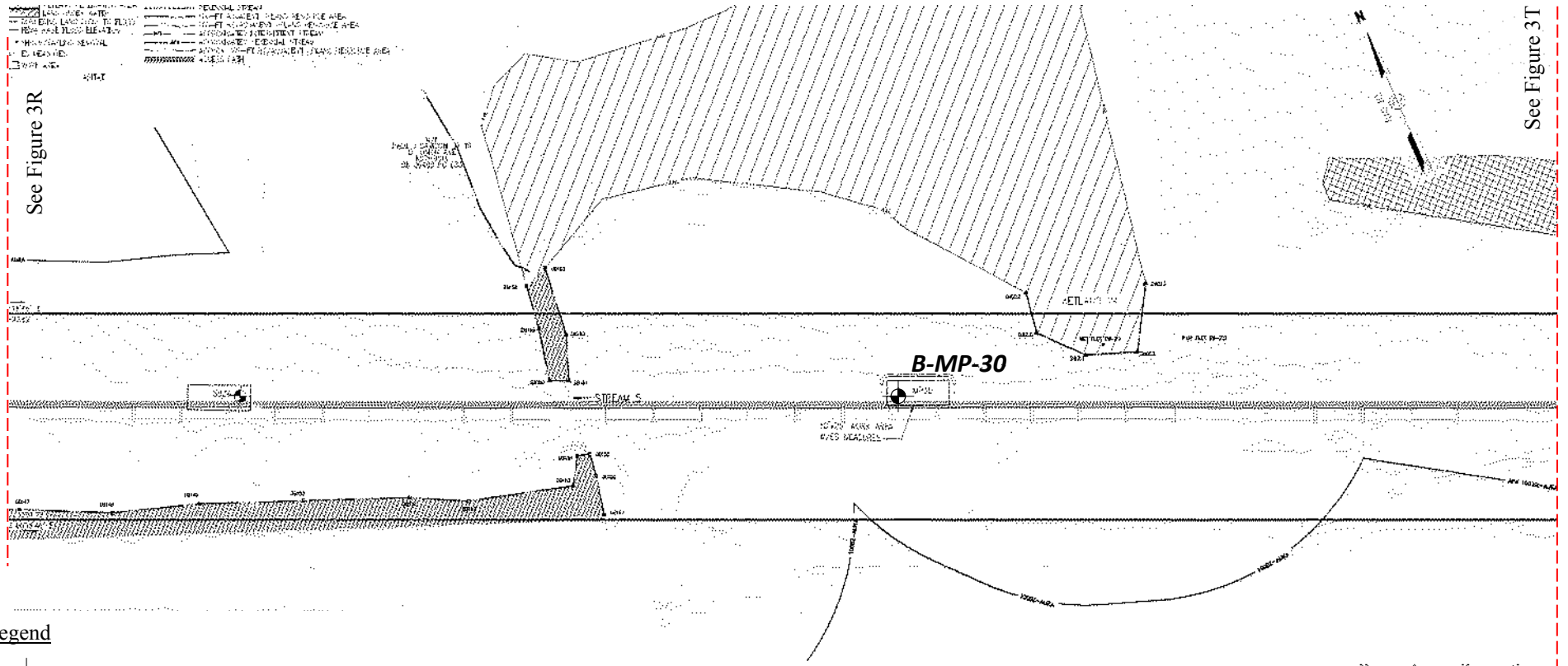
Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines.

Key Plan



Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3R – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



Graphic Scale (feet)

Legend

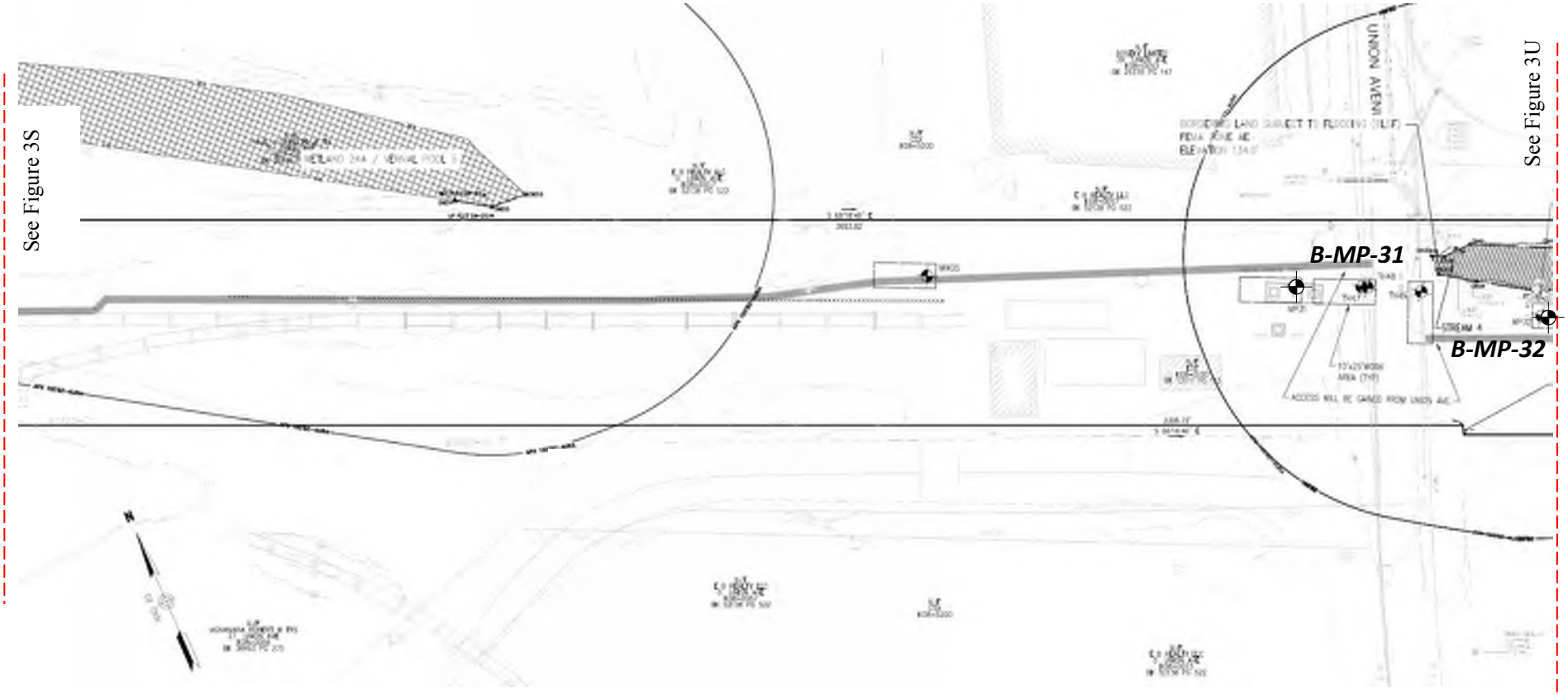
Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines.

Key Plan

Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3S – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



Graphic Scale (feet)

Legend

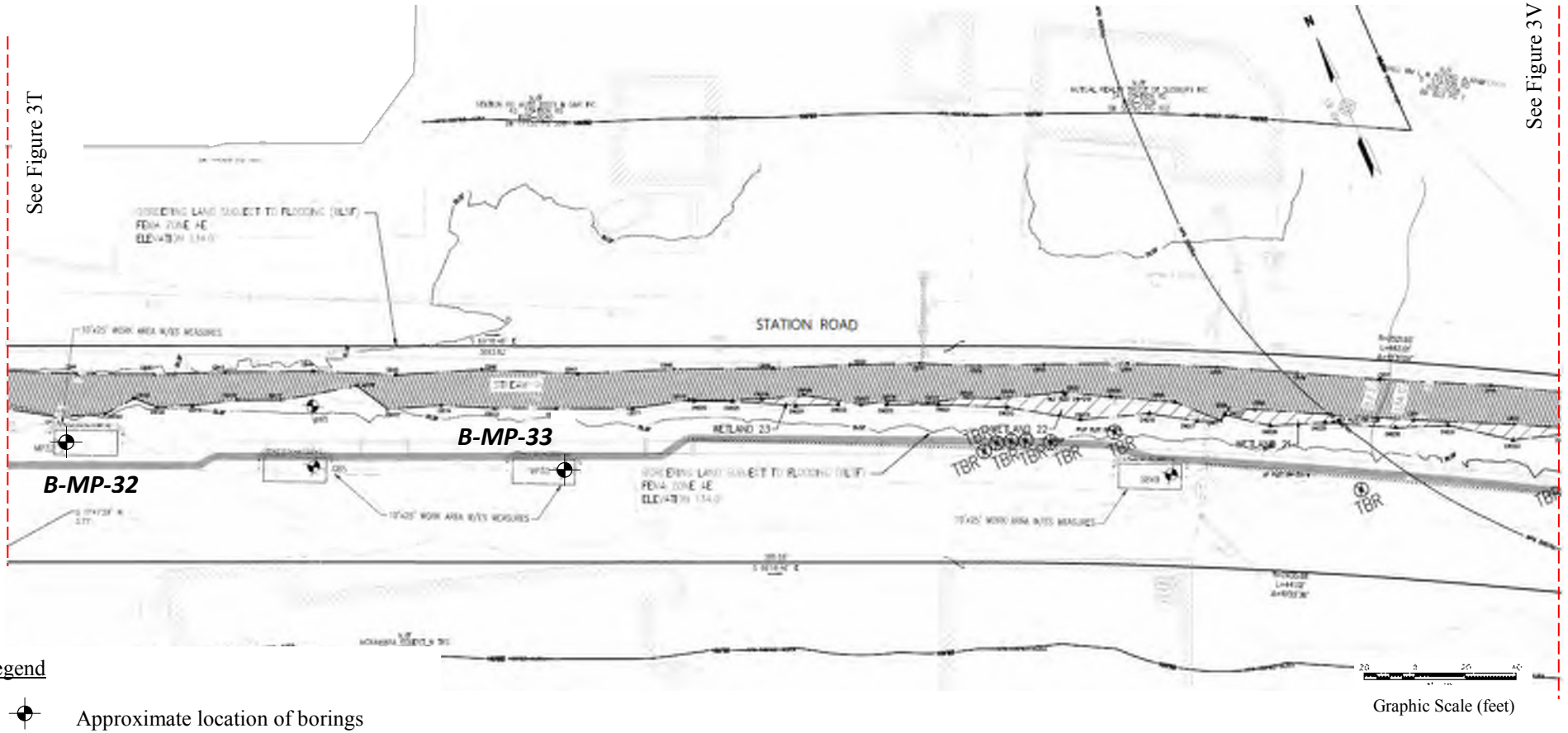
Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

Key Plan

Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines.

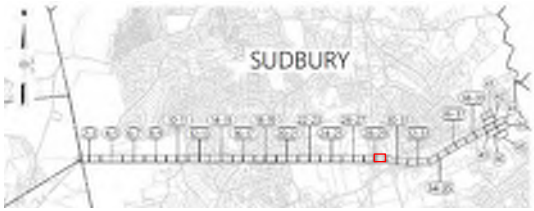
Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3T – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



Legend

⊕ Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

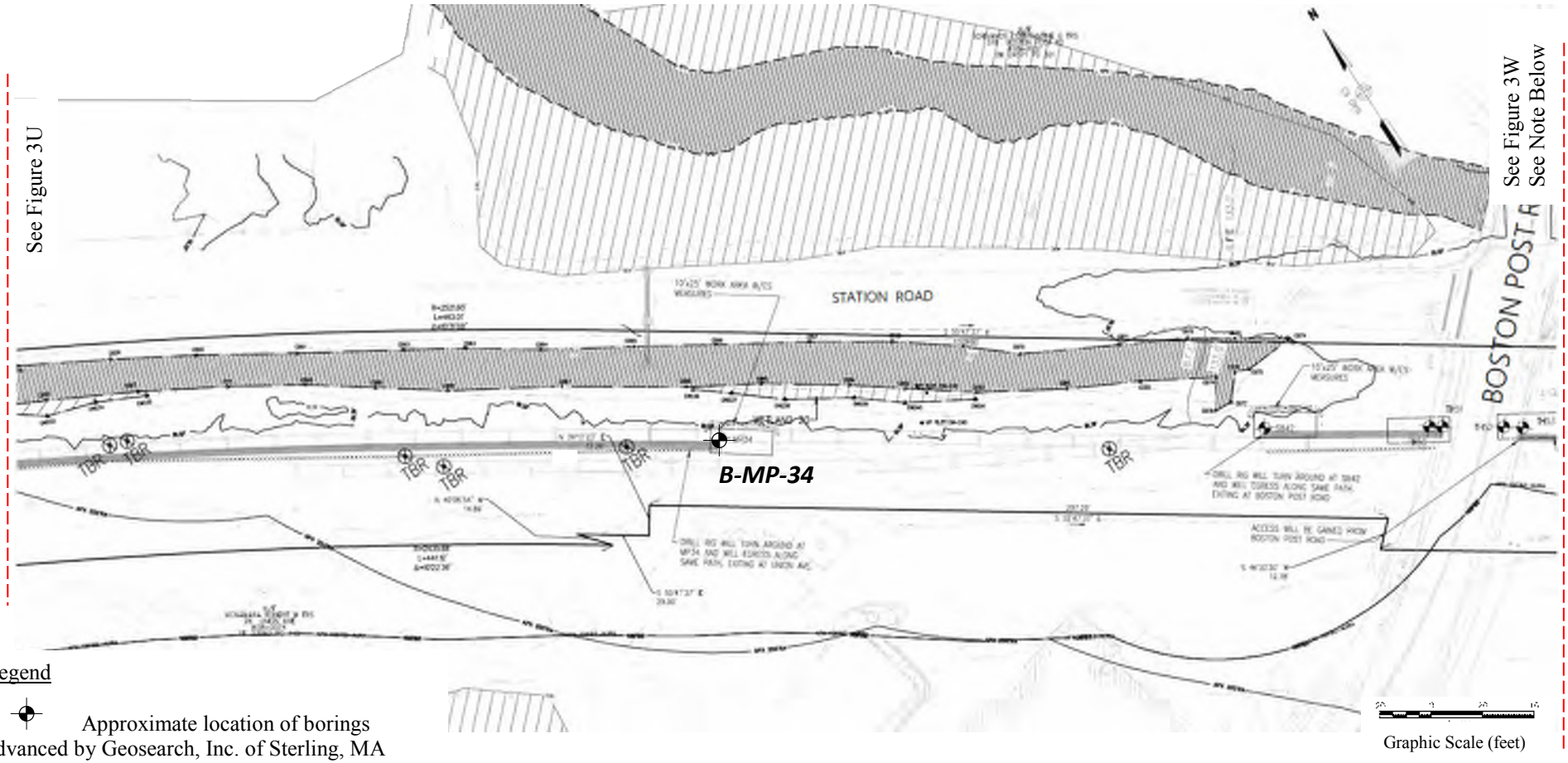
Key Plan



Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines.

Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3U – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



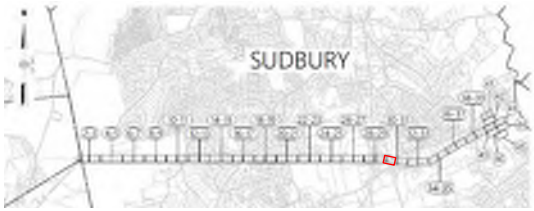
Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

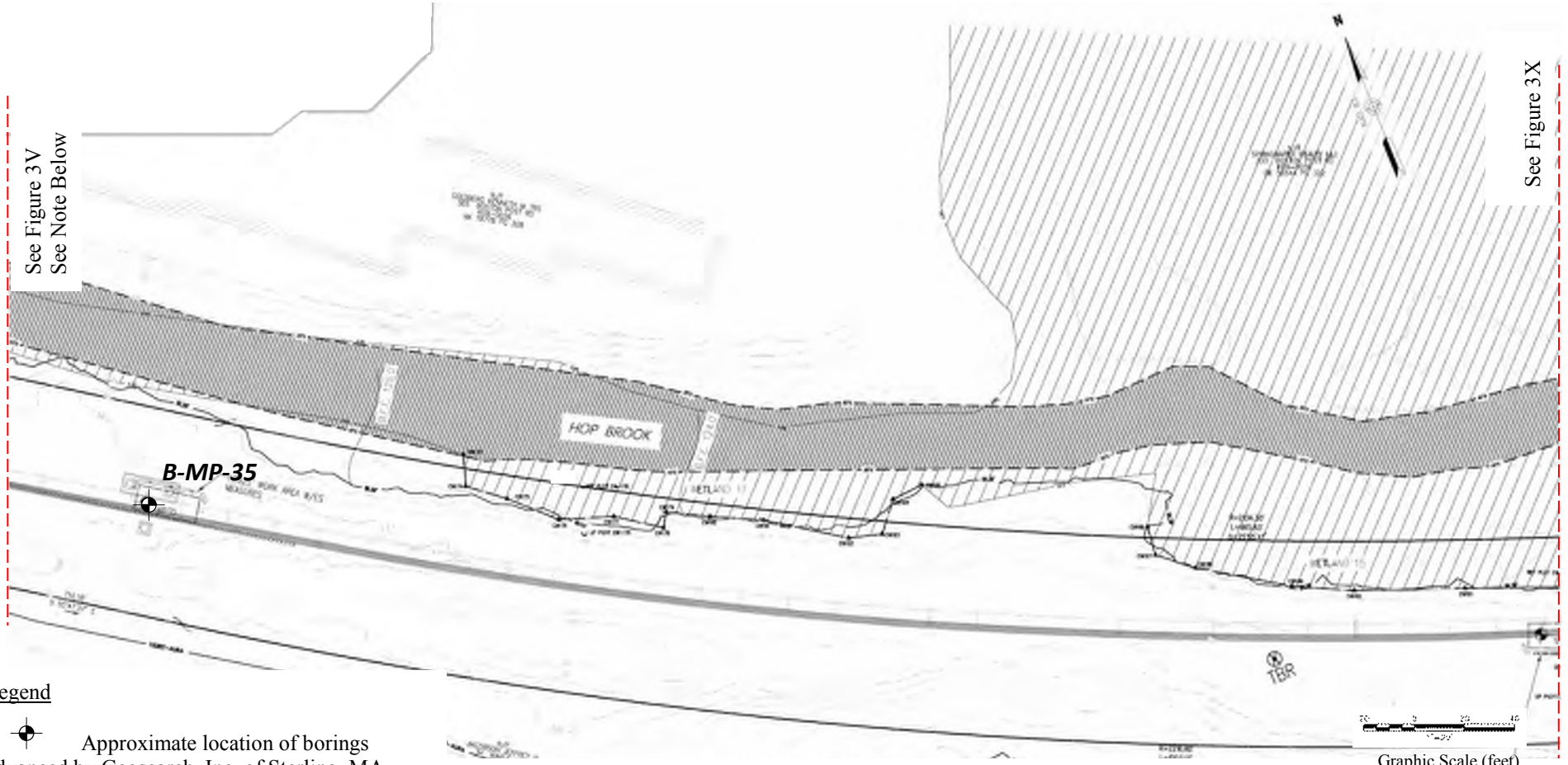
Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines. The subsequent sheet (Sheet 31) was skipped because no geotechnical borings are located within the area shown on Sheet 31.

Key Plan



Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3V – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



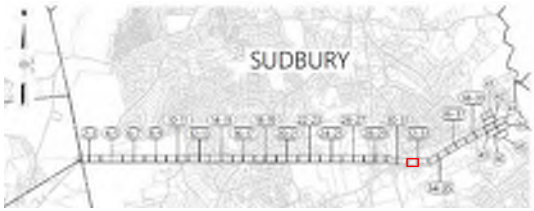
Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

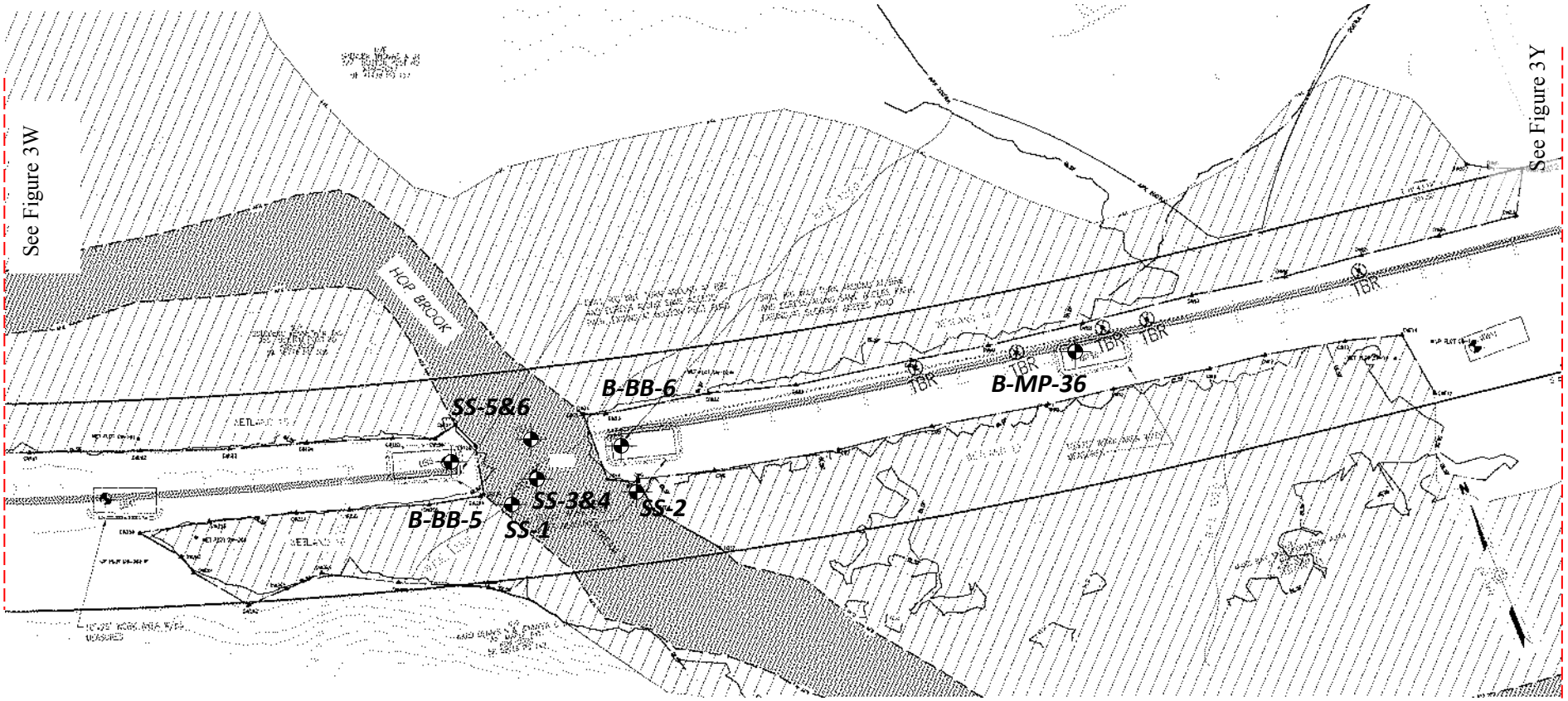
Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines. The previous sheet (Sheet 31) were skipped because no geotechnical borings are located within the area shown on Sheet 31.

Key Plan



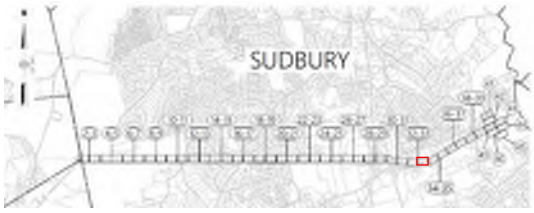
Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3W – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



Legend

⊕ Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

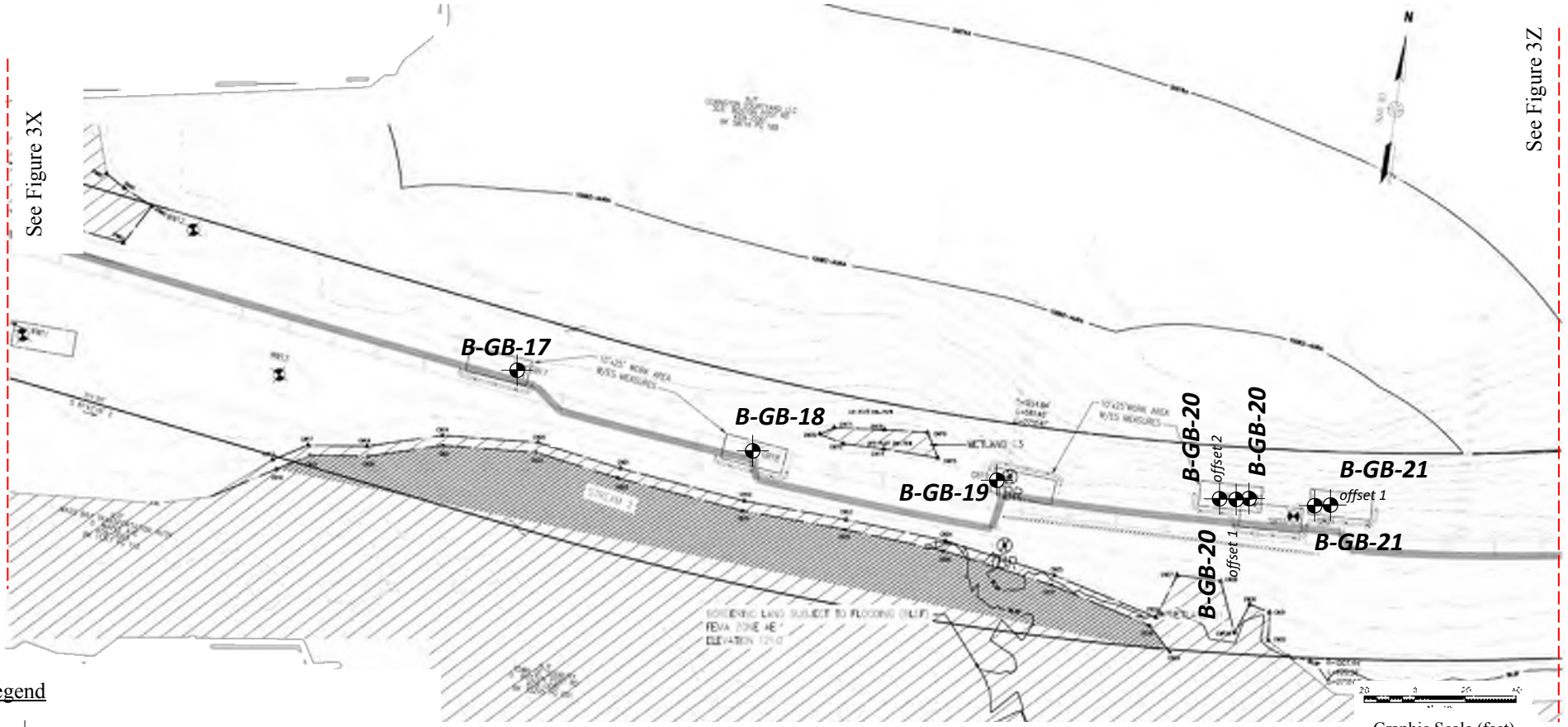
Key Plan



Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines.

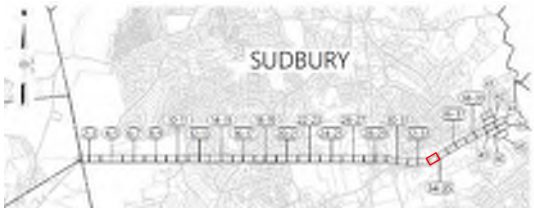
Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3X – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



Legend

⊕ Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

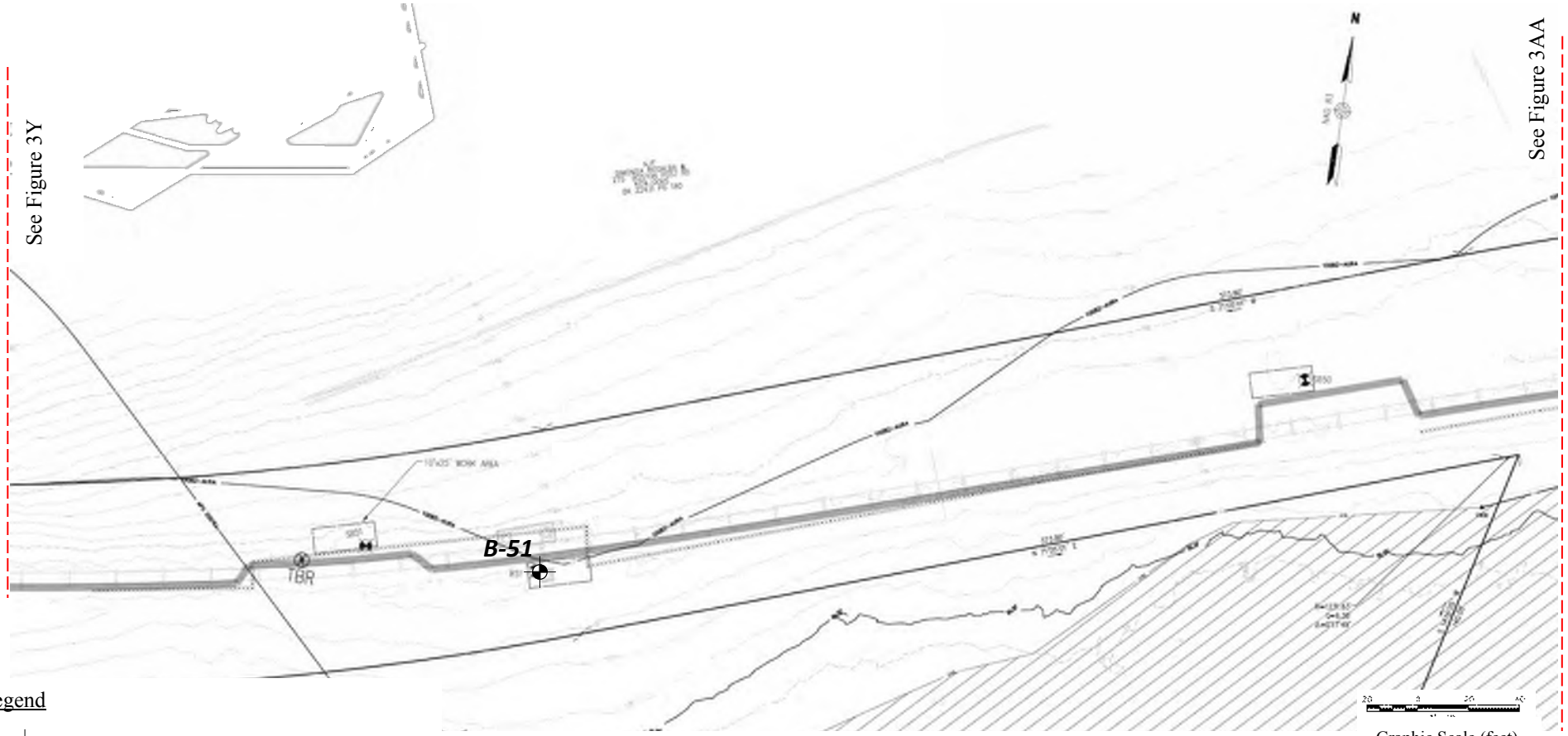
Key Plan



Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines.

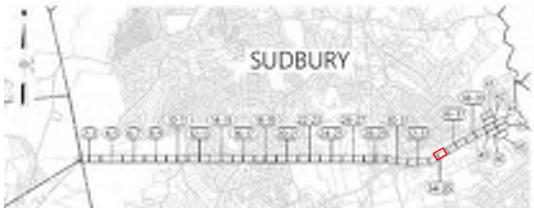
Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3Y – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

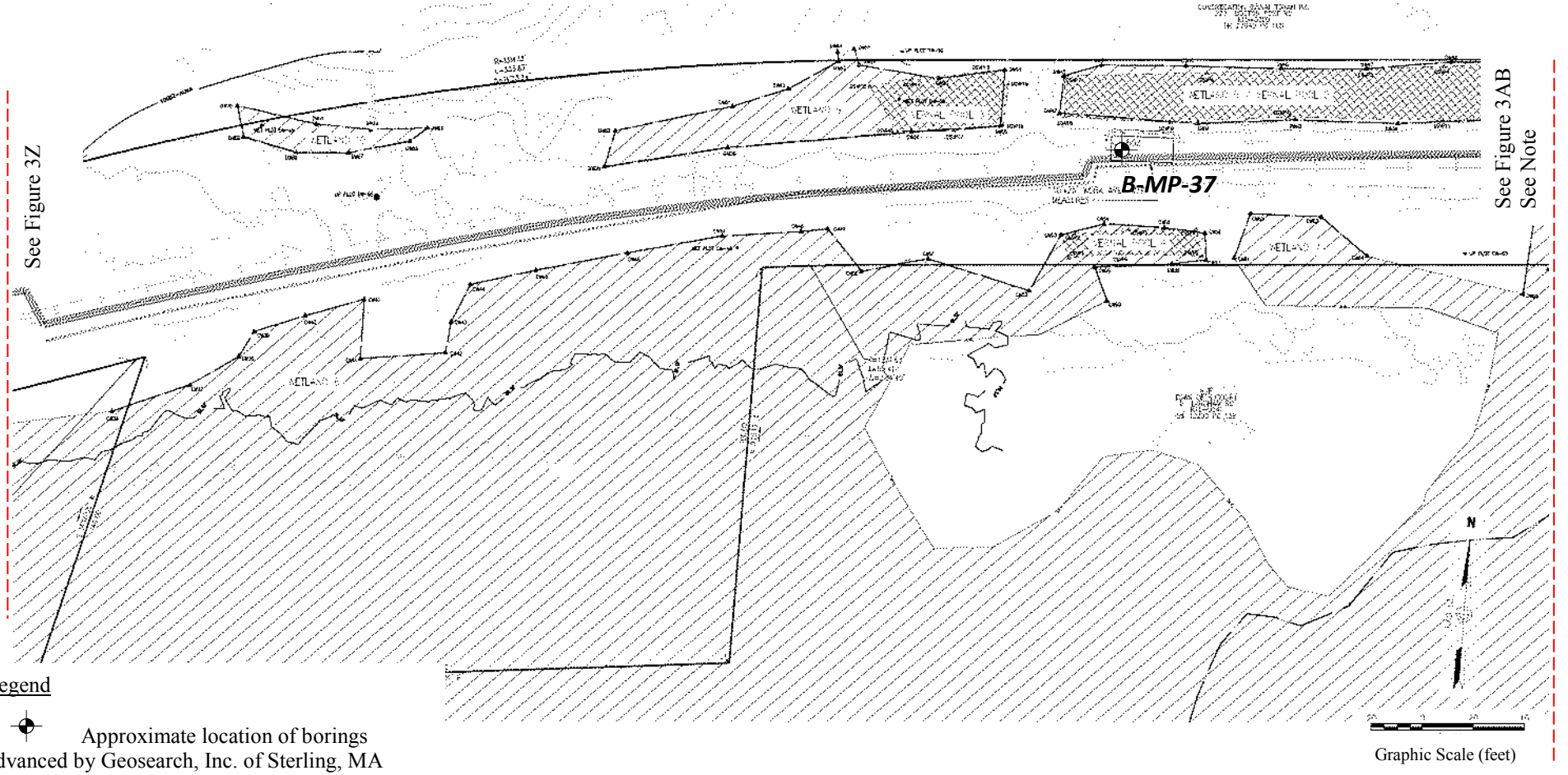
Key Plan



Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines.

Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3Z – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



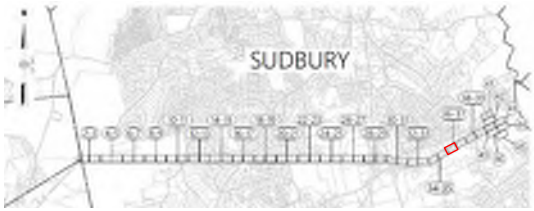
Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

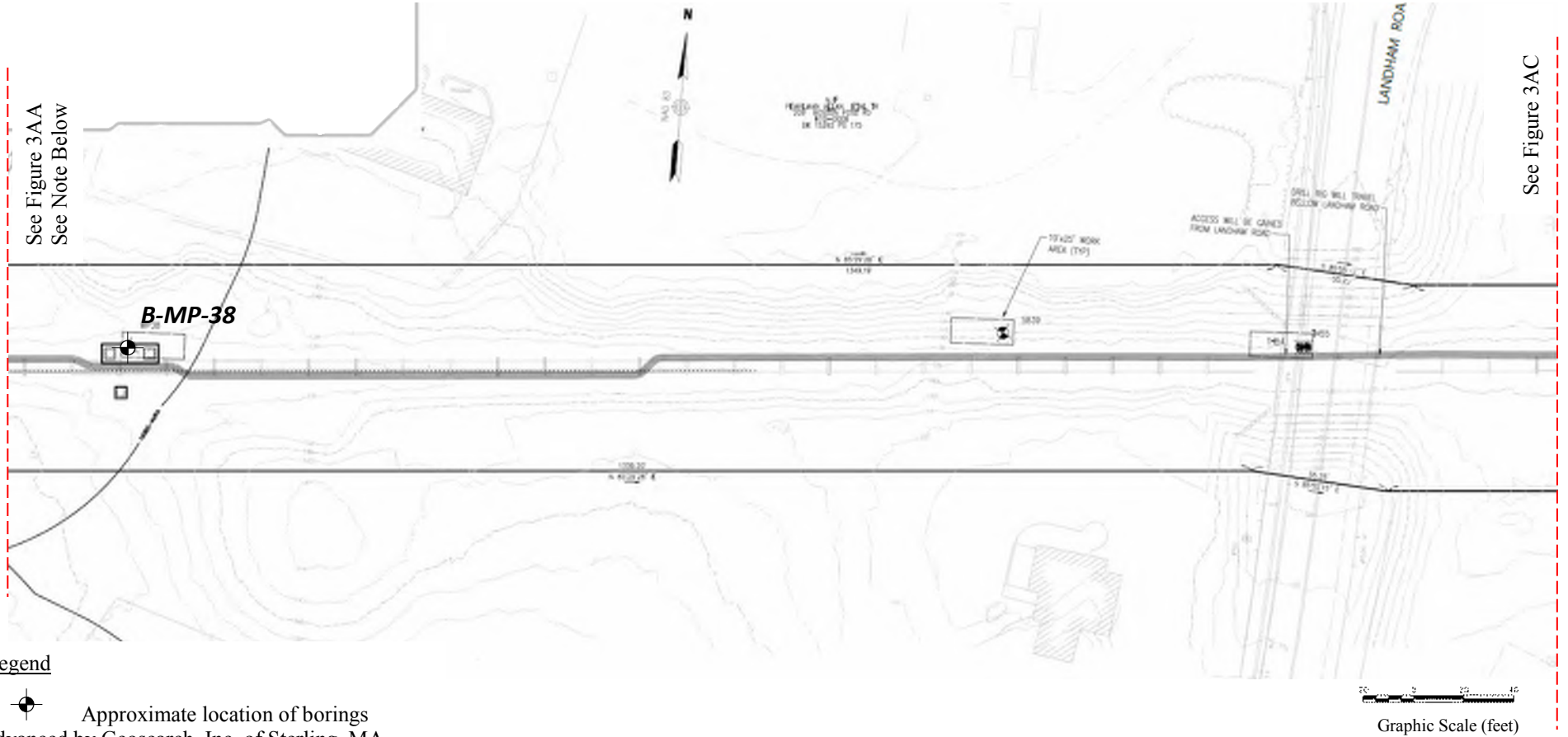
Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines. The subsequent sheet (Sheet 37) were skipped because no geotechnical borings are located within the area shown on Sheet 37.

Key Plan



Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3AA – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



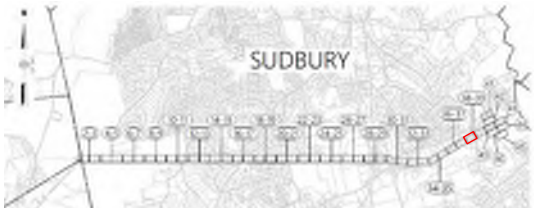
Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

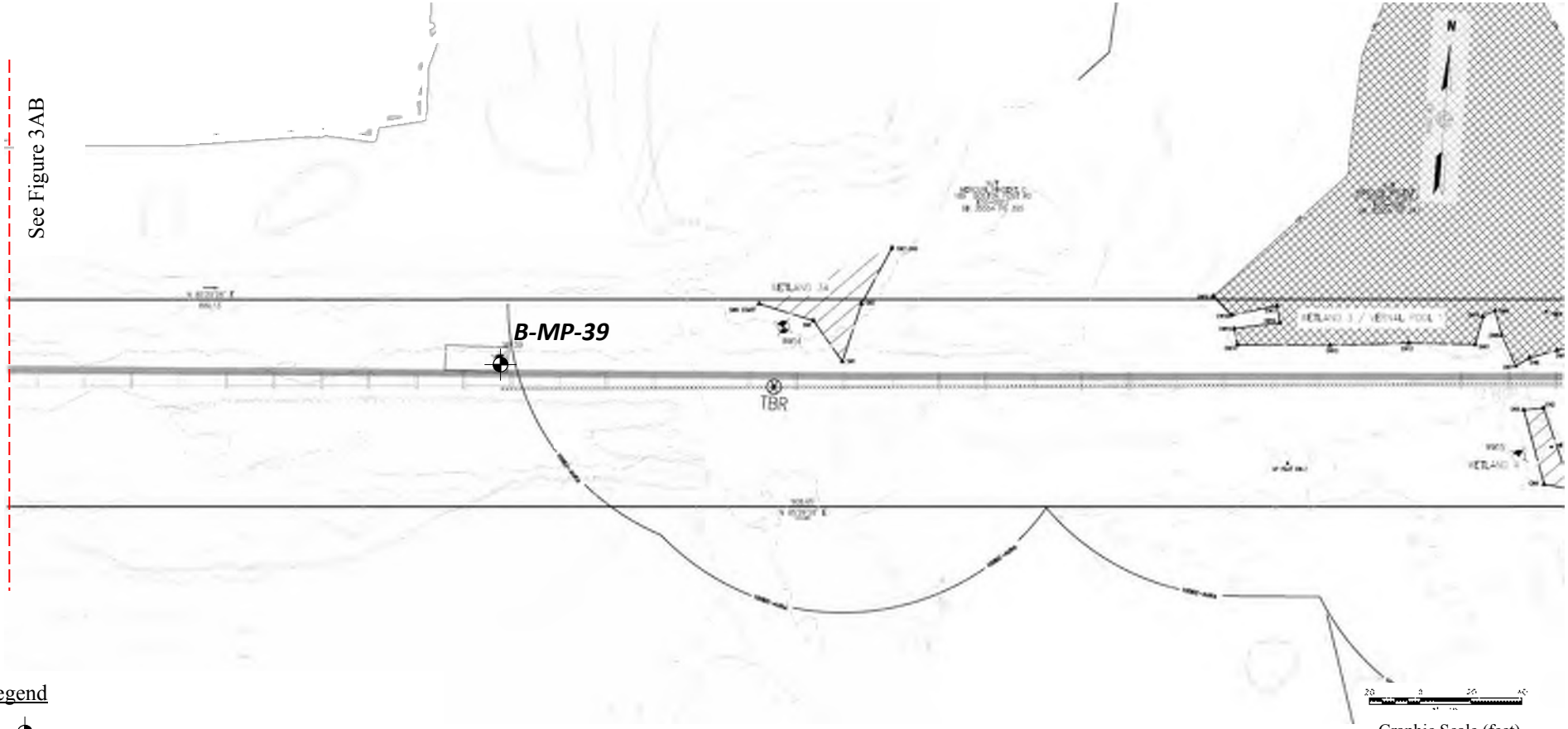
Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed lines are not match lines. The previous sheet (Sheet 37) were skipped because no geotechnical borings are located within the area shown on Sheet 37.

Key Plan



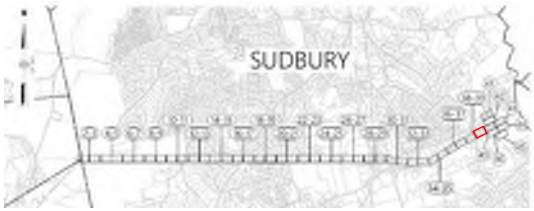
Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3AB – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between September 5 and November 14, 2018 and observed by LGCI.

Key Plan



Note

Figure based on Sheets 1 to 42 of a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 5, 2018. Dashed line is not a match line.

Client: Vanasse Hangen Brustlin, Inc.	Project: Proposed Transmission Power Line Borings	Figure 3AC – Boring Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Sudbury, MA	LGCI Project No.: 1836	Date: December 2018

Appendix A - LGCI's Boring Logs

LGCI
Lahlaf Geotechnical Consulting, Inc.
100 Chelmsford Road, Suite 2
Billerica, MA 01862
Telephone: (978) 330-5912
Fax: (978) 330-5056

BORING LOG

B-28

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/13/18 **DATE COMPLETED:** 11/13/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 198 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 50s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 5.4 ft. / El. 192.6 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El. (ft.)	Material Description
		0	S1	3-2-7-2 (9)	24/17		Forest Mat / Fill	0.2 / 197.8	S1 - Encountered ~2 inches of forest mat material Top 8": Silty SAND (SM), fine, trace medium, 25-30% fines, trace fine gravel, trace organic fines, trace coal ash, dark brown, moist Bot. 7": Silty SAND (SM), fine, trace medium, ~20% fines, ~5% fine subangular gravel, trace organic fines, light brown, moist
	195.0	2	S2	19-33-62-59 (95)	24/20		Sand	2.0 / 196.0	S2 - Silty SAND (SM), fine, trace medium to coarse, ~20% fines, 0-5% fine gravel, light brown, moist
5		4	S3	15-50-64-71 (114)	24/21				S3 - Similar to S2
		6	S4	58-61-72	18/6				S4 - Silty SAND (SM), fine, trace medium to coarse, ~15% fines, ~5% fine gravel, light brown, moist
	190.0	7.5 8	S5	13-26-18-14 (44)	24/10				S5 - Well Graded SAND with Silt and Gravel (SW-SM), fine to medium, trace coarse, 10-15% fines, ~15% fine to coarse gravel, light brown, wet
10		10						10.0 / 188.0	Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings.
	185.0								
15									
	180.0								
20									
	175.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.
100 Chelmsford Road, Suite 2
Billerica, MA 01862
Telephone: (978) 330-5912
Fax: (978) 330-5056

BORING LOG

B-29
PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/13/18 **DATE COMPLETED:** 11/13/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE EL.: 192 ft. (see note 1) **TOTAL DEPTH:** 15 ft.
WEATHER: 50s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 9.5 ft. / El. 182.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	1-2-1-2 (3)	24/8		Topsoil	0.3 / 191.7	S1 - Top 3": Silty SAND (SM), fine to medium, 25-30% fines, trace organic fines, trace roots, dark brown, moist
	190.0	2	S2	3-3-4-5 (7)	24/18		Fill		Bot. 5": Recovery was lost on forest ground, appears the same as S2 S2 - Poorly Graded SAND (SP), fine, trace medium, ~5% fines, trace organic fines, light brown, moist
5		4	S3	3-5-8-16 (13)	24/19	1	Sand	4.0 / 188.0	REMARK 1: Heavy auger chatter from 4 feet to 8 feet. S3 - Silty SAND (SM), fine, trace medium, 20-25% fines, light brown, moist
	185.0	6	S4	29-29-20-17 (49)	24/16				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 25-30% fine angular gravel, light brown to orange, moist
10		8	S5	3-8-11-10 (19)	24/13				S5 - Silty GRAVEL with Sand (GM), fine to coarse, subangular, ~20% fines, ~35% fine to medium sand, light brown, wet
	180.0	10							
		13	S6	3-7-21-26 (28)	24/10				S6 - Silty SAND with Gravel (SM), fine, 20-25% fines, ~20% fine to coarse gravel, light brown, wet
15		15						15.0	
	175.0								Bottom of borehole at 15.0 feet. Backfilled borehole with drill cuttings.
20									
	170.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

LGCI Lahlaf Geotechnical Consulting, Inc.
100 Chelmsford Road, Suite 2
Billerica, MA 01862
Telephone: (978) 330-5912
Fax: (978) 330-5056

BORING LOG

B-30

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/14/18 **DATE COMPLETED:** 11/14/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 188 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 30s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 7.3 ft. / El. 180.8 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	3-3-3-4 (6)	24/24		Forest Mat	0.5 / 187.5	S1 - Top 6": Silty SAND (SM), fine to medium, trace organic fines, trace coal ash, trace roots, dark brown, moist Bot. 18": Poorly Graded SAND (SP), fine, trace medium, ~5% fines, brown, moist
	185.0	2	S2	4-5-6-10 (11)	24/19				S2 - Top 12": Similar to Bot. 18" of S1 Bot. 7": Silty SAND (SM), fine, ~20% fines, light brown, wet
5		4	S3	3-5-6-120/2" (11)	20/17	1	Sand		REMARK 1: Auger chatter from 4 feet to 8 feet. S3 - Top 8": Similar to Bot. 7" of S2 Bot. 9": Silty SAND (SM), fine, trace medium to coarse, 30-35% fines, 0-5% fine gravel, brown, wet
		5.7							
	180.0	8	S4	11-19-26-25 (45)	24/24				S4 - Silty SAND (SM), fine to medium, trace coarse, 25-30% fines, 5-10% fine angular gravel, brown, wet
10		10						10.0	Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings.
	175.0								
15									
	170.0								
20									
	165.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-31

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/14/18 **DATE COMPLETED:** 11/14/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 178 ft. (see note 1) **TOTAL DEPTH:** 16 ft.
WEATHER: 30s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 8.0 ft. / El. 170.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.5 / 177.5	S1 - Top 6": Silty SAND (SM), fine to medium, ~25% fines, trace fine gravel, trace organic fines, trace coal ash, trace roots, dark brown, moist
			S1	4-3-3-4 (6)	24/20				Bot. 14": Well Graded SAND (SW), fine to coarse, ~5% fines, 0-5% fine gravel, brown, moist
		2							S2 - Similar to Bot. 14" of S1
	175.0		S2	5-6-8-9 (14)	24/22				
		4							S5 - Similar to Bot. 14" of S1
5			S5	3-9-9-8 (18)	24/19				
		6							
	170.0						Sand		
		9							S4 - Silty SAND (SM), fine, 25-30% fines, light brown, wet
10			S4	4-4-4-5 (8)	24/24				
		11							
	165.0								
		14							S5 - Silty SAND (SM), fine, 35-40% fines, light brown, wet
15			S5	8-10-13-12 (23)	24/24				
		16						16.0	
									Bottom of borehole at 16.0 feet. Backfilled borehole with drill cuttings.
	160.0								
20									
	155.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-32

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/14/18 **DATE COMPLETED:** 11/14/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 172 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 30s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: Not Encountered
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	2-3-4-4 (7)	24/20		Topsoil	0.6 / 171.4	S1 - Top 8": Silty SAND (SM), fine to medium, ~25% fines, trace organic fines, trace roots, trace coal ash, dark brown, moist Bot. 12": Poorly Graded SAND (SP), fine, trace medium, ~5% fines, brown, moist
	170.0	2	S2	6-6-6-8 (12)	24/19				S2 - Similar to Bot. 12" of S1
5		4	S3	4-5-6-7 (11)	24/18		Sand		S3 - Similar to Bot. 12" of S1
	165.0	6	S4	8-7-7-9 (14)	24/19				S4 - Poorly Graded SAND (SP), fine, trace medium, ~5% fines, light brown, moist
		8	S5	4-4-5-5 (9)	24/21				S5 - Similar to S4
10		10						10.0	Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings.
	160.0								
15									
	155.0								
20									
	150.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-33

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/08/18 **DATE COMPLETED:** 11/08/18
BORING LOCATION: MBTA ROW, West of Dutton Road
COORDINATES: NA
SURFACE El.: 170 ft. (see note 1) **TOTAL DEPTH:** 17 ft.
WEATHER: 50s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 12.5 ft. / El. 157.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El. (ft.)	Material Description
		0					Forest Mat / Topsoil	0.5 / 169.5	S1 - Encountered ~1 inches of forest mat material at ground surface Top 5": Silty SAND (SM), fine to medium, 25-30% fines, trace coal ash, trace organic fines, trace roots, dark brown, moist
		2	S1	2-10-42-28 (52)	24/15	1	Fill		Mid. 4": Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, ~15% fine to coarse subangular gravel, trace organic fines, trace roots, brown, moist Bot. 5": Angular stone fragments REMARK 1: Hevay auger chatter from 2 feet to 4 feet.
		4	S2	16-14-10-11 (24)	24/12	2			S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subangular gravel, trace organic fines, brown, moist
5	165.0		S3	4-13-12-15 (25)	24/18			4.9 / 165.1	REMARK 2: Heavy auger chatter 4 feet to 8 feet. S3 - Top 5": Silty SAND (SM), fine to medium, 25-30% fines, 5-10% fine gravel, trace coal ash, trace organic fines, trace roots, dark brown, moist (Buried Topsoil) Mid. 6": Poorly Graded SAND with Silt and Gravel (SP-SM), fine, trace medium, 5-10% fines, 30-35% fine to coarse subangular gravel, trace organic fines, brown, moist
		6	S4	28-27-24-20 (51)	24/19				Bot. 7": Silty SAND (SM), fine, trace medium, 30-35% slightly plastic fines, trace fine subangular gravel, trace stone fragments, light brown, moist S4 - Silty SAND (SM), fine to medium, trace coarse, ~20% fines, 30-35% fine to coarse subangular gravel, brown, moist
		8	S5	10-12-17-18 (29)	24/12				S5 - Silty GRAVEL with Sand (GM), fine to coarse, angular, ~25% fines, ~35% fine to coarse sand, light brown, wet
10	160.0	10	S6	8-15-20-19 (35)	24/16	3	Sand		REMARK 3: Heavy auger chatter from 10 feet to 15 feet. S6 - Silty SAND with Gravel (SM), fine to medium, ~25% fines, ~15% fine subangular gravel, light brown, wet
		12							
15	155.0	15	S7	11-21-15-17 (36)	24/16				S7 - Similar to S6, fine to coarse, 20-25% fines
		17						17.0	Bottom of borehole at 17.0 feet. Backfilled borehole with drill cuttings.
20	150.0								
25	145.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-34

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/08/18 **DATE COMPLETED:** 11/08/18
BORING LOCATION: MBTA ROW, West of Dutton Road
COORDINATES: NA
SURFACE El.: 176 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 50s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: Not Encountered
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	175.0	0	S1	8-4-1-2 (5)	24/13	1	Forest Mat / Topsoil	0.2 / 0.6 / 175.4	S1 - Encountered ~2 inches of forest mat material at ground surface Top 5": Silty SAND (SM), fine to medium, 25-30% fines, trace coal ash, trace organic fines, trace roots, dark brown, moist Bot. 6": Silty SAND (SM), fine to coarse, ~20% fines, 0-5% fine angular gravel, trace organic fines, light brown, moist
		2	S2	4-7-4-3 (11)	24/15				S2 - Similar to Bot. 6" of S1, ~25% fines
		4	S3	3-3-3-3 (6)	24/7		Fill		REMARK 1: Auger chatter from 4 feet to 8 feet. S3 - Similar to Bot. 6" of S1, trace wood
5	170.0	6	S4	3-10-13-15 (23)	24/14				S4 - Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, ~15% fine to coarse subangular gravel, trace coal ash, trace rock powder, trace organic fines, orange, moist
		8	S5	25-39-31-27 (70)	24/10		Sand	8.0 / 168.0	S5 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to coarse, 5-10% fines, 30-35% fine to coarse subangular gravel, angular stone fragments, brown, moist
10	165.0	10						10.0	Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings.
15	160.0								
20	155.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-35

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 09/06/18 **DATE COMPLETED:** 09/06/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 182 ft. (see note 1) **TOTAL DEPTH:** 8 ft.
WEATHER: 90s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: Not Encountered
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	6-5-17-42 (22)	24/24		Fill	1.3	S1 - Top 15": Silty SAND (SM), fine to medium, trace coarse, 15-20% fines, ~5% fine subrounded gravel, trace organic fines, trace roots, trace coal, brown to orange, moist
	180.0	2	S2	33-43-26-22 (69)	24/16		Sand	180.7	Bot. 9": Poorly Graded SAND with Silt and Gravel (SP-SM), fine to coarse, ~10% fines, ~25% fine to coarse subrounded to subangular gravel, light brown, moist S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subangular gravel, light brown to orange, moist
5		4	S3	6-16-38-78 (54)	24/12				S3 - Similar to S2, 10-15% fines
	175.0	6	S4	36-84	12/8	1			S4 - Silty SAND with Gravel (SM), fine to coarse, ~15% fines, ~20% fine to coarse subangular gravel, angular stone fragments, gray, moist REMARK 1: Heavy drill chatter from 7 feet to 8 feet.
		7				2		8.0	REMARK 2: Encountered auger refusal at 8 feet. Bottom of borehole at 8.0 feet. Backfilled borehole with drill cuttings.
10									
	170.0								
15									
	165.0								
20									
	160.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-36

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 09/05/18 **DATE COMPLETED:** 09/07/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 184 ft. (see note 1) **TOTAL DEPTH:** 10.5 ft.
WEATHER: 90s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 4.0 ft. / El. 180.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: HSA (4-1/4" I.D.) then 3-inch casing
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NX
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	4-5-10-21 (15)	24/20		Fill	1.1 182.9	S1 - Top 13": Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, ~10% fines, ~5% fine subangular gravel, trace organic fines, trace roots, trace coal, brown, moist
		2	S2	61-55-65	18/14		Sand		Bot. 7": Poorly Graded SAND with Silt (SP-SM), fine, trace medium to coarse, 10-15% fines, trace fine subangular gravel, light brown, moist S2 - Silty SAND (SM), fine, trace medium to coarse, 15-20% fines, ~5% fine subangular gravel, light brown, moist
	180.0	3.5							
		4	S3	120/4"	4/3	1			REMARK 1: Heavy drill chatter from 4 feet to 6 feet.
5		4.3 5	S4	42-78/2"	8/3				S3 - Silty SAND with Gravel (SM), fine to coarse, ~20% fines, 15-20% fine subangular gravel, trace organic fines, brown, moist S4 - Similar to S3, angular stone fragments, light brown
		5.7				2		6.0 178.0	REMARK 2: Encountered auger refusal at 6 feet. Switched to 3-inch casing at 6 feet.
		7	C1		24/21		Bedrock		C1 - min/ft: 5.3, 4.5 Hard, slightly weathered, slightly fractured, fine-grained, gray with black mottles, GRANITE Rec = 87.5%, RQD = 85.7%
	175.0	9	C2		18/11				C2 - min/ft: 11.6, 16.7/6" Hard, slightly weathered, slightly fractured, fine-grained, gray with black mottles, GRANITE
10		10.5						10.5	Rec = 61.1% , RQD = 72.7%
									Bottom of borehole at 10.5 feet. Backfilled borehole with drill cuttings. and one bag of sand.
	170.0								
15									
	165.0								
20									
	160.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-37

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/12/18 **DATE COMPLETED:** 11/12/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 192 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 40s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: Not Encountered
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Forest Mat	0.2	S1 - Encountered ~2 inches of forest mat material at ground surface
							Topsoil	1.0	Top 10": Silty SAND (SM), fine to medium, 25-30% fines, trace coal ash, trace organic fines, trace roots, trace wood, dark brown, moist
	190.0	2	S1	2-3-2-5 (5)	24/22			191.0	Bot. 10": Poorly Graded SAND with Silt (SP-SM), fine, trace medium to coarse, 5-10% fines, trace fine subrounded gravel, trace organic fines, brown, moist
			S2	5-5-5-5 (10)	24/8				S2 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium, ~10% fines, light brown, moist
5		4	S3	5-4-4-5 (8)	24/15		Fill		S3 - Similar to S2, 5-10% fines
		6	S4	4-4-4-4 (8)	24/21				S4 - Similar to S2, 5-10% fines
	185.0	8	S5	2-3-2-3 (5)	24/20				S5 - Similar to S2, 5-10% fines
10		10						10.0	Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings.
	180.0								
15									
	175.0								
20									
	170.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-38

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/12/18 **DATE COMPLETED:** 11/12/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE EI.: 196 ft. (see note 1) **TOTAL DEPTH:** 16 ft.
WEATHER: 40s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 15.0 ft. / El. 181.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	195.0	0	S1	2-3-3-7 (6)	24/18		Forest Mat / Topsoil	0.2 / 0.7 / 195.3	S1 - Encountered ~2 inches of forest mat material at ground surface Top 6": Coal ash, trace organic fines, trace roots, trace wood, dark brown, moist (Topsoil) Bot. 10": Poorly Graded SAND with Silt (SP-SM), fine, trace medium, ~10% fines, trace fine to coarse subrounded gravel, trace organic fines, brown, moist
		2	S2	5-5-22-16 (27)	24/10				S2 - Similar to Bot. 10" of S1, no gravel
5		4	S3	41-8-10-10 (18)	24/9	1			REMARK 1: Heavy auger chatter from 4 feet to 8 feet. S3 - Similar to Bot. 10" of S1
	190.0	6	S4	6-5-3-5 (8)	24/20				S4 - Top 9": Similar to Bot. 10" of S1 Bot. 11": Silty SAND (SM), fine, 15-20% fines, trace organic fines, orange and dark brown, moist
		8	S5	3-4-6-8 (10)	24/20		Fill		S5 - Top 12": Poorly Graded SAND (SP), fine, ~5% fines, light brown, moist Bot. 8": Well Graded SAND (SW), fine to coarse, ~5% fines, brown, moist
10		10	S6	5-9-7-7 (16)	24/20				S6 - Poorly Graded SAND (SP), fine, trace medium, ~5% fines, light brown, moist
	185.0	12	S7	8-8-9-9 (17)	24/20				S7 - Similar to S6
		14	S8	4-5-5-5 (10)	24/20				S8 - Similar to S6
15	180.0	16						16.0	Bottom of borehole at 16.0 feet. Backfilled borehole with drill cuttings.
20	175.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-39
PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/09/18 **DATE COMPLETED:** 11/09/18
BORING LOCATION: MBTA ROW, East of Pakham Road
COORDINATES: NA
SURFACE El.: 158 ft. (see note 1) **TOTAL DEPTH:** 15 ft.
WEATHER: 40s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 9.5 ft. / El. 148.5 ft.
AT END OF DRILLING: -
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Drive and wash with 3-inch casing
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Forest Mat	0.2	S1 - Encountered ~2 inches of forest mat material at ground surface
							Topsoil	0.8 157.2	Top 7": Silty SAND (SM), fine to medium, ~25% fines, trace coal ash, trace organic fines, trace roots, dark brown, moist
		2	S1	2-4-6-6 (10)	24/24				Bot. 15": Poorly Graded SAND with Silt (SP-SM), fine, trace medium, ~10% fines, trace organic fines, orange, moist
	155.0		S2	3-3-5-5 (8)	24/19		Fill		S2 - Silty SAND (SM), fine, trace medium, ~25% fines, trace organic fines, trace roots, brown, moist
		4	S3	3-3-4-5 (7)	24/21				S3 - Similar to S2, no roots
5		6	S4	7-9-10-11 (19)	24/20			6.0 152.0	S4 - Poorly Graded SAND (SP), fine, trace medium, ~5% fines, light brown, moist
	150.0	8	S5	5-7-10-11 (17)	24/15				S5 - Similar to S4, wet
10		10					Sand		
	145.0	13	S6	8-7-6-11 (13)					S6 - Similar to S4
15		15						15.0	Bottom of borehole at 15.0 feet. Backfilled borehole with drill cuttings.
	140.0								
20									
	135.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-40

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 09/06/18 **DATE COMPLETED:** 09/06/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 162 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 90s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 9.0 ft. / El. 153.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Fill	1.5	S1 - Top 18": Silty SAND (SM), fine, trace medium to coarse, 25-30% fines, trace fine subrounded gravel, trace organic fines, trace roots, brown to orange, moist
	160.0	2	S1	2-2-2-1 (4)	24/23			160.5	Bot. 5": Silty SAND (SM), fine, ~20% fines, trace organic fines, light brown to orange, moist
		4	S2	3-2-2-2 (4)	24/12				S2 - Similar to Bot. 5" of S1, light brown
5			S3	2-2-6-7 (8)	24/19				S3 - Similar to Bot. 5" of S1, light brown with orange mottles
	155.0	6	S4	12-9-10-9 (19)	24/12		Sand		S4 - Silty SAND (SM), fine, ~20% fines, light brown, moist
		8	S5	8-9-11-13 (20)	24/18				S5 - Silty SAND (SM), fine, ~20% fines, light brown with orange mottles, moist
10		10						10.0	Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings.
	150.0								
15									
	145.0								
20									
	140.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-41

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 09/06/18 **DATE COMPLETED:** 09/06/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE EL.: 168 ft. (see note 1) **TOTAL DEPTH:** 17 ft.
WEATHER: 90s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 9.0 ft. / El. 159.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El. (ft.)	Material Description
		0	S1	4-6-8-9 (14)	24/20		Forest Mat / Fill	1.1 / 166.9	S1 - Encountered ~2 inches of forest mat material. Top 12": Poorly Graded SAND with Silt (SP-SM), fine, trace medium, 10-15% fines, trace fine subangular gravel, trace organic fines, trace roots, brown to orange, moist. Bot. 8": Silty SAND (SM), fine, ~15% fines, trace fine subrounded gravel, light brown, moist
	165.0	2	S2	8-7-9-9 (16)	24/14				S2 - Silty SAND (SM), fine to medium, 15-20% fines, orange, moist
5		4	S3	7-8-8-7 (16)	24/15				S3 - Similar to S2, moist to wet
		6	S4	7-6-8-7 (14)	24/17				S4 - Silty SAND (SM), fine, ~20% fines, light brown, wet
	160.0	8	S5	4-6-5-6 (11)	24/15		Sand		S5 - Similar to S4, ~30% fines
10		10	S6	2-4-5-3 (9)	24/9				S6 - Similar to S4, 20-25% fines
	155.0	12							
15		15	S7	5-4-3-4 (7)	24/5				S7 - Similar to S4, ~25% fines
		17						17.0	Bottom of borehole at 17.0 feet. Backfilled borehole with drill cuttings.
	150.0								
20									
	145.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-42
PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/02/18 **DATE COMPLETED:** 11/02/18
BORING LOCATION: MBTA ROW, East of Horse Pond Road
COORDINATES: NA
SURFACE El.: 162 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 70s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 9.3 ft. / El. 152.7 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Forest Mat	162.0	S1 - Encountered ~2 inches of forest mat material at ground surface
	160.0	2	S1	3-2-3-2 (5)	24/22		Fill		Top 6": Silty SAND (SM), fine to medium, trace coarse, 25-30% fines, trace roots, black, moist Bot. 14": Poorly Graded SAND with Silt (SP-SM), fine, 5-10% fines, trace organic fines, light brown, moist
		4	S2	2-2-3-4 (5)	24/18				S2 - Similar to Bot. 14" of S1
5		6	S3	4-5-5-6 (10)	24/21				S3 - Silty SAND (SM), fine, 15-20% fines, trace organic fines, trace coal ash, light brown to orange, moist
	155.0		S4	8-7-8-8 (15)	24/22			7.0	S4 - Top 12": Poorly Graded SAND with Silt (SP-SM), fine to medium, ~10% fines, trace organic fines, trace roots, light brown to orange, wet
		8	S5	6-9-7-9 (16)	24/17		Sand	155.0	Bot. 10": Silty SAND (SM), fine, 35-40% fines, gray, wet S5 - Similar to Bot. 10" of S4
10		10						10.0	Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings.
	150.0								
15									
	145.0								
20									
	140.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-51

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 10/24/18 **DATE COMPLETED:** 10/24/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 128 ft. (see note 1) **TOTAL DEPTH:** 16 ft.
WEATHER: 50s/ Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 6.0 ft. / El. 122.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.4							Encountered a 5 inch wood rail tie.
		2.4	S1	21-17-20-18 (37)	24/15				S1 - Top 4": Coal ash, trace slag, trace fine sand, trace organic fines, trace roots, trace wood, black, moist Bot. 11": Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, 5-10% fine subangular gravel, trace organic fines, trac wood, brown, moist
	125.0	2	S2	13-22-20-17 (42)	24/4				S2 - Poorly Graded SAND with Silt (SP-SM), fine, 5-10% fines, trace organic fines, light brown, moist
5		4	S3	8-14-11-10 (25)	24/0		Fill		S3 - No recovery
		6	S4	3-9-15-18 (24)	24/9				S4 - SILT with Sand (ML), moderately plastic, ~15% fine sand, trace coal ash, trace organic fines, trace roots, light brown, moist
	120.0	8	S5	4-8-9-12 (17)	24/24			8.4 119.6	S5 - Top 5": Similar to S4, slightly to moderately plastic, wet Bot. 19": SILT with Sand (ML), slightly to moderately plastic, ~20% fine sand, gray, wet
10		10	S6	6-9-7-8 (16)	24/18				S6 - Similar to Bot. 19" of S5, ~25% fine sand
	115.0	12	S7	4-7-8-8 (15)	24/18		Sand		S7 - Similar to Bot. 19" of S5
15		14	S8	4-4-4-6 (8)	24/17				S8 - Similar to Bot. 19" of S5, moderately plastic
		16						16.0	Bottom of borehole at 16.0 feet. Backfilled borehole with drill cuttings.
	110.0								
20									
	105.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-BB-5

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 10/08/18 **DATE COMPLETED:** 10/10/18
BORING LOCATION: Western side of Hop Brook Bridge
COORDINATES: NA
SURFACE El.: 125 ft. (see note 1) **TOTAL DEPTH:** 54 ft.
WEATHER: 70s / Partly Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 4.0 ft. / El. 121.0 ft. measured on 10/9/18
AT END OF DRILLING: 3.5 ft. / El. 121.5 ft.
OTHER: 3.2 ft. / El. 121.8 ft. measured on 10/10/18

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Drive and wash with 4-inch casing, then 3" casing
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS / KD **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	4-3-5-4 (8)	24/24		Forest Mat Fill	0.0 / 124.9	S1 - Top 2": Forest material Bot. 22": Silty SAND (SM), fine to medium, trace coarse, ~20% fines, 5-10% fine subangular gravel, trace organic fines, trace roots, brown, moist
		2	S2	3-1-1-1 (2)	24/13			2.0 / 123.0	S2 - Silty SAND (SM), fine, trace medium, 25-30% fines, trace fine subangular gravel, trace organic fines, trace roots, trace wood, dark brown, wet
		4	S3	3-1-3-3 (4)	24/14				S3 - Similar to S2, ~35% fines
5	120.0	6	S4	3-2-4-4 (6)	24/11				S4 - Similar to S2, 35-40% fines
		8	S5	4-2-5-5 (7)	24/15		Swamp Deposits		S5 - Similar to S2, ~25% fines
10	115.0	10	S6	3-3-6-7 (9)	24/15				S6 - Top 12": Silty SAND (SM), fine to medium, trace coarse, ~15% fines, trace fine subangular gravel, trace organic fines, trace roots, dark brown, wet Bot. 3": Well Graded SAND with Silt (SW-SM), fine to medium, trace coarse, 5-10% fines, light brown to gray, wet
		12							
		13	S7	3-1-1-3 (2)	24/11				S7 - Silty SAND (SM), fine to medium, trace coarse, 20-25% fines, trace fine angular gravel, trace roots, orange to brown, wet
15	110.0	15	S8	0-3-6-16 (9)	24/13			15.0 / 110.0	S8 - Silty GRAVEL with Sand (GM), coarse, subangular, 15-20% fines, 20-25% fine to medium sand, brown to orange, wet
		17	S9	16-16-15-17 (31)	24/16				S9 - Silty SAND (SM), fine, ~20% fines, light brown, wet
		19	S10	12-8-10-14 (18)	24/18		Sand		S10 - Similar to S9
20	105.0	21							
		24		68-33-33-38					S11 - Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, ~20% fine to coarse subangular gravel, light brown to gray, wet
25	100.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-BB-5

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Material Description
		24	S11	(66)	24/9		Depth El.(ft.) 110.0	
		26						
		29	S12	60-120/4"	10/5	1		REMARK 1: Switched to 3-inch casing at 29 feet. S12 - Silty GRAVEL with Sand (GM), fine to coarse, subangular to rounded, ~15% fines, ~15% fine to coarse sand, light brown to gray, wet
30	95.0	29.8						
		34	S13	23-46-32-22 (78)	24/10			S13 - Similar to S12
35	90.0	36						
		39	S14	20-60-50-38 (110)	24/23		Sand	S14 - Top 17": Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, trace fine subangular gravel, light brown, wet Bot. 6": Silty GRAVEL with Sand (GM), fine to coarse, 15-20% fines, 15-20% fine to coarse sand, light brown, wet
40	85.0	41						
		44	S15	8-20-100/3"	15/7			S15 - Silty SAND with Gravel (SM), fine to coarse, ~25% fines, 15-20% fine subrounded gravel, light brown to gray, wet
45	80.0	45.3				2		REMARK 2: Open hole drive and wash technique used at 47 feet.
		49	S16	120/0"	0/0	3		REMARK 3: Attempted to obtain a core sample at 49 feet. Core barrel advanced ~5 feet in ~10 seconds, indicating that the material was not rock. S16 - No recovery
50	75.0	49						
		54	S17	120/0"	0/0		54.0	S17 - No recovery Bottom of borehole at 54.0 feet. Backfilled borehole with drill cuttings.
55	70.0							
60	65.0							

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BORING LOG

B-BB-6

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 10/15/18 **DATE COMPLETED:** 10/17/18
BORING LOCATION: Eastern side of Hop Brook Bridge
COORDINATES: NA
SURFACE El.: 124 ft. (see note 1) **TOTAL DEPTH:** 51 ft.
WEATHER: 60s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 4.0 ft. / El. 120.0 ft. measured on 10/16/18
AT END OF DRILLING: 6.8 ft. / El. 117.2 ft. measured at the end of drilling
OTHER: 3.3 ft. / El. 120.7 ft. measured on 10/17/18

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Drive and wash with 4-inch casing, then 3" casing
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Material Description
		0	S1	2-2-2-2 (4)	24/16		Forest Mat	S1 - Top 2": Forest Material Mid. 4": Silty SAND (SM), fine, ~25% fines, trace fine subangular gravel, trace organic fines, trace roots, dark brown, moist Bot. 10": Silty SAND (SM), fine, trace medium, ~20% fines, trace organic fines, trace roots, brown, moist
		2	S2	2-2-3-3 (5)	24/13		Fill	S2 - Silty SAND (SM), fine, trace medium, ~45% fines, trace fine angular gravel, trace organic fines, trace roots, brown, wet
	120.0	4	S3	3-2-2-3 (4)	24/15			S3 - Top 6": Silty SAND (SM), fine, trace medium, 25-30% fines, trace organic fines, trace roots, light brown, wet Bot. 9": Silty SAND (SM), fine, ~35% fines, trace organic fines, trace roots, light brown, wet
5		6	S4	2-3-2-3 (5)	24/24			6.0 S4 - Silty SAND (SM), fine, 35-40% fines, trace organic fines, trace roots, trace peat fibers, trace wood, dark brown, wet
	115.0	8	S5	2-2-1-2 (3)	24/17		Swamp Deposits	S5 - Similar to S4
10		10	S6	0-2-5-7 (7)	24/19			S6 - Top 14": Similar to S4
		12	S7	3-5-4-5 (9)	24/12			11.6 Bot. 5": Poorly Graded SAND with Silt (SP-SM), fine, 10-15% fines, trace roots, gray, wet S7 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium, 5-10% fines, light brown to gray, wet
	110.0	14						
15								
	105.0	19	S8	120/0"	0/0	1	Sand	REMARK 1: Open hole drive and wash technique used at 19 feet. S8 - No recovery
20		20	S9	120/5"	5/5			S9 - Silty SAND with Gravel (SM), fine to coarse, ~30% fines, ~20% fine to coarse subangular gravel, brown, wet
		20.4						
	100.0	24						S10 - Similar to S9
25				13-11-13-14				

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-BB-6

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Material Description
		24	S10	(24)	24/6			
		26						
	95.0	29				2		REMARK 2: Switched to 3-inch casing at 29 feet.
30			S11	11-10-13-13 (23)	24/13			S11 - Top 9": Silty SAND (SM), fine, 15-20% fines, light brown, wet Bot. 4": Similar to Top 9", ~35% fines
		31						
	90.0	34						S12 - Top 13": Silty SAND (SM), fine to medium, trace coarse, 30-35% fines, 5-10% fine subangular gravel, light brown, wet
35			S12	15-17-18-22 (35)	24/24			Mid. 4": Silty SAND (SM), fine to medium, ~20% fines, light brown to orange, wet Bot. 7": Silty SAND (SM), fine, ~35% fines, light brown, wet
		36					Sand	
	85.0	39						S13 - Top 19": Silty SAND (SM), fine to medium, 15-20% fines, ~5% fine to coarse subangular gravel, brown, wet
40			S13	10-15-14-14 (29)	24/24			Bot. 5": Silty SAND (SM), fine, ~20% fines, brown, wet
		41						
	80.0	44	S14	120/4"	4/4	3		REMARK 3: Open hole drive and wash technique used at 44 feet.
		44.3						S14 - Silty SAND (SM), fine to medium, trace coarse, 15-20% fines, ~5% fine subangular gravel, brown, wet
45								
	75.0	49						S15 - Top 12": Silty SAND with Gravel (SM), fine to coarse, ~20% fines, 15-20% fine to coarse subangular gravel, light brown, wet
50			S15	16-17-26-26 (43)	24/18			Bot. 6": Similar to Top 12", 20-25% fine to coarse subangular gravel
		51						51.0
	70.0							Bottom of borehole at 51.0 feet. Backfilled borehole with drill cuttings.
55								
	65.0							
60								

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BORING LOG

B-GB-1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 09/05/18 **DATE COMPLETED:** 09/05/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 180 ft. (see note 1) **TOTAL DEPTH:** 6 ft.
WEATHER: 90s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: Not encountered (NE)
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
0							Fill	0.8	S1 - Top 9": Silty SAND (SM), fine to coarse, ~25% fines, 10-15% fine to coarse subangular gravel, trace organic fines, trace roots, trace coal, dark brown, moist
		0-2	S1	5-5-20-31 (25)	24/15				Bot. 6": Silty SAND (SM), fine to medium, trace coarse, ~15% fines, 5-10% fine subangular gravel, light brown, moist
2		2-4	S2	40-46-47-48 (93)	24/19		Sand		S2 - Silty SAND (SM), fine to coarse, 15-20% fines, 10-15% fine subangular gravel, angular stone fragments, light brown, moist
4		4-6	S3	26-52-60-53 (112)	24/11				S3 - Similar to S2
5	175.0	6						6.0	Bottom of borehole at 6.0 feet. Backfilled borehole with drill cuttings.
10	170.0								
15	165.0								
20	160.0								
25	155.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-GB-2

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 09/05/18 **DATE COMPLETED:** 09/05/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 180 ft. (see note 1) **TOTAL DEPTH:** 3 ft.
WEATHER: 90s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: Not encountered (NE)
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	6-9-12-24 (21)	24/17		Fill	0.6 / 179.4	S1 - Top 7": Silty SAND with Gravel (SM), fine, trace medium to coarse, ~30% fines, ~15% fine to coarse subangular gravel, trace organic fines, trace roots, dark brown, moist
		2							Bot. 10": Silty SAND (SM), fine to coarse, ~20% fines, ~10% fine subrounded gravel, brown, moist
		2.3	S2	120/4"	4/1	1	Sand	3.0	S2 - Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, ~25% fine to coarse subangular gravel, light brown to gray, moist
									REMARK 1: Encountered auger refusal at 3 feet.
									Bottom of borehole at 3.0 feet. Backfilled borehole with drill cuttings.
5	175.0								
10	170.0								
15	165.0								
20	160.0								
25	155.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-GB-3

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 09/05/18 **DATE COMPLETED:** 09/05/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 182 ft. (see note 1) **TOTAL DEPTH:** 2.5 ft.
WEATHER: 90s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: Not encountered (NE)
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
0	180.0	0	S1	6-13-24-55 (37)	24/13	1	Fill	0.5 / 181.5	S1 - Top 6": Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, ~25% fine to coarse subangular gravel, trace organic fines, trace roots, trace coal, dark brown, moist Bot. 7": Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, ~20% fine to coarse subangular gravel, angular stone fragments, light brown, moist
2 / 2.3			S2	120/3"	3/1		Sand	2.5	S2 - Silty SAND (SM), fine to coarse, ~15% fines, 5-10% fine subangular gravel, angular stone fragments, light brown to gray, moist REMARK 1: Encountered auger refusal at 2.5 feet. Offset borehole 3 feet east and encountered auger refusal at 2.5 feet. Bottom of borehole at 2.5 feet. Backfilled borehole with drill cuttings.
5	175.0								
10	170.0								
15	165.0								
20	160.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-GB-5

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 10/11/18 **DATE COMPLETED:** 10/11/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 136 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
WEATHER: 70s / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 3.5 ft. / El. 132.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	135.0	0	S1	4-5-5-6 (10)	24/17		Topsoil	0.6 / 135.4	S1 - Top 7": Silty SAND (SM), fine, ~20% fines, trace fine subangular gravel, trace organic fines, trace roots, dark brown, moist
							Fill		Bot. 10": Poorly Graded SAND with Silt (SP-SM), fine, 5-10% fines, trace organic fines, trace roots, brown, moist
		2	S2	4-2-2-2 (4)	24/17			2.5 / 133.5	S2 - Top 6": Silty SAND (SM), fine, trace medium to coarse, 20-25% fines, trace organic fines, light brown to brown, moist
		4	S3	0-2-2-6 (4)	24/8		Swamp Deposits		Bot. 11": Silty SAND (SM), fine, ~45% fines, trace organic fines, trace roots, trace peat fibers, dark brown, moist S3 - Silty SAND (SM), fine, trace medium, 20-25% fines, trace organic fines, trace roots, brown, wet
5	130.0	6	S4	7-10-10-11 (20)	24/12			6.0 / 130.0	S4 - Silty SAND (SM), fine, 15-20% fines, gray, wet
		8	S5	5-5-7-5 (12)	24/13		Sand		S5 - SILT with Sand (ML), nonplastic, ~45% fine sand, gray, wet
10	125.0	10	S6	4-5-6-5 (11)	24/16				S6 - SILT with Sand (ML), nonplastic, ~15% fine sand, gray, wet
		12						12.0	Bottom of borehole at 12.0 feet. Backfilled borehole with drill cuttings.
15	120.0								
20	115.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-GB-17
PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 10/17/18 **DATE COMPLETED:** 10/17/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 128 ft. (see note 1) **TOTAL DEPTH:** 20 ft.
WEATHER: 60s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 6.8 ft. / El. 121.2 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.1					Forest Mat	0.3 / 127.7	Encountered ~4 inches of forest mat material. S1 - Top 5": Silty SAND (SM), fine to medium, trace coarse, ~30% fines, 5-10% coal ash, trace fine subangular gravel, trace organic fines, trace roots, trace wood, dark brown, moist
		2.1	S1	3-3-2-1 (5)	24/13				Bot. 8": Silty SAND (SM), fine to medium, trace coarse, ~15% fines, trace organic fines, trace roots, trace coal ash, brown, moist
	125.0	2	S2	2-1-3-5 (4)	24/21		Fill		S2 - Silty SAND (SM), fine, 25-30% fines, 5-10% fine subangular gravel, trace organic fines, trace roots, light brown, moist
		4	S3	2-3-5-7 (8)	24/17				S3 - Silty SAND (SM), fine, ~25% fines, 5-10% fine subangular gravel, trace organic fines, trace roots, light brown to orange, moist
5		6	S4	2-36-27-26 (63)	24/13			6.4 / 121.6	S4 - Top 5": Silty SAND (SM), fine to coarse, ~25% fines, ~5% fine subangular gravel, trace organic fines, trace roots, trace peat fibers, trace wood, dark brown, moist
	120.0	8	S5	3-6-8-6 (14)	24/20				Bot. 8": Silty SAND with Gravel (SM), fine to coarse, ~20% fines, 15-20% fine to coarse subangular gravel, brown to orange, wet S5 - Silty SAND (SM), fine, trace medium, 25-30% fines, trace fine subangular gravel, light brown with orange mottles, wet
10		10							
	115.0	13	S6	3-4-10-8 (14)	24/24		Sand		S6 - Top 18": SILT with Sand (ML), nonplastic, ~15% fine sand, light brown, wet
15		15							Bot. 6": Silty SAND (SM), fine, trace medium to coarse, ~35% fines, trace fine subangular gravel, light brown, wet
	110.0	18	S7	4-3-5-6 (8)	24/22				S7 - Top 10": Silty SAND (SM), fine to coarse, 35-40% fines, trace fine subangular gravel, light brown, wet Bot. 12": SILT with Sand (ML), nonplastic, ~15% fine sand, light brown, wet
20		20						20.0	
	105.0								Bottom of borehole at 20.0 feet. Backfilled borehole with drill cuttings.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-GB-18

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 10/18/18 **DATE COMPLETED:** 10/18/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 126 ft. (see note 1) **TOTAL DEPTH:** 21 ft.
WEATHER: 40s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 6.0 ft. / El. 120.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	125.0	0	S1	8-18-21-18 (39)	24/9		Forest Mat	0.3 / 125.8	S1 - Silty SAND (SM), fine to coarse, ~15% fines, 5-10% coal ash, trace organic fines, trace roots, trace wood, dark brown, moist
		2	S2	18-14-8-9 (22)	24/14		Fill		S2 - Top 4": Similar to S1, ~5% coal ash, trace leaves Bot. 10": Poorly Graded SAND with Silt (SP-SM), fine, trace medium to coarse, 5-10% fines, trace organic fines, trace roots, light brown, moist
5		4	S3	4-11-16-9 (27)	24/9				S3 - Top 5": Silty SAND (SM), fine, trace medium to coarse, 25-30% fines, roots, trace organic fines, trace wood, brown, moist Bot. 4": Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, ~15% fine to coarse subangular gravel, trace organic fines, trace roots, brown, moist
	120.0	6	S4	5-3-7-4 (10)	24/18				S4 - Silty SAND with Gravel (SM), fine to coarse, ~25% fines, 15-20% fine to coarse subangular gravel, trace organic fines, trace roots, brown, wet
		8	S5	2-3-5-5 (8)	24/23		Buried Organic Soil	8.0 / 118.0	S5 - Top 14": Organic SILT (OL), nonplastic, ~30% fine sand, trace medium to coarse sand, trace organic fines, trace roots, trace peat fibers, dark brown, wet
10		10	S6	0-0-4-5 (4)	24/24				Bot. 9": Silty SAND (SM), fine, ~20% fines, trace fine subangular gravel, trace organic fines, trace roots, gray, wet S6 - Top 13": Organic SILT (OL), nonplastic, ~30% fine sand, trace medium to coarse sand, trace organic fines, trace roots, trace peat fibers, dark brown, wet
	115.0	12	S7	10-9-11-9 (20)	24/15		Sand	11.1 / 114.9	Bot. 11": Silty SAND (SM), fine, trace medium, ~20% fines, gray, wet S7 - Similar to Bot. 11" of S6
15		14	S8	7-7-8-9 (15)	24/15				S8 - Silty SAND (SM), fine, trace medium, ~35% fines, light brown with orange mottles, wet
	110.0	16							
		19	S9	3-4-4-4 (8)	24/15				S9 - Silty SAND (SM), fine, 40-45% fines, light brown, wet
20	105.0	21						21.0	Bottom of borehole at 21.0 feet. Backfilled borehole with drill cuttings.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-GB-19

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 10/18/18 **DATE COMPLETED:** 10/19/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 126 ft. (see note 1) **TOTAL DEPTH:** 21 ft.
WEATHER: 40s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 2.5 ft. / El. 123.5 ft.
AT END OF DRILLING: 3.6 ft. / El. 122.4 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Material Description
	125.0	0	S1	4-6-9-10 (15)	24/15		Forest Mat	S1 - Top 7": Coal Ash, trace organic fines, trace roots, dark brown, moist Bot. 8": Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 10-15% fine subangular gravel, trace organic fines, trace roots, dark brown, moist
		2	S2	7-10-12-9 (22)	24/11			S2 - Top 5": Silty SAND (SM), fine, trace medium, 20-25% fines, trace organic fines, trace roots, light brown, moist Bot. 6": Silty SAND with Gravel (SM), fine to coarse, ~15% fines, 25-30% fine to coarse subangular gravel, trace organic fines, trace roots, brown to orange, moist
5		4	S3	7-5-7-12 (12)	24/13			S3 - Top 8": Silty SAND (SM), fine to medium, trace coarse, ~25% fines, trace fine subangular gravel, trace organic fines, trace roots, light brown, wet Bot. 5": Silty SAND with Gravel (SM), fine to coarse, ~15% fines, 15 to 20% fine to coarse rounded to subangular gravel, trace organic fines, trace roots, brown, wet
	120.0	6	S4	26-40-19-21 (59)	24/24		Fill	S4 - Similar to Bot. 5" of S3, 15-20% fine to coarse subangular gravel
		8	S5	4-21-44-30 (65)	24/15			S5 - Silty SAND with Gravel (SM), fine to coarse, ~20% fines, ~20% fine to coarse subangular gravel, trace organic fines, trace roots, brown, wet
10		10	S6	9-5-5-12 (10)	24/9			S6 - Silty SAND (SM), fine to medium, trace coarse, ~20% fines, trace fine subangular gravel, trace organic fines, trace roots, brown, wet
	115.0	12	S7	12-14-15-10 (29)	24/10			12.0 / 114.0 S7 - Silty SAND (SM), fine to medium, trace coarse, ~15% fines, trace fine subangular gravel, brown, wet
		14	S8	7-17-16-13 (33)	24/12			S8 - Similar to S7, 5-10% fine to coarse subangular gravel
15	110.0	16					Sand	
		19	S9	8-13-28-39 (41)	24/20			S9 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, ~15% fine to coarse subangular gravel, brown, wet
20	105.0	21						21.0 Bottom of borehole at 21.0 feet. Backfilled borehole with drill cuttings.
25								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-GB-20

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 10/19/18 **DATE COMPLETED:** 10/23/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 131 ft. (see note 1) **TOTAL DEPTH:** 23 ft.
WEATHER: 50s / Partly Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 5.3 ft. / El. 125.7 ft. at end of 10/19/18
AT END OF DRILLING: 5.0 ft. / El. 126.0 ft. before coring on 10/22/18
OTHER: 4.3 ft. / El. 126.7 ft. at end of coring

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.3					Forest Mat	0.3 / 130.7	Encountered ~3 inches of forest mat material.
	130.0	2.3	S1	3-6-9-11 (15)	24/18				S1 - Top 5": Coal ash, trace slag, trace organic fines, trace roots, dark brown, moist Bot. 10": Silty SAND (SM), fine, trace medium, ~20% fines, trace fine subangular gravel, trace organic fines, trace roots, brown, moist
		2	S2	12-27-30-24 (57)	24/15				S2 - Top 7": Silty SAND (SM), fine, 30-35% fines, trace organic fines, trace roots, light brown, moist Bot. 8": Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 20-25% fine to coarse subangular gravel, trace organic fines, trace roots, brown, wet
		4	S3	14-23-23-18 (46)	24/15		Fill		S3 - Similar to Bot. 8" of S2, ~20% fine to coarse subangular gravel
5	125.0	6	S4	7-12-14-19 (26)	24/15				S4 - Silty SAND (SM), fine to coarse, 15-20% fines, trace organic fines, brown, wet
		8	S5	1-3-6-5 (9)	24/14		Swamp Deposits	8.0 / 123.0	S5 - Top 4": Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, ~15% fine subangular gravel, trace organic fines, trace roots, dark brown, wet Bot. 10": Silty SAND (SM), fine to coarse, ~15% fines, 5-10% fine subangular gravel, trace organic fines, trace roots, brown, wet
10		10	S6	3-5-8-12 (13)	24/10			10.0 / 121.0	S6 - Silty SAND with Gravel (SM), fine to coarse, ~15% fines, 15-20% fine to coarse subangular gravel, trace organic fines, brown, wet
	120.0	12	S7	2-4-120/0"	12/12				S7 - Similar to S6, ~15% fine subangular gravel
		13							
		14							
		14.5	S9	14-120/5"	11/11	1	Sand		REMARK 1: Auger refusal at ~14 feet. Advanced roller bit to ~14.5 feet. Encountered spoon refusal at ~14.8 feet. Offset borehole ~5 feet west from original boring location. Encountered spoon refusal at ~14.9 feet. Advanced roller bit to 16 feet. S9 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, ~25% fine to coarse subangular gravel, brown, wet
15		14.8	S8	120/3"	3/3				S8 - Silty GRAVEL with Sand (GM), fine to coarse, subrounded to angular, ~20% fines, ~20% fine to medium sand, light gray, wet
	115.0	16	S10	120/0"	0/0	2			REMARK 2: Encountered spoon refusal at ~16 feet. S10 - No recovery
		18						18.0 / 113.0	C1 - min/ft: 7.25, 3.9, 5.2, 5.0, 4.75 HARD, slightly weathered, slightly fractured, fine-grained, gray with white and green mottles, GRANITE Rec = 100%, RQD = 85%
20	110.0		C1		60/60		Bedrock		
		23						23.0	Bottom of borehole at 23.0 feet. Backfilled borehole with drill cuttings.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-GB-21

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 10/23/18 **DATE COMPLETED:** 10/24/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 132 ft. (see note 1) **TOTAL DEPTH:** 20 ft.
WEATHER: 50s / Rainy
GROUNDWATER LEVELS:
DURING DRILLING: 4.2 ft. / El. 127.8 ft. at end of drilling on 10/23/18
AT END OF DRILLING: 3.0 ft. / El. 129.0 ft. before drilling on 10/24/18
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.3					Forest Mat	0.3 / 131.7	Encountered ~3 inches of forest mat material.
	130.0	2.3	S1	6-10-14-17 (24)	24/19				S1 - Top 9": Coal ash, trace organic fines, trace roots, dark brown, moist Bot. 10": Silty SAND (SM), fine, trace medium to coarse, 15-20% fines, trace fine subangular gravel, trace organic fines, trace roots, brown, moist
		2	S2	17-21-22-9 (43)	24/18				S2 - Top 13": Silty SAND (SM), fine to medium, ~20% fines, 5-10% fine angular gravel, trace organic fines, brown, moist Bot. 5": Silty SAND with Gravel (SM), fine, 25-30% fines, 35-40% fine to coarse subangular gravel, trace organic fines, trace roots, brown, moist
5		4	S3	9-6-7-11 (13)	24/19		Fill		S3 - Top 4": Silty SAND (SM), fine to coarse, ~15% fines, trace fine subangular gravel, trace coal ash, dark brown, moist Bot. 15": Silty SAND (SM), fine, 30-35% fines, trace organic fines, brown, wet
	125.0	6	S4	5-77-29-13 (106)	24/20				S4 - Top 11": SILT with Sand (ML), slightly plastic, ~20% fine sand, trace organic fines, trace roots, orange to brown, wet Bot. 9": Silty SAND with Gravel (SM), fine to coarse, ~20% fines, ~15% fine subangular gravel, angular stone fragments, trace organic fines, brown, wet
		8	S5	60-29-29-47 (58)	24/9				S5 - Silty SAND with Gravel (SM), fine to coarse, ~20% fines, 25-30% fine to coarse subangular gravel, angular stone fragments, trace organic fines, brown, wet
10		10	S6	29-28-25-18 (53)	24/8			10.0 / 122.0	S6 - Silty SAND with Gravel (SM), fine to medium, trace coarse, ~20% fines, ~25% fine to coarse subangular gravel, brown, wet
	120.0	12	S7	55-48-30-11 (78)	24/16				S7 - Similar to S6, 30-35% fine to coarse subangular gravel
		14	S8	22-15-37-43 (52)	24/9		Sand		S8 - Similar to S6, fine to coarse sand
15		16	S9	25-25-25-17 (50)	24/8				S9 - Silty SAND with Gravel (SM), fine to coarse, ~15% fines, 35-40% fine to coarse subangular gravel, angular stone fragments, brown, wet
	115.0	18	S10	27-110-72-80 (182)	24/15	1			REMARK 1: Casing broke at 18 feet. Offset borehole ~5 feet west form original boring location. Advanced augers to 16 feet and encountered rock. Offset borehole ~7 feet east of original boring location and advanced augers to 18 feet.
20		20				2		20.0	S10 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 30-35% fine to coarse subangular gravel, trace organic fines, trace roots, brown, wet REMARK 2: Encountered spoon bouncing on hardcobstruction at ~ 20 feet, terminated boring. Bottom of borehole at 20.0 feet. Backfilled borehole with drill cuttings.
	110.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-MP-27

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/05/18 **DATE COMPLETED:** 11/05/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 162 ft. (see note 1) **TOTAL DEPTH:** 15 ft.
WEATHER: 50s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 10.5 ft. / El. 151.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Forest Mat	0.6	S1 - Encountered ~2 inches of forest mat material at ground surface
	160.0	2	S1	3-3-5-6 (8)	24/24		Topsoil	161.4	Top 6": Silty SAND (SM), fine, trace medium, 25-30% fines, ~5% fine gravel, trace coal ash, trace organic fines, trace roots, dark brown, moist Bot. 16": Poorly Graded SAND with Silt (SP-SM), fine, trace medium to coarse, ~5% fines, light brown to orange, moist
		4	S2	7-7-7-7 (14)	24/20				S2 - Poorly Graded SAND (SP), fine, trace medium, ~5% fines, light brown to orange, moist
5		6	S3	3-5-6-5 (11)	24/16				S3 - Similar to S2, trace fine gravel, orange, moist
	155.0	8	S4	4-5-5-5 (10)	24/20				S4 - Similar to S2, light brown, wet
10							Sand		
	150.0	13	S5	3-4-7-3 (11)	24/18				S5 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium, 5-10% fines, light brown, wet
15		15						15.0	Bottom of borehole at 15.0 feet. Backfilled borehole with drill cuttings.
	145.0								
20									
	140.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-MP-28
PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/05/18 **DATE COMPLETED:** 11/05/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 158 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 50s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 6.0 ft. / El. 152.0 ft. based on sample moisture
AT END OF DRILLING: -
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark
0		0	S1	2-2-4-6 (6)	24/24	
	155.0	2	S2	6-8-7-8 (15)	24/20	
5		4	S3	4-8-7-7 (15)	24/24	
		6	S4	7-7-7-7 (14)	24/22	
	150.0	8	S5	5-7-8-8 (15)	24/24	
10		10				
	145.0					
15						
	140.0					
20						
	135.0					
25						

Strata	Depth El.(ft.)	Material Description
Forest Mat	0.5	S1 - Encountered ~3 inches of forest mat material at ground surface
Topsoil	0.6 / 157.4	Top 5": Silty SAND (SM), fine, trace medium, 25-30% fines, trace coal ash, trace organic fines, trace roots, dark brown, moist
		Bot. 16": Poorly Graded SAND with Silt (SP-SM), fine, ~10% fines, light brown, moist
		S2 - Similar to Bot. 16" of S1
Sand		S3 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium, 5-10% fines, trace organic fines, light brown, moist
		S4 - Top 10": Poorly Graded SAND with Silt (SP-SM), fine, trace medium, 5-10% fines, brown, wet
		Bot. 14": Silty SAND (SM), fine, ~20% fines, light brown, wet
		S5 - Poorly Graded SAND with Silt (SP-SM), fine, ~10% fines, light brown, wet
	10.0	Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-MP-29

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/05/18 **DATE COMPLETED:** 11/05/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 150 ft. (see note 1) **TOTAL DEPTH:** 16 ft.
WEATHER: 50s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 11.6 ft. / El. 138.4 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Material Description
		0	S1	4-6-9-8 (15)	24/24	1	Forest Mat / Topsoil	S1 - Encountered ~2 inches of forest mat material at ground surface
		2	S2	7-8-7-7 (15)	24/19			Top 7": Silty SAND (SM), fine, 25-30% fines, trace coal ash, trace organic fines, trace roots, trace glass, dark brown, moist REMARK 1: Pieces of glass observed in Top 7" of S1, samples were split with VHB and are not representative of entire spoon sample Bot. 15": Poorly Graded SAND (SP), fine, trace medium to coarse, ~5% fines, orange, moist S2 - Poorly Graded SAND (SP), fine, trace medium, ~5% fines, light brown, moist
		4	S3	3-5-6-6 (11)	24/17			S3 - Similar to S2
5	145.0	6	S4	6-8-7-7 (15)	24/20			S4 - Similar to S2
		8	S5	4-4-5-6 (9)	24/19		Sand	S5 - Top 16": Poorly Graded SAND (SP), fine, trace medium, ~5% fines, trace fine subangular gravel, light brown, wet Bot. 3": Silty SAND (SM), fine, 20-25% fines, light brown, wet
10	140.0	10	S6	0-3-2-3 (5)	24/16			S6 - Poorly Graded SAND (SP), fine, trace medium, ~5% fines, light brown, wet
		12	S7	3-3-4-6 (7)	24/24			S7 - Similar to S6
15	135.0	14	S8	3-3-3-7 (6)	24/24			S8 - Similar to S6
		16						Bottom of borehole at 16.0 feet. Backfilled borehole with drill cuttings.
20	130.0							
25	125.0							

Depth El.(ft.)
0.6 149.4
16.0

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.
2. Blow counts of "0" indicate weight-of-hammer conditions.

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BORING LOG

B-MP-30

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/06/18 **DATE COMPLETED:** 11/06/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 140 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 50s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 6.8 ft. / El. 133.3 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Byland
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	2-2-4-4 (6)	24/24		Topsoil	0.5 / 139.5	S1 - Top 6": Silty SAND (SM), fine to medium, ~20% fines, trace organic fines, trace roots, dark brown, moist
		2	S2	6-5-4-3 (9)	24/19		Fill		Bot. 18": Poorly Graded SAND with Silt (SP-SM), fine, ~10% fines, trace organic fines, light brown to orange, moist S2 - Silty SAND (SM), fine, 20-25% fines, trace organic fines, trace roots, dark brown to brown, moist
		4	S3	4-2-2-2 (4)	24/24				S3 - Top 20": Poorly Graded SAND with Silt (SP-SM), fine, ~10% fines, trace organic fines, trace roots, light brown, wet
5	135.0	6	S4	2-2-6-11 (8)	24/24				Bot. 4": Silty SAND (SM), fine, 25-30% fines, trace organic fines, trace roots, dark brown, wet (Buried Topsoil) S4 - Silty SAND (SM), fine, ~15% fines, trace organic fines, light brown, wet
		8	S5	6-6-7-8 (13)	24/24		Sand	8.0 / 132.0	S5 - Silty SAND (SM), fine, 30-35% fines, light brown, wet
10	130.0	10						10.0	Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings.
15	125.0								
20	120.0								
25	115.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-MP-31

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/06/18 **DATE COMPLETED:** 11/06/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 136 ft. (see note 1) **TOTAL DEPTH:** 16 ft.
WEATHER: 50s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 7.8 ft. / El. 128.3 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark
	135.0	0	S1	3-4-3-3 (7)	24/12	
		2	S2	3-2-11-9 (13)	24/9	
		4	S3	1-3-5-5 (8)	24/20	
5	130.0	6	S4	5-7-8-7 (15)	24/24	
		8	S5	3-3-4-3 (7)	24/24	
10	125.0	10	S6	3-4-5-6 (9)	24/15	
		12	S7	5-4-3-5 (7)	24/24	
15	120.0	14	S8	3-3-4-4 (7)	24/9	
		16				
20	115.0					
25						

Strata	Depth El. (ft.)	Material Description
Forest Mat	0.5	S1 - Encountered ~2 inches of forest mat material at ground surface
Topsoil	135.5	Top 4": Silty SAND (SM), fine to medium, 20-25% fines, trace fine subangular gravel, trace organic fines, trace roots, trace wood, dark brown, wet
Fill		Bot. 6": Silty SAND (SM), fine to medium, ~20% fines, trace fine subangular gravel, trace organic fines, trace roots, light brown, wet S2 - Silty SAND with Gravel (SM), fine to coarse, ~20% fines, ~15% fine subangular gravel, trace organic fines, light brown with orange seams, wet
	4.6	S3 - Top 7": Silty SAND (SM), fine, trace medium, 20-25% fines, trace organic fines, trace roots, trace peat fibers, dark brown, wet
	131.4	Bot. 13": Silty SAND (SM), fine, 30-35% fines, light brown, wet
		S4 - Similar to Bot. 13" of S3
		S5 - Similar to Bot. 13" of S3
Sand		S6 - Silty SAND (SM), fine, 35-40% fines, light brown, wet
		S7 - SILT with Sand (ML), non plastic, 20-25% fine sand, gray, wet
		S8 - Similar to S7
	16.0	Bottom of borehole at 16.0 feet. Backfilled borehole with drill cuttings.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-MP-32

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 10/11/18 **DATE COMPLETED:** 10/11/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 136 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
WEATHER: 70s / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 8.0 ft. / El. 128.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	135.0	0	S1	3-6-5-5 (11)	24/12		Topsoil	2.0	S1 - Silty SAND (SM), fine to medium, trace coarse, ~25% fines, 5-10% fine subangular gravel, trace organic fines, trace roots, trace wood, dark brown, moist
		2	S2	6-5-3-4 (8)	24/21		Fill	134.0	S2 - Top 15": Poorly Graded SAND with Silt (SP-SM), fine, ~10% fines, trace organic fines, trace roots, light brown, mosit Bot. 6": Silty SAND (SM), fine, 25-30% fines, trace organic fines, trace roots, dark brown, moist
		4	S3	4-3-1-2 (4)	24/21			4.6 131.4	S3 - Top 7": Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, trace organic fines, light brown, moist
5							Swamp Deposits		Bot. 14": Silty SAND (SM), fine, ~40% fines, trace organic fines, trace roots, trace peat fibers, dark brown, wet
	130.0	6	S4	1-2-2-6 (4)	24/17				S4 - Top 13": Organic SILT with Sand (OL), slightly plastic, 30-35% fine sand, trace organic fines, trace roots, trace peat fibers, dark brown, moist
		8	S5	9-11-11-11 (22)	24/16			8.0 128.0	Bot. 4": Silty SAND (SM), fine, ~25% fines, trace organic fines, trace roots, dark brown to gray, wet S5 - Silty SAND (SM), fine, ~20% fines, gray, wet
10							Sand		
	125.0	10	S6	0-6-6-7 (12)	24/19				S6 - Top 10": Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, gray, wet Bot. 9": SILT with Sand (ML), nonplastic, ~40% fine sand, light brown, wet
		12						12.0	Bottom of borehole at 12.0 feet. Backfilled borehole with drill cuttings.
15									
	120.0								
20									
	115.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-MP-33

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/01/18 **DATE COMPLETED:** 11/01/18
BORING LOCATION: MBTA ROW, near Union Avenue
COORDINATES: NA
SURFACE El.: 136 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 50s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 8.0 ft. / El. 128.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	135.0	0	S1	3-5-5-6 (10)	24/22		Forest Mat	0.3	S1 - Encountered ~3 inches of forest mat material at ground surface
							Topsoil	0.8 / 135.3	Top 6": Silty SAND (SM), fine, trace medium, 20-25% fines, trace coarse subangular gravel, trace organic fines, trace roots, dark brown, moist
		2	S2	3-3-2-2 (5)	24/20		Fill		Bot. 13": Poorly Graded SAND with Silt (SP-SM), fine, ~10% fines, trace organic fines, trace roots, light brown, moist S2 - Top 5": Similar to Bot. 13" of S1, 5-10% fines Bot. 15": Silty SAND (SM), fine, 20-25% fines, trace organic fines, trace roots, dark brown, moist
5		4	S3	2-1-1-3 (2)	24/19				S3 - Similar to Bot. 15" of S2
	130.0	6	S4	8-9-10-10 (19)	24/19			6.6 / 129.4	S4 - Top 8": Silty SAND (SM), fine, trace medium, 15-20% fines, trace organic fines, brown to orange, wet Bot. 11": Silty SAND (SM), fine, 30-35% fines, gray, wet
		8	S5	5-6-5-5 (11)	24/16		Sand		S5 - Silty SAND (SM), fine, ~35% fines, gray, wet
10		10						10.0	Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings.
	125.0								
15									
	120.0								
20									
	115.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-MP-34

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 10/11/18 **DATE COMPLETED:** 10/11/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 133 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
WEATHER: 70s / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 6.8 ft. / El. 126.2 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark
0		0 - 2	S1	3-3-3-3 (6)	24/17	
2	130.0	2 - 4	S2	7-7-19-31 (26)	24/10	
4		4 - 4.7	S3	13-120/2"	8/3	
5						
6		6 - 8	S4	11-119-41-34 (160)	24/8	
8	125.0	8 - 10	S5	11-16-13-11 (29)	24/6	
10		10 - 12	S6	4-8-10-9 (18)	24/11	
12						
15	120.0					
20	115.0					
25	110.0					

Strata	Depth El.(ft.)	Material Description
Topsoil	0.4 / 132.6	S1 - Top 5": Silty SAND (SM), fine to medium,~25% fines, trace fine subangular gravel, trace organic fines, trace roots, trace wood, dark brown, moist
Fill		Bot. 12": Silty SAND (SM), fine to medium, trace coarse, ~30% fines, trace fine subangular gravel, trace organic fines, trace roots, brown, moist S2 - Silty GRAVEL with Sand (GM), fine to coarse, angular, 15-20% fines, 15-20% fine to coarse sand, trace organic fines, trace roots, brown, moist S3 - Poorly Graded GRAVEL with Sand (GP), fine to coarse, subangular, 0-5% fines, 15-20% fine sand, trace organic fines, trace roots, trace leaves, large 2" piece of wood, dark brown, moist
Sand	6.3 / 126.7	S4 - Top 4": Silty GRAVEL with Sand (GM), fine to coarse, subangular, ~15% fines, ~15% fine to coarse sand, trace organic fines, trace roots, trace wood, dark brown, wet Bot. 4": Silty GRAVEL with Sand (GM), fine to coarse, subangular, ~15% fines, ~15% fine to coarse sand, gray, wet S5 - Silty SAND with Gravel (SM), fine to coarse, ~25% fines, ~35% fine to coarse subrounded to subangular gravel, light brown to gray, wet S6 - Similar to S5, 15-20% fine to coarse subangular gravel
	12.0	Bottom of borehole at 12.0 feet. Backfilled borehole with drill cuttings.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-MP-35
PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 11/06/18 **DATE COMPLETED:** 11/06/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 130 ft. (see note 1) **TOTAL DEPTH:** 15 ft.
WEATHER: 50s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 8.5 ft. / El. 121.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	4-6-6-6 (12)	24/24		Topsoil	0.5 / 129.5	S1 - Top 6": Silty SAND (SM), fine, trace medium, ~20% fines, trace organic fines, trace roots, trace coal ash, dark brown, moist Bot. 18": Silty SAND (SM), fine, trace medium, 15-10% fines, trace organic fines, light brown to brown, moist
		2	S2	3-5-8-12 (13)	24/17		Fill		S2 - Silty SAND (SM), fine, trace medium, 20-25% fines, trace fine to coarse subangular gravel, trace organic fines, trace roots, light brown, moist
		4	S3	3-6-7-8 (13)	24/16				S3 - Silty SAND (SM), fine to medium, 15-20% fines, trace organic fines, trace fine gravel, light brown, moist
5	125.0	6	S4	10-11-8-9 (19)	24/16				S4 - Similar to S3, trace fine subangular gravel
		8	S5	10-11-15-31 (26)	24/5				S5 - Silty SAND with Gravel (SM), fine to medium, trace coarse, 30-35% slightly plastic fines, ~15% fine to coarse subangular gravel, trace organic fines, trace roots, brown, wet
10	120.0	10	S6	29-120	24/5	1		11.0 / 119.0	S6 - Silty SAND with Gravel (SM), fine, 25-30% fines, 25-30% fine subangular gravel, trace organic fines, brown, wet REMARK 1: Spoon refusal at 10.5 feet, auger advanced to 11 feet.
		12 11	S7	16-120	24/4	2	Sand		S7 - Silty SAND (SM), fine to medium, trace coarse, ~20% fines, 10-15% fine subangular gravel, light brown, wet REMARK 2: Spoon refusal at 11.5 feet, auger advanced to 13 feet.
		13	S8	10-18-19-19 (37)	24/16				S8 - Similar to S7, 10-15% fine to coarse subangular gravel
15	115.0	15						15.0	Bottom of borehole at 15.0 feet. Backfilled borehole with drill cuttings.
20	110.0								
25	105.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-MP-36

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 10/18/18 **DATE COMPLETED:** 10/18/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 126 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 40s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 4.3 ft. / El. 121.8 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El. (ft.)	Material Description
	125.0	0	S1	2-3-2-2 (5)	24/18		Forest Mat	125.9	S1 - Top 6": Coal Ash, trace organic fines, roots, dark brown, moist Bot. 10": Silty SAND (SM), fine, trace medium, 20-25% fines, trace fine subangular gravel, trace organic fines, roots, light brown, moist
		2	S2	1-1-1-1 (2)	24/24		Fill		S2 - Silty SAND (SM), fine, ~25% fines, roots, trace organic fines, brown, wet
5		4	S3	2-1-2-3 (3)	24/23				▼ S3 - Top 13": Similar to S2
	120.0	6	S4	0-0-8-8 (8)	24/21		Swamp Deposits	5.1 120.9	Bot. 10": PEAT, fibrous, 30-35% fine sand, trace organic fines, trace roots, black, moist S4 - Top 11": Silty SAND (SM), fine to medium, ~25% fines, trace organic fines, trace roots, brown, wet Middle 7": PEAT, fibrous 30-35% fine sand, trace organic fines, trace roots, black, moist Bot. 3": Silty SAND (SM), fine, ~15% fines, light brown, wet
		8	S5	5-9-8-11 (17)	24/13		Sand	8.5 117.5	S5 - Top 6": Silty SAND (SM), fine, ~25% fines, 5-10% fine subangular gravel, trace organic fines, trace roots, brown, wet
10		10						10.0	Bot. 7": Silty SAND (SM), fine to coarse, ~15% fines, brown, wet Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings.
	115.0								
15									
	110.0								
20									
	105.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-MP-37

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 10/26/18 **DATE COMPLETED:** 10/26/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 128 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 40s / Partly Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 4.9 ft. / El. 123.1 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Material Description
		0					Forest Mat	S1 - Encountered ~2 inches of forest mat material at ground surface
			S1	2-4-6-5 (10)	24/17			Top 5": Coal ash, trace fine subangular gravel, trace organic fines, trace roots, dark brown, moist
		2						Bot. 10": Poorly Graded SAND with Silt (SP-SM), fine, trace medium to coarse, 10-15% fines, trace organic fines, trace roots, light brown, moist
	125.0		S2	7-6-7-5 (13)	24/13			S2 - Poorly Graded SAND with Silt (SP-SM), 10-15% fines, trace organic fines, light brown, moist
		4						
5			S3	5-4-3-3 (7)	24/0		Fill	S3 - No recovery
		6						
			S4	5-7-11-12 (18)	24/4			S4 - Poorly Graded SAND (SP), fine, trace medium, ~5% fines, trace organic fines, brown, wet
	120.0	8						
			S5	3-5-6-9 (11)	24/18			S5 - Silty SAND (SM), fine, 30-35% fines, trace organic fines, trace roots, light brown, wet
10		10						
								Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings.
	115.0							
15								
	110.0							
20								
	105.0							
25								

Depth El.(ft.): 0.0 / 127.9; 10.0

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-MP-38
PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 10/26/18 **DATE COMPLETED:** 10/26/18
BORING LOCATION: MBTA ROW, western side of Landham Road
COORDINATES: NA
SURFACE EL.: 136 ft. (see note 1) **TOTAL DEPTH:** 16.5 ft.
WEATHER: 40s / Partly Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 5.0 ft. / El. 131.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El. (ft.)	Material Description
		0.1					Forest Mat	0.1 / 135.9	Encountered ~1 inch of forest mat material.
	135.0	2.1	S1	4-6-10-8 (16)	24/16		Fill		S1 - Top 5": Silty SAND (SM), fine to medium, trace coarse, 20-25% fines, coal ash, trace organic fines, trace roots, dark brown, moist Bot. 10": Poorly Graded SAND with Silt (SP-SM), fine, trace medium, ~10% fines, trace fine subangular gravel, trace organic fines, light brown, moist
		2	S2	6-5-10-7 (15)	24/5				S2 - Silty SAND with Gravel (SM), fine to medium, trace coarse, 25-30% fines, ~30% fine to coarse subangular gravel, trace organic fines, trace roots, dark brown, moist
		4	S3	6-15-14-15 (29)	24/24				S3 - Silty SAND (SM), fine to medium, trace coarse, ~20% fines, 10-15% fine angular gravel, trace organic fines, trace roots, brown, moist
5	130.0	6	S4	17-20-21-21 (41)	24/20			6.4 / 129.6	S4 - Top 5": Similar to S3 Bot. 15": Silty SAND with Gravel (SM), fine to medium, 20-25% fines, ~15% fine subangular gravel, angular stone fragments, light brown to gray, moist
		8	S5	9-12-20-15 (32)	24/18				S5 - Similar to Bot. 15" of S4, ~20% fine subangular gravel
10	125.0	10	S6	26-20-11-18 (31)	24/10		Sand		S6 - Silty SAND with Gravel (SM), fine to medium, ~20% fines, ~20% fine subangular gravel, light brown, wet
		12							
15	120.0	15	S7	25-29-14-120/0" (43)	18/10	1		16.5	S7 - Similar to S6, ~25% fines, 25-30% fine to coarse subangular gravel REMARK 1: Encountered spoon refusal at 16.5 feet.
		16.5							Bottom of borehole at 16.5 feet. Backfilled borehole with drill cuttings.
20	115.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

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BORING LOG

B-MP-39

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Lines
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Sudbury, Massachusetts

DATE STARTED: 10/26/18 **DATE COMPLETED:** 10/26/18
BORING LOCATION: MBTA ROW, Eastern side of Landham Road
COORDINATES: NA
SURFACE El.: 140 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 40s / Partly Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 4.3 ft. / El. 135.7 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: KD **CHECKED BY:** MC

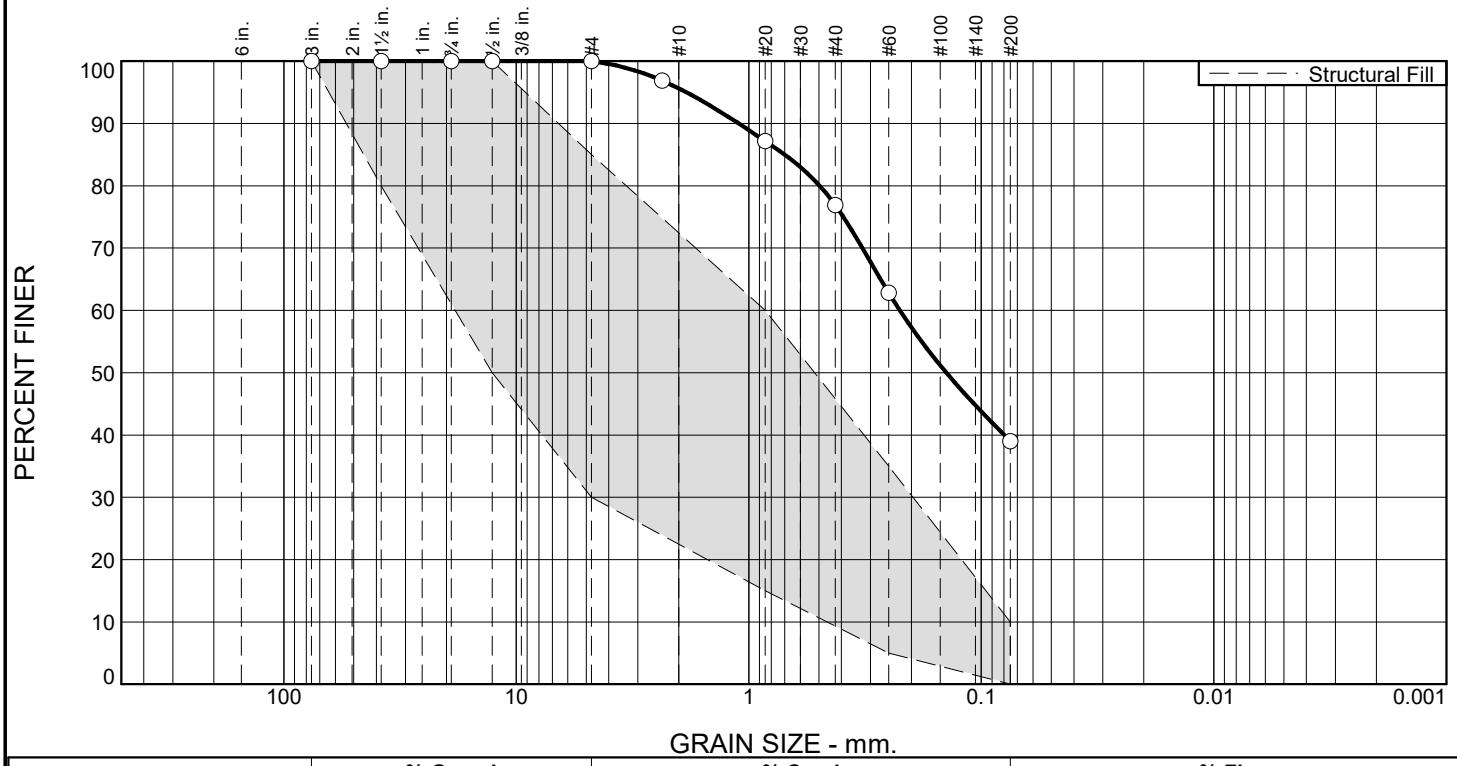
Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Material Description
		0	S1	4-9-61-41 (70)	24/16		Forest Mat (Depth 0.0 ft., El. 139.9)	S1 - Encountered ~1 inch of forest mat material at ground surface Top 10": Silty SAND (SM), fine to coarse, ~25% fines, trace coal ash, trace organic fines, trace roots, trace wood, dark brown, moist Bot. 5": Silty SAND (SM), fine, trace medium to coarse, ~20% fines, 5-10% fine to coarse subangular gravel, trace organic fines, brown, moist S2 - Similar to Bot. 5" of S1, ~25% fines, wet
		2	S2	33-26-22-17 (48)	24/18			
		4	S3	14-13-16-17 (29)	24/13		Fill	▼ S3 - Top 5": Silty SAND (SM), fine to coarse, ~25% fines, trace coal ash, trace coal, trace organic fines, trace roots, dark brown, moist Bot. 8": Silty SAND (SM), fine, trace medium to coarse, ~20% fines, 5-10% fine subangular gravel, trace organic fines, brown
5	135.0	6	S4	15-14-13-13 (27)	24/20			S4 - Silty SAND with Gravel (SM), fine to coarse, ~25% fines, ~15% fine to coarse subangular gravel, stone fragments, brown, wet
		8	S5	14-18-18-14 (36)	24/15		Sand (Depth 8.4 ft., El. 131.6 to Depth 10.0 ft.)	S5 - Top 5": Silty SAND with Gravel (SM), fine, 25-30% fines, ~15% fine to coarse subangular gravel, trace organic fines, trace roots, brown to dark brown, wet Bot. 10": Silty SAND with Gravel (SM), fine, trace medium, ~30% fines, 15-20% fine to coarse angular gravel, light brown, wet
10	130.0	10						Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings.
15	125.0							
20	120.0							
25	115.0							

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Sudbury, Massachusetts," prepared by VHB and dated February 5, 2018.

Appendix B - LGCI's Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	4.4	18.7	37.9	39.0	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	100.0		
0.5"	100.0	50.0 - 100.0	
#4	100.0	30.0 - 85.0	X
#8	96.9		
#20	87.2	15.0 - 60.0	X
#40	76.9		
#60	62.8	5.0 - 35.0	X
#200	39.0	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine to medium, trace coarse, 35-40% fines, trace organics, trace roots, dark brown, wet

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 1.1043 D_{85}= 0.7005 D_{60}= 0.2239
D_{50}= 0.1413 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: **Date Tested:** 11/30/18

Tested By: NP

Checked By:

Location: Stream Bed
Sample Number: S1 **Depth:** Top 5"

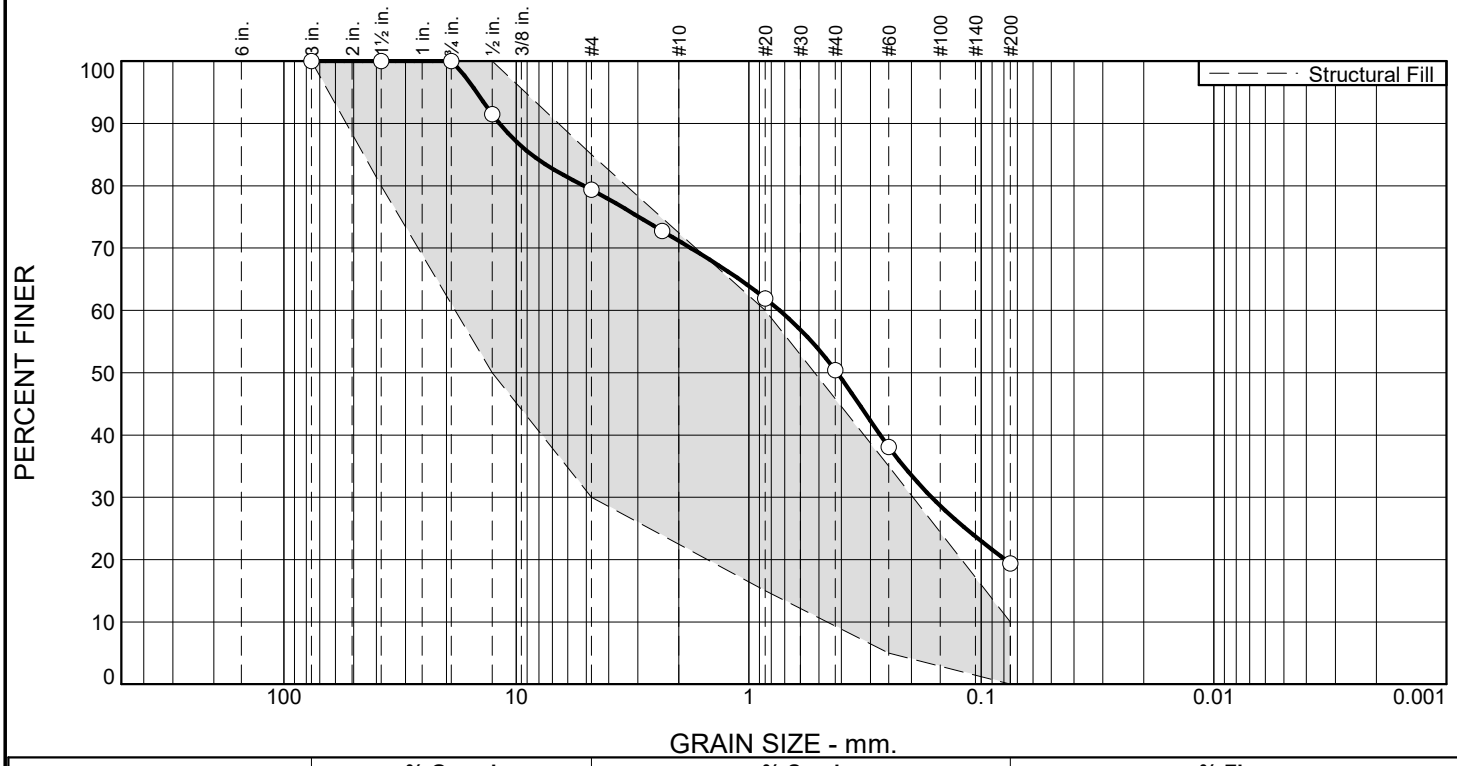
Date Sampled:

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client:
Project: Proposed UG Transmission Lines, Sudbury/Hudson, MA

Project No: 1836 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	20.6	8.2	20.8	31.0	19.4	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	100.0		
0.5"	91.5	50.0 - 100.0	
#4	79.4	30.0 - 85.0	
#8	72.8		
#20	61.9	15.0 - 60.0	X
#40	50.4		
#60	38.1	5.0 - 35.0	X
#200	19.4	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine to coarse, 15-20% fines, 20-25% fine gravel, trace organics, trace roots, dark brown, wet

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 11.8095 D_{85}= 8.5799 D_{60}= 0.7371
D_{50}= 0.4167 D_{30}= 0.1633 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: _____ **Date Tested:** 11/30/18

Tested By: NP

Checked By: _____

Location: Stream Bed
Sample Number: S2 **Depth:** Bottom 5"

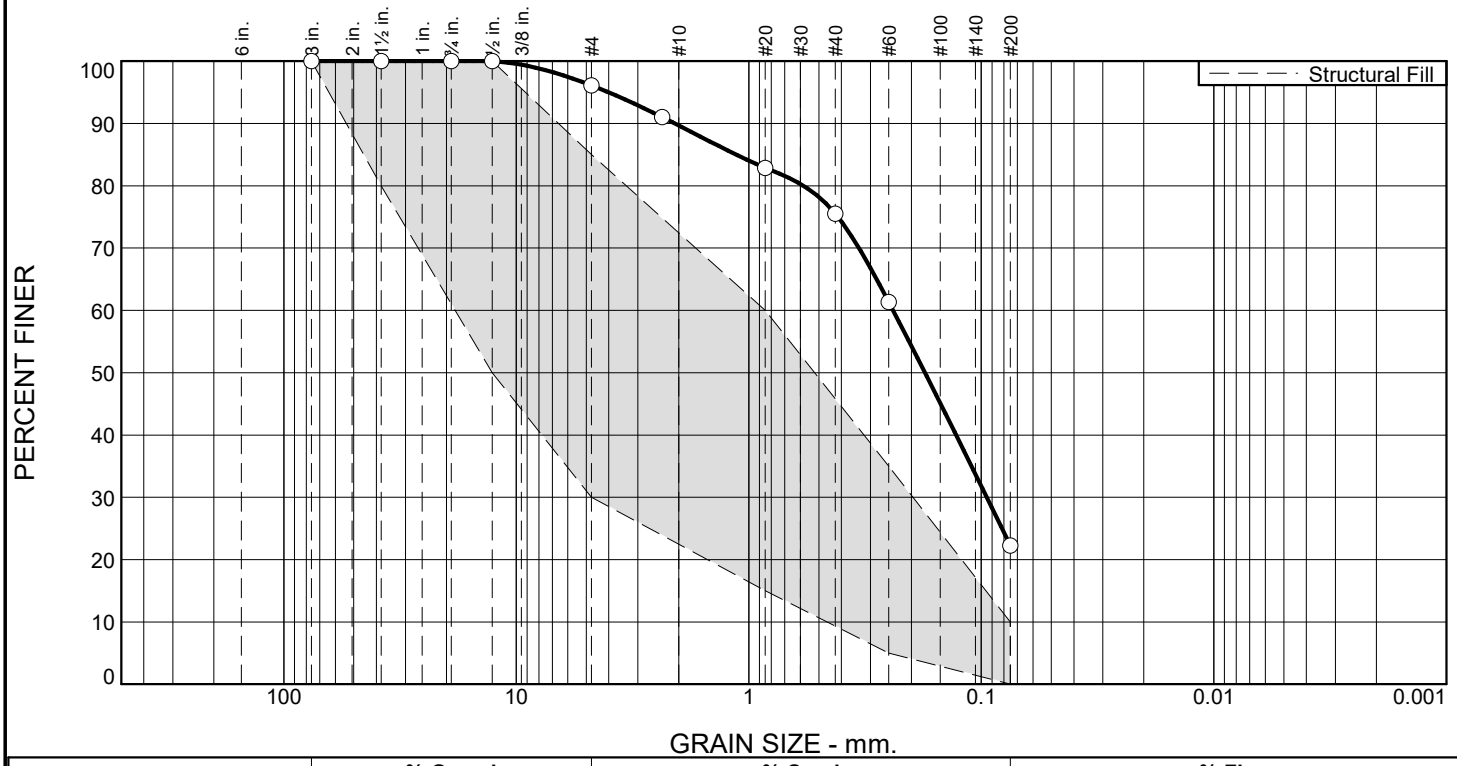
Date Sampled:

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client:
Project: Proposed UG Transmission Lines, Sudbury/Hudson, MA

Project No: 1836 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.9	6.4	14.2	53.2	22.3	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	100.0		
0.5"	100.0	50.0 - 100.0	
#4	96.1	30.0 - 85.0	X
#8	91.0		
#20	82.9	15.0 - 60.0	X
#40	75.5		
#60	61.3	5.0 - 35.0	X
#200	22.3	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine to medium, trace coarse, 20-25% fines, trace fine gravel, trace organics,trace roots, gray/black, wet

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 2.0776 D_{85}= 1.1303 D_{60}= 0.2394
D_{50}= 0.1745 D_{30}= 0.0947 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: _____ **Date Tested:** 11/30/18

Tested By: NP

Checked By: _____

Location: Stream Bed
Sample Number: S3 **Depth:** Top 5"

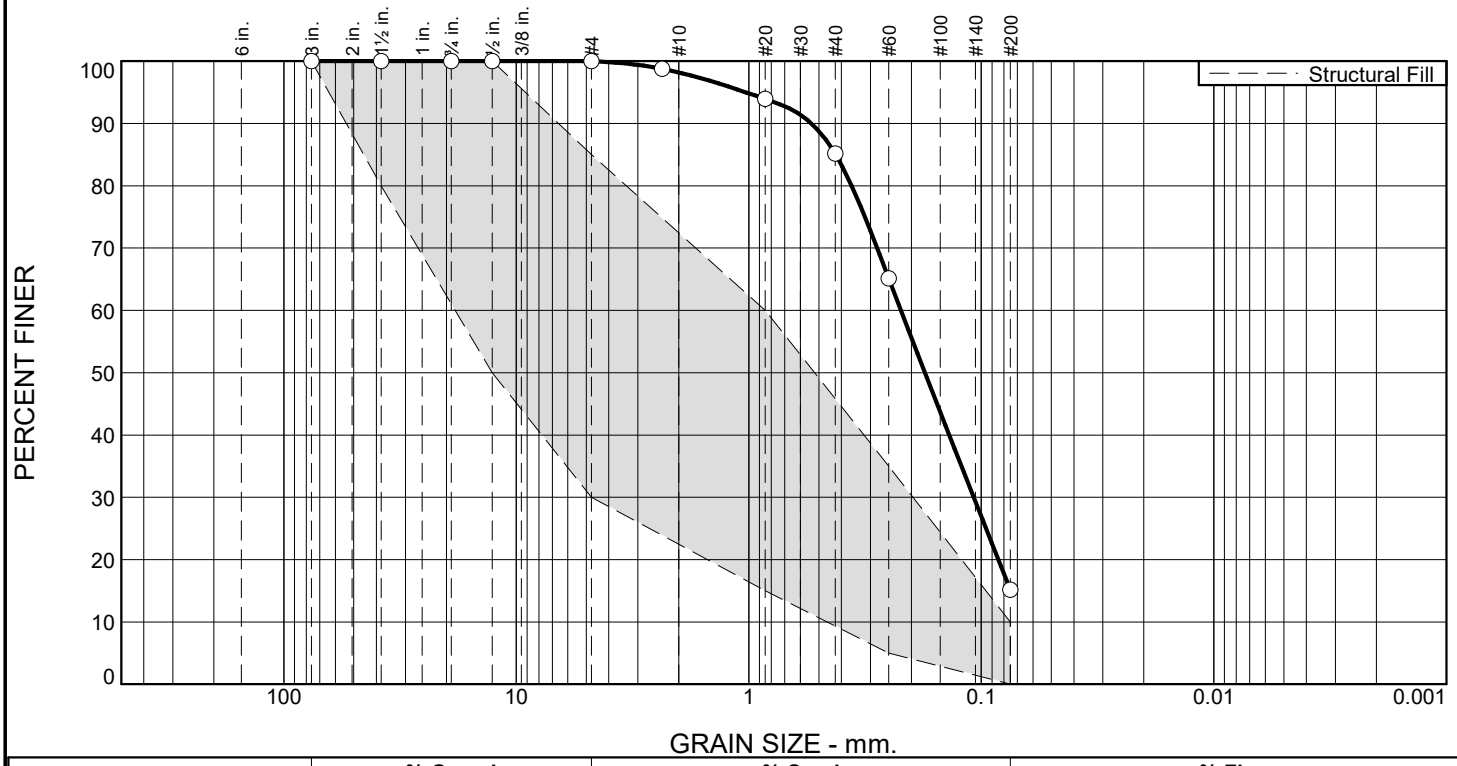
Date Sampled:

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client:
Project: Proposed UG Transmission Lines, Sudbury/Hudson, MA

Project No: 1836 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.8	13.0	70.0	15.2	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	100.0		
0.5"	100.0	50.0 - 100.0	
#4	100.0	30.0 - 85.0	X
#8	98.8		
#20	93.9	15.0 - 60.0	X
#40	85.2		
#60	65.2	5.0 - 35.0	X
#200	15.2	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine to medium, trace coarse, 15% fines, trace organics, gray/black, wet

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 0.5385 D_{85}= 0.4226 D_{60}= 0.2215
D_{50}= 0.1746 D_{30}= 0.1077 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: _____ **Date Tested:** 11/30/18

Tested By: NP

Checked By: _____

Location: Stream Bed
Sample Number: S4 **Depth:** Bottom 5"

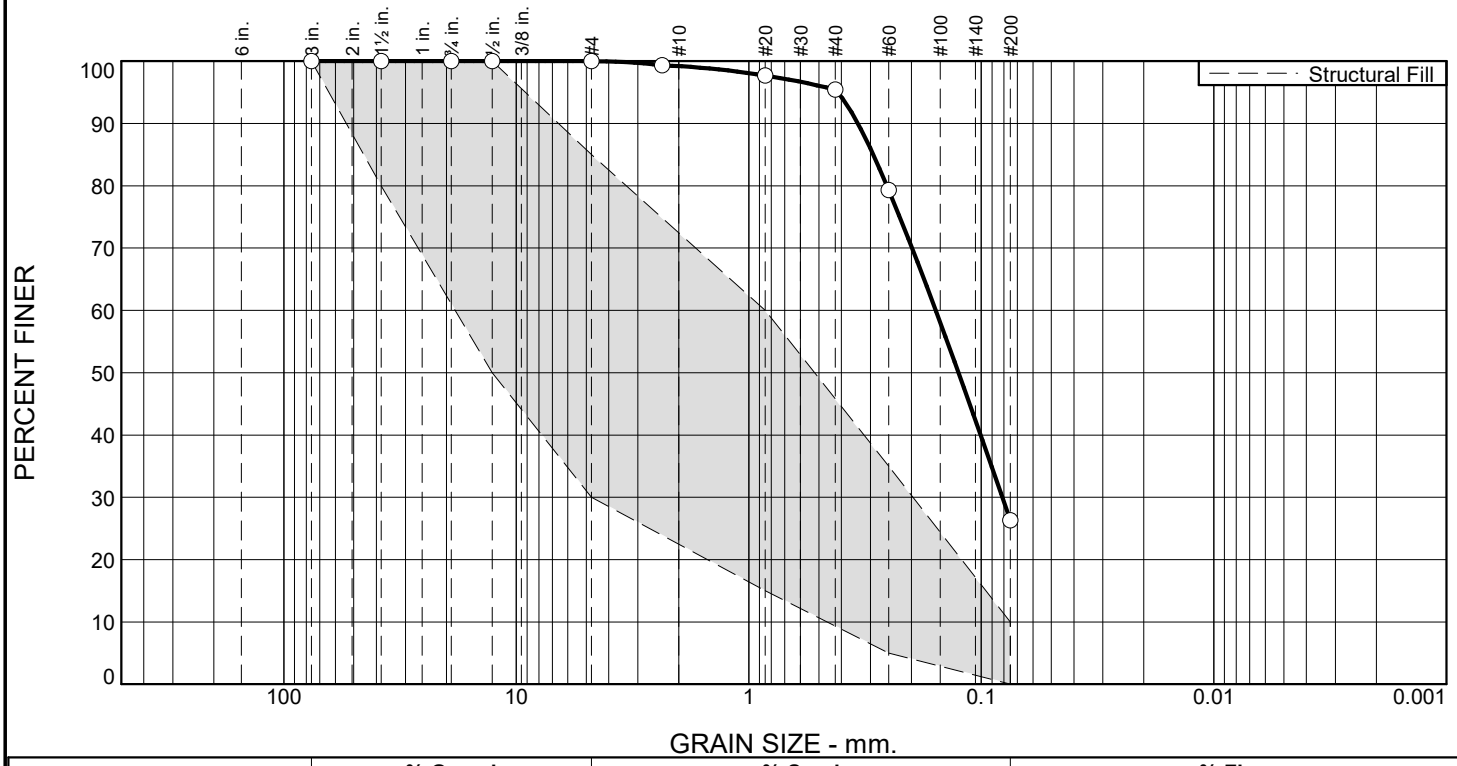
Date Sampled:

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client:
Project: Proposed UG Transmission Lines, Sudbury/Hudson, MA

Project No: 1836 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.8	3.8	69.1	26.3	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	100.0		
0.5"	100.0	50.0 - 100.0	
#4	100.0	30.0 - 85.0	X
#8	99.3		
#20	97.7	15.0 - 60.0	X
#40	95.4		
#60	79.3	5.0 - 35.0	X
#200	26.3	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine, trace medium to coarse, 25-30% fines, trace organics, trace roots, gray/ black, wet

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 0.3391 D_{85}= 0.2913 D_{60}= 0.1568
D_{50}= 0.1253 D_{30}= 0.0811 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: **Date Tested:** 11/30/18

Tested By: NP

Checked By:

Location: Stream Bed
Sample Number: S5 **Depth:** Top 5"

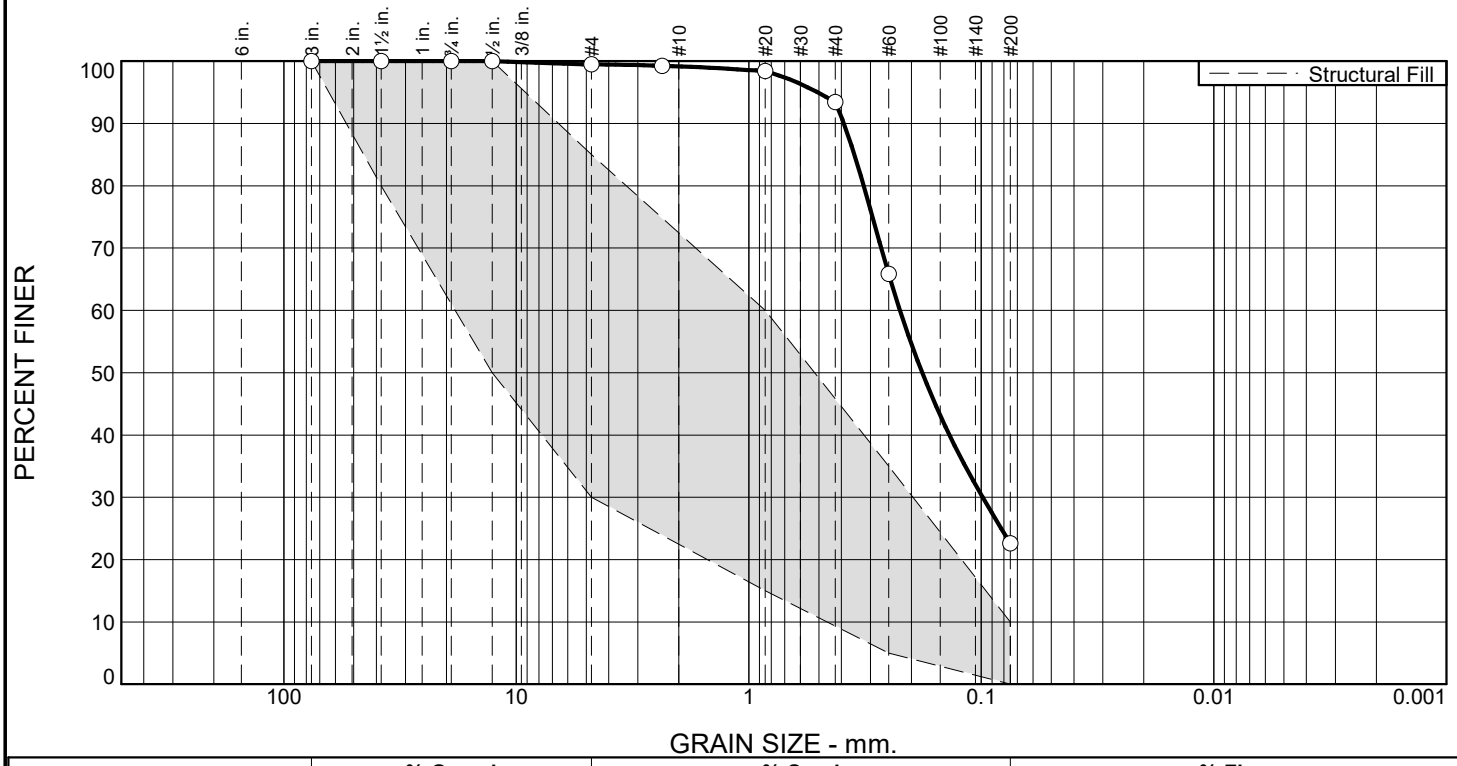
Date Sampled:

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client:
Project: Proposed UG Transmission Lines, Sudbury/Hudson, MA

Project No: 1836 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.5	0.3	5.8	70.8	22.6	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	100.0		
0.5"	100.0	50.0 - 100.0	
#4	99.5	30.0 - 85.0	X
#8	99.3		
#20	98.4	15.0 - 60.0	X
#40	93.4		
#60	65.8	5.0 - 35.0	X
#200	22.6	0.0 - 10.0	X

* Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine, trace medium to coarse, 20-25% fines, trace fine gravel, trace organics, trace roots, gray/black, wet

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 0.3894 D_{85}= 0.3510 D_{60}= 0.2235
D_{50}= 0.1793 D_{30}= 0.0986 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: _____ **Date Tested:** 11/30/18

Tested By: NP

Checked By: _____

Location: Stream Bed
Sample Number: S6 **Depth:** Bottom 5"

Date Sampled:

LGCI
Lahlaf Geotechnical Consulting, Inc.

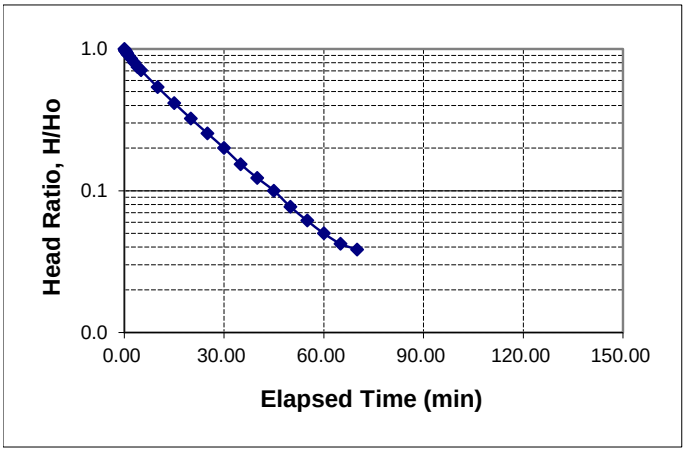
Client:
Project: Proposed UG Transmission Lines, Sudbury/Hudson, MA

Project No: 1836 **Figure**

Appendix C - Borehole Permeability Test

VARIABLE HEAD PERMEABILITY TEST

Perm. Tests	LGCI Rep.:	K. Dooley	Date: 11/9/18	Boring No. : B-39
Sudbury, MA	Calculated by:	K. Dooley	Date: 11/12/18	Test No. : #1
LGCI Project: 1836	Checked by:	AML	Date: 12/07/18	Page 1 of 1



STANDPIPE/RISER DETAILS

Casing inner diam, d, inches:	3.0
Casing length, feet:	15.5
Casing stick up length, feet (above ground surface) :	3.5
Initial Water Depth (below top of casing):	13.0

TEST INTERVAL DETAILS

Depth to bottom, feet (below ground surface):	14.0
Depth to top, feet (below ground surface):	12.0
Length, L, feet:	2.0
Hole diameter, D, inches:	4.00

Material at test interval: 12 ft to 14 ft
Poorly Graded SAND (SP), fine, ~5% fines
m = 1 i.e., isotropic material

TIME (hr:min:sec)	ELAPSED TIME (min)	DEPTH TO WATER FROM TOP OF CASING (ft)	HEAD H (feet)	HEAD RATIO H/Ho	K (ft/min)	K (cm/sec)
	0.00	0.00	13.00	1.00		
	0.17	0.33	12.67	0.97	**1.5E-03**	**7.5E-04**
	0.33	0.42	12.58	0.97	**9.6E-04**	**4.9E-04**
	0.50	0.50	12.50	0.96	**7.6E-04**	**3.9E-04**
	0.67	0.70	12.30	0.95	**8.0E-04**	**4.1E-04**
	0.83	0.90	12.10	0.93	**8.4E-04**	**4.3E-04**
	1.00	1.10	11.90	0.92	**8.6E-04**	**4.4E-04**
	2.00	1.90	11.10	0.85	**7.7E-04**	**3.9E-04**
	3.00	2.60	10.40	0.80	**7.2E-04**	**3.7E-04**
	4.00	3.30	9.70	0.75	**7.1E-04**	**3.6E-04**
	5.00	3.80	9.20	0.71	**6.7E-04**	**3.4E-04**
	10.00	6.00	7.00	0.54	**6.0E-04**	**3.1E-04**
	15.00	7.60	5.40	0.42	**5.7E-04**	**2.9E-04**
	20.00	8.80	4.20	0.32	**5.5E-04**	**2.8E-04**
	25.00	9.70	3.30	0.25	**5.3E-04**	**2.7E-04**
	30.00	10.40	2.60	0.20	**5.2E-04**	**2.6E-04**
	35.00	11.00	2.00	0.15	**5.2E-04**	**2.6E-04**
	40.00	11.40	1.60	0.12	**5.1E-04**	**2.6E-04**
	45.00	11.70	1.30	0.10	**5.0E-04**	**2.5E-04**
	50.00	12.00	1.00	0.08	**5.0E-04**	**2.5E-04**
	55.00	12.20	0.80	0.06	**4.9E-04**	**2.5E-04**
	60.00	12.35	0.65	0.05	**4.8E-04**	**2.5E-04**
	65.00	12.45	0.55	0.04	**4.7E-04**	**2.4E-04**
	70.00	12.50	0.50	0.04	**4.5E-04**	**2.3E-04**
					Average	**2.67E-04**

NOTES:
1 - Test procedure used was a falling head test in an open borehole.
2 - Hydraulic Conductivity, K = $(d^2*\ln(2mL/D))/(8L(t2-t1))*\ln(H1/H2)$, per Lambe & Whitman, Soil Mechanics, 1969, p. 285, case G: isotropic conditions and L/D not less than 4.
3 - H represents the difference between static ground water level and water level in casing.
4 - Average calculated over straight line portion of plot above (bold values in table).

LGCI
Lahlaf Geotechnical Consulting, Inc.

August 16, 2018

Mr. Paul A. McKinlay, PG, LSP
Vanasse Hangen Brustlin, Inc.
101 Walnut Street
Watertown, MA 02472
Phone: (617) 607-2956
Fax: (617) 924-2286
E-mail: pmckinlay@VHB.com

Re: **Geotechnical Report**
Proposed Transmission Power Line Borings
Hudson, Massachusetts
LGCI Project No. 1836

Dear Mr. McKinlay:

Lahlaf Geotechnical Consulting, Inc. (LGCI) has completed a geotechnical study for the proposed Transmission Power Line in Hudson, Massachusetts. We are submitting this report electronically, please notify us if you need a hard copy.

The soil samples from our explorations are currently stored at LGCI for further analysis, if requested. Unless notified otherwise, we will dispose of the soil samples after three months.

Thank you for choosing LGCI as your geotechnical engineer.

Very truly yours,

Lahlaf Geotechnical Consulting, Inc.

Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

LGCI
Lahlaf Geotechnical Consulting, Inc.

GEOTECHNICAL LETTER REPORT
PROPOSED TRANSMISSION POWER LINE BORINGS
HUDSON, MASSACHUSETTS

LGCI Project No. 1836
August 16, 2018

Prepared for:

VANASSE HANGEN BRUSTLIN, INC.
101 Walnut Street
Watertown, MA 02472
Phone: (617) 607-2956
Fax: (617) 924-2286

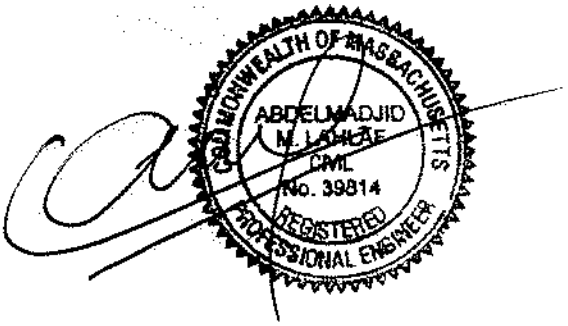
GEOTECHNICAL REPORT
PROPOSED TRANSMISSION POWER LINE BORINGS
HUDSON, MASSACHUSETTS
LGCI Project No. 1836
August 16, 2018

Prepared for:

VANASSE HANGEN BRUSTLIN, INC.
101 Walnut Street
Watertown, MA 01604
Phone: (617) 607-2956
Fax: (508) 924-2286

Prepared by:

LAHLAF GEOTECHNICAL CONSULTING, INC.
100 Chelmsford Road, Suite 2
Billerica, Massachusetts 01867
Phone: (978) 330-5912
Fax: (978) 330-5056



Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

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1. PROJECT INFORMATION

1.1 Project Authorization

This report presents the results of subsurface explorations and a geotechnical evaluation performed by Lahlaf Geotechnical Consulting, Inc. (LGCI) for the proposed transmission power line in Hudson, Massachusetts. We performed our services in general accordance with our proposal No. 16006-Rev. 3 dated January 23, 2016 and revised June 19, 2018.

1.2 Purpose and Scope of Services

The purpose of this geotechnical study was to obtain subsurface information at the site and to provide foundation design and construction recommendations for the utility vaults along the proposed transmission power line. LGCI performed the following services:

- Provided a geotechnical senior and field engineer to attend a site meeting with Vanasse Hangen Brustlin, Inc. (VHB) representatives and the drilling subcontractor's crew on May 22, 2018.

- Provided a geotechnical field engineer at the site. The engineer coordinated and observed the borings, described the soil samples, and prepared field logs.

- Submitted six (6) soil samples for laboratory testing.

- Performed two (2) borehole permeability tests.

- Prepared this geotechnical report containing the results of our subsurface explorations and our recommendations for foundation design and construction related to the proposed transmission power line.

This report presents the results of our geotechnical services for the Hudson portion of this project. We understand that more subsurface explorations will be advanced in the Sudbury portion at a future date.

Our scope did not include attending meetings, preparing specifications, reviewing contract documents and shop drawings, or providing construction services. LGCI would be pleased to perform these services when needed. Recommendations for stormwater management, erosion control, pavement design, subgrade preparation for roadways and other paved areas, slope stability analyses, and detailed cost or quantity estimates are not included in our scope of work.

Our scope does not include performing environmental services for this project. LGCI did not perform an environmental assessment to evaluate the presence or absence of wetlands or analytical testing for hazardous or toxic materials in the soil, surface water, groundwater, or air,

on or below this site, or mold in the soil or any structure at this site. Any statement about the color, odor, or the presence of suspicious materials included in our boring logs or report were made by LGCI for information only and to support our geotechnical services. No environmental recommendations and/or opinions are included in this report.

1.3 Site Description

Our understanding of the existing conditions is based on field observations, our discussions with VHB, and on the following drawing:

- "Proposed Conditions Plans for Notice of Intent (NOI) Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," (NOI Plans) prepared by VHB and dated February 14, 2018.

The site extends along Forest Avenue, Wilkins Street, and an abandoned MBTA railroad. Forest Avenue and Wilkins Street extend through residential areas. Private properties are located on either side of Forest Avenue and Wilkins Street. The site includes a four-way intersection where Forest Avenue and Wilkins Street intersect with Main Street. Overhead wires extend from the Hudson Light and Power Department, located at 49 Forest Avenue, along Forest Avenue and continue along Wilkins Street. Boulders up to 2 feet in diameter were observed on the northern edge of Forest Avenue near Jack's Automotive, located at 104 Forest Avenue.

The abandoned MBTA railroad intersects Wilkins Street near the East Hudson Trail point and Orchard Drive. The abandoned railroad tracks are built on a 5-foot embankment that extends through wooded areas and wetlands. Trees and boulders up to 4 feet in diameter were observed on either side of the embankment. Based on the NOI Plans and our field observations there appears to be approximately 12 feet of fill placed on the railroad bed when Chestnut Street was constructed. The abandoned railroad crosses over the Fort Meadow Brook over an existing timber bridge. The railroad extends along industrial and residential areas on the eastern side of the Fort Meadow Brook. Private properties border the railroad on either side. The railroad intersects with Main Street, Parmenter Road, and White Pond Road. Figure 1 shows the approximate extend of the project site.

The ground surface elevations of the portion of the project along the different areas listed above are as follows:

- Between El. 214 on the western side and El. 216 on the eastern side of Forest Avenue with a local high at about El. 245;
- Between El. 214 on the western side and El. 220 on the eastern site of Wilkins Street; and
- Between El. 224 on the western side and El. 192 on the eastern side of the abandoned MBTA railroad with a local low of El. 180 near the Fort Meadow Brook.

1.4 Project Description

Our understanding of the proposed transmission power line is based on our discussions with VHB and the NOI Plans listed in Section 1.3 and the following drawings:

- "Line 1151 South End Glenbrook, 115-kV Underground Transmission Line, Splice Vault Detail, Stamford, Connecticut," prepared by Northeast Utilities Service Co. and dated May 10, 2013.

- "Cross Sections, Sudbury Hudson Transmission Line Reliability Project, Hudson, Stow, Marlborough, and Sudbury, Massachusetts," (Cross Sections) prepared by VHB for Eversource Energy and dated July 2, 2018.

We understand that Eversource Energy (Eversource) engaged VHB to coordinate and observe a subsurface exploration for its proposed transmission power line. The transmission power line will be a 115-kV underground transmission power line connecting a substation in Hudson to a substation in Sudbury and will extend along a proposed bike path that will be constructed along the abandoned railroad bed.

We understand that the construction of the proposed transmission power line will include twenty-eight (28) vaults, three (3) bridges, and two (2) retaining walls as follows:

- Fourteen (14) vaults in Hudson and fourteen (14) vaults in Sudbury;
- Two (2) bridges (Chestnut Street Bridge and Fort Meadow Brook Bridge) in Hudson, and one (1) bridge (Hop Brook Bridge No. 127) in Sudbury.
- One (1) retaining wall in Hudson and one (1) retaining wall in Sudbury.

This report focuses on the portion of the proposed transmission power line in Hudson. Work related to the Sudbury line will be performed at a later date and will be described in a future report.

The Hudson portion of the transmission power line extends approximately 3 miles. The proposed transmission power line will be installed within a trench that will generally extend to depths of about 5 feet beneath the ground surface. We understand that the proposed transmission power line will be encased in concrete.

We understand that the proposed vaults will be spaced 1,500 to 1,900 feet apart. We also understand that the proposed vaults will have a length of 24 feet, a width of 8 feet, and a height of 8 feet. VHB indicated to us that the vaults will likely have a wall thickness of 6 inches. The vaults will be designed with two (2) 3-foot manholes per vault. The vaults are generally placed at a depth of 11 feet. This is to provide 2 feet between the top of the vault and the proposed finished grade for manhole brick work.

Based on the Cross Sections, the proposed retaining wall will extend from about Sta. 119+00 to Sta. 125+00, i.e., and will be about 600 feet long. The cross sections indicated that the exposed

height of the proposed wall ranges up to about 4 feet. VHB indicated to us that the current design includes sheet piles for the proposed wall. We understand that concrete a cap will be provided on top of the sheet piles.

1.5 Elevation Datum

We understand that elevations shown in the NOI Plans are referenced with respect to the North American Vertical Datum (NAVD) of 1988 and are in feet.

2. SITE AND SUBSURFACE CONDITIONS

2.1 Surficial Geology

LGCI reviewed the surficial geological map titled: "Surficial Geologic Map of the Clinton-Concord-Grafton-Medfield 12-Quadrangle Area in East Central Massachusetts," compiled by Bryon D. Stone and Janet R. Stone for U.S. Geological Survey, Open-File report (2006).

The geologic map indicates that the surficial soil in the general vicinity of the site consists of organic muck and peat that contain minor amounts of sand, silt, and clay, stratified and poorly sorted in kettle depressions or poorly drained areas. The surficial geologic map of the site is shown in Figure 2.

2.2 LGCI's Borings

VHB engaged Geosearch, Inc. (Geosearch) of Sterling, Massachusetts to advance thirty-seven (37) borings for the Hudson portion of the project between May 22 and July 13, 2018 as follows:

- Four (4) borings for the proposed bridges, the results of which are included in a separate report; and
- Thirty-three (33) borings for the proposed transmission power line. One of the bridge borings at the Fort Meadow Brook crossing was also advanced at an intermediate location along the proposed transmission power line and was combined with a transmission power line boring.

The borings extended to depths ranging from 10 to 101 feet beneath the ground surface. An LGCI engineer observed and logged the borings in the field. A representative from VHB was on site to collect soil samples from the borings along the proposed transmission power line for laboratory testing, including thermal resistivity, oil and/or hazardous materials, proctor, and grain-size analysis. The results of the tests performed by VHB are not included in our report.

Geosearch performed vacuum explorations at borings B-8, B-MP-1, B-MP-3, B-MP-4, B-MP6, and B-MP-9 to B-MP-11 to depths of about 6 feet.

The borings located in paved areas along Forest Avenue and Wilkins Street (B-MP-3, B-MP-4, B-MP-6, B-MP-9 to B-MP-11, and B-8) were advanced with a CME 55 truck mounted rig by employing 4 ¼-inch hollow stem augers to a depth of up to 16 feet.

Four (4) borings (B-13, and B-25 to B-27) were advanced with a tripod using a Honda GX200 motor. These borings were located in sections along the MBTA railroad that were inaccessible with a rubber track ATV rig. These borings were advanced to depths up to 16 feet.

The remaining borings were advanced in a grass area along Forest Street or on the MBTA railroad, and were advanced with a CME 55 LC rubber track ATV rig by employing 4 ¼-inch hollow stem augers to a depth of up to 30 feet. Boring B-BB-3/B-14 was advanced to a depth of 101 feet with a CME 55 LC rubber track ATV by employing 4 ¼-inch hollow stem augers to a depth of 12 feet, and then by employing a 4-inch casing to a depth of 29 feet and a 3-inch casing to the termination depth of the boring.

The drillers performed Standard Penetration Tests (SPT) and obtained split spoon samples with an automatic hammer typically at depth intervals of 2 feet or 5 feet, as noted on the boring logs, in general accordance with ASTM D-1586. Unless notified otherwise, we will dispose of the soil samples after three months.

Figure 3 shows the boring locations, and Appendix A contains LGCI's boring logs. The ground surface elevations noted on the boring logs were interpolated to the nearest foot from the NOI Plans.

2.3 Subsurface Conditions

2.3.1 General

The subsurface description in this report is based on a limited number of borings and is intended to highlight the major soil strata encountered during our borings. The subsurface conditions are known only at the actual boring locations. Variations may occur and should be expected between boring locations. The boring logs represent conditions that we observed at the time of our explorations and were edited, as appropriate, based on the results of the laboratory test data and inspection of the soil samples in the laboratory. The strata boundaries shown in our boring logs are based on our interpretations and the actual transition may be gradual. Graphic soil symbols are for illustration only.

Our subsurface descriptions were broken down into two sections: proposed transmission power line borings and retaining wall borings

2.3.2 Proposed Transmission Power Line Borings

This section describes the subsurface conditions encountered in the borings along or near the alignment of the proposed transmission power line, including borings B-8 to B-11,B-GB-10, B-13, B-14/B-BB-3, B-21 to B-27, B-MP-1, B-MP-3, B-MP-4, B-MP-6, and B-MP-9 to MP-11, B-MP-15, B-MP-17, B-MP-19, B-MP-20, and B-MP-22 to B-MP-24.

The soil strata encountered in the borings were as follows, starting at the ground surface:

Asphalt – A layer of asphalt was encountered in borings B-8, B-MP-3, B-MP-4, B-MP-6, and B-MP-9 to B-MP-11. The depth of the asphalt ranged between 0.7 to 0.9 feet below the ground surface.

Surficial Organic Soil – A layer of surficial organic topsoil and subsoil was encountered in borings B-9, B-10, B-13, B-21 to B-24, B-MP-1, B-MP-19, B-MP-20, and B-MP-22 to B-MP-24. This layer generally consisted of silty sand with organic fines, roots, leaves, grass, and wood. This layer had a thickness ranging between 0.1 and 4 feet but was generally less than 1.5 feet thick.

Fill – A layer of fill was encountered at the ground surface along the abandoned MBTA railroad in borings B-11/B-GB-10, B-BB-3/B-14, B-25 to B-27, B-MP-15, and B-MP-17. Fill was also encountered underneath the asphalt or surficial organic layers, except in borings B-22, B-MP-6, B-MP-10, B-MP-20, B-MP-23, and B-MP-24.

The fill was mostly described as poorly graded sand and less frequently as silty sand or well graded sand. There were two (2) samples in boring B-GB-13 that were described as silty gravel. The fines content in the fill ranged up to 30 percent but was generally between 5 and 20 percent. The gravel content in the fill ranged up to 40 percent, but generally ranged between 5 and 25 percent. The fill contained traces of organic fines, roots, and wood. The fill along Forest Avenue and Wilkins Street contained traces of asphalt. The fill along the abandoned MBTA railroad contained traces of coal ash and slag.

The Standard Penetration Test (SPT) N-values in this layer ranged between 1 and 93 blows per foot (bpf), with most values between 9 and 28 indicating loose to medium dense material.

Buried Organic Soil – A layer of buried organic soil was encountered beneath the fill in borings B-9, B-10, B-11/B-GB-10, B-BB-3/B-14, B-21, B-24, B-27, B-MP-15 and extended to depths of up to 10 feet beneath the ground surface, except in boring B-BB-3/B-14 located near the existing Fort Meadow Brook bridge, where the buried organics extended to a depth of 20 feet below the ground surface. The buried organics contained fibrous peat, organic fines, roots, and wood.

As a part of the Eversource transmission power line project, borings were advanced for the proposed Fort Meadow Brook bridge. In boring B-BB-4, advanced for the proposed bridge, the layer of buried organics extended to a depth of 25 feet.

Sand – A layer of sand was encountered beneath the asphalt, surficial organic soil, fill, or buried organic soil in all the borings and extended to the boring termination depths. The sand layer was mostly described as well graded sand and less frequently as poorly graded sand and occasionally as silty sand. The fines content in the sand ranged up to 30 percent,

but generally ranged between 5 and 20 percent. The gravel content in the sand ranged up to 45 percent, but generally ranged between 5 and 15 percent.

The SPT N-values in the sand ranged between 5 and 135 bpf, with most values between 5 and 49 bpf indicating loose to dense sand.

2.3.3 Proposed Retaining Wall Borings

This section describes the subsurface conditions encountered in the borings along or near the alignment of the proposed retaining wall, including borings B-GB-7, B-GB-8, B-11/B-GB-10, and B-GB-12 to B-GB-16.

The soil strata encountered within the borings were as follows, starting at the ground surface:

Topsoil – A layer of topsoil was encountered at the ground surface of borings B-GB-15 and B-GB-16. The topsoil thickness ranged between 5 and 6 inches.

Fill – A layer of fill was encountered at the ground surface or beneath the topsoil in all the borings advanced along or near the alignment of the proposed retaining wall. The fill extended to depths ranging between 2 and 6.6 feet beneath the ground surface. Coal was encountered at the ground surface in borings B-GB-7, B-GB-8, B-11/B-GB-10, and B-GB-12. The fill was mostly described as silty sand and poorly graded sand with silt, and occasionally as silty gravel. The fines content in the fill ranged between 5 and 40 percent. The gravel content in the fill ranged between 5 and 20 percent. The fill contained traces of asphalt, organic fines, wood, roots, leaves and slag.

The SPT N-values of the fill ranged between 1 and 93 bpf, with most values between 1 and 21 bpf, indicating very loose to medium dense material. The relatively high SPT N-Values recorded in the fill may be caused by cobbles and boulders in the fill and may not represent the true density.

Buried Organic Soil – A layer of buried organic soil was encountered beneath the fill in borings B-GB-7, G-GB-8, and B-11/B-GB-10. The buried organics extended to depths ranging between 6 to 8 feet beneath the ground surface. The buried organics consisted of silty sand with traces of organic fines and roots.

Sand – A layer of sand was encountered beneath the fill or buried organics in all borings advanced near the alignment of the proposed retaining wall. The sand layer extended to the termination depth of the borings. The sand was mostly described as silty sand and less frequently as poorly graded sand or well graded sand. The fines content in the sand ranged between 5 and 30 percent. The gravel content in the sand ranged between 5 and 35.

The SPT N-values in the sand ranged between 9 and over 120 bpf, with most values between 13 and 75 bpf, indicating mostly medium dense to very dense sand.

2.4 Groundwater

2.4.1 General

The groundwater data obtained during drilling and reported in this report is based on observations made during or shortly after completion of our explorations and may not represent the actual groundwater levels, as additional time may be required for the groundwater to stabilize. The groundwater levels presented in this report only represent the conditions encountered at the time and location of our explorations. Seasonal fluctuation should be anticipated.

Please note that our groundwater measurements were performed during the period between May and July. The groundwater levels are anticipated to be higher during the months of the wet season in early spring.

2.4.2 Proposed Transmission Power line

Groundwater was encountered in all the borings advanced along or near the alignment of the proposed transmission power line, except in borings B-8, B-MP-6, B-MP-15, and B-MP-24. Groundwater was encountered at depths of up to 13 feet beneath the ground surface, but generally ranged between 5 and 10 feet along Forest Avenue and Wilkins Street and between 4 and 13 feet along the MBTA railroad.

2.4.3 Proposed Retaining Wall

Groundwater was encountered in all the borings along or near the alignment of the proposed retaining wall at depths of up to 20 feet beneath the ground surface, but generally ranged between 8 and 15 feet.

The groundwater levels measured during drilling are based on observations made shortly after the completion of the explorations. Note that water was introduced into each borehole to maintain a stable borehole and the water levels noted may not represent the actual groundwater level, as additional time may be required for the groundwater levels to stabilize. The groundwater levels presented in this report only represent the conditions encountered at the time and location of the explorations. Seasonal fluctuation should be anticipated.

2.5 Borehole Permeability Tests

LGCI performed two (2) falling head borehole permeability tests in borings B-MP-19 and B-24. The tests were performed by filling the drill casing with water and measuring the drop in water level inside the casing. The tests were performed at the depths shown below:

- Boring B-MP-19: 12 feet to 14 feet
- Boring B-24: 12 feet to 14 feet,

The results of the borehole permeability tests are included in Attachment C. The results indicated that permeability of the soil at depths of 12 to 14 feet in borings B-MP-19 and B-24 is about 1.1×10^{-4} cm/sec and 3.3×10^{-4} cm/sec, respectively.

2.6 Laboratory Test Data

LGCI submitted six (6) samples for laboratory testing. The results are summarized in the table below. The laboratory data sheets are included in Appendix B.

Results of Grain-size Analyses

Boring No.	Sample No.	Stratum	Sample depth (ft.)	Percent Gravel	Percent Sand	Percent Fines
B-24	S4	Nat. Sand	6 – 8	0.7	94.2	5.1
B-24	S7	Nat. Sand	12 – 14	0.0	96.1	3.9
B-GB-13	S2	Fill	2 – 4	42.6	41.8	15.6
B-GB-16	S3	Nat. Sand	4 – 6	7.0	88.7	4.3
B-GB-19	S4	Nat. Sand	6 – 8	9.1	71.5	19.4
B-GB-19	S7	Nat. Sand	12 – 14	28.4	67.9	3.7

3. EVALUATION AND RECOMMENDATIONS

3.1 General

Based on our understanding of the proposed transmission power line, our observation of the borings, and the results of our laboratory testing, there are a few issues that we would like to highlight for consideration and discussion.

- Buried organic soil was encountered in many borings. The depth to the bottom of the organic soil was generally less than 10 feet. Accordingly, the presence of the organic soil is not anticipated to affect the proposed vaults. The proposed vaults should be supported on Structural Fill placed directly on top of the natural sand. Our recommendations for bearing resistance for the proposed vaults are presented in Section 3.2.

- The sheet pile wall is well suited for the subsurface conditions encountered in our borings, as it will not require the removal of the existing fill and the buried organic soil. The presence of the organic soil may result in longer sheet piles. Also, fill placed to raise the grades near the proposed retaining wall will result in settlement induced by the compression of the buried organic soil. This settlement will not affect the proposed vaults, transmission power lines, or sheet pile retaining wall. The contractor should be prepared to pre-trench to remove boulders at locations where boulders are encountered ahead of the sheet pile driving operations.

- At Sta. 119+25, the proposed wall will cross an existing culvert with a diameter of about 2 feet. Soldier piles could be driven on both sides of the existing culvert and should be fastened to the sheet pile wall on either side. Pressure treated wood or concrete lagging could be used down to the top of the culvert. The wedges on the sides of the existing culvert should be filled with flowable fill or drypack.

- The subsurface conditions encountered in our borings are in general suitable to support the proposed duct bank encasement of the proposed transmission power line as the trench for the proposed transmission power line will terminate in existing fill or natural soil. In a few locations, the proposed transmission power line trench will terminate in the organic soil or at the bottom of the existing fill, just above the organic soil. At these locations, we recommend over-excavating the organic soil and backfilling the trench to the bottom of the proposed transmission power line using suitable backfill. Where the organic soil is more than 2 feet from the bottom of the proposed transmission power line trench, the organic soil should not be removed. Additional recommendations for supporting the proposed transmission power line are presented in Section 4.1.

- Boulders were encountered at boring B-MP-3 at a depth of 6 feet and drill chattering was observed in the borings along the MBTA railroad. The contractor should be prepared to encounter boulders during excavation and should be prepared to remove the boulders from the site.

- The existing fill along the MBTA railroad contained varying amounts of organic matter and coal. Due to the presence of coal ash, these materials will have to be pre-characterized before disposal offsite. To reduce the quantity of material to be disposed of offsite, the contractor should be prepared to segregate the inorganic portion of the existing fill and amend it as needed to improve its gradation for reuse as backfill.. Our recommendations for fill materials and for reuse of onsite materials are presented in Sections 4.3 and 4.4, respectively.

- We anticipate that groundwater control will be required to construct the proposed vaults. The design and the construction sequence should be performed so as to allow for the construction of the proposed vaults in a dry excavation and to reduce the potential for uplift of the vault at the end of dewatering operations. Groundwater control will also be required along portions of the transmission power line trenches. Our recommendations for groundwater control are presented in Section 4.7.

- Foundations should be designed in accordance with the requirements of the Massachusetts State Building Code, Ninth Edition (MSBC 9th edition).

3.2 Vault Recommendations

- We recommend supporting the proposed vaults on a minimum of 12 inches of Structural Fill bearing on natural sand. In areas where the proposed transmission power line trench terminates in the buried organic soil or less than 2 feet from the top of the organic soil, the organic soil should be removed at least 2 feet beneath the bottom of the trench or to the natural sand, whichever occurs first.

- We recommend an allowable bearing pressure of 3 kips per square foot (ksf) for vaults bearing on natural sand.

- The vaults should be designed with slabs and walls thick enough such that the weight of the vault resists uplift pressure. We recommend a minimum factor of safety of 1.1 against uplift.

- We recommend that the vault walls be designed using at-rest pressure and to resist the hydrostatic pressure as described in section 3.4.

3.3 Seismic Design

In accordance with Section 1613 of MSBC 9th Edition, the seismic criteria for the site are as follows:

Site Class:	D
Spectral Response Acceleration at short period (Ss):	0.197g
Spectral Response Acceleration at 1 sec. (S1):	0.068g
Site Coefficient Fa (Table 9.4.1.2.4a):	1.6

Site Coefficient Fv (Table 9.4.1.2.4b):	2.4
Adjusted spectral response Sms:	0.315 g
Adjusted spectral responses Sm1:	0.163g

Based on our observations of the borings, the natural soil layer at the site is not susceptible to liquefaction during a seismic event.

3.4 Lateral Pressures for Wall Design

Lateral earth pressures recommended for design of the proposed retaining wall and vault walls are provided in the section below.

We recommend using the following values for retaining wall design:

Coefficient of Active Earth Pressure, K_A:	0.31
Coefficient of Active Earth Pressure, K_P in Top 5 feet	2.0
Coefficient of Active Earth Pressure, K_P at depths greater than 5 feet:	4.1
Coefficient of At-Rest Earth Pressure, K_o:	0.50
Friction Angle between Backfill and Back of Wall, δ:	10 degrees
Total Unit Weight, γ:	120 pcf
Buoyant Unit Weight γ':	57.4 pcf

Note: The coefficient of active pressure value is based on Coulomb's equation using an internal friction angle for the backfill, ϕ, of 30 degrees and a friction angle between the backfill and the structure, δ, of 10 degrees. The coefficients of active and at-rest earth pressure are provided for wall backfill with a horizontal surface (non-sloping backfill) on the active side for the retaining wall. The coefficient of passive earth pressure is provided for a sloping ground with a slope of 3H:1V in the top 5 feet.

- The proposed vault walls should be designed using the "at-rest" pressure coefficient.
- The length of the proposed sheet pile wall obtained using the design parameters recommended above should be increased by the thickness of the buried topsoil.
- We recommend placing free-draining material consisting of Structural Fill or crushed stone within the 3 feet immediately behind retaining walls. The sheet pile wall should be provided with weep hole near the bottom of the wall to promote drainage.
- The design of the sheet pile wall should include a traffic surcharge equivalent to 200 pounds per square foot.

3.5 Seismic Pressure

In accordance with the MSBC 9th Edition, Section 1610, a lateral earthquake force equal to $0.100*(S_s)*(F_a)*\gamma*H^2$ should be included in the design of walls (for horizontal backfill), where S_s

is the maximum considered earthquake spectral response acceleration (defined in Section 3.3), F_a is the site coefficient (defined in Section 3.3), γ is the total unit weight of the soil backfill, and H is the height of the wall.

The earthquake force should be distributed as an inverted triangle over the height of the wall. In accordance with MSBC 9th Edition, Section 1610.2, a load factor of 1.43 shall be applied to the earthquake force for wall strength design.

Temporary surcharges should not be included when designing for earthquake loads. Surcharge loads applied for extended periods of time shall be included in the total static lateral soil pressure and their earthquake lateral force shall be computed and added to the force determined above.

4. CONSTRUCTION CONSIDERATIONS

4.1 Subgrade Preparation

- Existing asphalt, existing fill, organic soil, abandoned utilities, and other below-ground structures should be entirely removed from within an area extending at least 2 feet beyond the limits of the proposed vaults.

- The proposed vault excavations should extend to 12 inches below the proposed bottom of vaults. Should existing fill, organic soil, or other deleterious material be present at these depths, it should be removed and replaced with compacted Structural Fill to the top of the natural sand or 2 feet beneath the bottom of the proposed vault, whichever occurs first.

- The subgrade of the vaults in the natural sand, should be compacted with a dynamic vibratory compactor imparting a minimum of 10 kips of force to the subgrade.

- Should boulders be encountered at the vault subgrade, the boulders should be removed, and the resulting excavation should be backfilled with compacted Structural Fill meeting the gradation requirements in Section 4.3.

- Loose or soft soils identified during the compaction of the footing subgrades that cannot be compacted in place should be excavated to a suitable bearing stratum as determined by the representative of LGCI. Grades should be restored by backfilling with Structural Fill.

- When crushed stone is required in the drawings or it is used for the convenience of the contractor, it should be wrapped in a geotextile fabric for separation except where introduction of the geotextile promotes sliding. A geotextile should not be placed between the bottoms of the footings and crushed stone.

- The proposed transmission power line trench should extend to at least 12 inches beneath the bottom of the transmission power line. Where the excavation terminates in organic soil or less than 2 feet from the top of the organic soil, the excavation should be continued to the natural sand layer or 2 feet beneath the bottom of the transmission power line, whichever occurs first. The over-excavation should be backfilled with Ordinary Fill meeting the gradation requirements in Section 4.3.

- An LGCI representative should observe the exposed foundation subgrades prior to fill and concrete placement to verify that the exposed bearing materials are suitable for the design soil bearing pressure. If soft or loose pockets are encountered in the footing excavations, the soft or loose materials that cannot be compacted in place should be removed, and the bottom of the footing should be placed at a lower elevation on firm soil, or the resulting excavation should be backfilled with Gravel Borrow, or crushed stone wrapped in a filter fabric.

4.2 Subgrade Protection

The onsite natural sand is frost susceptible. If construction takes place during freezing weather, special measures should be taken to prevent the subgrade from freezing. Such measures should include the use of heat blankets or excavating the final six inches of soil just before pouring concrete. Soil used as backfill should be free of frozen material, as should the ground on which it is placed. Filling operations should be halted during freezing weather.

Materials with high fines content are typically difficult to handle when wet as they are sensitive to moisture content variations. Subgrade support capacities may deteriorate when such soils become wet and/or disturbed. The contractor should keep exposed subgrades properly drained and free of ponded water. Subgrades should be protected from machine and foot traffic to reduce disturbance.

4.3 Fill Materials

Structural Fill and Ordinary Fill should consist of inert, hard, durable sand and gravel, free from organic matter, clay, surface coatings and deleterious materials, and should conform to the gradation requirements shown below.

4.3.1 Structural Fill

The Structural Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Structural Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of optimum moisture content.

Sieve Size	Percent Passing by Weight
3 inches	100
1 ½ inch	80 - 100
½ inch	50 – 100
No. 4	30 – 85
No. 20	15 – 60
No. 60	5 – 35
No. 200*	0 – 10

4.3.2 Ordinary Fill

Ordinary Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Ordinary Fill should be compacted in maximum 9-inch loose

lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of optimum moisture content.

Sieve Size	Percent Passing by Weight
6 inches	100
1 inch	50 - 100
No. 4	20 – 100
No. 20	10 - 70
No. 60	5 – 45
No. 200	0 – 20

4.4 Reuse of Onsite Materials

Based on our field observations and the results of the grain-size analyses, we do not anticipate that the site soils will meet the gradation requirements of Structural Fill. Some of the existing fill meets the gradation requirements of Ordinary Fill. Should the contractor encounter materials potentially suitable for reuse during earthwork operations, the contractor should avoid mixing the reusable soils with unsuitable soils. The soils to be reused should be excavated and stockpiled separately for compliance testing. The contractor should be prepared to amend the existing fill free of organics to meet the gradation requirements for Ordinary Fill for reuse as trench backfill.

Soils with 20 percent or greater fines content are generally very sensitive to moisture content variations and are susceptible to frost. Such soils are very difficult to compact at moisture contents that are much higher or much lower than the optimum moisture content determined from the laboratory compaction test. Therefore, strict moisture control should be implemented during compaction of onsite soils with fines contents of 20 percent or greater. The contractor should be prepared to remove and replace such soils if pumping occurs.

4.5 Contractor Submittals

The contractor should submit details about the construction procedures, including:

- The proposed construction sequence;
- Temporary earth support system for the proposed vaults if any; and
- Groundwater control system.

Contractor submittals should be prepared and sealed by a professional engineer registered in the Commonwealth of Massachusetts and should be submitted for review at least two weeks before the start of the work.

4.6 Temporary Excavations

All excavations to receive human traffic should be constructed in accordance with the OSHA guidelines.

The site soils should generally be considered Type "C" and should have a maximum allowable slope of 1.5 Horizontal to 1 Vertical (1.5H:1V) for excavations less than 20 feet deep. Deeper excavations, if needed, should have shoring designed by a professional engineer.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of the excavation sides and bottom.

4.7 Groundwater Control Procedures and Flow Rate Estimates

4.7.1 General

We anticipate that groundwater control procedures will be needed during the excavation for the proposed vaults to handle the groundwater. We recommend that the contractor design and submit a plan to collect and remove groundwater prior to the start of the excavations. Such a plan should include at a minimum multiple sump pump pits extending at least 3 feet beneath the bottom of the excavation.

Groundwater levels should be maintained at a minimum of 1-foot below the bottom of excavations during construction. The contractor should be permitted to employ whatever commonly accepted means and practices are available to dewater.

To reduce the potential for sinkholes developing over sump pump pits after the sump pumps are removed, the crushed stone placed in the sump pump pits should be wrapped in a geotextile fabric. Alternatively, the crushed stone should be entirely removed after the sump pump is no longer in use and the sump pump pit should be restored with suitable backfill.

Groundwater collected from excavations should be filtered for fines in sedimentation basins before being discharged. At a minimum, the sedimentation basins should be constructed of hay bales wrapped in a geotextile fabric.

The contractor should discharge groundwater from the dewatering system in accordance with permits and local and state regulations.

4.7.2 Flow Rate Estimates

We estimated the anticipated quantity of flow in the proposed vault excavations and the proposed utility trench. We assumed a groundwater depth of 5 feet, vault excavation dimensions of 30 feet by 10 feet with an excavation depth of 12 feet, and a utility trench depth of 6 feet.

Using the coefficient of permeability values listed in Sections 2.5, we estimate a quantity of flow ranging between 1,000 and 3,000 gal/day for the proposed vaults and between 12.5 and 37.5 gal/day per foot of excavation for the proposed transmission line.

5. RECOMMENDATIONS FOR FUTURE WORK

We recommend engaging LGCI to perform the following services:

- Assist VHB during the design of the proposed sheet pile wall;
- Review the geotechnical aspects of contractor submittals.
- Provide a field representative to observe the subgrades of foundations during construction.

6. REPORT LIMITATIONS

Our analysis and recommendations are based on project information provided to us at the time of this report. If changes to the type, size, and location of the proposed structures or to the site grading are made, the recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions and recommendations modified in writing by LGCI. LGCI cannot accept responsibility for designs based on our recommendations unless we are engaged to review the final plans and specifications to determine whether any changes in the project affect the validity of our recommendations and whether our recommendations have been properly implemented in the design.

It is not part of our scope to perform a more detailed site history; therefore, we have not explored for or researched the locations of buried utilities or other structures in the area of the proposed construction. Our scope did not include environmental services or services related to moisture, mold, or other biological contaminants in or around the site.

The recommendations in this report are based in part on the data obtained from the subsurface explorations. The nature and extent of variations between explorations may not become evident until construction. If variations from anticipated conditions are encountered, it may be necessary to revise the recommendations in this report. We cannot accept responsibility for designs based on recommendations in this report unless we are engaged to 1) make site visits during construction to check that the subsurface conditions exposed during construction are in general conformance with our design assumptions and 2) ascertain that, in general, the work is being performed in compliance with the contract documents.

Our report has been prepared in accordance with generally accepted engineering practices and in accordance with the terms and conditions set forth in our agreement. No other warranty, expressed or implied, is made. This report has been prepared for the exclusive use of Vanasse Hangen Brustlin, Inc. for the specific application to the proposed transmission power line in Hudson, Massachusetts as conceived at this time.

7. REFERENCES

In addition to the references included in the text of the report, we used the following references:

The Commonwealth of Massachusetts (2010), "The Massachusetts State Building Code, Eighth Edition," comprised of the International Building Code (IBC-2009) and 780 CMR: Massachusetts Amendments to IBC-2009.

The Department of Labor, Occupational Safety and Health Administration (1989), "Occupational Safety and Health Standards - Excavations; Final Rule," 20 CFR Part 1926, Subpart P.

US Geological Survey Hudson, MA Topo Map from http://mapserver.mytopo.com.

Appendix C - Borehole Permeability Tests

Table 1 - Summary of LGCI's Borings
Proposed Transmission Power Line Borings
Hudson, MA
LGCI Project No. 1836

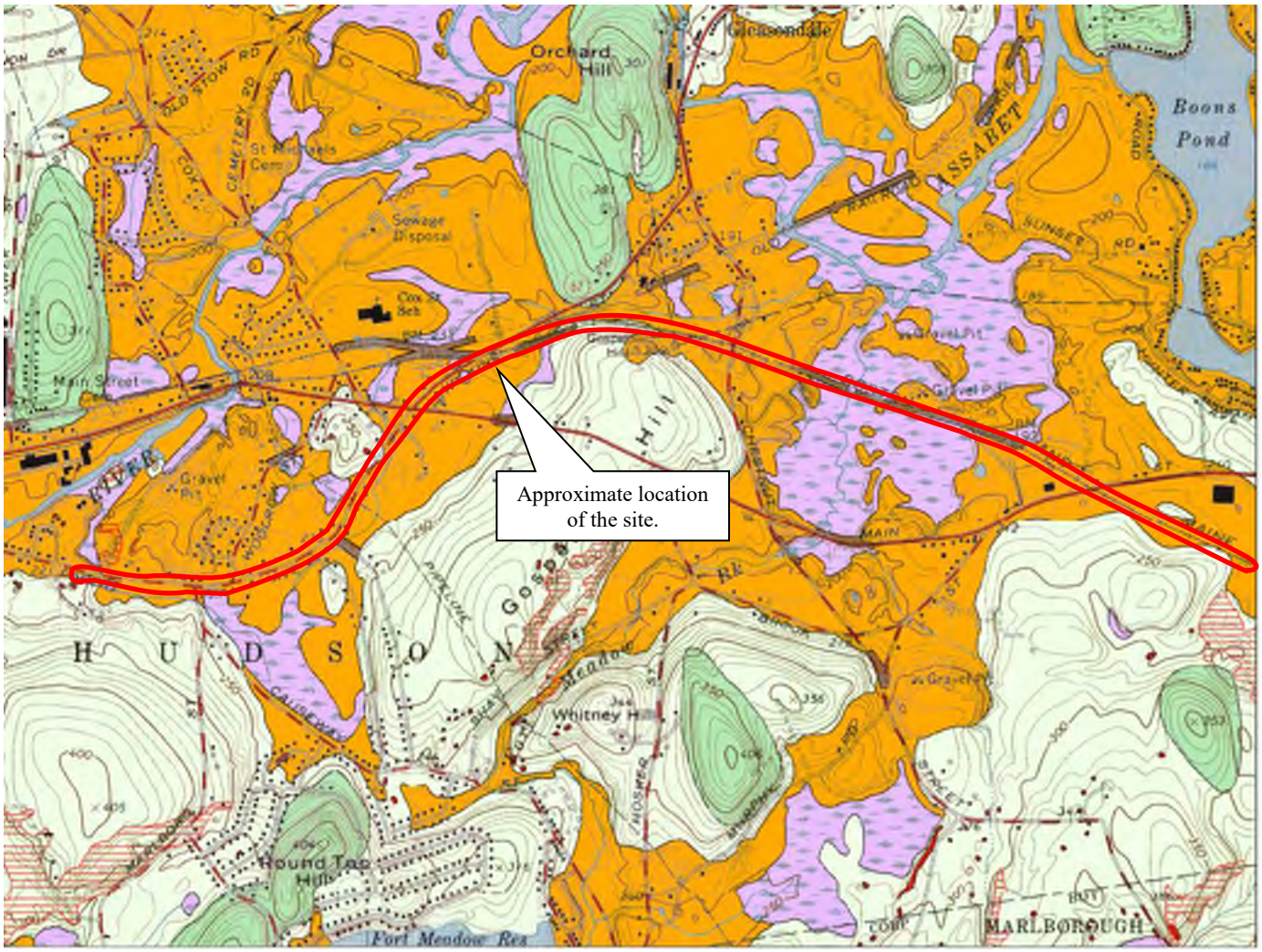
Boring No.[1]	Ground Surface Elevation (ft.)[2]	Groundwater Depth / El. (ft.)[3]	Bottom of Asphalt Depth / El. (ft.)	Bottom of Topsoil/Subsoil Depth / El. (ft.)	Bottom of Fill Depth / El. (ft.)	Bottom of Buried Organics Depth / El. (ft.)	Bottom of Boring Depth / El. (ft.)
B-8	218.0	- / -	0.7 / 217.3	- / -	6 / 212.0	- / -	10.0 / 208.0
B-9	224.0	13.0 / 211.0	- / -	0.1 / 223.9	6 / 218.0	10.0 / 214.0	16.0 / 208.0
B-10	214.0	9.3 / 204.7	- / -	0.1 / 213.9	6 / 208.0	9.3 / 204.7	14.0 / 200.0
B-11/B-GB-10	205.0	15.0 / 190.0	- / -	- / -	6 / 199.0	8.0 / 197.0	21.6 / 183.4
B-13	187.0	9.0 / 178.0	- / -	0.4 / 186.6	11.4 / 175.6	- / -	15.0 / 172.0
B-BB-3/B-14	180.0	6.0 / 174.0	- / -	- / -	8 / 172.0	20.0 / 160.0	101.0 / 79.0
B-21	211.0	8.0 / 203.0	- / -	0.5 / 210.5	2 / 209.0	2.7 / 208.3	16.0 / 195.0
B-22	215.0	7.7 / 207.3	- / -	1.4 / 213.6	- / -	- / -	10.0 / 205.0
B-23	211.0	10.0 / 201.0	- / -	0.5 / 210.5	2 / 209.0	- / -	16.0 / 195.0
B-24	200.0	12.0 / 188.0	- / -	0.5 / 199.5	4 / 196.0	6.0 / 194.0	14.0 / 186.0
B-25	192.0	4.0 / 188.0	- / -	- / -	4 / 188.0	- / -	16.0 / 176.0
B-26	191.0	4.0 / 187.0	- / -	- / -	0.6 / 190.4	- / -	10.0 / 181.0
B-27	192.0	4.0 / 188.0	- / -	- / -	0.9 / 191.1	4.0 / 188.0	15.0 / 177.0
B-GB-7	208.0	8.0 / 200.0	- / -	- / -	2.3 / 205.7	6.0 / 202.0	11.7 / 196.3
B-GB-7A	208.0	10.0 / 198.0	- / -	- / -	- / -	- / -	32.0 / 176.0
B-GB-8	208.0	10.0 / 198.0	- / -	- / -	2 / 206.0	6.0 / 202.0	22.0 / 186.0
B-GB-12	205.0	20.0 / 185.0	- / -	- / -	3 / 202.0	- / -	32.0 / 173.0
B-GB-13	203.0	15.0 / 188.0	- / -	- / -	6 / 197.0	- / -	32.0 / 171.0
B-GB-14	202.0	15.0 / 187.0	- / -	- / -	6.6 / 195.4	- / -	22.0 / 180.0
B-GB-15	202.0	16.1 / 185.9	- / -	0.5 / 201.5	2 / 200.0	- / -	22.0 / 180.0
B-GB-16	203.0	15.0 / 188.0	- / -	0.4 / 202.6	2.5 / 200.5	- / -	32.0 / 171.0
B-MP-1	214.0	10.0 / 204.0	- / -	2 / 212.0	6 / 208.0	- / -	15.0 / 199.0
B-MP-3	227.0	5.0 / 222.0	0.9 / 226.1	- / -	6 / 221.0	- / -	12.5 / 214.5
B-MP-4	231.0	10.0 / 221.0	0.9 / 230.1	- / -	4 / 227.0	- / -	16.0 / 215.0
B-MP-6	240.0	- / -	0.8 / 239.2	- / -	- / -	- / -	10.0 / 230.0
B-MP-9	232.0	5.0 / 227.0	0.8 / 231.2	- / -	5.5 / 226.5	- / -	15.0 / 217.0
B-MP-10	231.0	8.0 / 223.0	0.9 / 230.1	- / -	- / -	- / -	10.0 / 221.0
B-MP-11	221.0	6.0 / 215.0	0.7 / 220.3	- / -	5 / 216.0	- / -	16.0 / 205.0
B-MP-15	198.0	- / -	- / -	- / -	4 / 194.0	6.0 / 192.0	10.0 / 188.0
B-MP-17	184.0	6.0 / 178.0	- / -	- / -	3.1 / 180.9	- / -	15.0 / 169.0
B-MP-19	190.0	10.0 / 180.0	- / -	0.3 / 189.7	6 / 184.0	- / -	14.0 / 176.0
B-MP-20	200.0	10.0 / 190.0	- / -	1.1 / 198.9	- / -	- / -	16.0 / 184.0
B-MP-22	211.0	6.0 / 205.0	- / -	0.6 / 210.4	2 / 209.0	- / -	10.0 / 201.0
B-MP-23	211.0	8.0 / 203.0	- / -	2.3 / 208.7	- / -	- / -	16.0 / 195.0
B-MP-24	180.0	- / -	- / -	4 / 176.0	- / -	- / -	10.0 / 170.0

1. The boring numbers are not in sequence as many borings were renumbered prior to the start of drilling. Borings labeled "B" were borings that included geotechnical and thermal resistivity sampling. Borings labeled "GB" were borings that included geotechnical sampling for the proposed retaining wall. Borings labeled "BB" were borings that included geotechnical sampling for the proposed bridge. Borings labeled "MP" were multipurpose borings that included geotechnical, thermal resistivity, and oil and/or hazardous materials sampling.
2. The ground surface elevations was interpolated to the nearest foot from a plan titled: "Proposed Conditions Plan for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc. and dated February 14, 2018.
3. Groundwater observed at the end of drilling or based on sample moisture, as indicated on the boring logs.
4. "-" means layer not encountered.

Contour Intervals: 3 meters

Figure based on USGS topographic map of Hudson, MA obtained from www.mytopo.com/maps

Client:	Project:	Figure 1 – Site Location Map	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Coarse deposits include: *Gravel deposits* composed mainly of gravel-sized clasts; cobbles and boulders predominate; minor amounts of sand within gravel beds, and sand comprises few separate layers. Gravel layers generally are poorly sorted and bedding commonly is distorted and faulted due to postdepositional collapse related to melting of ice. *Sand and gravel deposits* composed of mixtures of gravel and sand within individual layers and as alternating layers. Sand and gravel layers generally range from 25 to 50 percent gravel particles and from 50 to 75 percent sand particles. Layers are well to poorly sorted; bedding may be distorted and faulted due to postdepositional collapse. *Sand deposits* composed mainly of very coarse to fine sand, commonly in well-sorted layers. Coarser layers may contain up to 25 percent gravel particles, generally granules and pebbles; finer layers may contain some very fine sand, silt, and clay.

Thin till—Nonsorted, nonstratified matrix of sand, some silt, and little clay containing scattered gravel clasts and few large boulders; in areas where till is generally less than 10-15 ft thick and including areas of bedrock outcrop where till is absent. Predominantly upper till of the last glaciation; loose to moderately compact, generally sandy, commonly stony. Two facies are present in some places: a looser, coarser-grained ablation facies, melted out from supraglacial position; and an underlying more compact, finer-grained lodgement facies deposited subglacially. In general, both ablation and lodgement facies of upper till derived from fine-grained bedrock are finer grained, more compact, less stony and have fewer surface boulders than upper till derived from coarser grained crystalline rocks. Fine-grained bedrock sources include the red Mesozoic sedimentary rocks of the Connecticut River lowland, marble in the western river valleys, and fine-grained schists in upland areas.

Swamp deposits—Organic muck and peat that contain minor amounts of sand, silt, and clay, stratified and poorly sorted, in kettle depressions or poorly drained areas. Most swamp deposits are less than about 10 ft thick. Swamp deposits overlie glacial deposits or bedrock. They locally overlie glacial till even where they occur within thin glacial meltwater deposits.

N

Figure based on map titled: "Surficial Geologic Map of the Clinton-Concord-Grafton-Medfield 12-Quadrangle Area in East Central Massachusetts," prepared by Stone, B.D. and Stone, J.R. for U.S. Geological Survey, Open-File Report 2006-1260-A, 2006.

Client:	Project:	Figure 2A – Surficial Geologic Map	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018

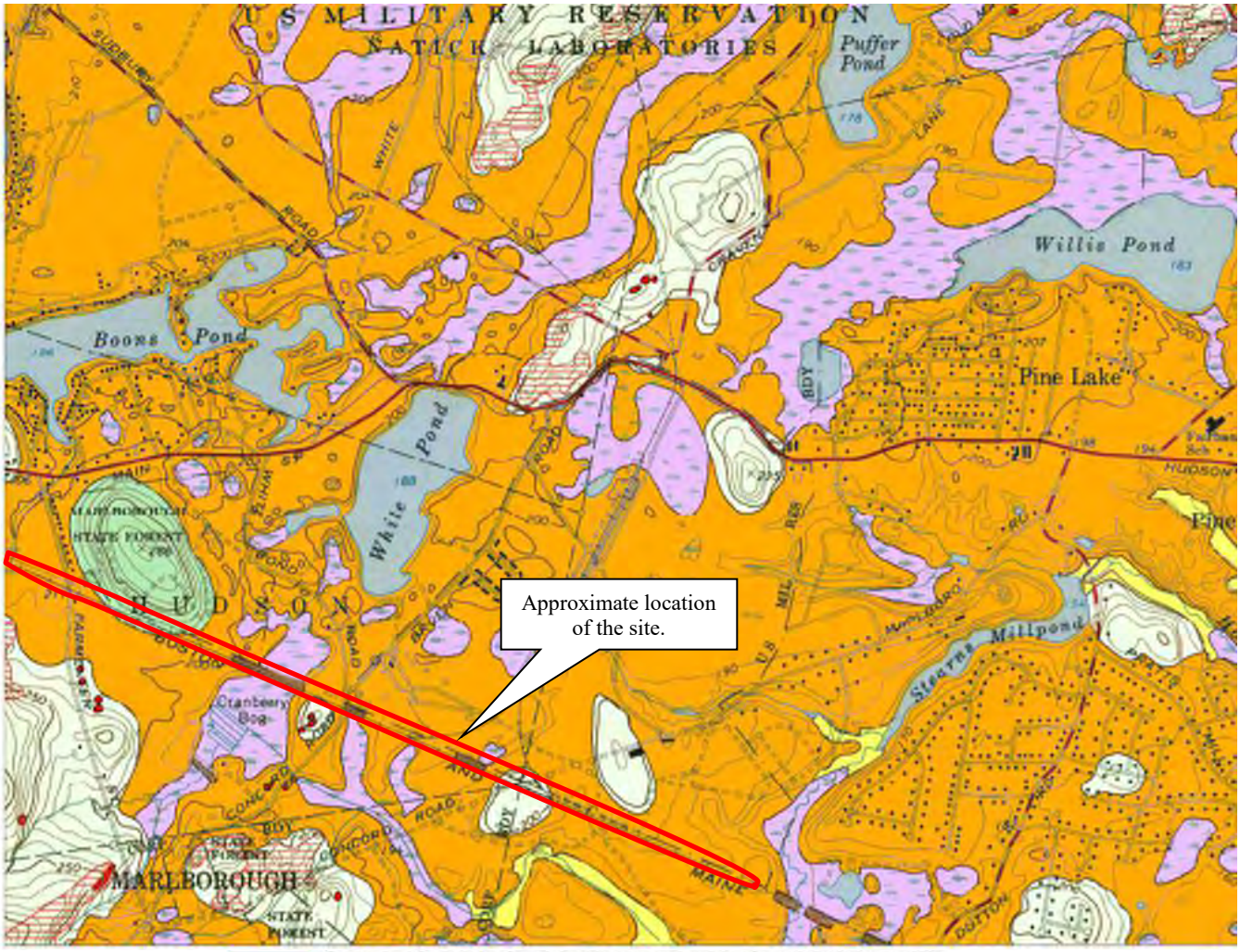


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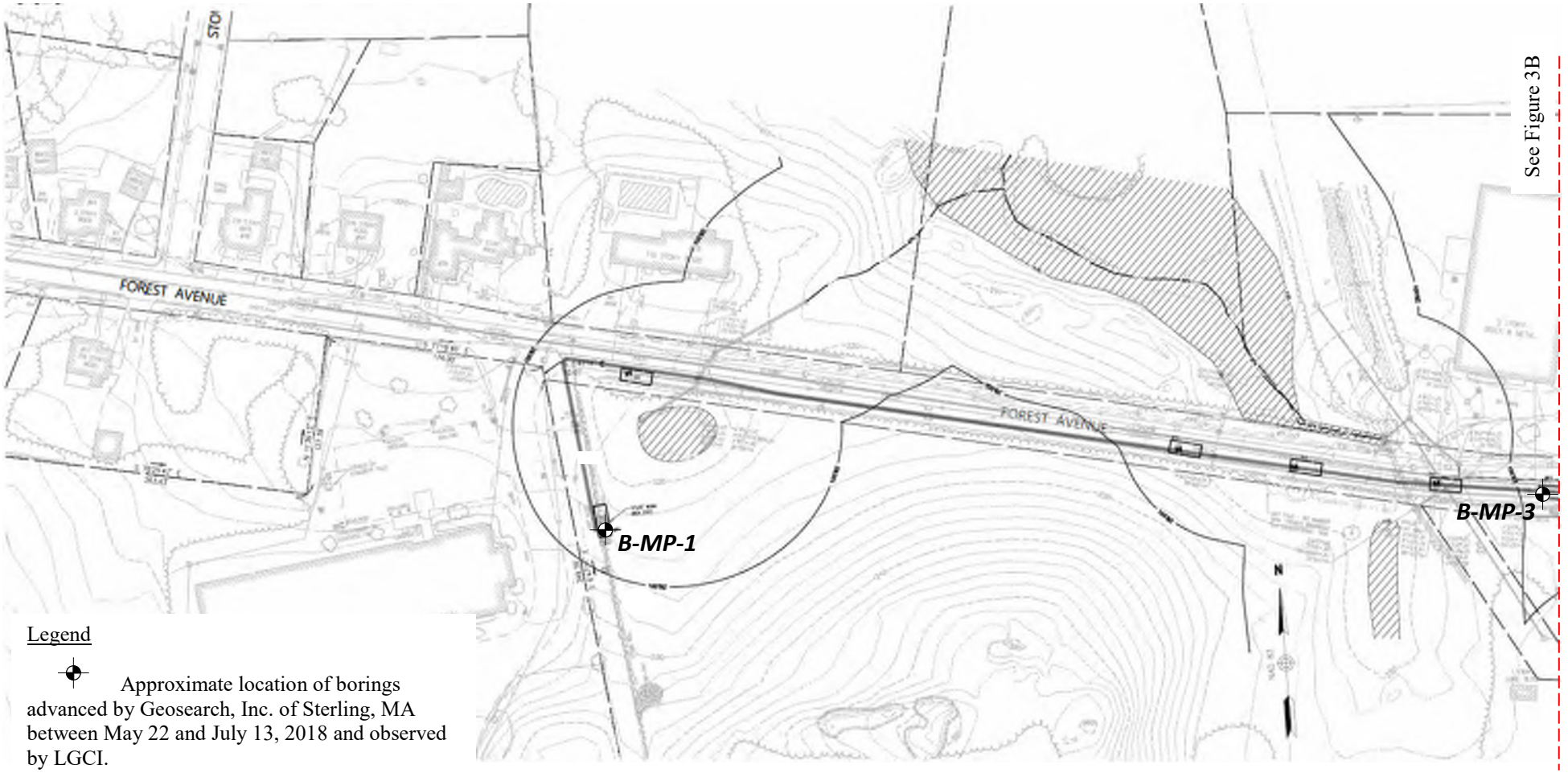
Figure based on map titled: "Surficial Geologic Map of the Clinton-Concord-Grafton-Medfield 12-Quadrangle Area in East Central Massachusetts," prepared by Stone, B.D. and Stone, J.R. for U.S. Geological Survey, Open-File Report 2006-1260-A, 2006.

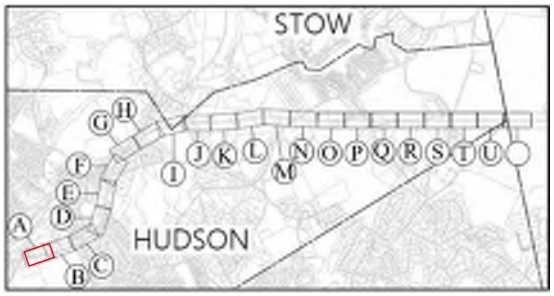
Client:	Project:	Figure 2B – Surficial Geologic Map	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

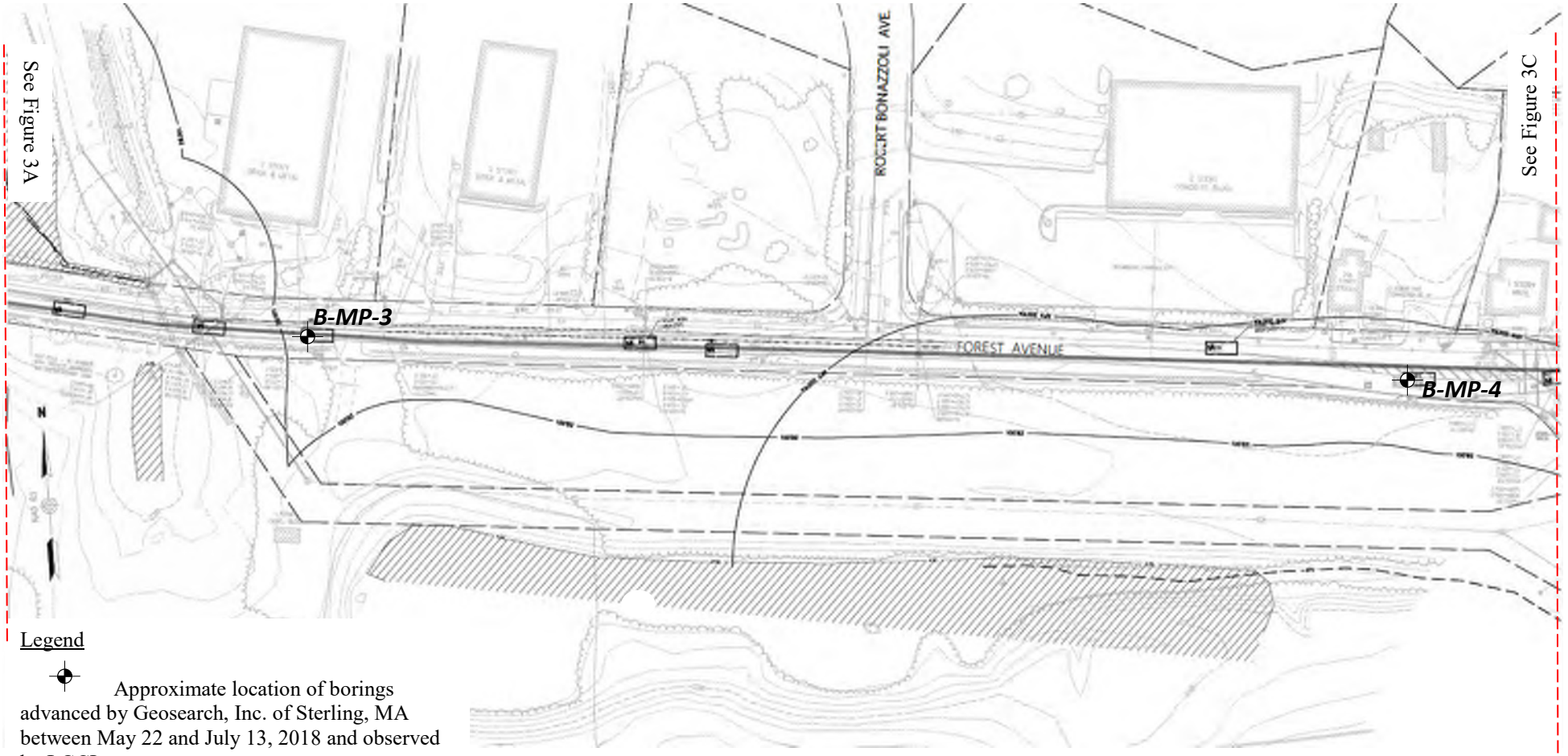
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

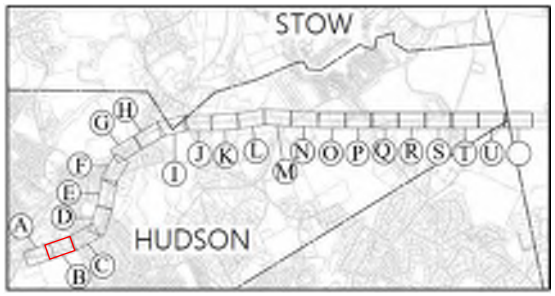
Client:	Project:	Figure 3A – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

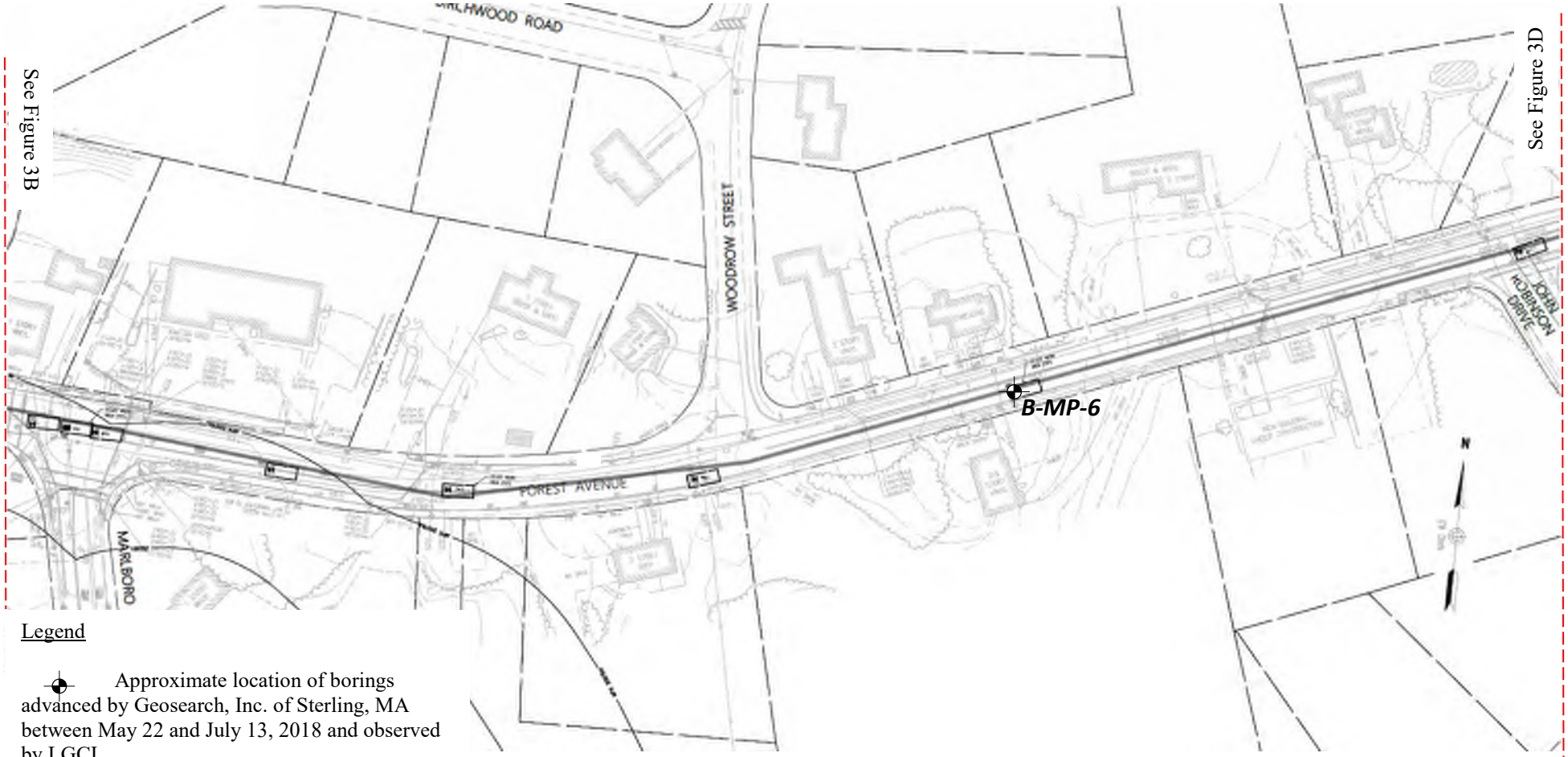
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

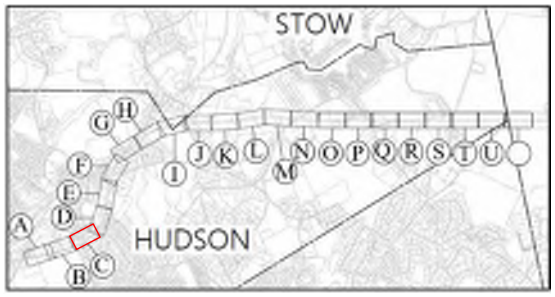
Client:	Project:	Figure 3B – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

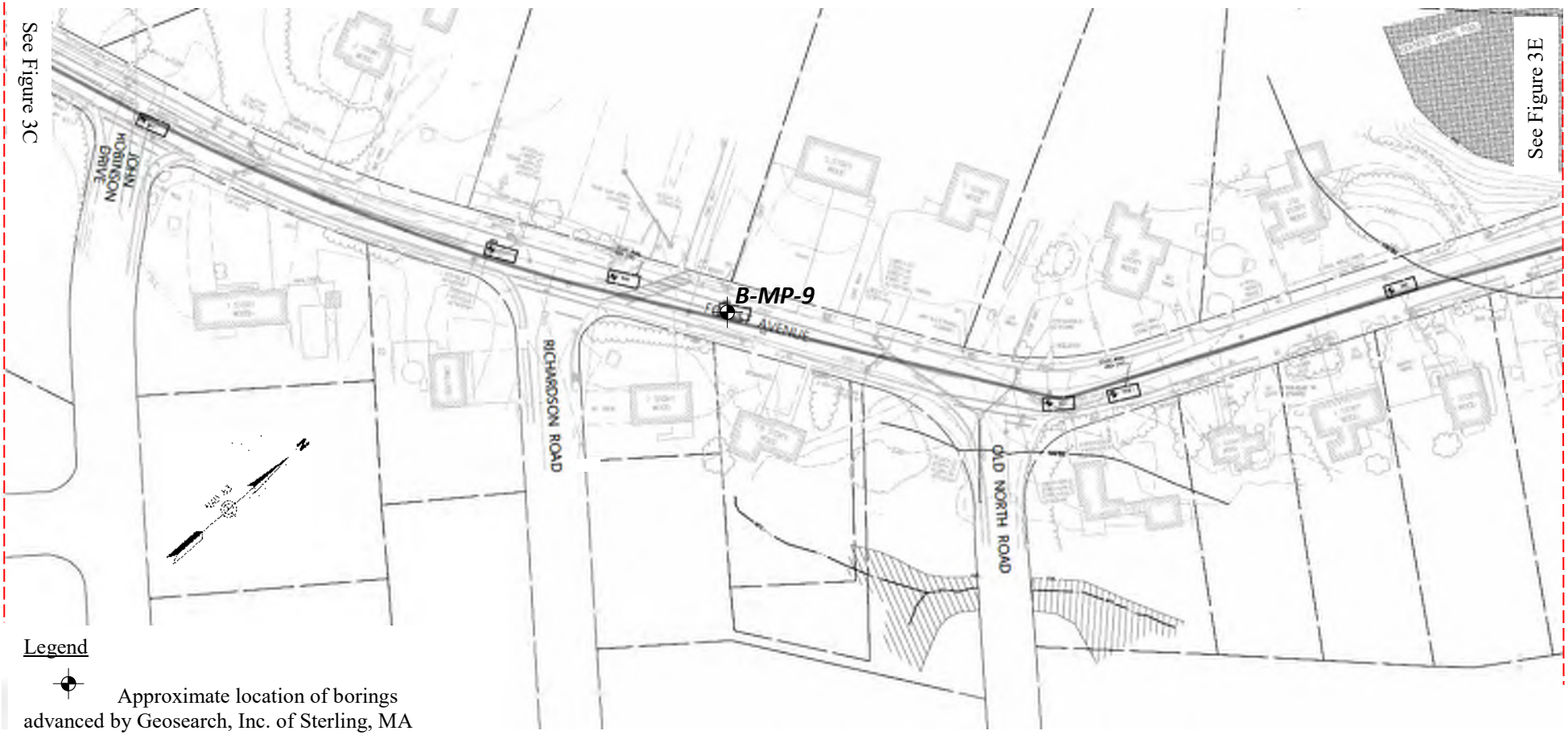
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

Client:	Project:	Figure 3C – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018

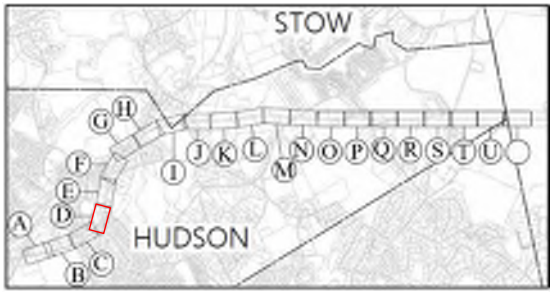


Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

Graphic Scale (feet)

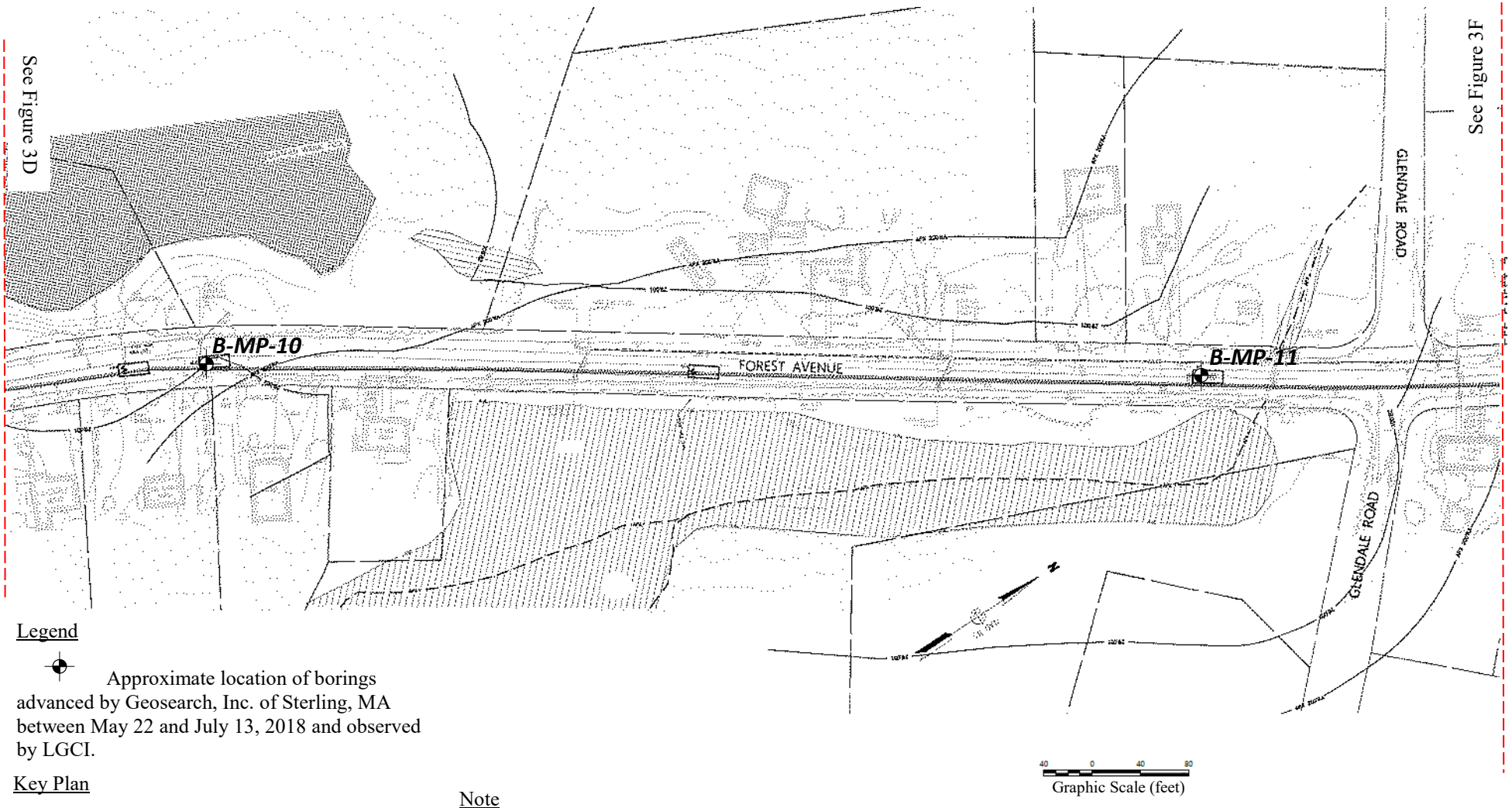
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

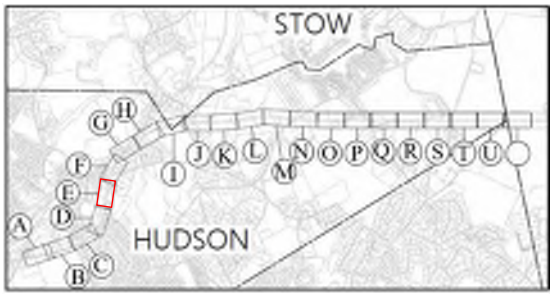
Client:	Project:	Figure 3D – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

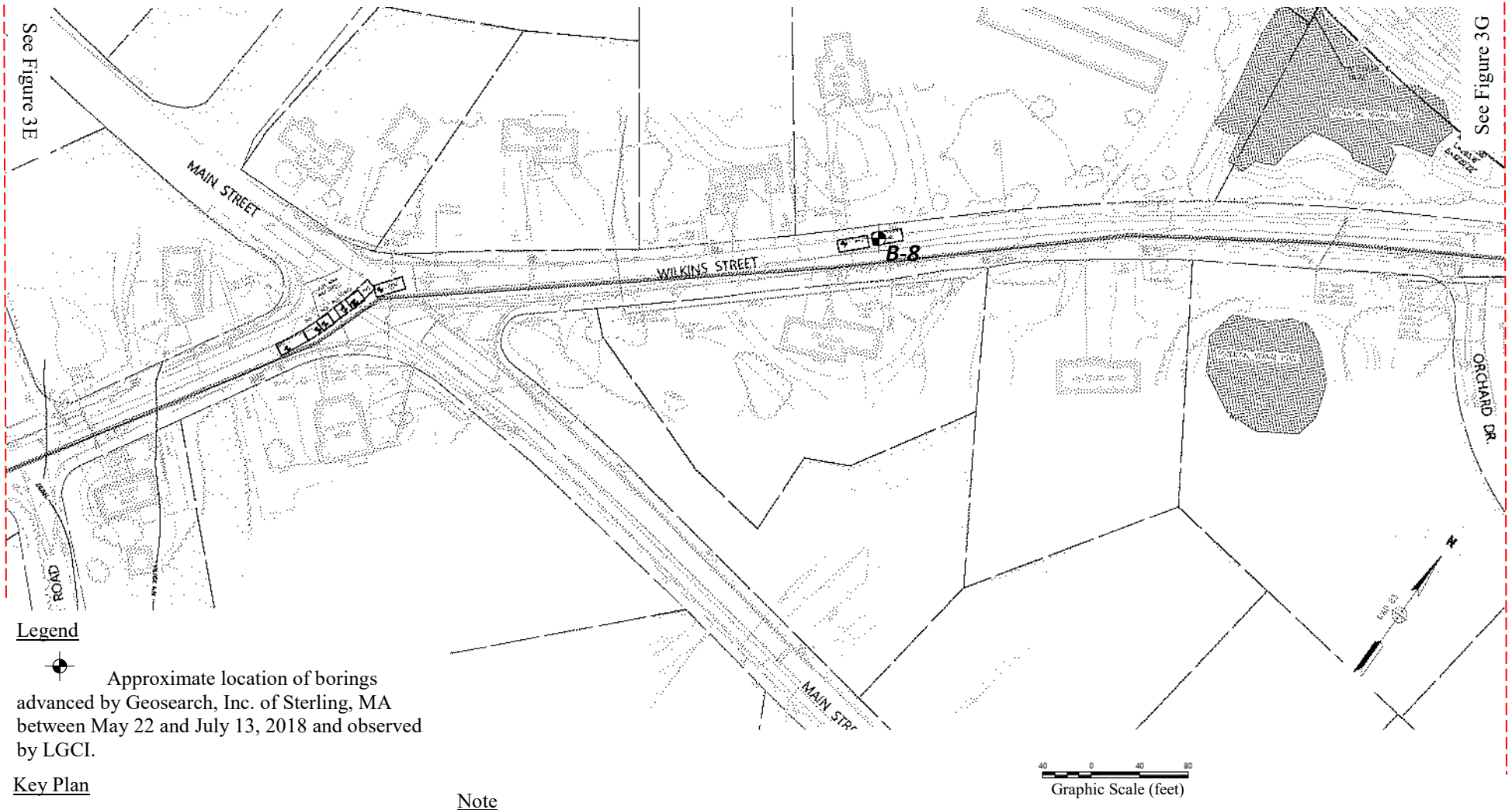
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

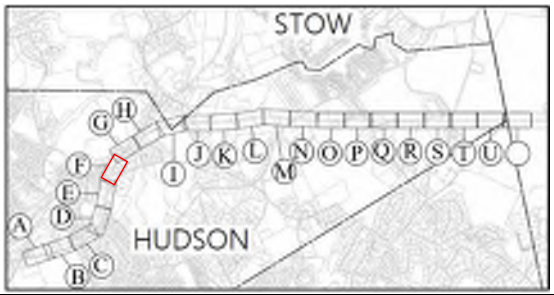
Client:	Project:	Figure 3E – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

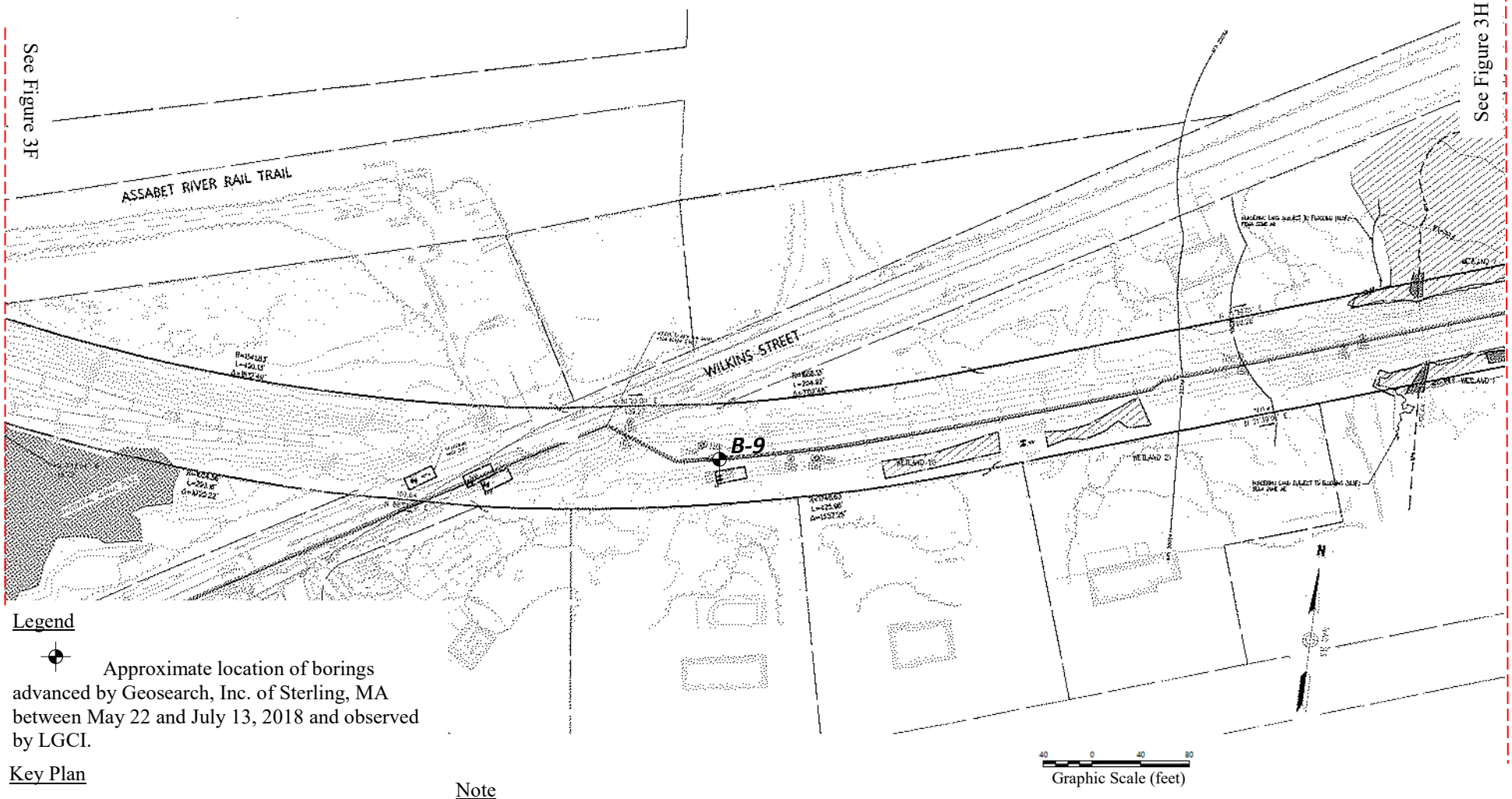
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

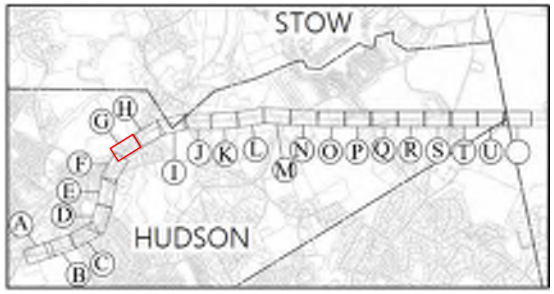
Client:	Project:	Figure 3F – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

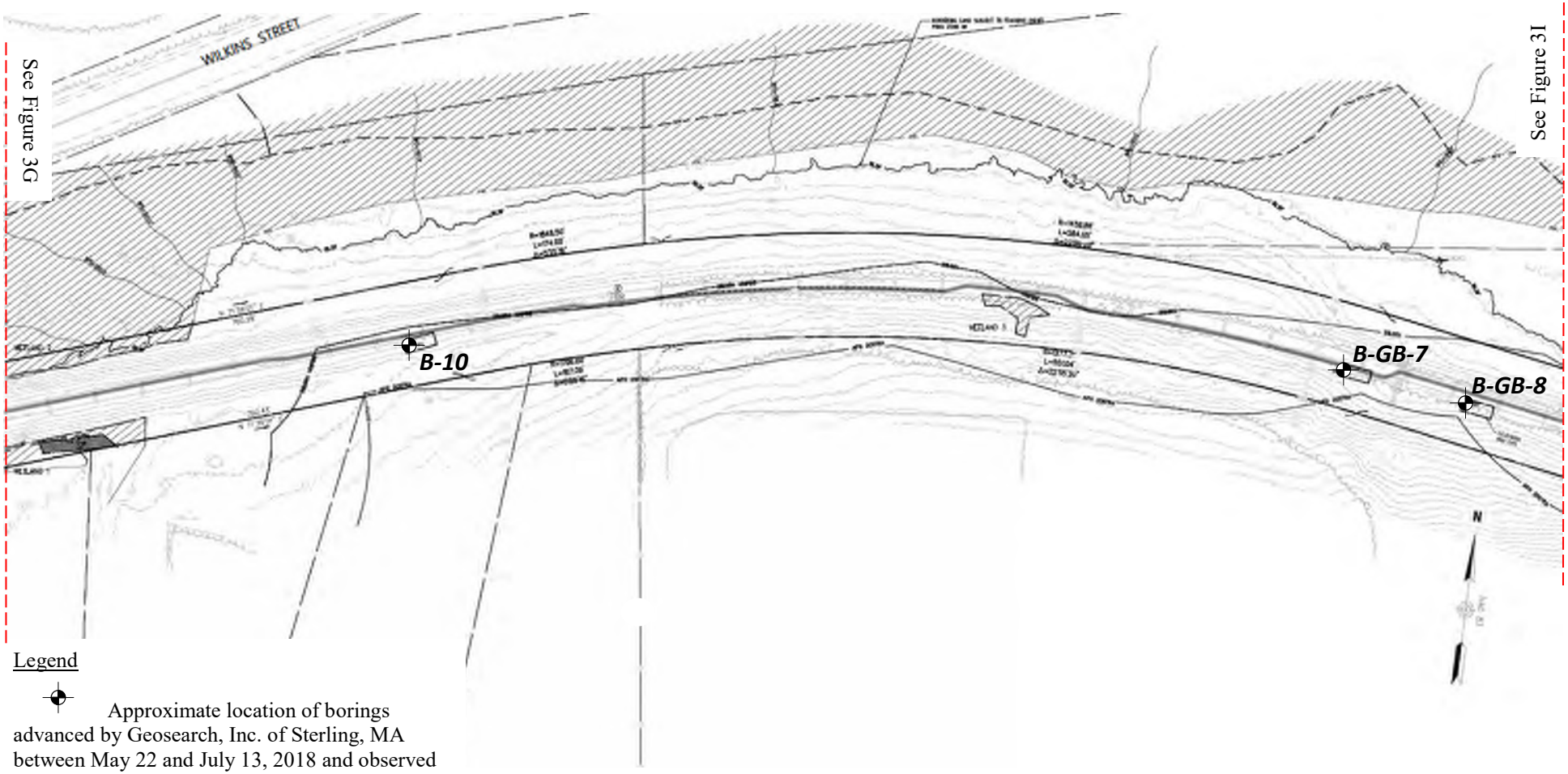
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

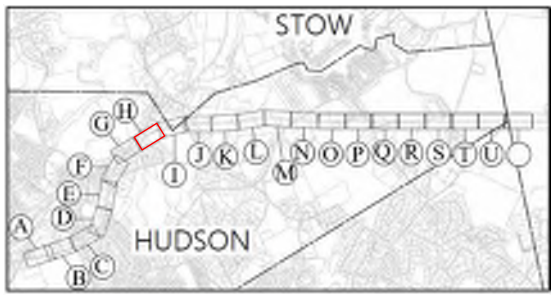
Client:	Project:	Figure 3G – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

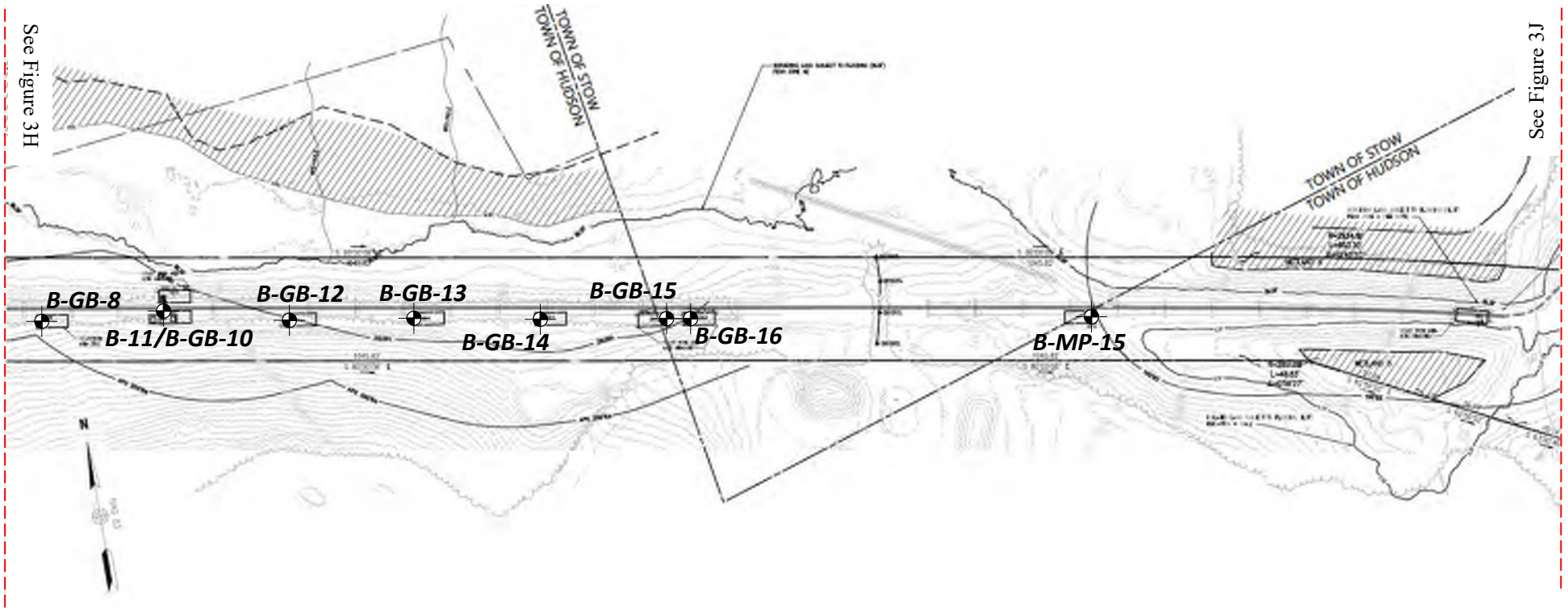
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

Client:	Project:	Figure 3H – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018

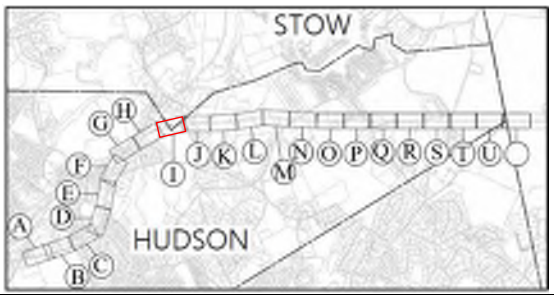


Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed

Graphic Scale (feet)

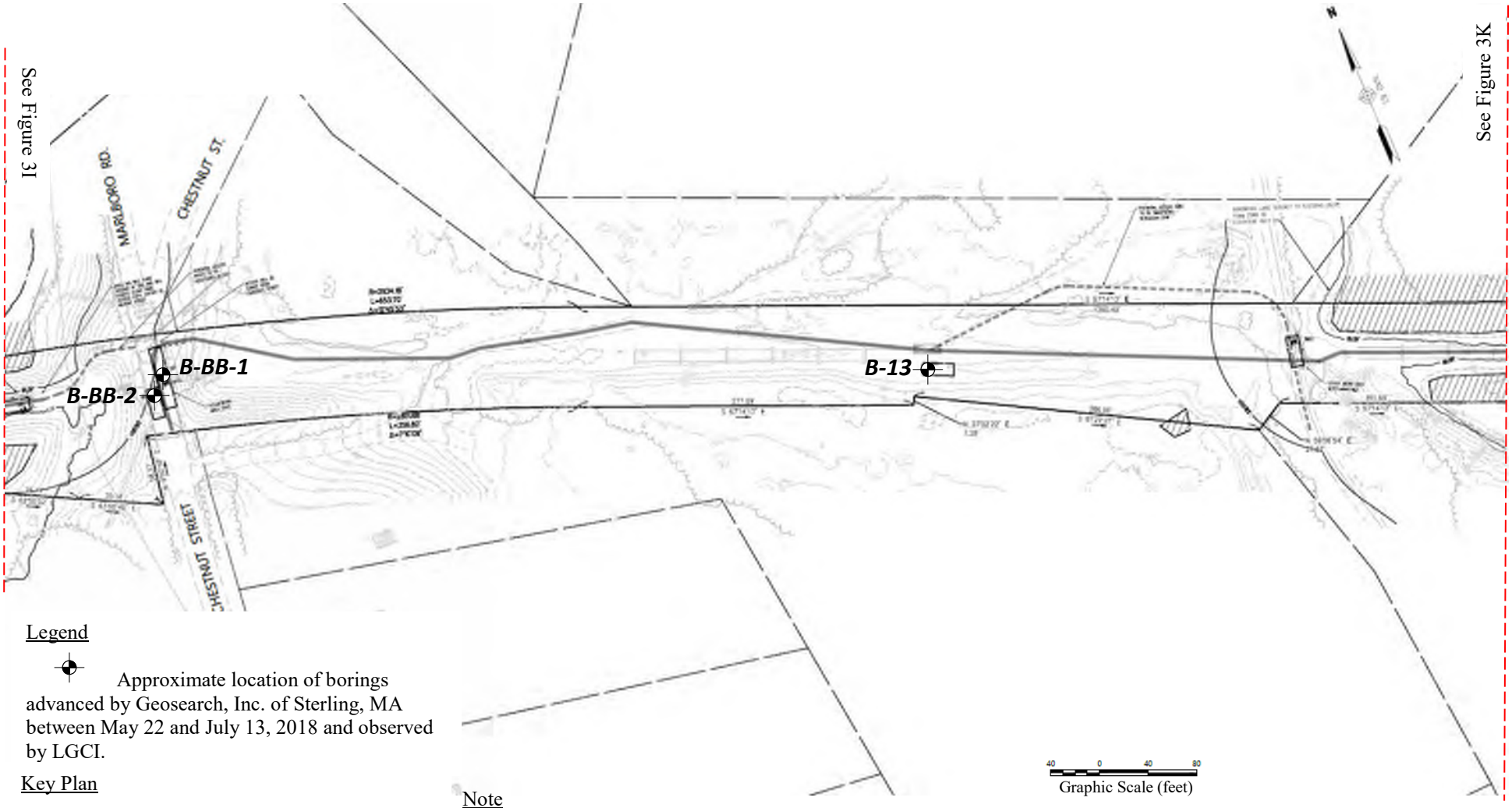
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

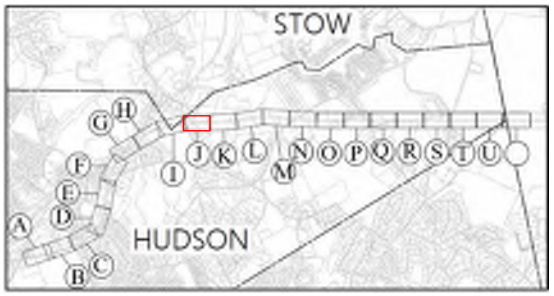
Client:	Project:	Figure 3I – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

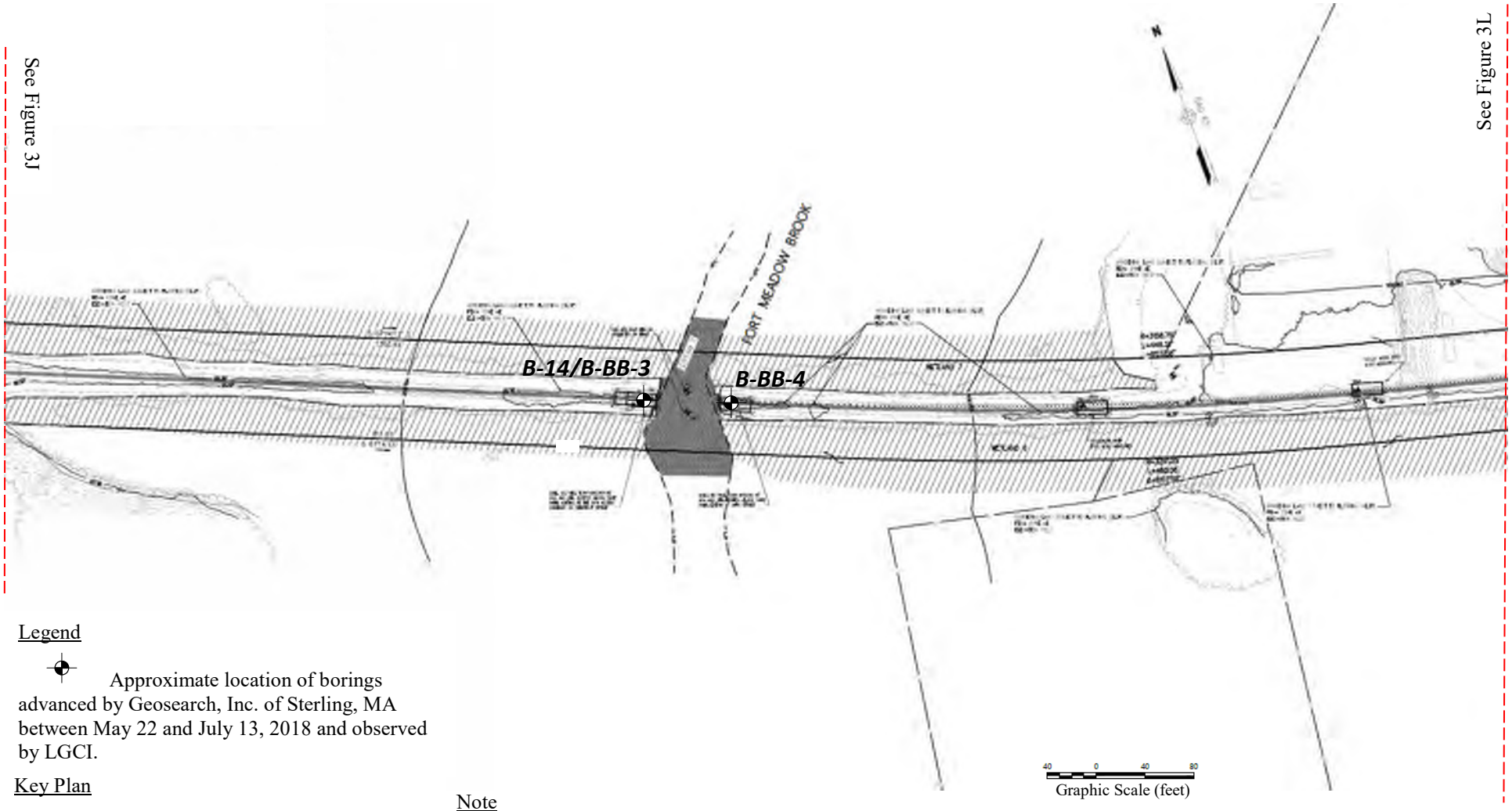
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

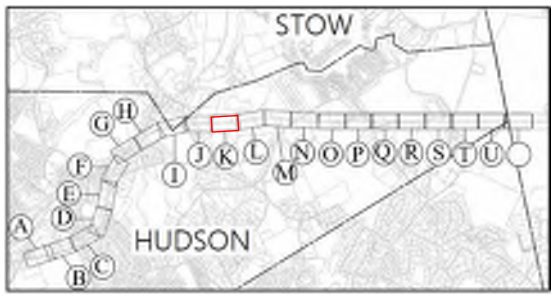
Client:	Project:	Figure 3J – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

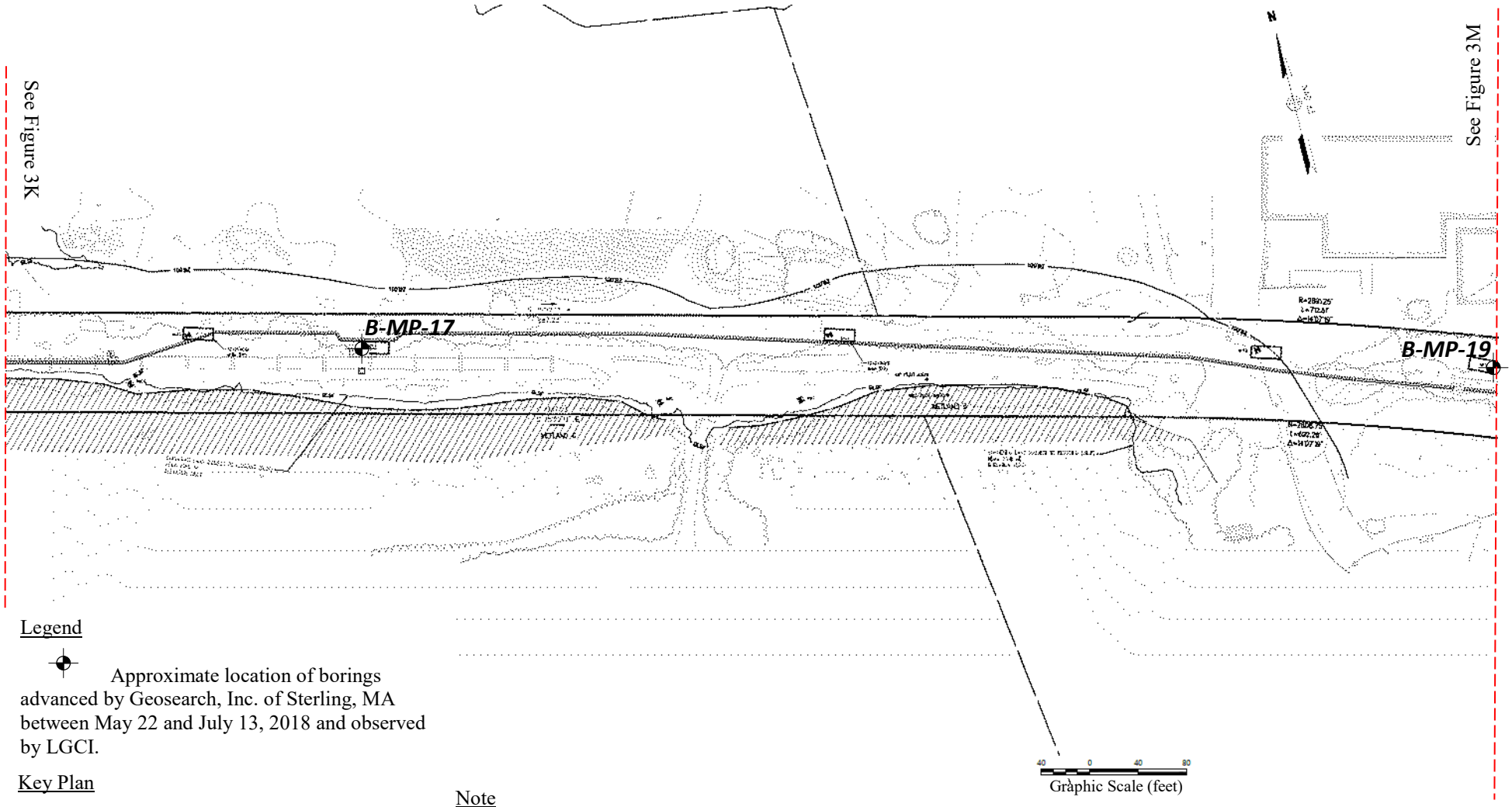
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

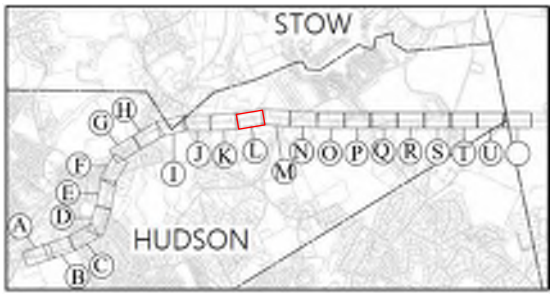
Client:	Project:	Figure 3K – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

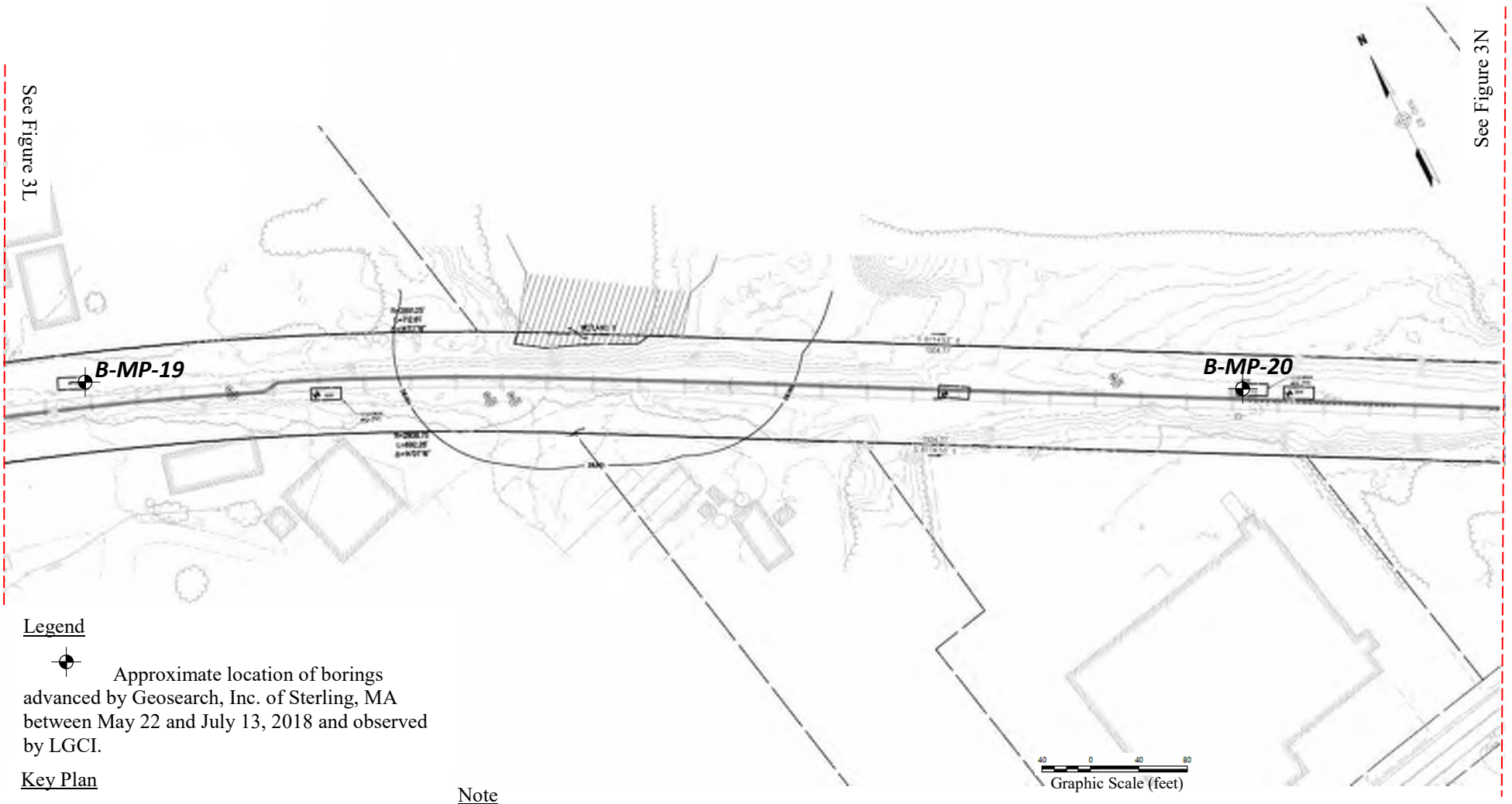
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

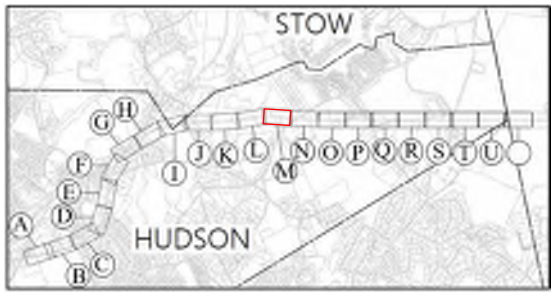
Client:	Project:	Figure 3L – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

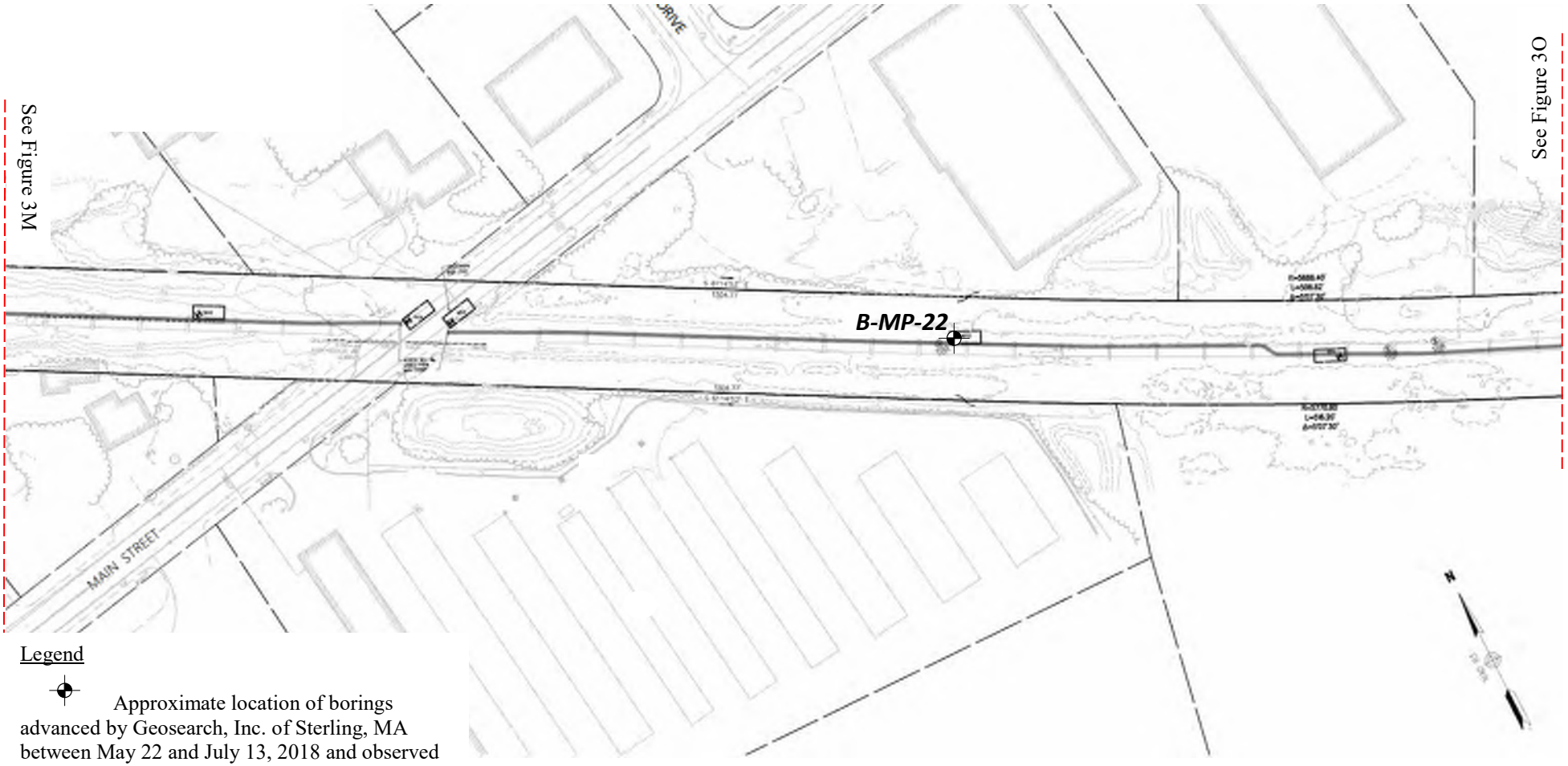
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

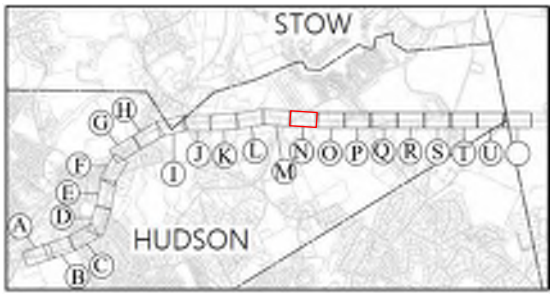
Client:	Project:	Figure 3M – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

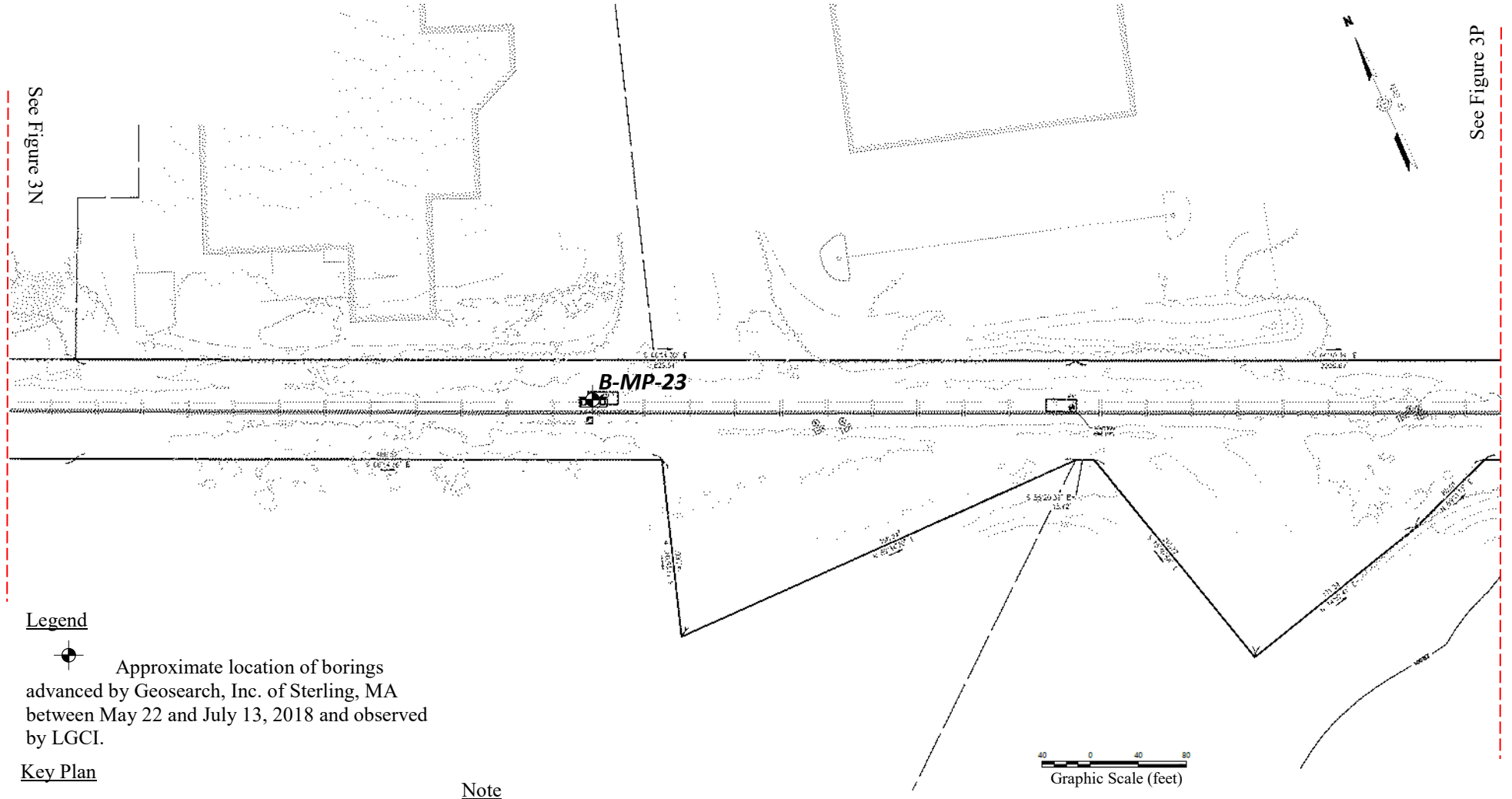
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

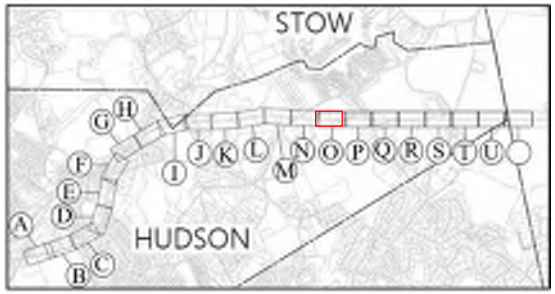
Client:	Project:	Figure 3N – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

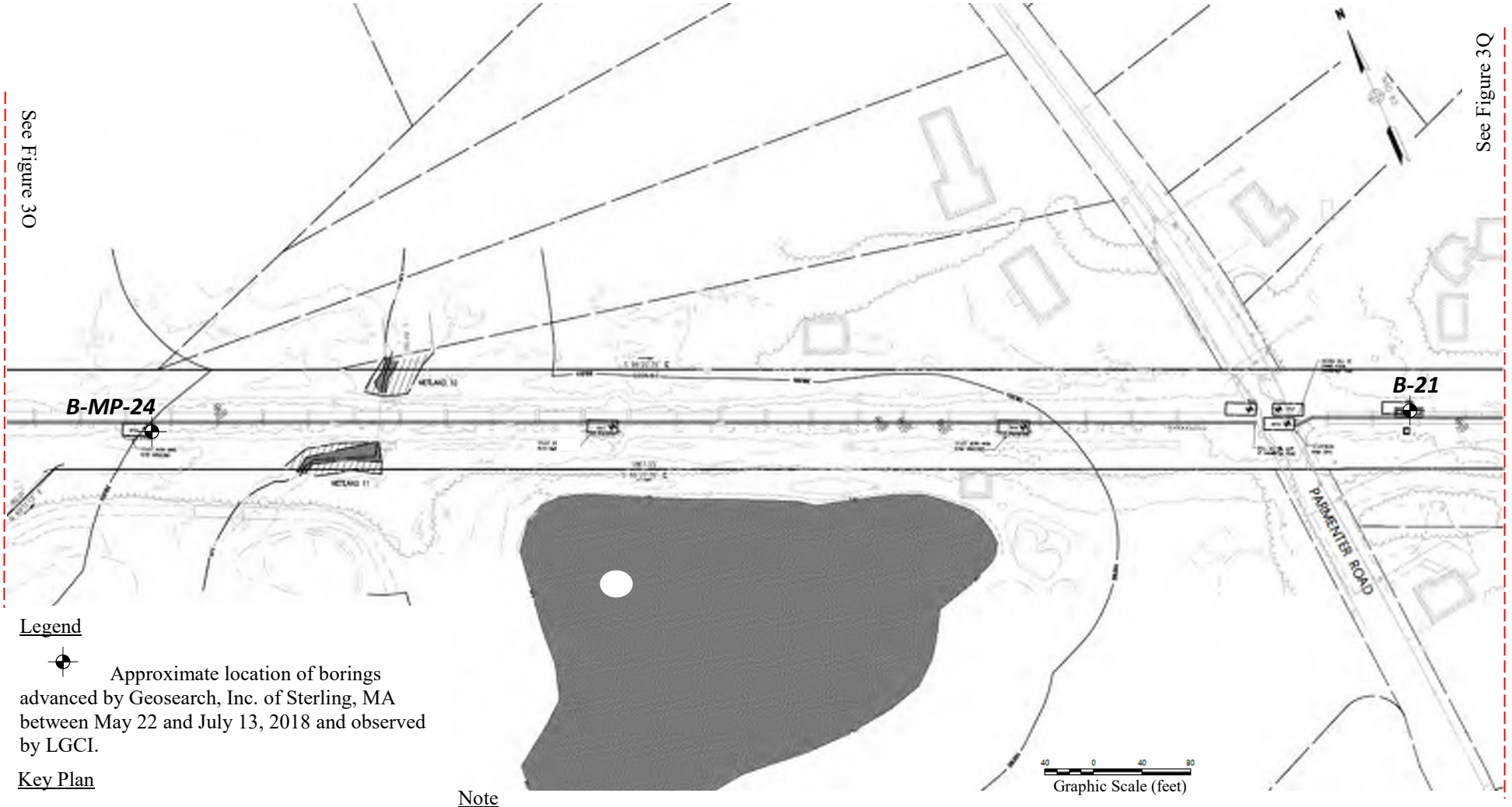
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

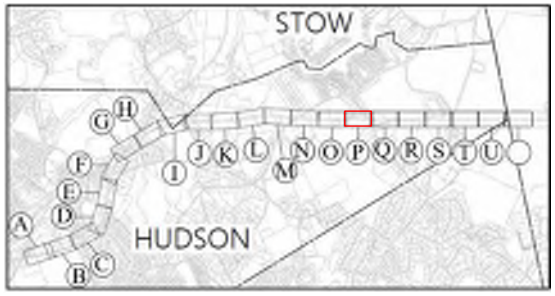
Client:	Project:	Figure 3O – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

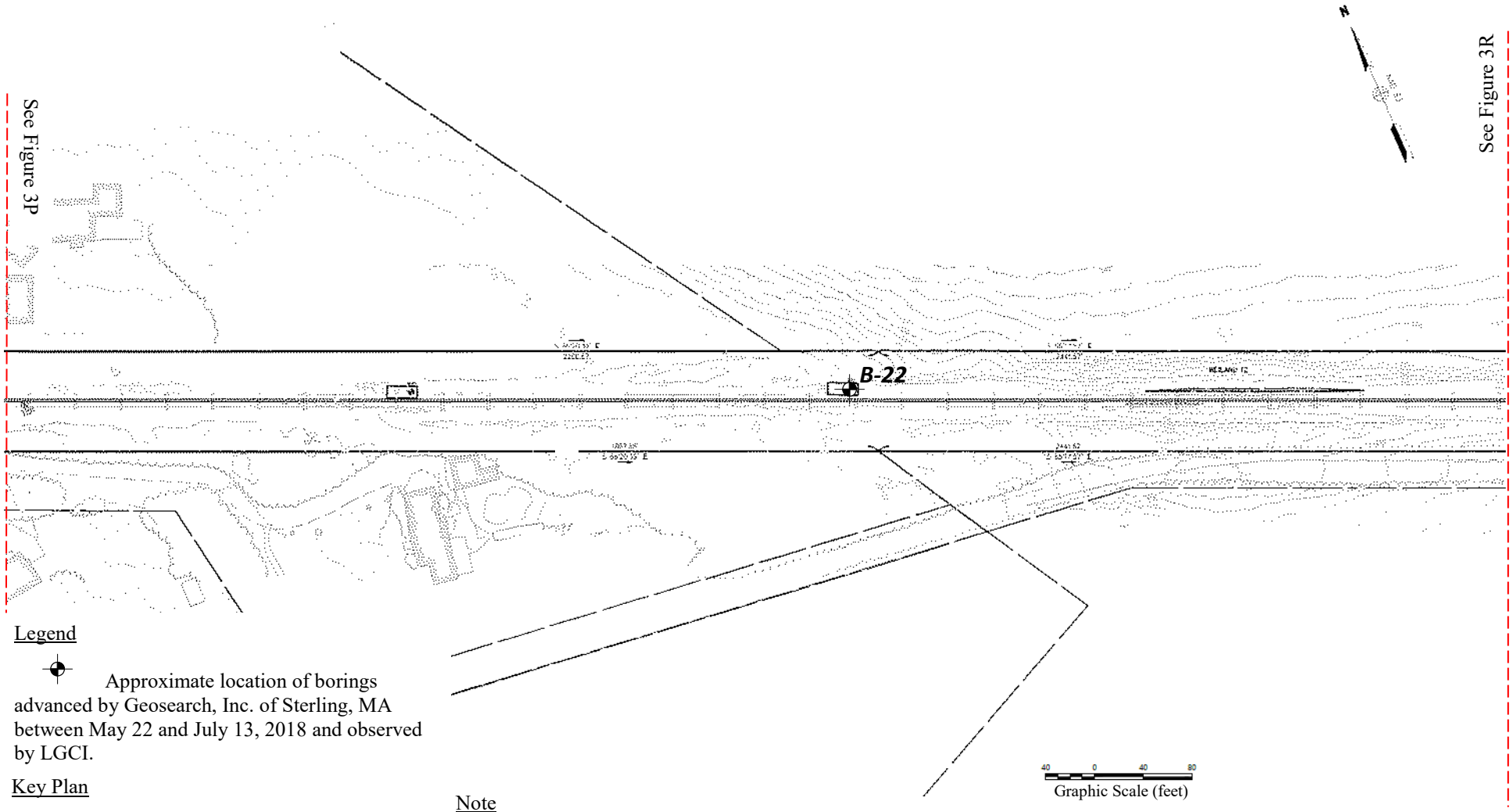
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

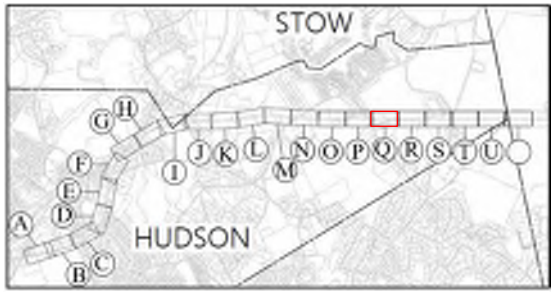
Client:	Project:	Figure 3P – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

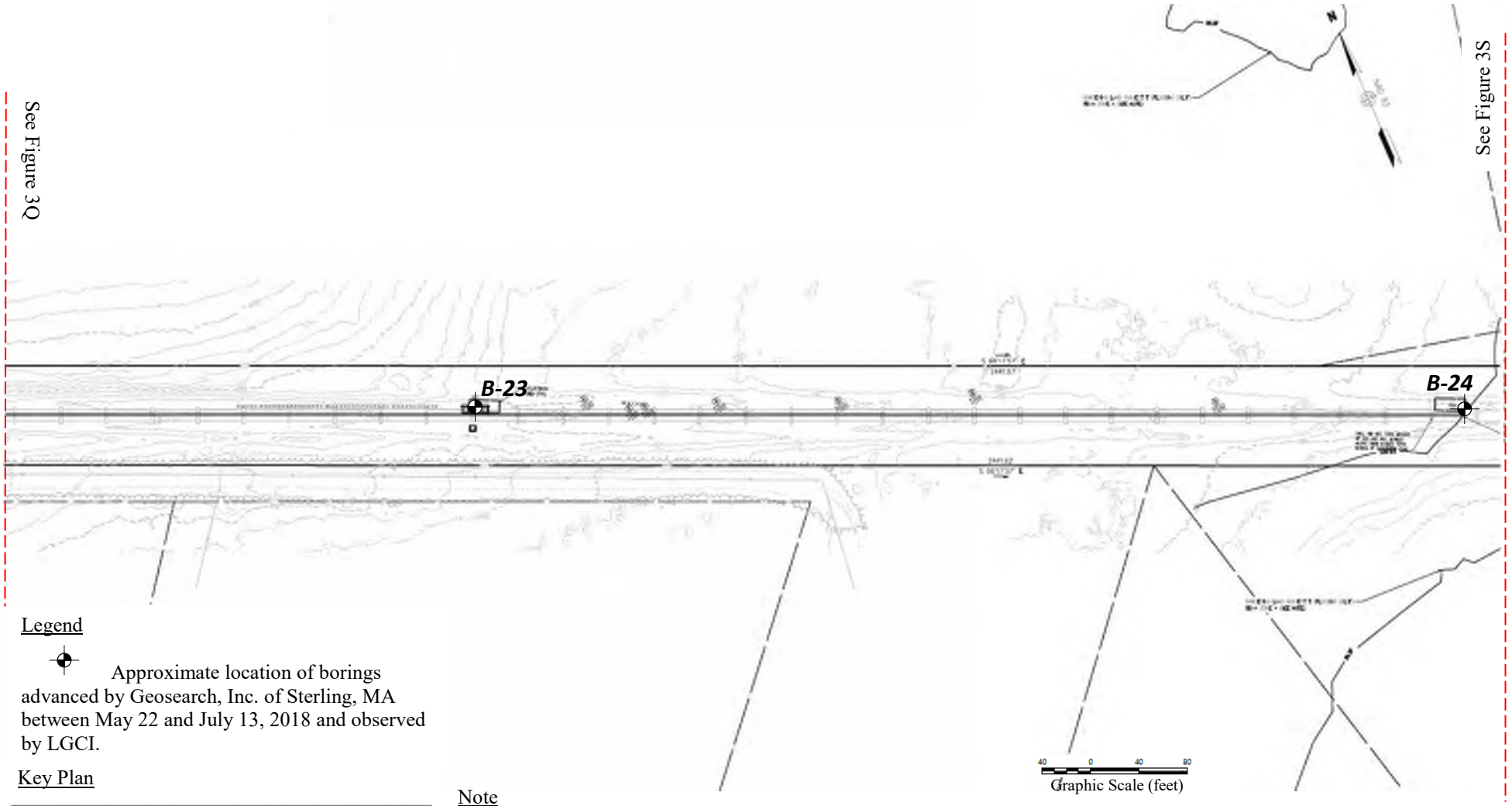
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

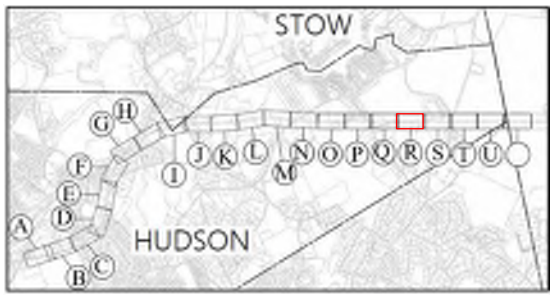
Client:	Project:	Figure 3Q – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

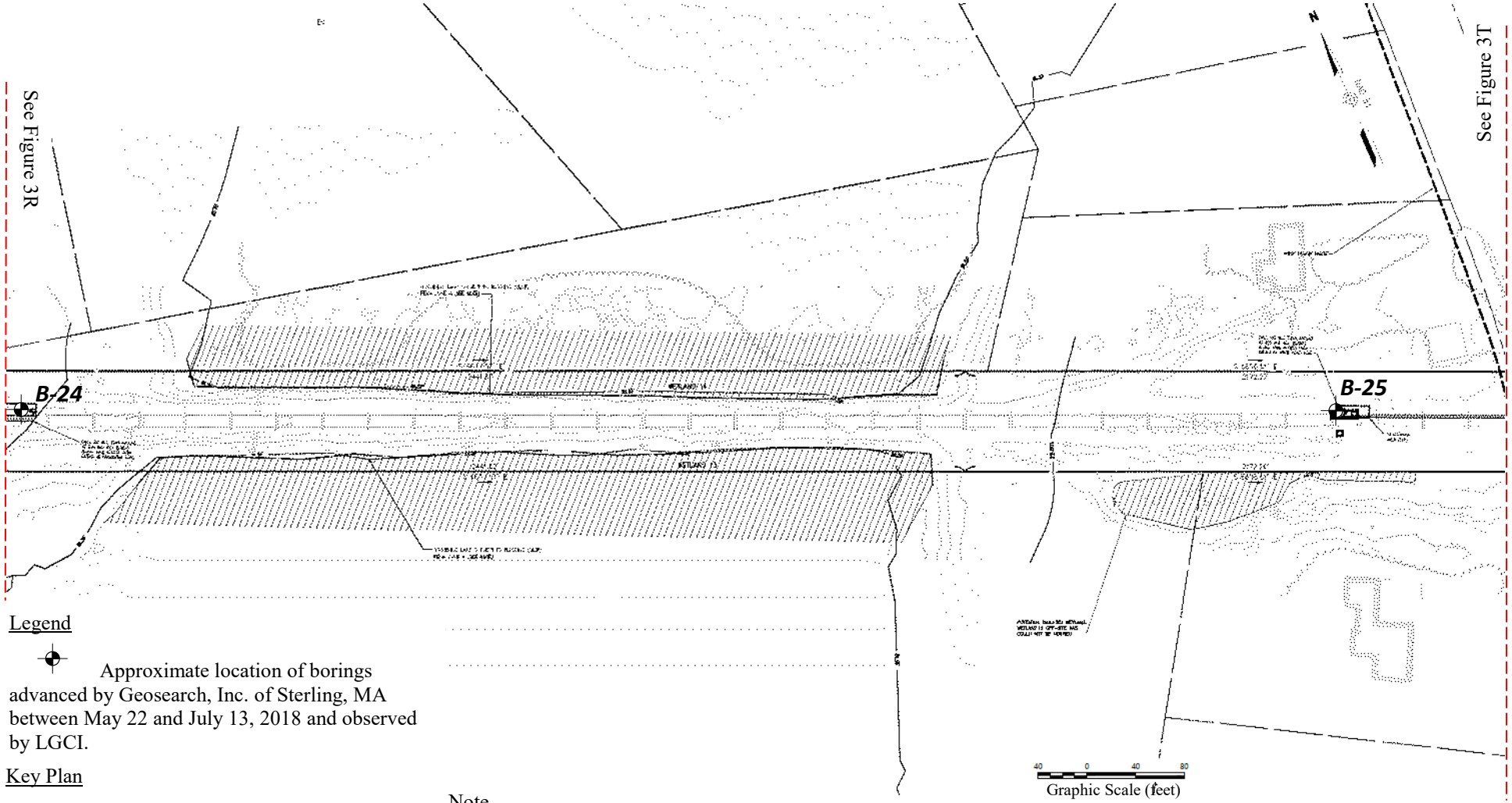
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

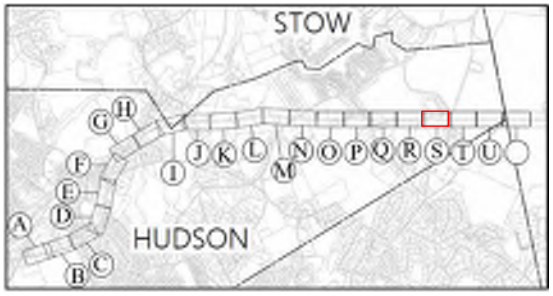
Client:	Project:	Figure 3R – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

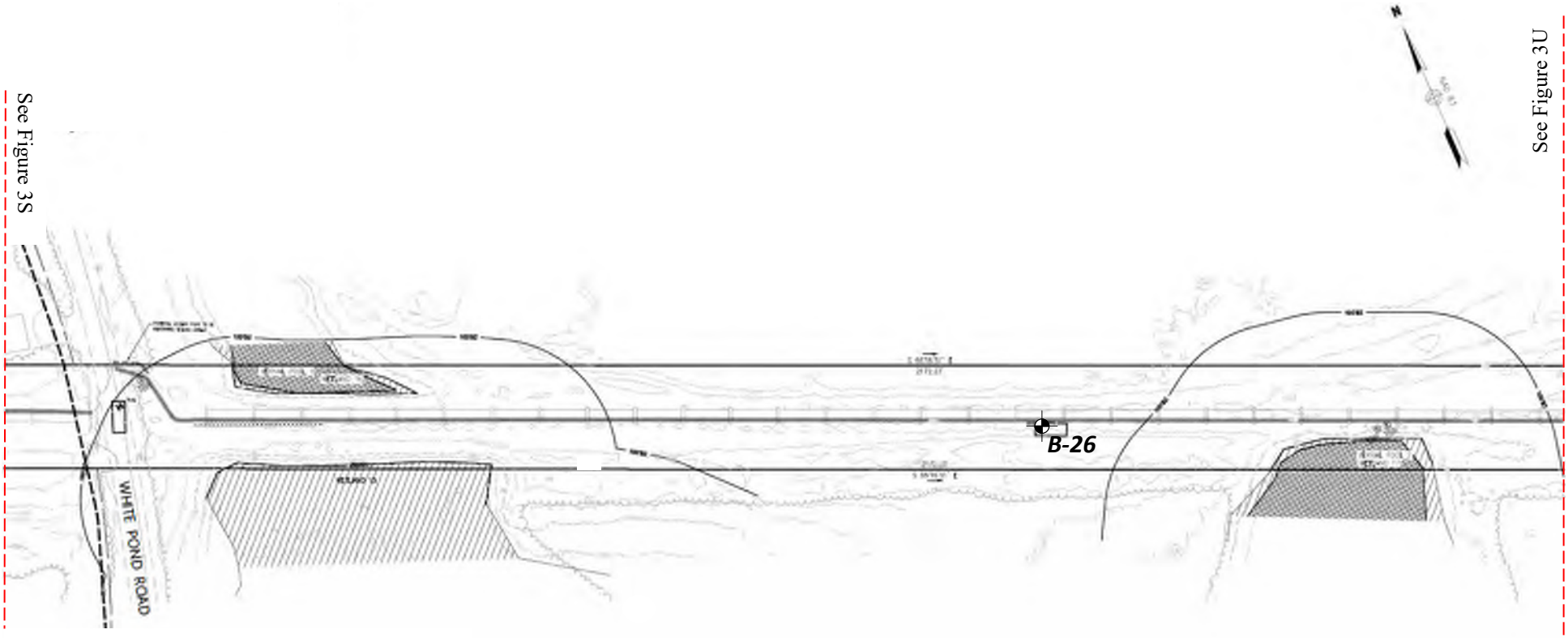
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

Client:	Project:	Figure 3S – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018

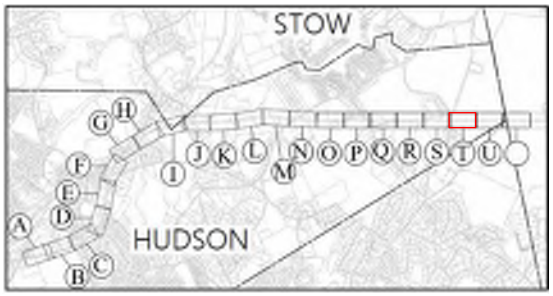


Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

Graphic Scale (feet)

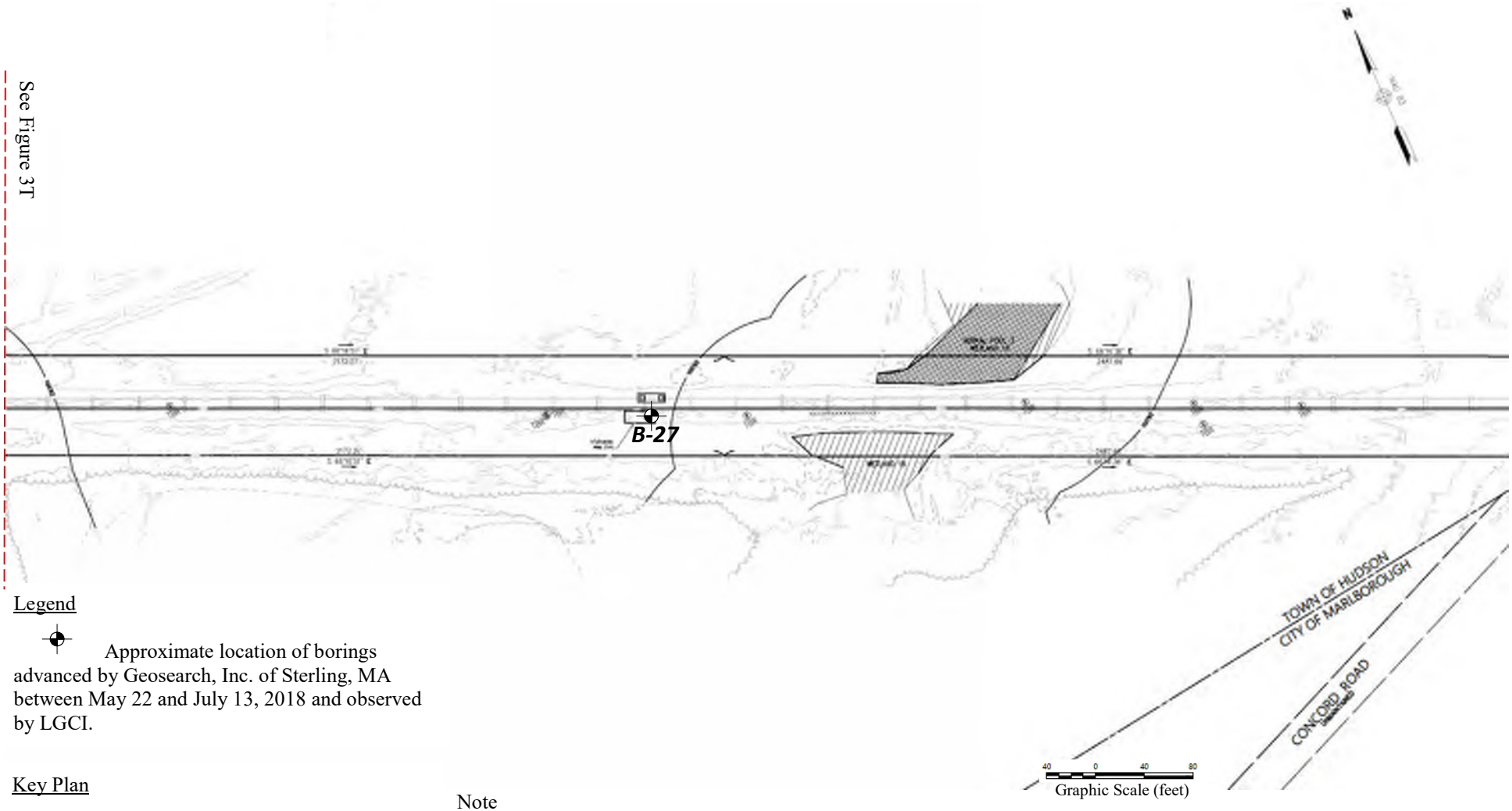
Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

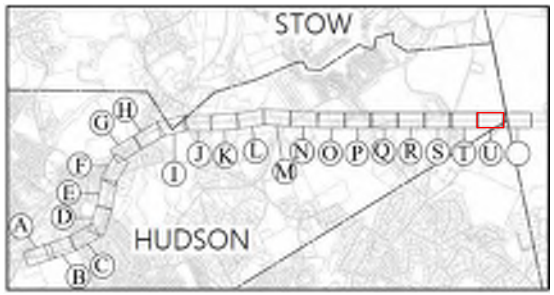
Client:	Project:	Figure 3T – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018



Legend

Approximate location of borings advanced by Geosearch, Inc. of Sterling, MA between May 22 and July 13, 2018 and observed by LGCI.

Key Plan



Note

Figure based on a drawing titled: "Proposed Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by Vanasse Hangen Brustlin, Inc., and dated February 14, 2018.

Client:	Project:	Figure 3U – Boring Location Plan	
Vanasse Hangen Brustlin, Inc.	Proposed Transmission Power Line Borings		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Hudson, MA	LGCI Project No.: 1836	Date: August 2018

Appendix A - LGCI's Boring Logs

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/11/18 **DATE COMPLETED:** 6/11/18
BORING LOCATION: Roadway near 6 Wilkins Street
COORDINATES: NA
SURFACE EI.: 218 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 70s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: Not encountered
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Justin Emma
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.7					Asphalt	0.7	Drilled through 8 inches of asphalt.
	215.0		G1				Fill	217.3	G1 - Silty SAND (SM), fine to medium, trace coarse, ~15% fines, trace fine subangular gravel, brown, moist
		3.5	G2						G2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, ~25% fine to coarse subrounded gravel, trace coal, brown, moist
5		6				1		6.0	REMARK 1: Borehole was previously vacuum explorated to a depth of 6 feet on 6/6/18.
	210.0		S1	2-4-5-3 (9)	24/7		Sand	212.0	S1 - Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, ~15% fine subrounded gravel, light brown, moist
		8	S2	5-8-9-6 (17)	24/16				S2 - Similar to S1, weathered rock fragments, light brown to tan
10		10						10.0	Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings. Restored ground surface with asphalt cold patch.
	205.0								
15									
	200.0								
20									
	195.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

BORING LOG

B-9
PAGE 1 OF 1

LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 5/22/18 **DATE COMPLETED:** 5/22/18
BORING LOCATION: Off Wilkins St., MBTA Right-of-way (ROW)
COORDINATES: NA
SURFACE EI.: 224 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 16 ft.
WEATHER: 60s / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 13.0 ft. / El. 211.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El. (ft.)	Material Description
		0	S1	4-4-5-6 (9)	24/19		Topsoil / Fill	223.9	S1 - Top 2": Silty SAND (SM), fine to coarse, 25-30% fines, trace fine subangular gravel, trace coal ash, trace slag, dark brown, moist (topsoil) Bot. 17": Coal ash/slag
		2	S2	11-7-8-8 (15)	24/13				S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 10-15% fine subrounded gravel, light brown to orange, moist
	220.0	4	S3	7-5-4-3 (9)	24/14				S3 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, ~15% fine subrounded gravel, brown, moist
5		6	S4	2-3-5-5 (8)	24/4		Buried Topsoil	6.0 218.0	S4 - Silty SAND (SM), fine, ~20% fines, trace organic fines, trace wood, dark brown, moist
		8	S5	4-4-3-4 (7)	24/15		Buried Subsoil	8.8 215.2	S5 - Top 10": Similar to S4, trace roots Bot. 5": Silty SAND (SM), fine, 20-25% fines, trace organic fines, trace roots, trace wood, brown to orange, moist
	215.0							10.0	
10		10	S6	6-14-18-19 (32)	24/13		Sand	214.0	S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, ~35% fine to coarse subrounded gravel, light brown, moist
		12	S7	17-10-9-9 (19)	24/14				S7 - Silty SAND (SM), fine, 20-25% fines, light brown to gray, moist
	210.0	14	S8	10-9-8-13 (17)	24/16				S8 - Similar to S7, light brown
15		16						16.0	Bottom of borehole at 16.0 feet. Backfilled borehole with drill cuttings.
	205.0								
20									
	200.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

B-10
PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 5/22/18 **DATE COMPLETED:** 5/22/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE EI.: 214 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 14 ft.
WEATHER: 60s / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 9.3 ft. / El. 204.7 ft. (Based on sample moisture)
AT END OF DRILLING: 11.0 ft. / El. 203.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El. (ft.)	Material Description
		0					Topsoil	213.9	S1 - Top 1": Silty SAND (SM), fine to coarse, 25-30% fines, trace fine subangular gravel, trace coal ash, trace organic fines, dark brown, moist (topsoil)
			S1	3-5-8-3 (13)	24/12				Bot. 11": Coal ash
		2					Fill		S2 - Silty SAND (SM), fine to medium, 15-20% fines, trace fine subrounded gravel, light brown, moist
	210.0		S2	7-5-5-4 (10)	24/10				
		4							S3 - Similar to S2, trace roots
5			S3	3-2-3-3 (5)	24/16				
		6						6.0	
			S4	6-4-7-4 (11)	24/15		Buried Topsoil	208.0	S4 - Silty SAND (SM), fine, 25-30% fines, trace organic fines, trace roots, trace fine subrangular gravel, dark brown to brown, moist
		8							S5 - Top 15": Silty SAND (SM), fine, 25-30% fines, trace organic fines, trace roots, dark brown, moist
	205.0		S5	3-2-3-8 (5)	24/21			9.3 ▽	
10							Sand	204.7	Bot. 6": Silty SAND (SM), fine, 15-20% fines, light brown, wet
		10	S6	24-11-11-13 (22)	24/3				S6 - Silty SAND with Gravel (SM), fine to medium, ~15% fines, 40-45% fine to coarse subrounded gravel, light brown, wet ▼
		12							S7 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, 15-20% fine subrounded gravel, brown, wet
			S7	14-20-21-26 (41)	24/14				
	200.0	14						14.0	
15									Bottom of borehole at 14.0 feet. Backfilled borehole with drill cuttings.
	195.0								
20									
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

B-11 / GB-10

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/26/18 **DATE COMPLETED:** 6/26/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE EI.: 205 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 21.6 ft.
WEATHER: 80s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 15.0 ft. / El. 190.0 ft. (Based on sample moisture)
AT END OF DRILLING: 16.5 ft. / El. 188.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	5-6-7-7 (13)	24/20		Fill		S1 - Top 14": Coal Bot. 6": Poorly Graded SAND (SP), fine, trace medium, 0-5% fines, light brown to tan, moist
		2	S2	6-5-5-22 (10)	24/12				S2 - Silty SAND (SM), fine, ~25% fines, ~5% fine subangular gravel, trace organic fines, trace roots, dark brown to orange, moist
		4	S3	11-8-7-4 (15)	24/5				S3 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 5-10% fines, ~15% fine to coarse subangular gravel, trace wood, trace organic fines, trace roots, light brown to gray, moist
5	200.0	6	S4	3-2-4-85 (6)	24/14		Buried Subsoil	6.0 199.0	S4 - Silty SAND (SM), fine, trace coarse, ~20% fines, 5-10% fine subangular gravel, trace organic fines, trace roots, orange, moist
		8	S5	7-27-33-25 (60)	24/15	1	Sand	8.0 197.0	REMARK 1: Auger refusal at 8 feet. Offset borehole 5 feet west. S5 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 5-10% fines, ~15% fine to coarse subangular gravel, light brown to gray, moist
10	195.0	10	S6	25-33-100	18/11				S6 - Similar to S5, 25-30% fine to coarse subrounded gravel
		11.5 12	S7	7-20-11-7 (31)	24/15				S7 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, 5-10% fines, ~15% fine to coarse subrounded gravel, light brown to orange, moist
15	190.0	14 15	S8	4-5-4-8 (9)	24/17				S8 - Similar to S7, light brown, wet
		17							
20	185.0	20	S9	18-28-53-50/1" (81)	19/11				S9 - Silty SAND with Gravel (SM), fine to medium, trace coarse, 20-25% fines, ~35% fine to coarse subangular gravel, weathered rock fragments, gray to dark gray, wet
		21.6						21.6	Bottom of borehole at 21.6 feet. Backfilled borehole with drill cuttings.
25	180.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

BORING LOG

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LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 7/13/18 **DATE COMPLETED:** 7/13/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE EL.: 187 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 15 ft.
WEATHER: 80s / Partly Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 9.0 ft. / El. 178.0 ft. (Based on sample moisture)
AT END OF DRILLING: 12.0 ft. / El. 175.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Jean Prinsloo
DRILLING METHOD: Drove split spoon sampler
DRILL RIG TYPE/MODEL: Tripod with Honda GX200 Motor
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.4 / 186.6	S1 - Top 5": Silty SAND (SM), fine, ~20% fines, trace organic fines, trace roots, dark brown, moist
	185.0	2	S1	5-13-22-33 (35)	24/15				Bot. 10": Poorly Graded SAND with Gravel (SP), fine to medium, ~5% fines, ~15% fine subangular gravel, trace organic fines, light brown, moist
		2.6	S2	23-50/1"	7/6				S2 - Poorly Graded SAND (SP), fine to medium, trace coarse, ~5% fines, angular stone fragments, light brown, moist
5		5	S3	18-17-11-11 (28)	24/14		Fill		S3 - Well Graded SAND (SW), fine to coarse, ~5% fines, 5-10% fine subrounded gravel, light brown, moist
	180.0	7	S4	43-27-19-14 (46)	24/12				S4 - Similar to S3
		9	S5	32-40-31-31 (71)	24/15				▽ S5 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, ~35% fine to coarse subangular gravel, brown, wet
10		11	S6	29-35-53-51 (88)	24/10			11.4 / 175.6	S6 - Top 5": Angular stone fragments, black, wet
	175.0						Sand		▽ Bot. 5": Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, ~35% fine subrounded gravel, brown to red, wet
		13	S7	25-21-20-16 (41)	24/8				S7 - Silty SAND with Gravel (SM), fine to coarse, ~20% fines, ~30% fine subrounded gravel, brown to orange, wet
15		15						15.0	Bottom of borehole at 15.0 feet. Backfilled borehole with soil from surrounding area.
	170.0								
20									
	165.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

B-14/B-BB-3

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 5/23/18 **DATE COMPLETED:** 5/30/18
BORING LOCATION: Western edge of Fort Meadow Brook bridge
COORDINATES: NA
SURFACE El.: 180 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 101 ft.
WEATHER: 80s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 6.0 ft. / El. 174.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: HSA 4-1/4" I.D. to 12 feet then 4-inch casing
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	5-5-5-4 (10)	24/15		Fill		S1 - Coal ash, trace fine subangular gravel, trace roots, trace brick
		2	S2	10-8-17-12 (25)	24/11				S2 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 5-10% fines, ~15% fine to coarse subangular gravel, brown, moist
		4	S3	7-10-7-8 (17)	24/20				S3 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 35-40% fine subangular gravel, trace organic fines, brown, moist
5	175.0	6	S4	6-2-2-1 (4)	24/1				S4 - Similar to S3, ~20% fine subangular gravel, trace roots
		8	S5	0-0-0-3 (0)	24/15			8.0 / 172.0	S5 - Silty SAND (SM), fine, ~40% fines, gray, wet
10	170.0	10	S6	2-2-3-2 (5)	24/11				S6 - Silty SAND (SM), fine to coarse, ~25% fines, trace organic fines, trace roots, gray to brown, wet
		12	S7	0-0-1-1 (1)	24/21	1	Buried Organics		REMARK 1: Switched to 4-inch casing at 12 feet. S7 - PEAT (PT), fibrous, trace roots, black, wet
		14	S8	0-0-3-3 (3)	24/17				S8 - Silty SAND (SM), fine to medium, 25-30% fines, trace peat fibers, trace roots, black, wet
15	165.0	16	S9	3-2-3-3 (5)	24/12				S9 - Poorly Graded SAND with Silt (SP-SM), fine to medium, ~10% fines, ~5% fine subrounded gravel, trace wood, dark brown, wet
		18	S10	3-4-3-4 (7)	24/11				S10 - Similar to S9, no wood
20	160.0	20	S11	2-1-4-4 (5)	24/15		Sand	20.0 / 160.0	S11 - Well Graded SAND with Silt (SW-SM), fine to coarse, ~10% fines, trace fine subrounded gravel, gray to black, wet
		22	S12	3-5-5-5 (10)	24/20				S12 - Similar to S11, 10-15% fine subrounded gravel
25	155.0	24		7-7-5-6					S13 - Similar to S12, angular stone fragments

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

CLIENT: Vanasse Hangen Brustlin, Inc. **PROJECT NAME:** Proposed Transmission Power Line Borings

LGCI PROJECT NUMBER: 1836 **PROJECT LOCATION:** Hudson, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Material Description
		24	S13	(12)	24/8		Depth El.(ft.) 160.0	
		26						
		29				2		REMARK 2: Switched to 3-inch casing at 29 feet.
30	150.0		S14	7-6-6-6 (12)	24/3			S14 - Well Graded Gravel with Silt and Sand (GW-GM), fine to coarse, subrounded, 10-15% fines, 35-40% fine to coarse sand, gray, wet
		31						
		34						
35	145.0		S15	7-8-5-4 (13)	24/10			S15 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, ~15% fine to coarse subrounded gravel, gray, wet
		36						
		39						
40	140.0		S16	12-6-11-16 (17)	24/18			S16 - Well Graded SAND (SW), fine to coarse, 0-5% fines, gray, wet
		41						
							Sand	
		44						
45	135.0		S17	3-3-5-5 (8)	24/10			S17 - Similar to S16
		46						
		49						
50	130.0		S18	6-10-8-8 (18)	24/6			S18 - Poorly Graded SAND (SP), fine to medium, trace coarse, 0-5% fines, gray, wet
		51						
		54						
55	125.0		S19	6-3-7-10 (10)	24/17			S19 - Poorly Graded SAND with Silt (SP-SM), fine, ~10% fines, gray, wet
		56						
		59						
60	120.0		S20	8-2-6-7 (8)	24/10			S20 - Similar to S19, 10-15% fines

CLIENT: Vanasse Hangen Brustlin, Inc. **PROJECT NAME:** Proposed Transmission Power Line Borings

LGCI PROJECT NUMBER: 1836 **PROJECT LOCATION:** Hudson, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		59 61						160.0	
65	115.0	64 66	S21	2-4-7-11 (11)	24/16				S21 - Similar to S20
70	110.0					3			REMARK 3: Issues with bottom blow in encountered; sample at 69 to 71 feet could not be taken.
75	105.0	74 76	S22	8-7-12-24 (19)	24/15				S22 - Similar to S20
80	100.0	79 81	S23	3-14-15-23 (29)	24/10		Sand		S23 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, ~10% fines, ~30% fine to coarse subangular gravel, gray, wet
85	95.0	84 86	S24	8-8-13-14 (21)	24/12				S24 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, ~30% fine to coarse subangular gravel, gray, wet
90	90.0	89 91	S25	25-32-13-15 (45)	24/9				S25 - Well Graded SAND and Gravel (SW), fine to coarse, ~5% fines, 20-25% fine to coarse subrounded gravel, gray, wet
95	85.0	94	S26	32-48-21-15 (69)	24/4				S26 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 20-25% fine to coarse subrounded gravel, gray, wet

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BORING LOG

B-14/B-BB-3

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		96					Sand	160.0	
		99							
100	80.0		S27	22-57-59-56 (116)	24/6				S27 - Silty SAND with Gravel (SM), fine to coarse, ~20 fines, 25-30% fine to coarse subangular gravel, gray, wet
		101						101.0	
									Bottom of borehole at 101.0 feet. Backfilled borehole with drill cuttings.
105	75.0								
110	70.0								
115	65.0								
120	60.0								
125	55.0								
130	50.0								

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BORING LOG

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CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/6/18 **DATE COMPLETED:** 6/6/18
BORING LOCATION: Off Parmenter Road, MBTA ROW
COORDINATES: NA
SURFACE EI.: 211 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 16 ft.
WEATHER: 60s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 8.0 ft. / El. 203.0 ft. (Based on sample moisture)
AT END OF DRILLING: 9.5 ft. / El. 201.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El. (ft.)	Material Description
	210.0	0	S1	2-3-3-3 (6)	24/19		Topsoil / Fill		S1 - Top 6": Silty SAND (SM), fine, 25-30% fines, trace fine subangular gravel, trace organic fines, trace leaves, dark brown, moist Bot. 13": Poorly Graded SAND (SP), fine, trace medium to coarse, ~5% fines, trace organic fines, tan to orange, moist
		2	S2	4-1-1-3 (2)	24/15		Buried Subsoil	2.0 2.7	S2 - Top 8": Silty SAND (SM), fine, 15-20% fines, trace organic fines, trace roots, orange, moist Bot. 7": Poorly Graded SAND (SP), fine, trace medium, ~5% fines, tan, moist
5		4	S3	2-3-5-6 (8)	24/17				S3 - Similar to Bot. 7" of S2, tan to gray
	205.0	6	S4	7-10-9-12 (19)	24/16				S4 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium, ~10% fines, tan, moist
		8	S5	5-8-7-6 (15)	24/20		Sand		S5 - Well Graded SAND (SW), fine to coarse, ~5% fines, brown to gray, wet
10		10	S6	3-7-7-8 (14)	24/22				S6 - Similar to S5
	200.0	12	S7	1-5-5-10 (10)	24/19				S7 - Similar to S5
		14	S8	15-22-17-15 (39)	24/20				S8 - Top 17": Similar to S5
15		16						16.0	Bot. 3": Silty SAND (SM), fine, ~25% fines, brown, wet Bottom of borehole at 16.0 feet. Backfilled borehole with drill cuttings.
	195.0								
20									
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

BORING LOG

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LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/6/18 **DATE COMPLETED:** 6/6/18
BORING LOCATION: Off Parmenter Road, MBTA ROW
COORDINATES: NA
SURFACE El.: 215 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 60s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 7.7 ft. / El. 207.3 ft. (Based on sample moisture)
AT END OF DRILLING: -
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MC **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.6	S1 - Top 7": Silty SAND (SM), fine, trace coarse, ~30% fines, trace fine subrounded gravel, trace organic fines, trace roots, dark brown, moist
			S1	2-2-2-5 (4)	24/22		Subsoil	1.4	Mid. 9": Silty SAND (SM), fine, ~20% fines, trace organic fines, trace roots, orange, moist
		2						213.6	Bot. 6": Poorly Graded SAND (SP), fine, ~5% fines, light brown, moist
			S2	7-7-8-10 (15)	24/17				S2 - Poorly Graded SAND with Silt (SP-SM), fine, 5-10% fines, light brown, moist
		4							
5	210.0		S3	6-7-7-8 (14)	24/17				S3 - Similar to S2
		6					Sand		
			S4	5-7-7-7 (14)	24/24				S4 - Silty SAND (SM), fine, trace medium, ~15% fines, tan, moist (Bot. 4" wet)
		8							
			S5	5-8-9-20 (17)	24/22				S5 - Similar to S4, wet
10	205.0	10						10.0	
									Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings.
15	200.0								
20	195.0								
25	190.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/6/18 **DATE COMPLETED:** 6/6/18
BORING LOCATION: Off Parmenter Road, MBTA ROW
COORDINATES: NA
SURFACE EI.: 211 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 16 ft.
WEATHER: 60s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 10.0 ft. / El. 201.0 ft. (Based on sample moisture)
AT END OF DRILLING: 11.0 ft. / El. 200.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MC **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	210.0	0					Topsoil	0.5 / 210.5	S1 - Top 6": Silty SAND (SM), fine, trace medium, 25-30% fines, trace fine subrounded gravel, trace organic fines, dark brown, moist
			S1	5-8-8-7 (16)	24/15		Fill		Bot. 9": Silty SAND (SM), fine to medium, trace coarse, ~15% fines, 10-15% fine subangular gravel, trace organic fines, brown, moist
		2	S2	16-18-16-9 (34)	24/16	1		2.0 / 209.0	S2 - Silty SAND with Gravel (SM), fine, trace medium, 15-20% fines, ~15% fine angular gravel, light brown, moist REMARK 1: Auger chattered at 3 feet.
		4	S3	6-7-6-4 (13)	24/10				S3 - Similar to S2
5	205.0	6	S4	4-10-16-24 (26)	24/13				S4 - Similar to S2, trace roots
		8	S5	6-10-43-30 (53)	24/18		Sand & Gravel		S5 - Silty SAND with Gravel (SM), fine, ~20% fines, ~15% fine angular gravel, light brown, moist
10	200.0	10	S6	14-22-30-31 (52)	24/15				S6 - Similar to S5, wet
		12	S7	7-20-23-23 (43)	24/16				S7 - Similar to S6
		14	S8	17-25-26-22 (51)	24/23				S8 - Similar to S6, ~15% fines, light brown to gray
15	195.0	16						16.0	Bottom of borehole at 16.0 feet. Backfilled borehole with drill cuttings.
20	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/28/18 **DATE COMPLETED:** 6/28/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE EI.: 200 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 14 ft.
WEATHER: 70s / Rain
GROUNDWATER LEVELS:
DURING DRILLING: 12.0 ft. / El. 188.0 ft. (Based on sample moisture)
AT END OF DRILLING: 12.0 ft. / El. 188.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: HSA 4-1/4" I.D. to 10 feet then 4-inch casing
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	2-11-8-4 (19)	24/17		Topsoil	0.5 / 199.5	S1 - Top 6": Silty SAND (SM), fine to medium, 15-20% fines, ~10% fine subrounded gravel, trace organic fines, trace roots, dark brown, moist
		2	S2	3-3-5-12 (8)	24/11		Fill	4.0	Bot. 11": Poorly Graded SAND with Silt (SP-SM), fine, 10-15% fines, 5-10% fine to coarse subangular gravel, trace roots, light brown, moist S2 - Similar to Bot. 11" of S1
5	195.0	4	S3	5-5-2-3 (7)	24/4		Buried Organics	196.0 / 6.0	S3 - Silty SAND (SM), fine, trace medium to coarse, ~30% fines, trace fine subrounded gravel, trace organic fines, trace roots, trace leaves, black, moist
		6	S4	3-2-4-4 (6)	24/16		Sand	194.0	S4 - Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 5-10% fines, trace fine gravel, light brown, moist
		8	S5	3-3-5-7 (8)	24/18				S5 - Similar to S4
10	190.0	10	S6	5-7-8-9 (15)	24/16	1			REMARK 1: Switched to 4-inch casing at 10 feet. S6 - Similar to S4, light brown to orange
		12	S7	7-7-7-7 (14)	24/17				S7 - Poorly Graded SAND (SP), fine to medium, trace coarse, 0-5% fines, brown to orange, wet
		14						14.0	
15	185.0								Bottom of borehole at 14.0 feet. Backfilled borehole with drill cuttings.
20	180.0								
25	175.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

BORING LOG

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LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 7/2/18 **DATE COMPLETED:** 7/2/18
BORING LOCATION: MBTA ROW off White Pond Road
COORDINATES: NA
SURFACE EL.: 192 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 16 ft.
WEATHER: 90s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 4.0 ft. / El. 188.0 ft. (Based on sample moisture)
AT END OF DRILLING: 7.0 ft. / El. 185.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Jean Prinsloo
DRILLING METHOD: Drove split spoon sampler
DRILL RIG TYPE/MODEL: Tripod with Honda GX200 Motor
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Material Description
		0						
	190.0	2	S1	5-6-6-7 (12)	24/21		Fill	S1 - Top 13": Silty SAND (SM), fine, trace medium to coarse, 15-20% fines, trace organic fines, trace roots, trace coal, dark brown, moist Bot. 8": Well Graded SAND (SW), fine to coarse, 0-5% fines, trace fine subangular gravel, light brown to orange, moist
			S2	7-17-18-14 (35)	24/9			S2 - Similar to Bot. 8" of S1, trace roots
		4						4.0 ft. / 188.0 ft. ▽
5			S3	19-11-10-19 (21)	24/11		Sand	S3 - Well Graded SAND (SW), fine to coarse, 0-5% fines, 0-5% fine subrounded gravel, trace organic fines, orange, wet
		6	S4	54-120/5"	11/11			S4 - Similar to S3, 10-15% fine to coarse subrounded gravel
	185.0	6.9				1		▼ REMARK 1: Split spoon refusal at 6.9 feet. Offset borehole 3 feet west.
		8	S5	34-55-60-20 (115)	24/15			S5 - Silty SAND with Gravel (SM), fine, 20-25% fines, ~25% fine subrounded gravel, weathered rock fragments, gray to orange, wet
10		10	S6	22-16-17-25 (33)	24/13			S6 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, ~30% fine subrounded gravel, weathered rock fragments, gray to orange, wet
	180.0	12	S7	14-25-39-75 (64)	24/14			S7 - Poorly Graded SAND with Gravel (SP), fine, ~5% fines, ~15% fine to coarse subrounded gravel, weathered rock fragments, gray, wet
		14	S8	29-42-51-65 (93)	24/14			S8 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, ~15% fine to coarse subrounded gravel, weathered rock fragments, gray, wet
15		16						16.0
	175.0							Bottom of borehole at 16.0 feet. Backfilled borehole with drill cuttings, one bag of concrete and one bag sand.
20								
	170.0							
25								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

BORING LOG

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LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 7/3/18 **DATE COMPLETED:** 7/3/18
BORING LOCATION: MBTA ROW off White Pond Road
COORDINATES: NA
SURFACE EL.: 191 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 90s / Partly Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 4.0 ft. / El. 187.0 ft. (Based on sample moisture)
AT END OF DRILLING: -
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Jean Prinsloo
DRILLING METHOD: Drove split spoon sampler
DRILL RIG TYPE/MODEL: Tripod with Honda GX200 Motor
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	190.0	0	S1	4-5-6-14 (11)	24/18		Fill	0.6 / 190.4	S1 - Top 7": Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, ~10% fines, trace fine subrounded gravel, trace organic fines, trace roots, trace coal, black, moist Bot. 11": Poorly Graded SAND (SP), fine, 0-5% fines, light brown, moist
		2	S2	12-12-13-13 (25)	24/17				S2 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown to tan, moist
5		4	S3	4-4-9-8 (13)	24/18		Sand		S3 - Poorly Graded SAND (SP), fine to medium, trace coarse, 0-5% fines, light brown to gray, wet
	185.0	6	S4	11-12-8-9 (20)	24/15				S4 - Poorly Graded SAND (SP), fine, trace medium to coarse, 0-5% fines, trace fine subrounded gravel, light brown to gray, wet
		8	S5	10-7-8-7 (15)	24/15				S5 - Poorly Graded SAND (SP), fine, 0-5% fines, light brown to gray, wet
10		10						10.0	
	180.0								Bottom of borehole at 10.0 feet. Backfilled borehole with soil from surrounding area.
15									
	175.0								
20									
	170.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 7/3/18 **DATE COMPLETED:** 7/3/18
BORING LOCATION: MBTA ROW off White Pond Road
COORDINATES: NA
SURFACE EI.: 192 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 15 ft.
WEATHER: 90s / Partly Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 4.0 ft. / El. 188.0 ft. (Based on sample moisture)
AT END OF DRILLING: 4.0 ft. / El. 188.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Jean Prinsloo
DRILLING METHOD: Drove split spoon sampler
DRILL RIG TYPE/MODEL: Tripod with Honda GX200 Motor
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark
		0				
			S1	6-5-3-4/0" (8)	18/2	
		1.5				
	190.0	2				
			S2	2-2-2-4 (4)	24/16	
		4				
5			S3	8-10-12-12 (22)	24/17	
		6				
	185.0		S4	16-22-34-21 (56)	24/16	
		8				
		9				
10			S5	6-11-16-17 (27)	24/13	
		11				
	180.0		S6	14-15-15-16 (30)	24/18	
		13				
15			S7	12-14-12-15 (26)	24/17	
		15				
	175.0					
20						
	170.0					
25						

Strata	Depth El.(ft.)	Material Description
Fill	0.9 / 191.1	S1 - Top 4": Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, ~10% fines, trace fine subrounded gravel, trace organic fines, trace roots, trace coal, black, moist Mid. 7": Poorly Graded SAND (SP), fine to medium, 0-5% fines, 5-10% fine subrounded gravel, trace roots, light brown, moist
Buried Subsoil		Bot. 7": Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, ~10% fines, trace fine subrounded gravel, trace organic fines, trace roots, brown to orange, moist
	4.0 / 188.0	S2 - Silty SAND (SM), fine, trace medium to coarse, 15-20% fines, trace organic fines, orange, moist
Sand		S3 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, 5-10% fine subrounded gravel, light brown, wet
		S4 - Similar to S3, light brown to gray
		S5 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, brown, wet
		S6 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown, wet
		S7 - Similar to S6
	15.0	Bottom of borehole at 15.0 feet. Backfilled borehole with soil from surrounding area.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
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BORING LOG

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PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 5/22/18 **DATE COMPLETED:** 5/22/18
BORING LOCATION: Western edge of retaining wall, west of Chestnut St.
COORDINATES: NA
SURFACE El.: 208 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 11.7 ft.
WEATHER: 60s / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 8.0 ft. / El. 200.0 ft. (Based on sample moisture)
AT END OF DRILLING: 11.0 ft. / El. 197.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	4-6-7-9 (13)	24/22		Fill		S1 - Top 14": Coal ash Bot. 8": Poorly Graded SAND with Silt (SP-SM), fine, trace medium to coarse, ~10% fines, 5-10% fine subangular gravel, light brown to orange, moist
		2	S2	9-7-13-34 (20)	24/13			2.3 205.7	S2 - Top 4": Similar to Bot. 8" of S1 Bot. 9": Silty SAND (SM), fine, trace coarse, 20-25% fines, trace fine subangular gravel, trace organic fines, trace roots, dark brown, moist
	205.0	4	S3	18-33-17-13 (50)	24/13	1	Buried Topsoil		S3 - Silty SAND with Gravel (SM), fine, 20-25% fines, 15-20% fine to coarse subangular gravel, trace organic fines, trace roots, dark brown to orange, moist REMARK 1: Drill chattered from 5 feet to 7 feet.
5		6	S4	7-20-11-4 (31)	24/16			6.0 202.0	S4 - Silty SAND (SM), fine, 20-25% fines, trace roots, angular stone fragments, light brown, moist
	200.0	8	S5	3-7-3-5 (10)	24/18		Sand		S5 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, light brown, wet
10		10	S6	5-4-15-120/2" (19)	20/9				S6 - Similar to S5, weathered stone fragments
		11.7				2		11.7	REMARK 2: Auger refusal at 11.7 feet. Bottom of borehole at 11.7 feet. Backfilled borehole with drill cuttings.
	195.0								
15									
	190.0								
20									
	185.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
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BORING LOG

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PAGE 1 OF 2

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/14/18 **DATE COMPLETED:** 6/14/18
BORING LOCATION: MBTA ROW, about 5 feet west of boring B-GB-7
COORDINATES: NA
SURFACE El.: 208 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 32 ft.
WEATHER: 70s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 10.0 ft. / El. 198.0 ft. (Based on sample moisture)
AT END OF DRILLING: 12.5 ft. / El. 195.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Material Description
								Drilled without sampling to 10 feet
	205.0							
5							N/A	
	200.0							
10								10.0 ▽ 198.0
		10	S1	10-16-22-35 (38)	24/16			S1 - Silty SAND (SM), fine, ~20% fines, 10-15% fine subrounded gravel, weathered rock fragments, light brown to orange, wet
		12						▼
	195.0							
15		15	S2	7-8-11-11 (19)	24/11			S2 - Silty SAND (SM), fine, ~20% fines, gray, wet
		17					Sand	
	190.0							
20		20	S3	5-7-9-9 (16)	24/15			S3 - Similar to S2, 25-30% fines, 5-10% fine to coarse subrounded gravel
		22						
	185.0							
25								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
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BORING LOG

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CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		25						198.0	
			S4	3-3-10-13 (13)	24/18				S4 - Similar to S3
		27							
	180.0						Sand		
30									
		30							
			S5	10-11-16-23 (27)	24/20				S5 - Similar to S3
		32						32.0	
	175.0								Bottom of borehole at 32.0 feet. Backfilled borehole with drill cuttings.
35									
	170.0								
40									
	165.0								
45									
	160.0								
50									
	155.0								
55									
	150.0								
60									

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BORING LOG

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PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/14/18 **DATE COMPLETED:** 6/14/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE EI.: 208 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 70s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 10.0 ft. / El. 198.0 ft. (Based on sample moisture)
AT END OF DRILLING: 15.0 ft. / El. 193.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	5-4-5-5 (9)	24/24		Fill		S1 - Top 16": Coal Bot. 8": Poorly Graded SAND (SP), fine, trace medium, 0-5% fines, trace fine subrounded gravel, light brown, moist
	205.0	2	S2	15-21-6-5 (27)	24/6		Buried Subsoil	2.0	S2 - Silty SAND with Gravel (SM), fine, 20-25% fines, ~25% fine to coarse subangular gravel, trace organic fines, orange to dark brown, moist
5		4	S3	2-4-4-3 (8)	24/5				S3 - Silty SAND with Gravel (SM), fine, trace coarse, 20-25% fines, ~20% fine to coarse subrounded gravel, trace organic fines, orange, moist
		6	S4	5-11-8-10 (19)	24/12			6.0	S4 - Silty SAND with Gravel (SM), fine, trace medium to coarse, 15-20% fines, ~15% fine to coarse subrounded gravel, light brown, moist
	200.0	8	S5	9-17-27-21 (44)	24/14				S5 - Similar to S4, angular stone fragments
10		10	S6	16-21-20-21 (41)	24/17				▽ S6 - Similar to S4, ~25% fine to coarse subrounded gravel, wet
	195.0	12					Sand		
15		15	S7	7-15-13-11 (28)	24/14				▼ S7 - Silty SAND with Gravel (SM), fine, trace medium to coarse, ~25% fines, ~15% fine to coarse subrounded gravel, gray, wet
	190.0	17							
20		20	S8	7-10-15-20 (25)	24/20				S8 - Silty SAND (SM), fine, 20-25% fines, trace fine subrounded gravel, gray, wet
		22						22.0	
	185.0								Bottom of borehole at 22.0 feet. Backfilled borehole with drill cuttings.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 2

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/15/18 **DATE COMPLETED:** 6/15/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE EI.: 205 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 32 ft.
WEATHER: 70s / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 20.0 ft. / El. 185.0 ft. (Based on sample moisture)
AT END OF DRILLING: 21.0 ft. / El. 184.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	2-3-3-6 (6)	24/17		Fill		S1 - Coal
		2	S2	17-34-47-25 (81)	24/16				S2 - Top 12": Angular stone fragments
								3.0 / 202.0	Bot. 4": Poorly Graded SAND (SP), fine, 0-5% fines, light brown, moist
		4	S3	18-22-24-17 (46)	24/13				S3 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium, 5-10% fines, 5-10% fine subrounded gravel, light brown, moist
5	200.0	6	S4	44-47-33-35 (80)	24/16				S4 - Well Graded SAND with Silt (SW-SM), fine to coarse, ~5% fines, 5-10% fine subrounded gravel, angular stone fragments, light brown, moist
		8	S5	14-21-22-20 (43)	24/14				S5 - Similar to S4
10	195.0	10	S6	26-68-44-120/0" (112)	18/11				S6 - Similar to S4, tan to gray
		11.5					Sand		
15	190.0	15	S7	30-60-32-45 (92)	24/15				S7 - Similar to S4, 5-10% fines, light brown to orange
		17							
20	185.0	20	S8	24-14-12-14 (26)	24/14				S8 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 20-25% fine to coarse subrounded gravel, light brown, wet
		22							
25	180.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		25						202.0	
		27	S9	6-7-8-12 (15)	24/4		Sand		S9 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium, ~10% fines, light brown, wet
30	175.0	30	S10	8-11-17-22 (28)	24/20				S10 - Poorly Graded SAND with Silt (SP-SM), fine, ~10% fines, light brown, wet
		32						32.0	Bottom of borehole at 32.0 feet. Backfilled borehole with drill cuttings.
35	170.0								
40	165.0								
45	160.0								
50	155.0								
55	150.0								
60	145.0								

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 2

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/11/18 **DATE COMPLETED:** 6/12/18
BORING LOCATION: Near farm off Chesnut Street, MBTA ROW
COORDINATES: NA
SURFACE EI.: 203 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 32 ft.
WEATHER: 70s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 15.0 ft. / El. 188.0 ft. (Based on sample moisture)
AT END OF DRILLING: 16.0 ft. / El. 187.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MC / TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0							S1 - Silty SAND (SM), fine to medium, 25-30% fines, trace fine subangular gravel, trace asphalt, dark brown to black, moist
		2	S1	3-5-6-12 (11)	24/13				
	200.0		S2	24-21-32-70 (53)	24/10		Fill		S2 - Silty GRAVEL with Sand (GM), fine, trace coarse, 15-20% fines, 40-45% fine to coarse sand, light brown to tan, moist
		4							
5			S3	35-38-55-75 (93)	24/12	1			S3 - Similar to S2, trace organic fines REMARK 1: Heavy drill chatter from 5 feet to 8 feet.
		6						6.0	
			S4	35-36-39-37 (75)	24/10				S4 - Silty SAND with Gravel (SM), fine, 15-20% fines, 20-25% fine subangular gravel, light brown to tan, moist
	195.0	8	S5	8-33-42-51 (75)	24/12				S5 - Similar to S4, fine to medium, trace coarse
10		10	S6	16-25-25-22 (50)	24/17	2			REMARK 2: On 6/11/18, left auger in borehole at 10 feet. Samples S6-S10 were taken on 6/14/18. S6 - Similar to S5, 25-30% fine to coarse subrounded gravel
		12							
	190.0								
15		15	S7	35-23-20-12 (43)	24/11		Sand		S7 - Similar to S6, wet
		17							
	185.0								
20		20	S8	17-18-15-16 (33)	24/18				S8 - Similar to S7
		22							
	180.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

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BORING LOG

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CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		25							S9 - Similar to S7
			S9	7-16-50-20 (66)	24/11				
		27							
	175.0						Sand		
30		30							S10 - Silty SAND (SM), fine, trace medium to coarse, 15-20% fines, trace fine subrounded gravel, light brown to gray, wet
			S10	19-28-62-50 (90)	24/12				
		32						32.0	
	170.0								Bottom of borehole at 32.0 feet. Backfilled borehole with drill cuttings.
35									
	165.0								
40									
	160.0								
45									
	155.0								
50									
	150.0								
55									
	145.0								
60									

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BORING LOG

B-GB-14
PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/11/18 **DATE COMPLETED:** 6/11/18
BORING LOCATION: Near farm off Chestnut Street, MBTA ROW
COORDINATES: NA
SURFACE EI.: 202 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 70s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 15.0 ft. / El. 187.0 ft. (Based on sample moisture)
AT END OF DRILLING: -
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MC **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0							
	200.0	2	S1	4-4-3-11 (7)	24/16		Fill		S1 - Top 14": Silty SAND (SM), fine to medium, ~20% fines, trace asphalt, trace slag, dark brown to black, moist Bot. 2": Silty SAND (SM), fine, trace medium to coarse, 15-20% fines, trace organic fines, trace wood, trace roots, light brown to orange, moist
			S2	4-3-2-2 (5)	24/17				S2 - Similar to Bot. 2" of S1, fine, 20-25% fines, trace fine subangular gravel
		4							
5			S3	0-0-1-1 (1)	24/20				S3 - Similar to S2
		6						6.6	S4 - Top 7": Similar to S2, tan to orange
	195.0		S4	0-10-11-19 (21)	24/13		Sand		Bot. 6": Poorly Graded SAND (SP), fine, trace medium, ~5% fines, light brown, moist
		8	S5	8-14-12-10 (26)	24/17				S5 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, trace fine gravel, light brown, moist
10		10							
	190.0								
15		15	S6	28-37-35-53 (72)	24/18				▽ S6 - Silty SAND with Gravel (SM), fine to coarse, ~15% fines, ~30% fine subangular gravel, light brown, wet
	185.0	17							
20		20	S7	23-26-89-30 (115)	24/24				S7 - Silty SAND with Gravel (SM), fine, ~20% fines, 15-20% fine angular gravel, light brown, wet
	180.0	22						22.0	
25									Bottom of borehole at 22.0 feet. Backfilled borehole with drill cuttings.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

BORING LOG

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CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/8/18 **DATE COMPLETED:** 6/8/18
BORING LOCATION: Behind farm off Chestnut Street
COORDINATES: NA
SURFACE El.: 202 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 80s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 16.1 ft. / El. 185.9 ft. (Based on sample moisture)
AT END OF DRILLING: 17.5 ft. / El. 184.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MC **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.5 / 201.5	S1 - Top 6": Silty SAND (SM), fine, trace medium, 20-25% fines, trace fine gravel, trace roots, trace organic fines, trace leaves, dark brown, moist
	200.0	2	S1	3-4-17-22 (21)	24/20		Fill	2.0 / 200.0	Mid. 8": Silty SAND (SM), fine to medium, trace coarse, ~20% fines, trace fine gravel, trace organic fines, trace wood, trace asphalt, dark brown to black, moist
		3	S2	30-80	12/10	1			Bot. 6": Poorly Graded SAND with Silt and Gravel (SP-SM), fine, trace medium to coarse, 5-10% fines, 15-20% fine to coarse angular gravel, light brown, moist
5		5							S2 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine, trace medium to coarse, 5-10% fines, ~15% fine angular gravel, light brown, moist REMARK 1: Auger chattered from 3 feet to 5 feet. Observed pieces of gravel in drill cuttings.
	195.0	7	S3	15-39-30-29 (69)	24/18				S3 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, ~10% fines, ~20% fine to coarse angular gravel, light brown to tan, moist
		9	S4	21-24-32-31 (56)	24/16				S4 - Similar to S3
10		11	S5	33-51-52-46 (103)	24/17				S5 - Similar to S3, 10-15% fines, 25-30% fine angular gravel
	190.0						Sand		
15		15	S6	9-43-28-26 (71)	24/16				S6 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 20-25% fine subangular gravel, light brown, moist (wet at Bot. 3")
	185.0	17							
20		20	S7	21-28-26-21 (54)	24/18				S7 - Silty SAND (SM), fine, trace medium, ~20% fines, ~5% fine subangular gravel, light brown to gray, wet
	180.0	22						22.0	Bottom of borehole at 22.0 feet. Backfilled borehole with drill cuttings.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

BORING LOG

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LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/11/18 **DATE COMPLETED:** 6/11/18
BORING LOCATION: Off farm near Chestnut Street, MBTA ROW
COORDINATES: NA
SURFACE El.: 203 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 32 ft.
WEATHER: 70s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 15.0 ft. / El. 188.0 ft. (Based on sample moisture)
AT END OF DRILLING: -
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MC **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.4 / 202.6	S1 - Top 5": Silty SAND (SM), fine, 25-30% fines, trace fine to coarse subangular gravel, trace organic fines, trace grass, trace roots, dark brown, moist
			S1	3-10-8-7 (18)	24/13		Fill		Bot. 8": Silty SAND (SM), fine, trace medium, ~15% fines, trace organic fines, trace roots, trace leaves, trace wood, tan, moist
		2						2.5 / 200.5	S2 - Top 6": Silty SAND (SM), fine, trace medium, 15-20% fines, trace fine subangular gravel, trace organic fines, trace asphalt, trace wood, dark brown to black, moist
	200.0		S2	13-12-11-13 (23)	24/20				Bot. 14": Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown moist
		4							S3 - Well Graded SAND (SW), fine to coarse, 0-5% fines, 5-10% fine gravel, light brown, moist
5			S3	10-9-9-8 (18)	24/13				
		6							S4 - Well Graded SAND (SW), fine to coarse, ~5% fines, 10-15% fine subangular gravel, light brown, moist
			S4	12-17-16-17 (33)	24/11	1			REMARK 1: Auger chattered from 7 feet to 8 feet.
	195.0	8							
			S5	8-67-68-35 (135)	24/12				S5 - Well Graded SAND with Gravel (SW), fine to coarse, ~5% fines, 15-20% fine gravel, light brown, moist
10		10							
	190.0						Sand		
15		15							▽ S6 - Silty SAND (SM), fine, ~15% fines, light brown, wet
			S6	7-8-8-8 (16)	24/15				
		17							
	185.0								
20		20							S7 - Silty SAND (SM), fine, trace medium, ~20% fines, trace fine gravel, light brown to gray, moist
			S7	17-18-23-22 (41)	24/18				
		22							
	180.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

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BORING LOG

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CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		25						200.5	
			S8	41-19-24-31 (43)	24/16				S8 - Similar to S7, ~5% fine subrounded gravel
		27							
	175.0						Sand		
30									
		30							S9 - No recovery
			S9	13-18-20-17 (38)	24/0				
		32						32.0	
	170.0								Bottom of borehole at 32.0 feet. Backfilled borehole with drill cuttings.
35									
	165.0								
40									
	160.0								
45									
	155.0								
50									
	150.0								
55									
	145.0								
60									

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BORING LOG

B-MP-1
PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/26/18 **DATE COMPLETED:** 6/26/18
BORING LOCATION: Driveway near 49 Forest Avenue
COORDINATES: NA
SURFACE EI.: 214 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 15 ft.
WEATHER: 80s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 10.0 ft. / El. 204.0 ft. (Based on sample moisture)
AT END OF DRILLING: 10.0 ft. / El. 204.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	G1		24/24		Topsoil	2.0	G1 - Poorly Graded SAND with Silt (SP-SM), fine to medium, ~10% fines, 5-10% fine subangular gravel, trace organic fines, trace roots, brown, moist
		2	G2		42/42		Fill	6.0	G2 - Silty SAND (SM), fine, ~20% fines, trace fine subrounded gravel, trace organic fines, trace roots, trace wood, orange to brown, moist
	210.0								
5		5.5	G3		6/6				G3 - Similar to G2, 15-20% fines, brown
		6	S1	4-5-33-45 (38)	24/17	1			REMARK 1: Borehole was previously vacuum explored on 6/6/18. S1 - Silty SAND (SM), fine, trace medium to coarse, 20-25% fines, 5-10% fine subangular gravel, light brown to orange, moist
	205.0	8	S2	10-39-27-50 (66)	24/18		Sand		S2 - Silty SAND (SM), fine, trace coarse, ~30% fines, angular stone fragments, gray, moist
10		10	S3	15-23-26-37 (49)	24/8				S3 - Silty SAND (SM), fine, trace medium to coarse, ~20% fines, ~5% fine subangular gravel, angular stone fragments, orange, wet
		12	S4	20-120/3"	9/9				S4 - Silty SAND (SM), fine, trace medium to coarse, ~25% fines, trace fine to coarse subrounded gravel, trace weathered rock, light brown, wet
		12.8				2			REMARK 2: Drill chattered from 13 feet to 15 feet.
	200.0	14	S5	15-120	12/10				S5 - Similar to S4, angular stone fragments
15		15						15.0	Bottom of borehole at 15.0 feet. Backfilled borehole with drill cuttings.
	195.0								
20									
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/7/18 **DATE COMPLETED:** 6/8/18
BORING LOCATION: Roadway near 100 Forest Avenue
COORDINATES: NA
SURFACE EI.: 227 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 12.5 ft.
WEATHER: 70s / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 11.0 ft. / El. 216.0 ft. (Based on sample moisture)
AT END OF DRILLING: 5.0 ft. / El. 222.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Justin Emma
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.8					Asphalt	0.8	Drilled through 10 inches of asphalt.
	225.0		G1				Fill	226.2	G1 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, 5-10% fines, 30-35% fine to coarse subangular gravel, trace asphalt, brown, moist
5									
		6	S1	120/1"	1/0	1		6.0	
	220.0	6.1					Boulder	221.0	REMARK 1: Borehole was previously vacuum explored to a depth of 6 feet on 6/4/18.
		8	S2	120/0"	0/0	2			S1 - No recovery REMARK 2: Auger refusal at 7 feet. Switched to 4 inch casing. Open hole at 7 feet.
		8							S2 - No recovery
10								11.0 ▽	
		11	S3	120/4"	4/3		Sand	216.0	S3 - Silty SAND (SM), fine, trace medium to coarse, ~25% fines, trace fine subrounded gravel, light brown to orange, wet
	215.0	11.5				3		12.5	REMARK 3: Hole collapsed at 12.5 feet.
									Bottom of borehole at 12.5 feet. Backfilled borehole with drill cuttings. Restored ground surface with asphalt cold patch.
15									
	210.0								
20									
	205.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

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BORING LOG

B-MP-4
PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/7/18 **DATE COMPLETED:** 6/7/18
BORING LOCATION: Intersection of Forest Ave. and Marlborough St.
COORDINATES: NA
SURFACE El.: 231 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 16 ft.
WEATHER: 70s / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 10.0 ft. / El. 221.0 ft. (Based on sample moisture)
AT END OF DRILLING: 10.0 ft. / El. 221.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Justin Emma
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	230.0	0.8					Asphalt	0.8	Drilled through 10 inches of asphalt.
			G1				Fill	230.2	G1 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, ~20% fine subangular gravel, brown, moist
		4						4.0	
5			G2					227.0	G2 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, trace fine subrounded gravel, light brown, moist
	225.0	6				1			REMARK 1: Borehole was previously vacuum explored to a depth of 6 feet on 6/4/18.
			S1	2-2-2 (4)	24/2				S1 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, trace fine subrounded gravel, light brown, moist
		8	S2	8-7-6-5 (13)	24/5				S2 - Silty SAND (SM), fine to medium, ~15% fines, light brown to orange, moist
10		10					Sand		
	220.0		S3	2-3-3-6 (6)	24/14				S3 - Silty SAND (SM), fine, trace medium, ~15% fines, trace fine subrounded gravel, brown to gray, wet
		12	S4	6-8-25-37 (33)	24/18				S4 - Similar to S3, fine, angular stone fragments, tan to gray
		14							
15			S5	11-9-14-17 (23)	24/15				S5 - Silty SAND with Gravel (SM), fine, ~15% fines, 15-20% fine subrounded gravel, light brown to orange, wet
	215.0	16						16.0	
									Bottom of borehole at 16.0 feet. Backfilled borehole with drill cuttings. Restored ground surface with asphalt cold patch.
20									
	210.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/7/18 **DATE COMPLETED:** 6/7/18
BORING LOCATION: Roadway near 126 Forest Avenue
COORDINATES: NA
SURFACE El.: 240 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 70s / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: Not encountered
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Justin Emma
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.8					Asphalt	0.8	Drilled through 9 inches of asphalt.
5	235.0		G1				Sand	239.2	G1 - Silty SAND (SM), fine, trace medium to coarse, ~20% fines, 0-5% fine to coarse subrounded gravel, brown to orange, moist
		6	S1	15-8-11-17 (19)	24/18	1			REMARK 1: Borehole was previously vacuum explored to a depth of 6 feet on 6/4/18. S1 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine, trace medium to coarse, 10-15% fines, ~25% fine subrounded gravel, brown, moist
		8	S2	20-18-30-32 (48)	24/20				S2 - Weathered rock fragments
10	230.0	10						10.0	Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings. Restored ground surface with asphalt cold patch.
15	225.0								
20	220.0								
25	215.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

BORING LOG

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LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/7/18 **DATE COMPLETED:** 6/7/18
BORING LOCATION: Roadway near Forest Avenue and Richardson Street
COORDINATES: NA
SURFACE EI.: 232 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 15 ft.
WEATHER: 70s / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 5.0 ft. / El. 227.0 ft. (Based on sample moisture)
AT END OF DRILLING: 9.0 ft. / El. 223.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Justin Emma
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.8					Asphalt	0.8	Drilled through 9 inches of asphalt.
	230.0		G1				Fill	231.2	G1 - Silty SAND (SM), fine, trace medium to coarse, ~20% fines, 0-5% fine to coarse subrounded gravel, trace organic fines, dark brown, moist
		3	G2						G2 - Silty SAND (SM), fine to medium, trace coarse, ~20% fines, trace fine to coarse subangular gravel, trace asphalt, light brown, moist
5		5							
		5.5	G3	0-0-1-2 (1)	24/4	1		5.5	S1 - Silty SAND (SM), fine, trace medium to coarse, 20-25% fines, 0-5% fine gravel, brown, wet
	225.0	6	S1					226.5	G3 - Silty SAND with Gravel (SM), fine to medium, trace coarse, 20-25% fines, 25-30% fine to coarse subrounded gravel, brown to orange, wet
		7	S2	12-15-23-20 (38)	24/17				REMARK 1: Borehole was previously vacuum explored to a depth of 6 feet on 6/5/18.
		9	S3	12-19-21-18 (40)	24/10		Sand		S2 - Silty SAND (SM), fine to medium, ~20% fines, trace weathered rock fragments, light brown to orange, wet
10									S3 - Silty SAND (SM), fine to coarse, ~20% fines, trace fine subrounded gravel, red to brown, wet
		11	S4	13-11-35-17 (46)	24/15				S4 - Well Graded SAND with Silt (SW-SM), fine to coarse, 10-15% fines, trace fine to coarse subrounded gravel, gray, wet
	220.0	13	S5	6-11-12-15 (23)	24/13				S5 - Similar to S4, weathered rock fragments
15		15						15.0	Bottom of borehole at 15.0 feet. Backfilled borehole with drill cuttings. Restored ground surface with asphalt cold patch.
	215.0								
20									
	210.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
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BORING LOG

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PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/8/18 **DATE COMPLETED:** 6/8/18
BORING LOCATION: Roadway near 153 Forest Avenue
COORDINATES: NA
SURFACE El.: 231 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 80s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 8.0 ft. / El. 223.0 ft. (Based on sample moisture)
AT END OF DRILLING: 9.0 ft. / El. 222.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Justin Emma
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	230.0	0.8					Asphalt	0.8	Drilled through 10 inches of asphalt.
			G1				Sand	230.2	G1 - Poorly Graded SAND with Silt (SP-SM), fine, 10-15% fines, trace fine subrounded gravel, light brown to tan, moist
5	225.0	6				1			REMARK 1: Borehole was previously vacuum explored to a depth of 6 feet on 6/5/18.
			S1	0-0-0-0 (0)	24/0				S1 - No recovery
		8							▽ S2 - Similar to G1, no gravel, wet
			S2	1-1-3-3 (4)	24/15				▼
10		10						10.0	
	220.0								Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings. Restored ground surface with asphalt cold patch.
15	215.0								
20	210.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

BORING LOG

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LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/11/18 **DATE COMPLETED:** 6/11/18
BORING LOCATION: Roadway near 156 Forest Avenue
COORDINATES: NA
SURFACE EI.: 221 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 16 ft.
WEATHER: 70s / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 6.0 ft. / El. 215.0 ft. (Based on sample moisture)
AT END OF DRILLING: 7.0 ft. / El. 214.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Justin Emma
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	220.0	0.7					Asphalt	0.7	Drilled through 8 inches of asphalt.
			G1				Fill	220.3	G1 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, ~15% fine subrounded gravel, brown, moist
		3	G2						G2 - Similar to G1, 10-15% fines, ~25% fine subrounded gravel
5		5	G3					5.0	
	215.0	6	S1	2-4-3-2 (7)	24/17		Sand	216.0	G3 - Silty SAND (SM), fine, 15-20% fines, gray, moist
		8	S2	4-3-4-4 (7)	24/20				S1 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium, 10-15% fines, light brown to orange, wet
10		10	S3	1-1-3-3 (4)	24/15				S2 - Poorly Graded SAND with Silt (SP-SM), fine, 5-10% fines, gray, wet
	210.0	12	S4	3-2-3-2 (5)	24/18				S3 - Similar to S2
		14	S5	1-2-2-4 (4)	24/19				S4 - Similar to S2
15		16							S5 - Similar to S2
	205.0							16.0	
									Bottom of borehole at 16.0 feet. Backfilled borehole with drill cuttings. Restored ground surface with asphalt cold patch.
20									
	200.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
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BORING LOG

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CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/15/18 **DATE COMPLETED:** 6/15/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE EI.: 198 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 70s / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: Not encountered
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	6-5-15-34/2" (20)	20/14		Fill		S1 - Poorly Graded SAND (SP), fine to medium, trace coarse, 0-5% fines, 5-10% fine subangular gravel, brown to orange, moist
		1.7							
		2	S2	10-50/1"	7/0				S2 - No recovery
	195.0	2.6							
		4	S3	5-3-3-6 (6)	24/9		Buried Subsoil	194.0	S3 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium to coarse, 10-15% fines, 5-10% fine subrounded gravel, trace organic fines, brown to orange, moist
5		6	S4	19-21-11-10 (32)	24/11		Sand	6.0 192.0	S4 - Silty SAND (SM), fine, trace medium, 15% fines, light brown, moist
	190.0	8	S5	16-29-16-14 (45)	24/12				S5 - Well Graded SAND with Silt (SW-SM), fine to medium, trace coarse, 5-10% fines, ~10% fine to coarse subrounded gravel, light brown, moist
10		10						10.0	Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings.
	185.0								
15									
	180.0								
20									
	175.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

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BORING LOG

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CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/27/18 **DATE COMPLETED:** 6/27/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE El.: 184 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 15 ft.
WEATHER: 70s / Partly Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 6.0 ft. / El. 178.0 ft. (Based on sample moisture)
AT END OF DRILLING: 9.0 ft. / El. 175.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	12-4-5-7 (9)	24/6		Fill		S1 - Poorly Graded SAND (SP), fine, trace medium, 0-5% fines, trace fine subrounded gravel, light brown to gray, moist
		2	S2	24-12-5-5 (17)	24/23			3.1	S2 - Top 13": Silty SAND (SM), fine, trace medium, ~20% fines, ~5% fine to coarse gravel, trace organic fines, trace roots, trace coal ash, dark brown, moist
	180.0	4						180.9	Bot. 10": Poorly Graded SAND (SP), fine, 0-5% fines, light brown, moist
5			S3	5-6-4	24/3				S3 - Poorly Graded GRAVEL with Sand (GP), coarse, trace medium to fine, subrounded, 0-5% fines, ~20% fine sand, light brown, moist
		6	S4	5-4-3-7 (7)	24/13				S4 - Top 7": Poorly Graded SAND (SP), fine, 0-5% fines, light brown, wet Bot. 6": Well Graded SAND (SW), fine to coarse, 0-5% fines, ~5% fine subrounded gravel, brown, wet
		8	S5	5-3-3-3 (6)	24/8		Sand		S5 - Similar to Bot. 6" of S4, gray
	175.0	10							
10									
		13	S6	9-3-5-22 (8)	24/11				S6 - Similar to S5
	170.0	15						15.0	
15									Bottom of borehole at 15.0 feet. Backfilled borehole with drill cuttings.
	165.0								
20									
	160.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
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BORING LOG

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CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/27/18 **DATE COMPLETED:** 6/27/18
BORING LOCATION: MBTA ROW
COORDINATES: NA
SURFACE EI.: 190 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 14 ft.
WEATHER: 70s / Partly Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 10.0 ft. / El. 180.0 ft. (Based on sample moisture)
AT END OF DRILLING: 10.5 ft. / El. 179.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	5-8-9-7 (17)	24/19		Topsoil	0.3 / 189.7	S1 - Top 4": Silty SAND (SM), fine, ~15% fines, trace organic fines, trace wood, black, moist
		2	S2	8-4-3-3 (7)	24/20		Fill		Bot. 15": Poorly Graded SAND with Silt (SP-SM), fine, 5-10% fines, ~5% fine subrounded gravel, light brown, moist S2 - Top 15": Similar to Bot. 15" of S1
		4	S3	3-2-4-6 (6)	24/7				Bot. 5": Silty SAND (SM), fine, trace coarse, ~20% fines, trace organic fines, trace roots, brown to orange, moist S3 - Poorly Graded SAND with Silt (SP-SM), fine, 10-15% fines, trace fine subrounded gravel, trace organic fines, trace roots, dark brown, moist
5	185.0	6	S4	6-5-3-3 (8)	24/9			6.0 / 184.0	S4 - Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 10-15% fines, 5-10% fine to coarse subrounded gravel, trace roots, light brown to orange, moist
		8	S5	4-5-7-7 (12)	24/12				S5 - Well Graded SAND (SW), fine to coarse, 0-5% fines, trace fine gravel, brown, moist
10	180.0	10	S6	6-6-7-4 (13)	24/15		Sand		S6 - Similar to S5, wet
		12	S7	5-7-7-6 (14)	24/15				S7 - Similar to S5, brown to orange, wet
		14						14.0	
15	175.0								Bottom of borehole at 14.0 feet. Backfilled borehole with drill cuttings.
20	170.0								
25	165.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
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BORING LOG

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CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/7/18 **DATE COMPLETED:** 6/7/18
BORING LOCATION: Off Main St., MBTA ROW
COORDINATES: NA
SURFACE EI.: 200 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 16 ft.
WEATHER: 70s / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 10.0 ft. / El. 190.0 ft. (Based on measurement)
AT END OF DRILLING: 10.0 ft. / El. 190.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MC **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	3-3-4-4 (7)	24/23		Topsoil	0.6	S1 - Top 7": Silty SAND (SM), fine, trace medium, 25-30% fines, trace organic fines, trace leaves, dark brown, moist
							Subsoil	1.1	Mid. 6": Silty SAND (SM), fine, ~15% fines, trace organic fines, light brown to tan, moist
		2	S2	5-5-5-5 (10)	24/18			198.9	Bot. 10": Poorly Graded SAND (SP), fine, trace medium, ~5% fines, light brown to orange, moist S2 - Silty SAND (SM), fine, ~15% fines, light gray, moist
		4	S3	6-6-7-5 (13)	24/6				S3 - Poorly Graded SAND (SP), fine, ~5% fines, light brown to tan, moist
5	195.0	6	S4	4-6-5-6 (11)	24/13				S4 - Similar to S3, 5-10% fines
		8	S5	8-9-12-10 (21)	24/11		Sand		S5 - Well Graded SAND (SW), fine to medium, trace coarse, ~5% fines, ~10% fine to coarse gravel, light brown, moist
10	190.0	10	S6	8-7-6-5 (13)	24/20				S6 - Poorly Graded SAND (SP), fine, 5-10% fines, light brown, wet
		12	S7	3-4-5-5 (9)	24/15				S7 - Similar to S6
15	185.0	14	S8	2-4-10-9 (14)	24/22				S8 - Similar to S6, trace medium to coarse, trace fine gravel
		16						16.0	Bottom of borehole at 16.0 feet. Backfilled borehole with drill cuttings.
20	180.0								
25	175.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/7/18 **DATE COMPLETED:** 6/7/18
BORING LOCATION: Off Main St., MBTA ROW
COORDINATES: NA
SURFACE EI.: 211 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 70s / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 6.0 ft. / El. 205.0 ft. (Based on sample moisture)
AT END OF DRILLING: -
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MC **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	210.0	0					Topsoil	0.6	S1 - Top 7": Silty SAND (SM), fine, trace medium, 15-20% fines, trace fine gravel, trace organic fines, trace roots, moist
			S1	3-6-6-8 (12)	24/19		Fill	210.4	Bot. 12": Poorly Graded SAND (SP), fine to medium, trace coarse, ~5% fines, 5-10% fine gravel, trace organic fines, orange to light brown, moist
		2	S2	7-9-10-11 (19)	24/15			2.0 209.0	S2 - Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, 10-15% fine gravel, tan, moist
5		4	S3	6-7-10-13 (17)	24/20				S3 - Similar to S2
	205.0	6	S4	12-10-8-9 (18)	24/17		Sand	▽	S4 - Similar to S2, trace coarse sand, trace fine gravel, wet
		8	S5	8-10-13-13 (23)	24/24				S5 - Similar to S2, ~5% fine gravel, wet
10		10						10.0	Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings.
	200.0								
15									
	195.0								
20									
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

BORING LOG

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LGCI Lahlaf Geotechnical Consulting, Inc.

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/7/18 **DATE COMPLETED:** 6/7/18
BORING LOCATION: Off Main St., MBTA ROW
COORDINATES: NA
SURFACE El.: 211 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 16 ft.
WEATHER: 70s / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 8.0 ft. / El. 203.0 ft. (Based on sample moisture)
AT END OF DRILLING: 10.0 ft. / El. 201.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MC **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	210.0	0	S1	3-2-2-2 (4)	24/22		Forest Mat	0.6	S1 - Top 7": Silty SAND (SM), fine, trace medium, ~25% fines, trace organic fines, trace leaves, dark brown, moist (forest mat)
							Topsoil	1.5	Mid. 11": Silty SAND (SM), fine, trace medium, 20-25% fines, trace organic fines, trace roots, trace wood, dark brown, moist
		2	S2	3-7-8-10 (15)	24/17		Subsoil	2.3	Bot. 4": Silty SAND (SM), fine, trace medium, 15-20% fines, trace organic fines, brown to orange, moist
								208.7	S2 - Top 3": Similar to Bot. 4" of S1, trace fine gravel
		4							Bot. 14": Poorly Graded SAND (SP), fine to medium, trace coarse, ~5% fines, light brown, moist
5			S3	5-10-13-12 (23)	24/16				S3 - Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, 5-10% fine gravel, light brown, moist
	205.0	6	S4	14-13-12-12 (25)	24/20				S4 - Similar to S3, ~5% fine gravel
		8	S5	5-7-9-7 (16)	24/19		Sand		S5 - Similar to S3, wet
10		10	S6	9-6-6-7 (12)	24/20				S6 - Similar to S3, ~10% fine gravel, wet
	200.0	12	S7	4-8-10-8 (18)	24/24				S7 - Top 12": Similar to S3, ~5% fine gravel, wet Bot. 12": Silty SAND (SM), fine, ~20% fines, gray to tan, wet
		14	S8	7-9-11-8 (20)	24/20				S8 - Similar to Bot. 12" of S7
15	195.0	16						16.0	Bottom of borehole at 16.0 feet. Backfilled borehole with drill cuttings.
20	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

B-MP-24
PAGE 1 OF 1

CLIENT: Vanasse Hangen Brustlin, Inc.
PROJECT NAME: Proposed Transmission Power Line Borings
LGCI PROJECT NUMBER: 1836
PROJECT LOCATION: Hudson, Massachusetts

DATE STARTED: 6/4/18 **DATE COMPLETED:** 6/4/18
BORING LOCATION: MBTA ROW and Parmenter Road
COORDINATES: NA
SURFACE EI.: 210 ft. NAVD 88 (see note 1) **TOTAL DEPTH:** 10 ft.
WEATHER: 50s / Rain
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: Not encountered
OTHER: -

DRILLING SUBCONTRACTOR: Geosearch, Inc.
DRILLING FOREMAN: Kenny Bylund
DRILLING METHOD: Hollow Stem Augers 4-1/4" I.D.
DRILL RIG TYPE/MODEL: CME 55 LC ATV
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TS **CHECKED BY:** NB

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	2-1-1-2 (2)	24/24		Topsoil	0.5 / 209.5	S1 - Top 6": Silty SAND (SM), fine, ~15% fines, trace fine subrounded gravel, trace roots, trace organic fines, dark brown, moist
		2							Bot. 18": Similar to Top 6", no gravel, no roots, tan to orange
			S2	2-2-5-22 (7)	24/20		Subsoil		S2 - Poorly Graded SAND with Silt (SP-SM), fine, trace medium to coarse, 5-10% fines, trace fine subrounded gravel, trace roots, orange, moist
		4						4.0 / 206.0	
5	205.0		S3	5-26-58-50 (84)	24/18				S3 - Poorly Graded SAND with Gravel (SP), fine to medium, trace coarse, 0-5% fines, ~15% fine subrounded gravel, light brown, moist
		6	S4	39-120/4"	10/5				S4 - Similar to S3, angular stone fragments
		6.8					Sand		
		8	S5	22-35-24-36 (59)	24/16				S5 - Silty SAND with Gravel (SM), fine, trace medium, ~15% fines, ~15% fine subrounded gravel, light brown to orange, moist
10	200.0	10						10.0	Bottom of borehole at 10.0 feet. Backfilled borehole with drill cuttings.
15	195.0								
20	190.0								
25	185.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot using a drawing titled: "Conditions Plans for Notice of Intent Submittal, Sudbury-Hudson Transmission Reliability Project, Hudson, Massachusetts," prepared by VHB and dated February 14, 2018.

CERTIFICATE OF ANALYSIS

Paige Cornell
Vanasse Hangen Brustlin, Inc
101 Walnut Street
Watertown, MA 02272

RE: Eversource Transmission Project (12970.03)
ESS Laboratory Work Order Number: 1810642

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 1:56 pm, Nov 01, 2018

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: Vanasse Hangen Brustlin, Inc
Client Project ID: Eversource Transmission Project

ESS Laboratory Work Order: 1810642

SAMPLE RECEIPT

The following samples were received on October 23, 2018 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Low Level VOA vials were frozen by the Client on October 18, 2018 at 16:00.

Question I: All samples for EPH were analyzed for a subset of the required MCP list per the client's request.

Lab Number	Sample Name	Matrix	Analysis
1810642-01	MP36	Soil	1010, 6010C, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8260B Low, 8270D, 9045, 9050A

CERTIFICATE OF ANALYSIS

Client Name: Vanasse Hangen Brustlin, Inc
Client Project ID: Eversource Transmission Project ESS Laboratory Work Order: 1810642

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Low Level

C8J0541-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Bromomethane (25% @ 20%)

C8J0541-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
1,4-Dioxane (21% @ 20%), Bromoform (27% @ 20%)

CJ82421-BS1 **Blank Spike recovery is above upper control limit (B+).**
Bromomethane (135% @ 70-130%)

CJ82421-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
Bromomethane (40% @ 20%)

8151A Chlorinated Herbicides

1810642-01 **Modified result**
MCPP

1810642-01 **Peaks found in the retention time window for MCPP did not confirm by GC/MS.**

8270D Semi-Volatile Organic Compounds

C8J0525-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (101% @ 80-120%), Pentachlorophenol (116% @ 80-120%)

C8J0525-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
4-Chloroaniline (22% @ 20%)

C8J0525-CCV1 **Initial Calibration Verification recovery is above upper control limit (ICV+).**
4-Nitrophenol , Di-n-octylphthalate

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: Vanasse Hangen Brustlin, Inc
Client Project ID: Eversource Transmission Project

ESS Laboratory Work Order: 1810642

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 04-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Vanasse Hangen Brustlin, Inc
Client Project ID: Eversource Transmission Project

ESS Laboratory Work Order: 1810642

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **1810642-01**

Matrices: ( ) Ground Water/Surface Water (X) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

CAM Protocol (check all that apply below):

(X) 8260 VOC CAM II A	(X) 7470/7471 Hg CAM III B	( ) MassDEP VPH (GC/PID/FID) CAM IV A	(X) 8082 PCB CAM V A	( ) 9014 Total Cyanide/PAC CAM VI A	( ) 6860 Perchlorate CAM VIII B
(X) 8270 SVOC CAM II B	( ) 7010 Metals CAM III C	( ) MassDEP VPH (GC/MS) CAM IV C	(X) 8081 Pesticides CAM V B	( ) 7196 Hex Cr CAM VI B	( ) MassDEP APH CAM IX A
(X) 6010 Metals CAM III A	( ) 6020 Metals CAM III D	(X) MassDEP EPH CAM IV B	(X) 8151 Herbicides CAM V C	( ) Explosives CAM VIII A	( ) TO-15 VOC CAM IX B

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes (X) No ( )
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (X) No ( )
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes (X) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (X) No ( )
E	VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes (X) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes (X) No ( )

Responses to Questions G, H and I below are required for '"Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?	Yes (X) No ( )*
	***Data User Note:** Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.*	
H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	Yes ( ) No (X)*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ( ) No (X)*

****All negative responses must be addressed in an attached laboratory narrative.***

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: _____ Date: November 01, 2018

Printed Name: Laurel Stoddard Position: Laboratory Director

Attachment B

STATE-LISTED SPECIES AND VERNAL POOLS

ATTACHMENT B-1: MNHESP NO TAKE DETERMINATION

ATTACHMENT B-2: STATE-LISTED TURTLE PROTECTION PLAN

ATTACHMENT B-3: TIME OF YEAR RESTRICTIONS

MASSWILDLIFE

DIVISION OF
FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6300 | f: (508) 389-7890
MASS.GOV/MASSWILDLIFE

Jack Buckley, *Director*

October 19, 2018

Denise Bartone
NSTAR Electric dba Eversource Energy
247 Station Drive, SE270
Westwood, MA 02090

Paul Jahnige
DCR Greenways & Trails Program
136 Damon Rd
Northampton, MA 01060

RE:	Applicant:	Denise Bartone
	Project Location:	MBTA Right of Way- Sudbury, Marlborough, Hudson, Stow
	Project Description:	Sudbury–Hudson Transmission Reliability; DCR Phase 2: Mass Central Rail Trail (MCRT)
	NHESP File No.:	**15-34327**

Dear Applicant:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the "Division") received the MESA Project Review Checklist (dated September 2018) with plans, Corridor Management Plan, Turtle Protection Plan, and other required materials, including the for review pursuant to the Massachusetts Endangered Species Act (MESA) (MGL c.131A) and its implementing regulations (321 CMR 10.00).

The proposed project includes the installation of an underground electrical transmission line in the existing MBTA right-of-way (Phase 1), totaling 4 acres of disturbance within Priority Habitat. Total habitat loss from the project will be minimized through compatible management of 1.9 acres of the duct bank and slopes of the construction platform. The Division understands that following the completion of the transmission line project the Department of Conservation and Recreation (DCR) proposes to install a segment of the Mass Central Rail Trail (MCRT) within the final construction platform layout (Phase 2). Eversource and DCR have coordinated to develop a Corridor Management Plan to address ongoing management activities within the right-of-way and an Eastern Box Turtle Protection Plan.

The MESA is administered by the Division, and prohibits the Take of state-listed species. The Take of state-listed species is defined as "in reference to animals…harm…kill…disrupt the nesting, breeding, feeding or migratory activity…and in reference to plants…collect, pick, kill, transplant, cut or process…Disruption of nesting, breeding, feeding, or migratory activity may result from, but is not limited to, the modification, degradation, or destruction of Habitat" of state-listed species (321 CMR 10.02).

The Division has determined that this Project, as currently proposed, will occur **within** the actual habitat of the following state listed species. These species and their habitats are protected in accordance with the MESA. Fact sheets for state-listed species can be found at www.mass.gov/nhesp.

Scientific Name	Common Name	Taxonomic Group	State Status
Terrapene carolina	Eastern Box Turtle	Reptile	Special Concern
Caprimulgus vociferous	Eastern Whip-poor-will	Bird	Special Concern
Catocala herodias gerhardi	Gerhard's Underwing	Butterflies and Moths	Special Concern
Metarranthis pilosaria	Coastal Swamp Metarranthis	Butterflies and Moths	Special Concern

Based on the information provided and the information contained in our database, the Division finds that a portion of this project, as currently proposed, **must be conditioned** in order to avoid a prohibited Take of state-listed species (321 CMR 10.18(2)(a)). To avoid a prohibited Take of state-listed species, the following conditions must be met:

1. The Eastern Box Turtle Protection Plan (dated 5/31/2018) must be implemented as proposed.
2. The Corridor Management Plan for Massachusetts Central Rail Trail and Sudbury-Hudson Transmission Reliability Project (dated 5/31/2018) must be implemented as proposed.
3. Timing restrictions for construction activities within Whip-poor-will habitats must be implemented, as proposed unless otherwise approved by the Division.
4. Within thirty (30) days of the completion of the transmission line project, or as otherwise approved by the Division, the Applicant shall submit a compliance report containing, including a summary of construction timelines and photographs, to the Division documenting the completion of the project.

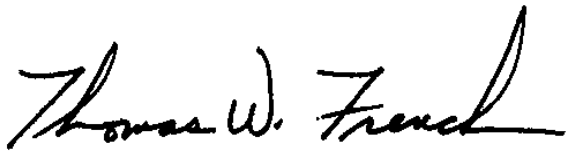
DCR Mass Central Rail Trail (Phase 2)

The Division has been involved in ongoing coordination with DCR regarding the proposed MCRT segment following completion of the transmission line. The Division's review of the Mass Central Rail Trail pursuant to the MESA is ongoing. DCR must submit a supplemental MESA Project Review Checklist which must include site plans for the MRCT for Division review and written approval.

Provided the above-noted conditions are fully implemented and there are no changes to the transmission line project plans, this project will not result in a Take of state-listed species. We note that all work is subject to the anti-segmentation provisions (321 CMR 10.16) of the MESA. This determination is a final decision of the Division of Fisheries and Wildlife pursuant to 321 CMR 10.18. Any changes to the proposed project or any additional work beyond that shown on the site plans may require an additional filing with the Division pursuant to the MESA. This project may be subject to further review if no physical work is commenced within five years from the date of issuance of this determination, or if there is a change to the project.

Please note that this determination addresses only the matter of state-listed species and their habitats. If you have any questions regarding this letter please contact Lauren Glorioso, Endangered Species Review Biologist, at 508-389-6361.

Sincerely,



Thomas W. French, Ph.D.
Assistant Director

cc: John Vieira, VHB
MBTA
Sudbury Conservation Commission
Hudson Conservation Commission
Marlborough Conservation Commission
Stow Conservation Commission

Turtle Protection Plan
Sudbury-Hudson Transmission Reliability Project
NHESP File No. 15-34327
August 2, 2021

Project Overview/Background

The Massachusetts Department of Conservation and Recreation ("DCR") and NSTAR Electric Company d/b/a Eversource Energy ("Eversource") will be constructing a portion of the Massachusetts Central Rail Trail ("MCRT") and installing an underground electric transmission line within an inactive Massachusetts Bay Transportation Authority ("MBTA") railroad right-of-way ("ROW") within the limits of the towns of Sudbury, Marlborough, Stow, and Hudson, Massachusetts. As proposed, the MCRT and the underground electric transmission line, referred to as "the Sudbury-Hudson Transmission Reliability Project" is a joint project (the "Project") to be constructed in a two-phased approach. Phase 1 of the Project will be under the control and responsibility of Eversource and will include vegetation removal, all major earthwork, bridge reconstruction, installation of the underground electric transmission line, upgrades at the existing Sudbury substation, installation of stormwater management features, creation of a gravel-based access road to be used for installation of the MCRT, and revegetation of disturbed areas. Phase 2 of the Project will be under the control of DCR and will include installation of facilities at road crossings, paving the MCRT and final restoration.

Both phases of this Project are associated with NHESP File No. 15-34327, however, each phase of the Project was issued a separate No Take Determination letter from the Natural Heritage & Endangered Species Program ("NHESP") of the Massachusetts Division of Fisheries & Wildlife (the "Division"). Eversource received a No Take Determination letter for the Sudbury-Hudson Transmission Reliability Project on October 19, 2018. DCR received a No Take Determination letter for the MCRT on May 17, 2019.

Condition 1 of the No Take Determination letter for the Sudbury-Hudson Transmission Reliability Project identified that the Eastern Box Turtle Protection Plan ("TPP"), dated 5/31/2018 must be implemented as proposed. The 2018 TPP was developed to protect both Eastern Box Turtle (EBT: *Terrapene Carolina*) and Wood Turtle (WT: *Glyptemys insculpta*) and was based upon field data collected through 2018.

Since the approval of the 2018 TPP, Eversource has continued to collect field data related to the presence and movement of EBT and WT and has developed specific contractor training and responsibilities throughout the permitting phase for the Project. Eversource is submitting this updated TPP to NHESP for their review and approval. This updated TPP contains all the same elements approved in the 2018 TPP, but, is updated with the most current field data and expectations for Contractor Training and environmental monitor oversight during the construction of Phase 1 of the Project.

EBT and WT are listed and protected by the NHESP as "Species of Special Concern". Both EBT and WT are known to occur in Priority Habitat 1040 / Estimated Habitat 1440 (PH 1040 / EH 1440) in Hudson, Marlborough, and Sudbury generally located between Dutton Road in Sudbury and White Pond Road in Hudson. Since 2017 and up to the present, an ongoing field survey for EBT and WT has been completed on the MBTA corridor in Sudbury, Marlborough and Hudson and lands adjacent to it within the mapped

Priority Habitat. As part of this survey, a number of EBT and one WT have been captured and fitted with radio transmitters. Using radio telemetry techniques, the movements of these animals have been closely followed during their active periods. Based on the observations made during this survey, it is now known that there are turtle movements beyond the mapped Priority Habitat. ***Based on survey efforts, the TPP applies to areas along and within the construction corridor between Dutton Road in Sudbury, west to Parmenter Road in Hudson.***

The TPP consists of rigorous measures that will be taken to protect turtles from unintentional injury or death during the construction of Eversource's portion of the Project (Phase 1). The TPP also describes measures that are intended to protect their nests and overwintering locations. DCR will develop a TPP specific to Phase 2 of the project through discussions with the NHESP.

Following construction, rare turtle protective measures will be implemented by Eversource as part of their yearly Operation and Maintenance Plan (OMP) for maintenance and operational work on electric transmission line rights-of-way (ROW). Similarly, DCR will follow their trail Guidelines and Best Management Practices Manual.

The TPP consists of several important components that will work effectively to protect EBT, WT, and other turtle species that may be encountered during construction both within Priority Habitat and elsewhere on the project corridor.

It is the intent that this TPP not be a static document. As construction and on-going turtle survey efforts proceed beyond the construction corridor, changes may be made to the TPP. These changes will be made should new information regarding turtle movements and / or behavior indicate necessary changes to protect turtles during construction activities.

Protective measures that Eversource will follow during construction are as follows:

Pre-Construction

Contractor Education and Awareness Program

Prior to construction, Project construction plans will be developed clearly identifying the locations of sensitive rare turtle habitats. These plans will clearly and concisely identify rare turtle work restrictions and requirements that will be implemented while working within rare turtle habitat.

Prior to construction, all workers who will be working on the Project will be required to attend a rare turtle training session. The session will be conducted by a qualified biologist knowledgeable with EBT and WT biology and behavior. The session will include discussions on rare turtle identification, biology, habitat preferences, natural history, and mandatory work requirements and practices within designated rare turtle habitats. The session will make use of a PowerPoint presentation and handout materials that workers can refer to while working on the Project Site. All attendees of the training session will be required to sign an attendance sheet. ***Following completion on the training session, all workers in attendance will be provided a hard hat sticker. While working on the Project Site, workers will be required to display this sticker on their hard hats to clearly identify trained workers while on site. Workers not trained or trained workers not displaying a sticker on their hard hats will not be allowed on the Project ROW in areas identified as turtle habitat in this TPP (i.e., from Dutton Road to Parmenter Road).*** Additional training sessions will be given as new contractors or crews are added to the workforce.

Refresher training sessions will be given on as need basis should non-compliance activities occur on the Project site.

Environmental Inspectors

Qualified Environmental Inspectors (EI) assigned to the section of the construction corridor where the TPP applies, should be familiar with the biology, behavior and radio telemetry tracking of rare turtles and the measures that are necessary to protect them during construction. The EI(s) shall also be required to either obtain a Scientific Collection or be listed as a subpermittees on such a permit obtained for the Project by a qualified individual.

During Construction

Construction Inspections and Treatment of Animals

Prior to daily work activities within rare turtle habitat between April 1 and October 31, a qualified EI will visibly search (sweep) access roads, work areas in the construction corridor and occasionally in areas adjacent to the construction corridor on the MBTA corridor for rare turtles. Additionally, radio telemetry scans will be made from the construction corridor to locate turtles previously fitted with radio transmitters (as part of ongoing rare turtle survey efforts) near work areas. Pinpoint locations of turtles fitted with radio transmitters outside of the MBTA corridor is not needed, but daily telemetry will be used to determine if their general location(s) are near or within the construction corridor***. Both visible searches and telemetry scans are required. While a number of turtles have been fitted with radio transmitters it must be assumed that all rare turtles in the area of the Project may not have been captured and fitted with transmitters.***

Any rare turtles without previously fitted radio transmitters that are encountered will be fitted with radio transmitters (to make it easier to relocate them during subsequent work excursions into the area). Turtles captured within the Limits of Work will be relocated greater than 500 horizontal feet from their capture points. Attempts will be made to relocate turtles in their perceived direction of travel, avoiding areas of private/no-access properties. In some circumstances it may be necessary to temporarily detain captured turtles and relocate them at the end of the workday. ***Should any rare turtle be located within the construction corridor or the MBTA ROW, proper handling, care, and relocation must follow the "Rare Turtle Capture and Handling Protocol" provided in Attachment A.***

While work is occurring, the area surrounding the work area will also be inspected periodically to ensure that any turtle(s) that may wander into the area will be located and properly moved from harm. If a contractor employee locates a rare turtle in the absence of an EI, he or she will be required to notify the EI as soon as possible for directions on how to proceed.

Rare turtle sweeps and construction oversight for rare turtles will not be required during the dormant season, between November 1 and March 31, when turtles are presumed to be hibernating in locations away from the work area (see particular circumstances described below in "Protection of Turtle Hibernacula" for exceptions to this). However, other wildlife time of year restrictions may apply.

Coordination with Ongoing Turtle Survey

Since 2017, a rare turtle survey has been ongoing in areas that include the MBTA corridor located in Priority Habitat and some of the lands adjacent to it. Because the EI will be responsible for implementing the TPP on the construction corridor only, the inspector will be responsible for direct communications with the biologists completing that study. Information that will be provided to the EI shall include an update on turtle movements of those turtles previously fitted with radio transmitters near the construction corridor. The EI will also be responsible for reporting all rare turtle observations to the survey biologists made during construction and any rare turtles fitted with a radio transmitter (including radio frequency of the transmitter).

The tentative schedule for tracking efforts by the survey biologists is as follows.

- April 15th to May 15, every 10 days.
- Every 7 days during nesting season (May 15 to July 1).
- July to August, every 10 days.
- September to October 15 every 7 days.
- One day at the end of October.
- Hibernacula confirmation in December.

Protection of Turtle Hibernacula

Based on the current data for known hibernacula, since 2017 no tracked rare turtle has hibernated within 100 feet of the Project Site. If, based on ongoing studies, a hibernaculum is identified within 50 feet of the Project Limit of Work for any Project related activities (e.g., tree clearing and/or trenching), NHESP will be contacted to schedule a site visit. During the site visit, potential risks to the hibernaculum and turtle will be determined and if necessary protective measures to be followed during construction will be established. If a hibernaculum is located between 30 and 50 feet of the Limits of Work and Project activities are allowed to continue following NHESP site walk, regular radio checks for turtle movements beyond the hibernaculum will be required especially during periods of unusually warm weather during the typical overwintering period (October 31 through April 1). Special attention needs to be paid to hibernacula relatively close to the construction Limit of Work during the month of March. If a hibernaculum is located closer than 30 feet from the Construction Limit of Work during the overwintering period, construction activity may be limited to only of driving equipment along the construction corridor. If this situation occurs, special attention must be paid to monitoring possible turtle movements from their hibernaculum. If a turtle is found overwintering within 30 feet of the Construction Limits of Work, under limited and rare circumstances, it may be relocated from its hibernaculum but only with direct input from NHESP.

Protection of Turtle Nests

Rare turtles typically nest within well-drained, open areas during evening hours typically between May 25 and July 5. Turtle nests incubate through the summer and hatchlings typically emerge and migrate away from the nest by early October. Based on rare turtle survey efforts completed to date, there have been no turtle nesting areas identified within the project construction corridor. If, based on the ongoing rare turtle survey, work will occur within potential nesting habitat in June through early July, the following protection measures will be implemented.

Survey biologists will conduct evening surveys as part of ongoing turtle tracking studies independent of construction oversight. If there appears to be a rare turtle nesting conflict during construction, the EI will be notified. Searches will be completed within the identified potential nesting habitat areas between May 25 and July 5 to locate females in search of suitable nest locations. Observed state-listed female turtles will be watched from a distance or tracked using thread bobbins to identify nest locations. After females have completed nesting, the nest locations will be flagged for avoidance to prevent destruction of incubating eggs. Efforts will be made to pinpoint the precise nest location.

If nest avoidance is not possible during construction, nests may be excavated by the survey biologists and relocated to a suitable incubation area beyond the limits of work. The biologist will confer with NHESP prior to relocating state-listed turtle nests. All identified state-listed turtle nests will be equipped with predator excluding hardware cloth and treated with cayenne pepper. The nest enclosures will be removed during early September to allow unhindered hatchling egress unless directed otherwise by NHESP.

Other Protective Measures

Erosion control barriers and soil erosion blankets containing plastic or wire mesh can ensnare turtles and other animals resulting in mortality. Therefore, erosion control and stabilization measures containing such mesh (straw wattles, mesh-backed silt fence, and open mesh blankets) will be prohibited within mapped rare turtle habitat. As such, syncopated erosion control barriers and other erosion control devices that will be used within Priority Habitat areas as shown on Project plans and designed to allow for the passage certain wildlife species across the corridor, will not contain plastic or wire mesh as part of their installation. Any area containing erosion control protective measures or syncopated barriers should be inspected regularly for any turtle that may have entered the construction corridor and detained within it. Any turtle found in any such area should be relocated or handled as prescribed in the "Rare Turtle Capture and Handling Protocol" provided in Attachment A. Materials used for erosion barriers or soil erosion blankets within turtle habitat areas must be approved by the EI. Any such measure that is employed within mapped rare turtle habitat will be removed as soon as site stabilization has occurred.

EIs will coordinate with contractors in the field to effectively prevent turtles from falling into open trenches or newly excavated areas. The EI will be responsible for approving and inspecting protective measures designed to prevent turtles from falling into them during non-work hours. During the rare turtle active season (April 1 through October 31), protective measures that may be applied daily may include surrounding open trenches with barriers at the end of each day or covering them with iron plates. Other measures may be acceptable if approved by the EI. At the end of each workday any open trench that is protected in such a manner will be inspected for approval by the EI.

Within the area covered by this TPP, signs shall be placed in strategic locations notifying contractors that the area they are entering and/or working in is subject to special requirements designed to protect wildlife. Any such sign shall meet the requirements of the NHESP.

Post Construction

Following construction of the Eversource underground transmission line, DCR will construct the MCRT. Rare turtle protection measures that will be implemented as part of that construction will follow a TPP specifically developed for work that will be completed by DCR.

As is typical with other Eversource ROW facilities, the company will submit to NHESP an Operations and Maintenance Plan (OMP) on an annual basis for review and approval under the utility maintenance exemption section of the Massachusetts Endangered Species Act (MESA) implementing regulations (321 CMR 10.14 (11)). Rare turtle protective measures that will be adhered to shall follow those typically included in the Company's annual OMP.

Alteration of Turtle Protection Plan Elements

The TPP detailed above is designed to avoid direct mortality to any turtles that are known to use the work area or by chance are found during construction activities. Because work plans may change or weather conditions may necessitate changes in schedules, the TPP offers a certain amount of flexibility to accommodate any such schedule or program change. It is the intention of the TPP to respond to any such change to assure that resident turtles in the planned work area will not be directly harmed by construction equipment or activities. If it is necessary to modify the protective approaches detailed herein, NHESP Staff will be consulted in the development of a modified protective approach.

Data Recording and Reporting

All rare turtle observations will be reported online using the NHESP's Heritage Hub reporting portal. An annual summary report will be submitted to NHESP at the end of each year during construction. The report will include sections on turtle demographics, morphometric data, locational data, movement data and the results of mortality avoidance measures. Additionally, a separate report will be submitted to NHESP detailing rare turtle survey efforts and observations as part of the ongoing rare turtle survey beyond the limits of the Eversource underground transmission line / MCRT construction corridor. That report will include a summary of turtle observation made by the EI for completeness of annual rare turtle observations as part of the overall survey.

Attachment A
Rare Turtle Handling Procedures

Rare turtle Capture and Handling Protocol

Purpose

Eastern Box Turtle (EBT) (*Terrapene carolina*) and the Wood Turtle (WT) (*Glyptemys insculpta*) are state listed in Massachusetts as Species Special Concern. As such, they are protected against direct harm to the individual and protected against destruction or disturbance of their habitats. The purpose of this document is to provide construction personnel with important information that will help reduce the potential for direct harm to individual turtles should they be encountered during construction activities. This document includes information about general habitat use, proper turtle handling procedures, relocation information, contact information of qualified Environmental Inspectors (EI) / Biologists, and representative photographs of both species to assist in proper identification.

General Overview of Eastern Box Turtle Habitat Use

EBTs in the northeast use a variety of habitats over the course of the year based on seasonal availability of food items, life cycle requirements (e.g., nesting and hibernating) and body temperature regulation. A generalized breakdown of this seasonal habitat use is provided below to give contractors an idea of where chance encounters are most likely given the time of year.

- *April through June*. EBTs are typically observed in open fields, early successional scrub-shrub/sapling areas and forest-field edges but may be observed in forested habitats as well. In June, female box turtle may be in open sandy areas with sparse vegetation for nesting.
- *July through September*. EBTs are typically observed in forested uplands and forested wetlands but will sometimes use forest-field edges or dense shrubby areas.
- *October through March*. EBTs use forested habitats almost exclusively but are difficult or impossible to find because they are buried under root/duff layer of the forest floor.

General Overview of Wood Turtle Habitat Use

WT preferred habitat is riparian areas that include slow moving mid-sized streams with sandy bottoms and densely vegetated banks. When not located in riparian habitats they can be found in forests, early successional fields and/or hayfields sometimes great distances from streams.

- *April through June.* WT are found either within slow moving steam or within several hundred meters of them in dense vegetation. They are sometimes found basking in sunlight on stream banks or in areas nearby. In June, female WT may be in open sandy areas with sparse vegetation for nesting.
- *June through early to mid-September*. WT move from riparian habitats into forests, early successional fields and/or hayfields to feed.
- *Mid-September to March*. WT move back into streams or stream banks where they will overwinter.

Methods

Below is a step-by-step process that shall be followed in the event of a rare turtle observation.

1) If an EBT or WT is observed, first determine if the individual is within harm's way. If the individual is observed outside of the exclusion zones (i.e., outside of the work area), then it should not be

handled to minimize disturbance and prevent altering their behavior. Report the observation to the EI as soon as possible. If the EI is not immediately available report the observation to a Biologist.

2) When an EBT or WT is determined to be within harm's way, it should be captured and temporarily detained until the designated EI, or Biologist has been notified and can arrive onsite to perform standard data collection and turtle relocation. Contact the EI or as soon as possible. If the EI is not immediately available report the observation to a Biologist.
3) To properly detain a turtle, place the turtle into a plastic tub. Turtles can easily die from overheating. Therefore, this tub **MUST** be placed in a cool shaded area out of direct sunlight, indoors or out. Outdoor shaded areas must be persistent, that is, make sure that the tub is not in an area that will BECOME sunny later in the day. In addition, fresh vegetation (e.g., leaves, tall grass cuttings) and water **SHALL** be placed into the tub for cover and hydration.
4) When handling an EBT or WT grasp it firmly by the sides of the carapace (top shell). These turtles are typically very shy and will usually retract their head and legs into the shell. If the turtle does not retreat into its shell, be cautious of the turtle's head, mouth, and feet. Although these turtles typically do not bite, they are certainly capable of doing so. In addition, they have very sharp claws and powerful legs for digging, which can scratch the skin.
5) As soon as possible an no greater than one (1) hour of either observing or capturing an EBT or WT, contact the EI for direction. If the EI is not present, contact one of the qualified biologists listed below. Turtles shall not be detained for more than four hours at any time.
6) If an injured EBT or WT is seen or captured, contact the EI or a Biologist as soon as possible. If it is possible to detain the injured turtle, detain it as described in item 3 above.

Contact Information for Environmental Inspectors

Name:	TBI	Name:	TBI
Cell No:	TBI	Cell No:	TBI
Email:	TBI	Email:	TBI

Contact Information for Qualified Biologists

Name:	TBI	Name:	TBI
Cell No:	TBI	Cell No:	TBI
Email:	TBI	Email:	TBI

Eastern Box Turtle Photographs

Plastron of female

Plastron of male

Variation in turtle carapace patterns

Turtle under old hay bale

Partially buried turtle in forested area

2-year old juvenile

Wood Turtle Photographs

Wood Turtle Plastron (bottom shell)

Wood Turtle Carapace (top shell)

Wood Turtle Front View (note bright orange limbs)

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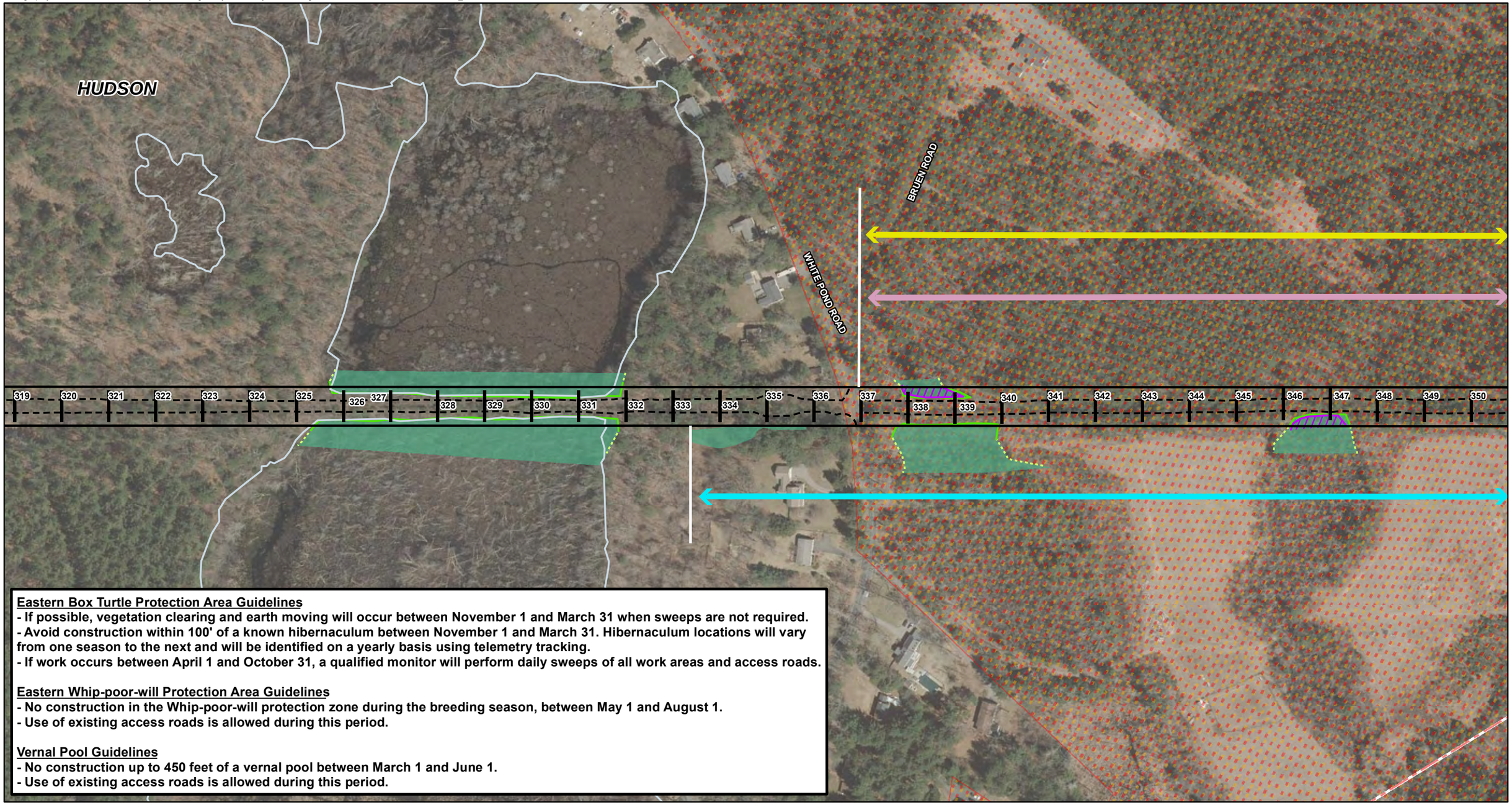

Eastern Box Turtle Protection Area Guidelines
- If possible, vegetation clearing and earth moving will occur between November 1 and March 31 when sweeps are not required.
- Avoid construction within 100' of a known hibernaculum between November 1 and March 31. Hibernaculum locations will vary from one season to the next and will be identified on a yearly basis using telemetry tracking.
- If work occurs between April 1 and October 31, a qualified monitor will perform daily sweeps of all work areas and access roads.

Eastern Whip-poor-will Protection Area Guidelines
- No construction in the Whip-poor-will protection zone during the breeding season, between May 1 and August 1.
- Use of existing access roads is allowed during this period.

Vernal Pool Guidelines
- No construction up to 450 feet of a vernal pool between March 1 and June 1.
- Use of existing access roads is allowed during this period.

Stationing Locations
Limit of Grading
MBTA ROW Boundary
Town Boundaries

Approximate Wetland Edge
Delineated Wetland Edge
Delineated Vernal Pool Edge
Delineated Top of Bank
Land Under Water

10-year Floodplain
Bordering Land Subject to Flooding
Wetland Area
Vernal Pool Area
Land Under Water
NHESP Primary Habitat
NHESP Estimated Habitat

Time of Year Restrictions
Black Racer
Eastern Box Turtle
Eastern Whip-Poor-Will
Vernal Pool

DRAFT

Source:
MassGIS, VHB

10/14/2020

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0 200 400 Feet

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Time-of-Year (TOY) Restrictions and Guidelines

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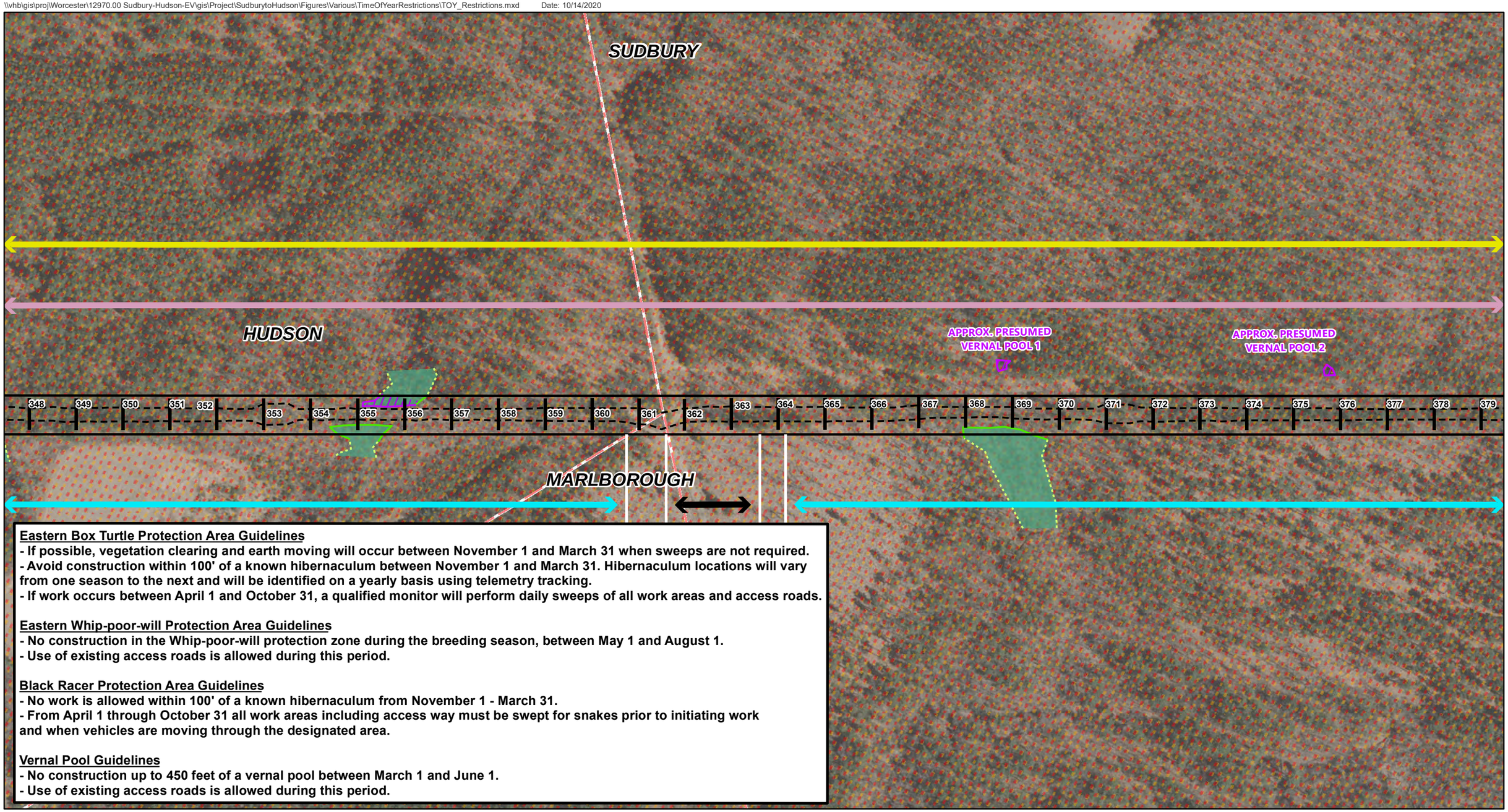

Eastern Box Turtle Protection Area Guidelines
- If possible, vegetation clearing and earth moving will occur between November 1 and March 31 when sweeps are not required.
- Avoid construction within 100' of a known hibernaculum between November 1 and March 31. Hibernaculum locations will vary from one season to the next and will be identified on a yearly basis using telemetry tracking.
- If work occurs between April 1 and October 31, a qualified monitor will perform daily sweeps of all work areas and access roads.

Eastern Whip-poor-will Protection Area Guidelines
- No construction in the Whip-poor-will protection zone during the breeding season, between May 1 and August 1.
- Use of existing access roads is allowed during this period.

Black Racer Protection Area Guidelines
- No work is allowed within 100' of a known hibernaculum from November 1 - March 31.
- From April 1 through October 31 all work areas including access way must be swept for snakes prior to initiating work and when vehicles are moving through the designated area.

Vernal Pool Guidelines
- No construction up to 450 feet of a vernal pool between March 1 and June 1.
- Use of existing access roads is allowed during this period.

Stationing Locations
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MBTA ROW Boundary
Town Boundaries

Approximate Wetland Edge
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Delineated Top of Bank
Land Under Water

10-year Floodplain
Bordering Land Subject to Flooding
Wetland Area
Vernal Pool Area
Land Under Water
NHESP Primary Habitat
NHESP Estimated Habitat

Time of Year Restrictions
Black Racer
Eastern Box Turtle
Eastern Whip-Poor-Will
Vernal Pool

DRAFT

Source: MassGIS, VHB

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Time-of-Year (TOY) Restrictions and Guidelines

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Eastern Box Turtle Protection Area Guidelines
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- Avoid construction within 100' of a known hibernaculum between November 1 and March 31. Hibernaculum locations will vary from one season to the next and will be identified on a yearly basis using telemetry tracking.
- If work occurs between April 1 and October 31, a qualified monitor will perform daily sweeps of all work areas and access roads.

Eastern Whip-poor-will Protection Area Guidelines
- No construction in the Whip-poor-will protection zone during the breeding season, between May 1 and August 1.
- Use of existing access roads is allowed during this period.

Coldwater Fishery Resources (CFR)
- No instream work permitted from October 1 - June 30.

Vernal Pool Guidelines
- No construction up to 450 feet of a vernal pool between March 1 and June 1.
- Use of existing access roads is allowed during this period.

Stationing Locations
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Vernal Pool Area
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NHESP Primary Habitat
NHESP Estimated Habitat

Time of Year Restrictions
Black Racer
Eastern Box Turtle
Eastern Whip-Poor-Will
Vernal Pool

DRAFT

Source: MassGIS, VHB

10/14/2020

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Black Racer
Eastern Box Turtle
Eastern Whip-Poor-Will
Vernal Pool

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Source:
MassGIS, VHB

10/14/2020

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Eastern Box Turtle
Eastern Whip-Poor-Will
Vernal Pool

DRAFT

Source:
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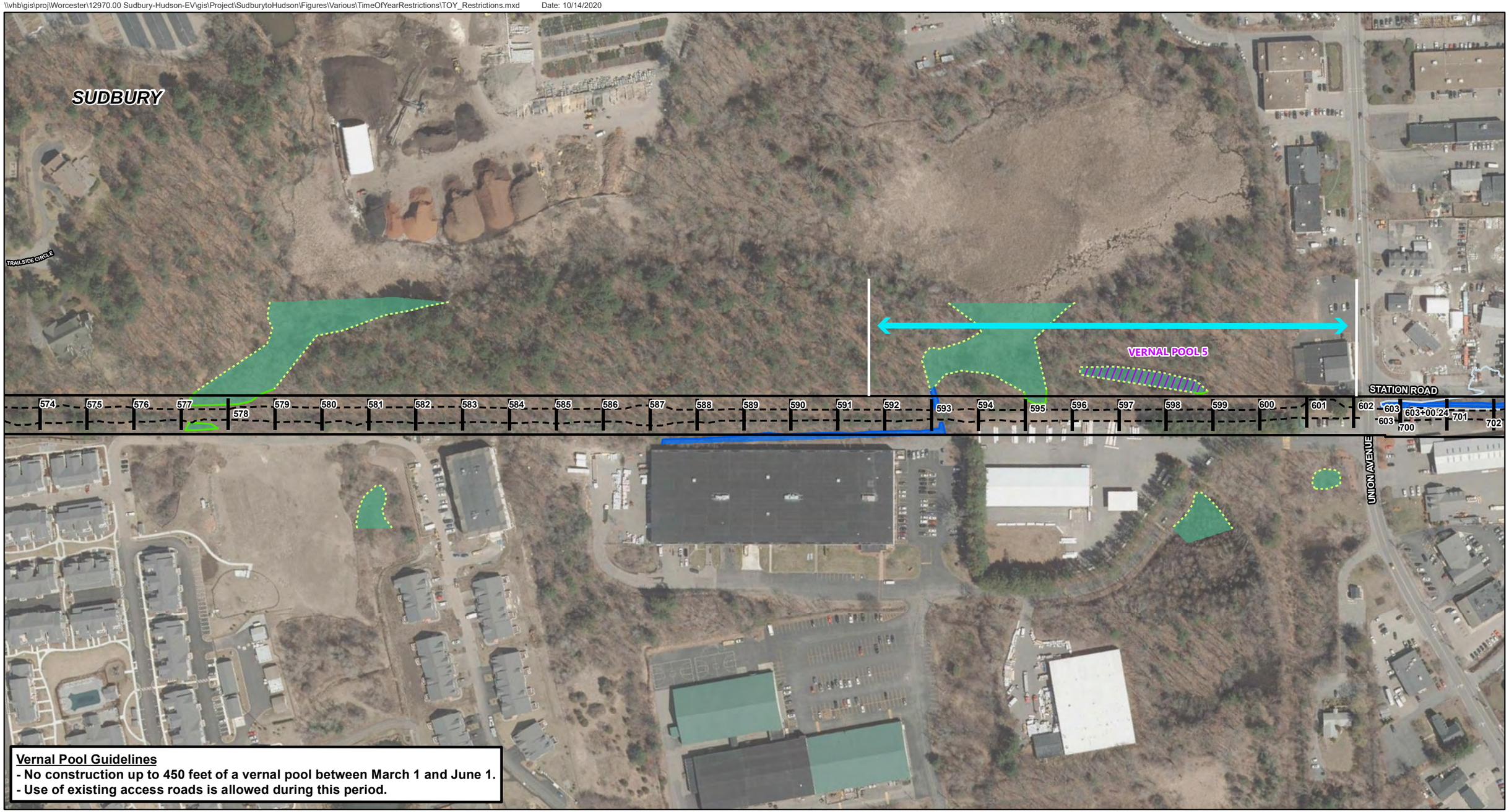

Vernal Pool Guidelines
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NHESP Estimated Habitat

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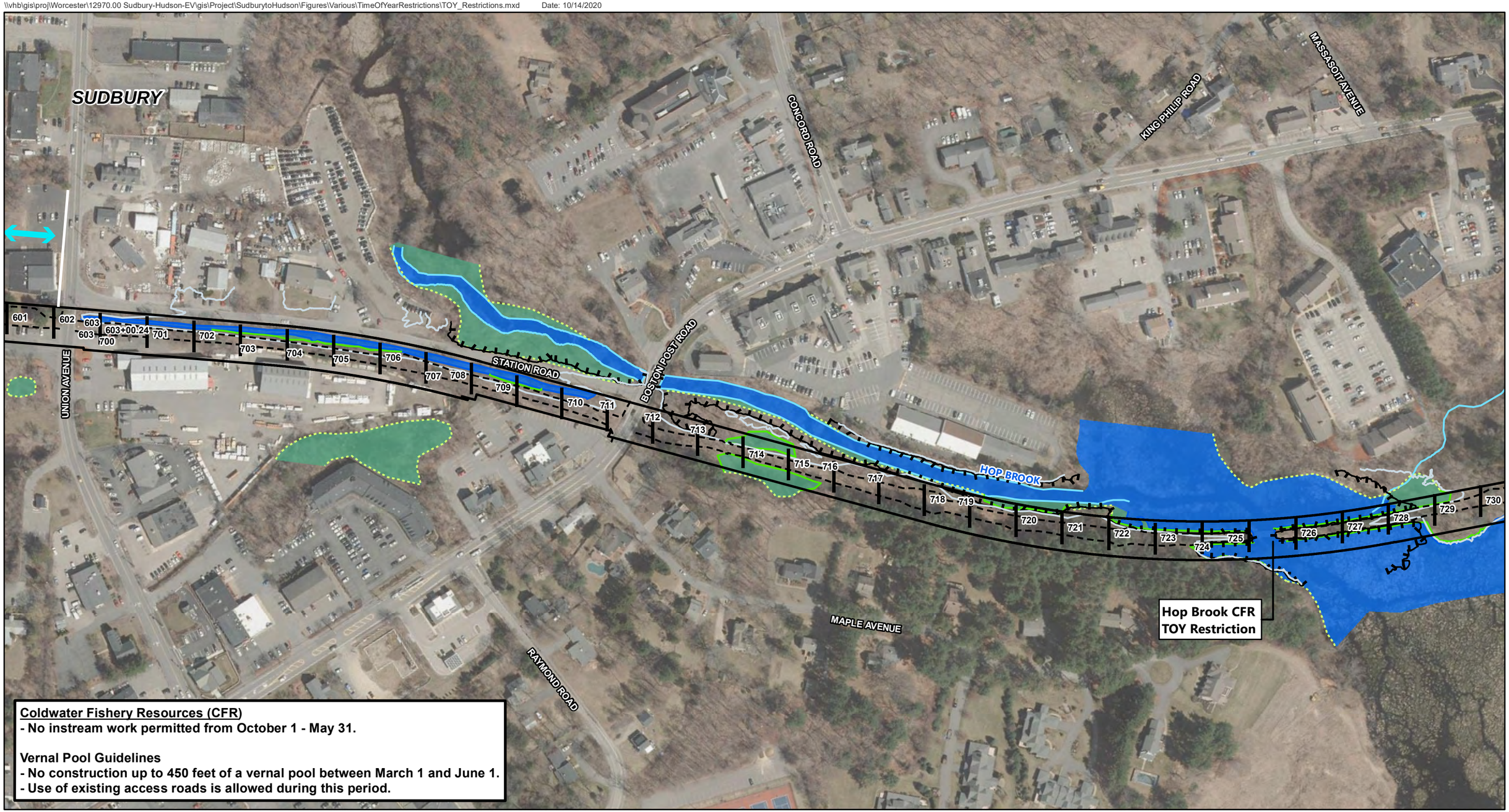

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Vernal Pool

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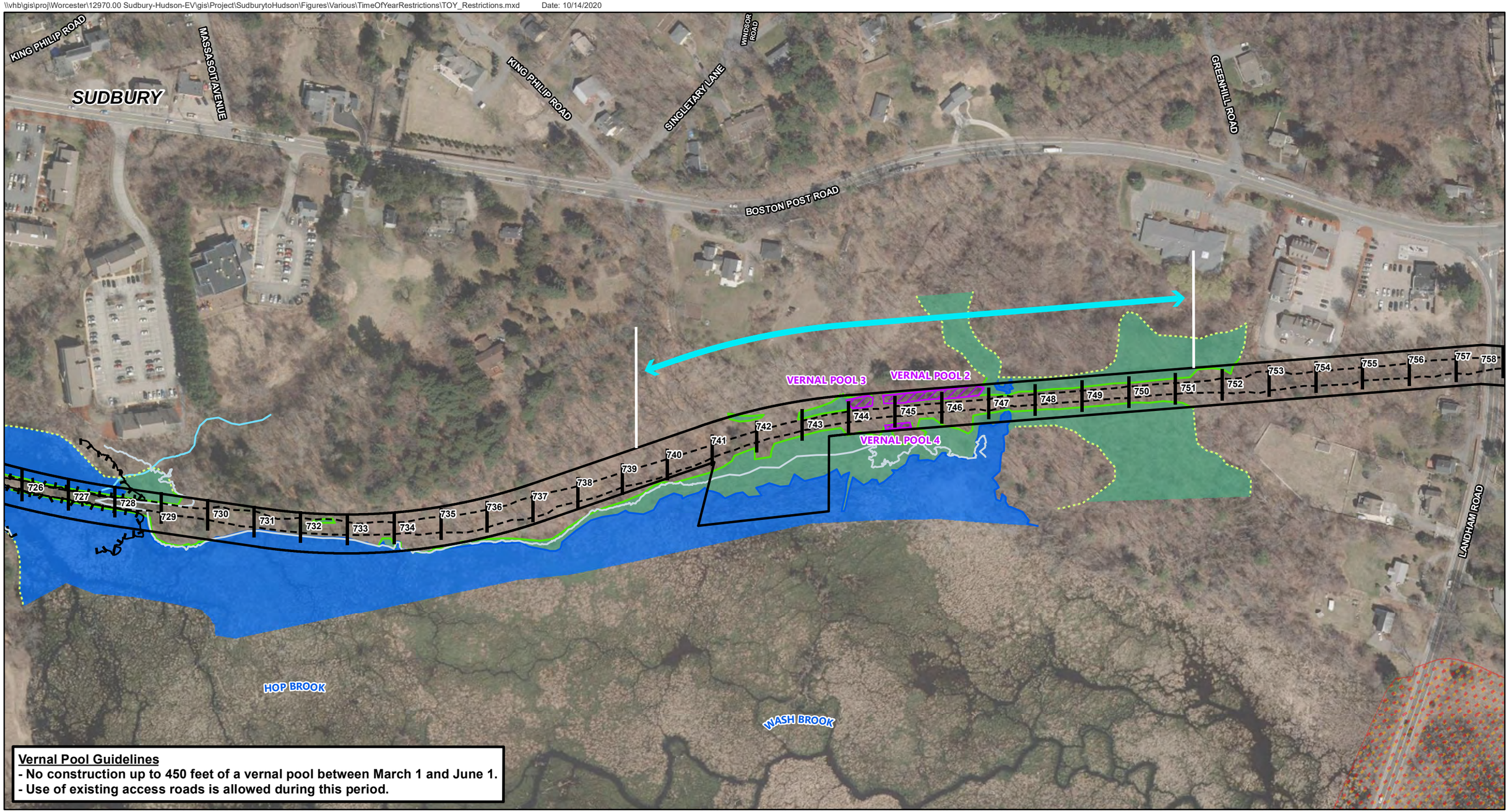

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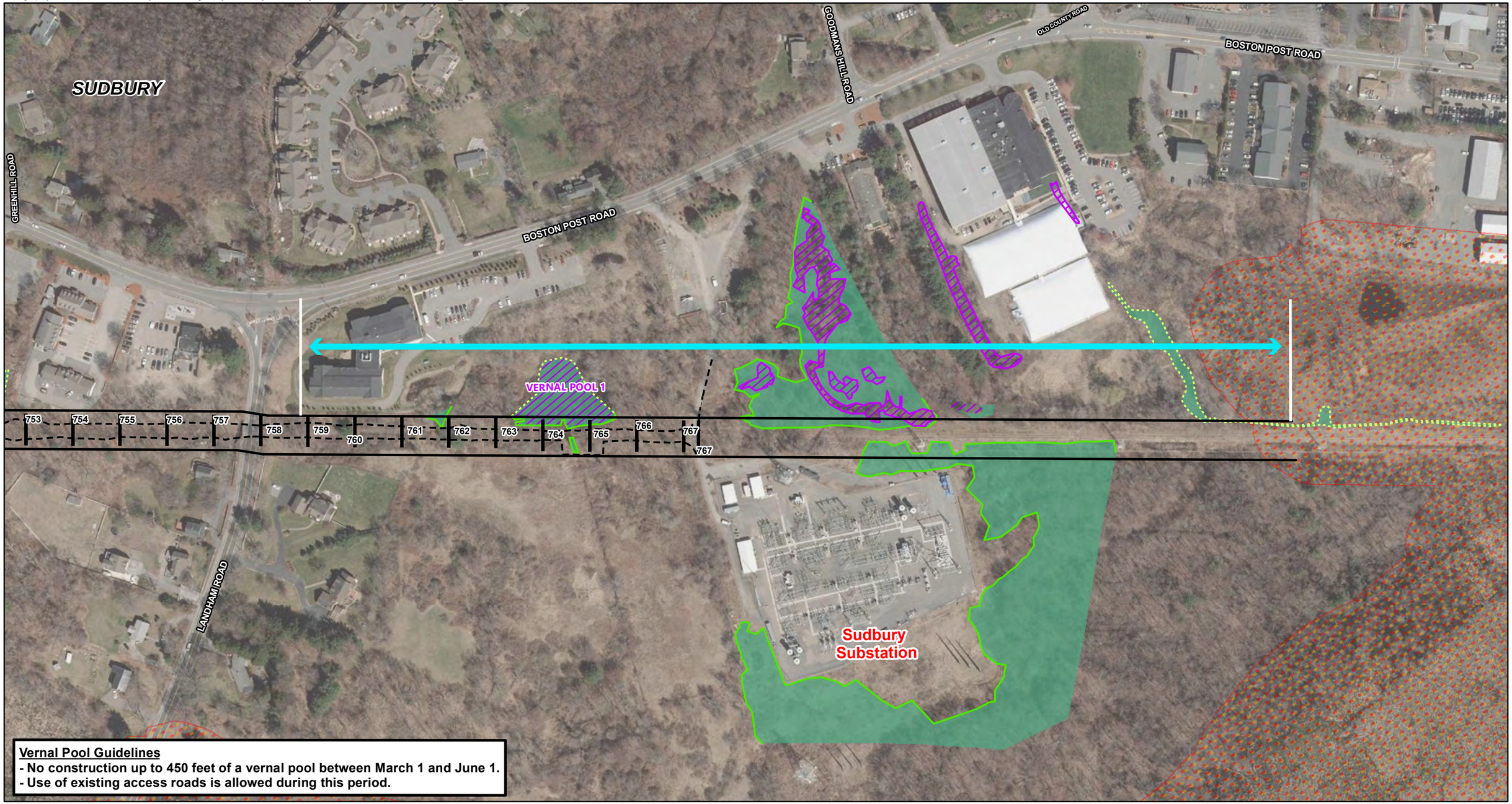

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EVERSOURCE ENERGY

Sudbury-Hudson Transmission Reliability and Mass Centrail Rail Trail Project

Time-of-Year (TOY) Restrictions and Guidelines

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Attachment C

Important Wildlife Habitat Features

SWCA
ENVIRONMENTAL CONSULTANTS
Sound Science. Creative Solutions.®

1900 West Park Drive, Suite 280
Westborough, Massachusetts 01581
Tel 413.256.0202
www.swca.com

March 3, 2022

Lori Capone, Conservation Coordinator
Sudbury Conservation Commission
275 Old Lancaster Road
Sudbury, MA 01776

Re: Important Wildlife Habitat Features Mapping and Supplemental Restoration Plan
Sudbury to Hudson Transmission Reliability Project
Sudbury, Massachusetts
SWCA Project No. 00678949-000-AMH

Dear Ms. Capone and Sudbury Conservation Commission Members:

SWCA Environmental ("SWCA") has developed this report and associated mapping on behalf of NSTAR d/b/a Eversource Energy ("Eversource)" and as per Special Condition L of Part II: Conditions Specific to Phase I: Eversource Underground Transmission Line in the Order of Conditions issued by the Sudbury Conservation Commission ("Commission") on February 4, 2021, for the Sudbury to Hudson Transmission Reliability Project ("the Project") (MADEP File No. 301-1287). Specifically, this Special Condition requires the Applicant's wildlife biologist or other qualified individual to document the location of all important habitat features that will be removed (such as brush piles, snags, overhanging trees, logs within or near the water, large woody debris, etc.).

The following sections provide detailed descriptions of the method of data collection implemented to document important habitat features and presents the results along with proposed restoration measures to supplement the previously approved plans associated with the Order of Conditions for the Project. This information will be utilized by the Environmental Monitor and the Contractor during construction for each wetland impact area along the Project in Sudbury to finalize the exact location of the installation of the wildlife habitat features proposed to restore disturbed areas and to ensure that the Project will not result in an adverse effect to important wildlife habitat features. Please note that the Commission reviewed and approved certain important wildlife habitat feature restoration measures, such as the installation of brush piles in wetland impact areas as part of the approved plans for the Project. Also, as per the findings in the Order of Conditions, the Sudbury Conservation Commission has already found that the project as designed would meet the performance standards of the Wetlands Protection Act and the Sudbury Wetlands Administration Bylaw, including for wildlife habitat. As required by this Special Condition, supplemental reports will be provided to the Commission every six months, for the life of the Order, documenting wildlife habitat feature removal and restoration efforts implemented in each wetland impact area in Sudbury.

WILDLIFE HABITAT FEATURES REVIEWED

A Detailed Wildlife Habitat Evaluation was originally completed by VHB during the Notice of Intent process for the Project. Specifically, VHB submitted a Detailed Wildlife Habitat Evaluation with the Notice of Intent filed in March 2020 and then provided additional detail and information related to

important wildlife habitat features on October 15, 2020 (see Attachment A- Wildlife Habitat Summary Tables).

On September 6, 2021, wildlife biologists with SWCA Environmental Consultants (SWCA) have reviewed and documented important habitat features within 100 feet of vernal pool locations and within 200 feet of Hop Brook in the Town of Sudbury along the Project corridor. An additional survey was conducted on January 27, 2022, during which SWCA wildlife biologists reviewed all Wetland Impact Areas identifying locations of snags, overhanging trees, and trees (both live and dead) with cavities. During the January site visit, SWCA reviewed and updated data on previously observed snags. It is important to note that a handful of snags have fallen since the last visit. It is also important to note that as survey parameters have changed, additional snags have been identified. Please refer to Attachment B for mapping of the reviewed habitat features and Attachment C for representative site photographs.

The evaluation completed by SWCA is consistent with VHB's Detailed Wildlife Habitat Evaluation and in accordance with 310 CMR 10.60, of the implementing regulations of the Massachusetts Wetlands Protection Act (WPA) (MGL Ch. 131 s. 40), and the 2006 Massachusetts Wildlife Habitat Protection Guidance for Inland Resources[1] (Guidance). As identified during the NOI process, the Guidance does not specifically state size requirements for habitat features such as brush piles, woody debris, or snags to be considered significant. As previously mentioned, this mapping and evaluation of important wildlife habitat features within the proposed Impact Areas along the Project was completed to supplement the previous evaluations and to finalize the restoration approach within each impact area. It is important to note that trees and tree limbs fall over time, which may cause minor discrepancies in the data between observation periods; snags were observed even within the four-month period between SWCA's surveys in September 2021 and January 2022 to have fallen creating downed woody debris.

SNAGS

As part of the Detailed Wildlife Habitat Evaluation completed during the NOI process, all snags within the Project Site and the proposed limits of work were counted. It was determined that snags removed from the impact areas would not result in an adverse effect to wildlife habitat given the general abundance of snags in the remaining and undisturbed portions of the Project Site. As part of this exercise to comply with the Special Condition, this evaluation was completed to specifically map each snag within the Wetland Impact Areas and to determine if any supplemental restoration or mitigation could be implemented. All snags within Wetland Impact Areas were surveyed with a tablet/geode capable of sub-meter accuracy, diameter-at-breast-heigh (DBH) was estimated and recorded. Each snag was evaluated for potential in providing significant wildlife habitat functions. If there was no evidence of existing wildlife habitat function or potential for these functions, the dead tree was not regarded as an important habitat feature.

[1] Massachusetts Department of Environmental Conservation. 2006. Massachusetts Wildlife Habitat Protection Guidance of Inland Wetlands. MassDEP, Bureau of Resource Protection, Wetlands and Waterways Program, Boston, MA. 64 pp.

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Determination of significance in providing important wildlife habitat function was based on size (as estimated by DBH), the presence of insect holes or cavities, proximity to open water, and perching opportunities. The following criteria were used to establish significance of each snag:

- All snags with a DBH of less than 1-inch were considered **not significant**.
- All snags with a DBH of greater than or equal to 5 inches were considered **significant.**
- Snags with a DBH 1-5 inches with any of the following features were considered **significant**:
    - Evidence of many insect holes;
    - Small or large cavities that could be used by wildlife;
    - Significant decay;
    - Actively used by wildlife;
    - Adjacent to water;
    - Peeling bark that could be used for bat roosting; or
    - Branches that would be suitable for perching.
- Snags within a DBH of 1-5 inches that lacked the above characteristics were considered to have **low significance.**

During the January 2022 survey, SWCA observed that several previously identified significant snags have fallen. The mapping data has therefore been updated by removing any fallen snags and adding any new significant snags. A total of 46 significant snags were identified within the Sudbury Project route with five (5) of the significant snags also having cavities. Photos 1 through 7, in Attachment C, show snags within Wetland Impact Areas along the Project route.

BRUSH PILES / LARGE WOODY DEBRIS

As part of the Detailed Wildlife Habitat Evaluation completed during the NOI process, all brush piles/large woody debris within the Project Site and the proposed limits of work were counted. The approved restoration plan included the installation of brush piles and woody debris within certain Wetland Impact Areas. As part of this exercise to comply with the Special Condition, this evaluation was completed to specifically map each existing brush pile/large woody debris within the Wetland Impact Areas to inform the Environmental Monitor and the Contractor where to install the approved “restoration brush piles”. In general, brush piles and large woody debris are defined as fallen woody material, such as tree limbs, fallen trees, and logs. They can be an important habitat feature, as they provide breeding/nesting areas, shelter, and overwintering/hibernation habitat. Large woody debris can be in the form of a single or pile or fallen trees or large limbs.

Fallen trees and brush within each Wetland Impact Area and within 200 feet of both Hop Brook bridge crossings were assessed in accordance with the following criteria:

- Trees and brush deemed to be **significant** were identified as those which:

  - overhang over water, allowing for wildlife to span across the wet area;
  - are partially submerged within the water, allowing for potential for egg mass attachment in vernal pools;
  - have fallen and are decomposing; and/or
  - have fallen and created a shelter-like feature.

- Individual fallen trees and branches that did not display any of the above features were deemed **not significant.**

It is important to note that there are several brush piles and large woody debris currently located within some of the Wetland Impact Areas, which were cut and placed there by people. Though these features were man-made, and the habitat functions provided by them were most likely not made intentionally, if they appear to display any of the above-mentioned features, they were identified and deemed **significant**.

Within the Wetland Impact Area within the Project route in Sudbury, a significant quantity of brush piles/ woody debris was observed in Wetland Impact Area 5 and 19. Several brush piles and woody debris, along route, appear to be cut and placed by people, possibly to clean up the walking path. Please refer to Photos 10 through 12 in Attachment C.

CAVITIES

As part of the Detailed Wildlife Habitat Evaluation completed during the NOI process, all cavities within the Wetland Impact Areas were counted. During the most recent survey in January 2022, SWCA completed the cavity evaluation to specifically map each existing cavity within the Wetland Impact Areas. Cavities are an important habitat feature as they provide nests or dens to both birds and mammals. Cavities are also used by wildlife as a temporary shelter from elements or protection from predators. Feeding cavities are often created by birds to access a variety of insects, however feeding cavities are considered of lesser importance. Cavities can be found in live and dead standing trees. During the site survey all cavities within the Wetland Impact Area have been identified, with “Tree with cavities” referring to live trees. Occasionally, more than one cavity was observed on a tree.

Within all Wetland Impact Areas along the Project route in Sudbury, a total of 21 cavities were observed, with 10 of cavities located within snags and 11 of cavities were located within live and overhanging trees. All cavities observed were approximately 6 inches or smaller. Cavities were observed at the base of trees and approximately halfway up trees. It is important to note that many more cavities and larger in size cavities were observed outside the Wetland Impact Area. Please refer to Photos 10 through 12, in Attachment C, to see examples of cavities observed within the Wetland Impact Area.

OVERHANGING TREES

As part of the Detailed Wildlife Habitat Evaluation completed during the NOI process, all overhanging trees within the Wetland Impact Areas were counted. Overhanging trees are an important wildlife feature, as they help moderate the effects of extreme temperatures, as they provide shade to the

resource area during the summers and can act as insulators to a stream or wetland area during the winter. Overhanging trees also act as perches for birds to use when scavenging for food sources.

During the site visit in January, SWCA identified trees within the Wetland Impact Area that were overhanging over Hop Brook or wetland resource areas. SWCA observed a significant number of trees overhanging wetlands and Hop Brook; however, if they were outside the Wetland Impact Area, they were not counted. A total of 128 trees were identified as overhanging trees within the Wetland Impact Areas along the Project route in Sudbury. Please see Photo 8 and 9 in Attachment C for a representation of overhanging trees.

SMALL MAMMAL BURROWS

As part of the Detailed Wildlife Habitat Evaluation completed during the NOI process, VHB identified small mammal burrows within each Wetland Impact Area. During the January 2022 survey, SWCA observed several burrows along the Project route in Sudbury. Many of the burrows were near and around the base of live or dead standing trees and typically were no more than 3 inches in diameter, which were consistent with VHB's observations of these burrows being used by chipmunks or other small mammals.

It is important to note that suitable small mammal habitat is also prevalent outside Wetland Impact Areas, where small mammal burrows were observed during the recent survey and are expected to be in great numbers. In addition, the Project includes mitigation that will include the placement of brush piles to provide mitigation for wildlife. Please refer to Photo 16 through 19 in Attachment C for a representative photo of small mammal burrow.

CONCLUSION

Those habitat features that were determined to be **significant**, in accordance with the methodology noted above, are depicted on the attached Pre-Construction Significant Wildlife Habitat Features mapping, provided in Attachment B. Table 1 in Attachment A compares the 2020 and 2022 Field surveys for Significant Wildlife Habitat Features and any suggested mitigation measures.

The Habitat Maps and Table 1 above will be used during construction by the environmental compliance monitors to inform habitat feature mitigation. As required under the Order of Conditions, mitigation will be provided for significant wildlife habitat features located within wetland resource areas that are impacted by Project construction, and these mitigation measures will be documented in reports that will be provided to the Commission every 6 months.

WPA regulations define adverse effect as any impact that would alter habitat characteristics listed in 310 CMR 10.60(2), such that the alteration will substantially reduce the capacity of the area to provide wildlife habitat functions following two growing seasons after project completion. The 2006 Guidance notes that it is insufficient to find that a project will result in adverse impacts to wildlife habitat simply because alterations to habitat are proposed. In addition, the Guidance notes, that impacts to wildlife habitat only become "adverse when they substantially reduce a site's capability to provide important wildlife habitat functions (such as shelter, food, breeding areas, etc.) and consequently reduce the site's capacity to support wildlife." A project may demonstrate No Adverse Effect through two methods: (1) demonstrating that the site lacks any important wildlife habitat features; or (2)

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demonstrating that important habitat features exist on a site, but that adverse effects will be avoided because the project will not substantially reduce the capacity of the site to provide important wildlife habitat functions.

The Wetland Impact Areas associated with this Project are predominantly within an old railroad bed with few trees growing between the rails. Important wildlife habitat features were identified within the Wetland Impact Area; however, numerous important wildlife habitat features were also observed immediately adjacent to each of the Wetland Impact Areas. Though impacts are proposed in the area, with the proposed restoration and mitigation efforts and with the numerous important wildlife habitat features adjacent to the Wetland Impact Areas, the overall area will continue to have sufficient undisturbed important habitat for wildlife use. Therefore, the capacity of the Site to provide important wildlife habitat functions will not be impaired, and there will be No Adverse Effect as a result of this Project.

Sincerely,

Polina Safran, AWB
Wildlife Biologist

Attachments: Attachment A - Table 1 Wetland Impact Areas: Comparison
Attachment B - Significant Habitat Features Maps
Attachment C - Habitat Features Photographs

ATTACHMENT A

TABLE 1 WETLAND IMPACT AREAS: COMPARISON

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Table 1. Wetland Impact Areas: Comparison of 2020 and 2022 Field Efforts and Additional Mitigation Measures

Wetland Impact Area ID	Map Sheet # (Attachment A)	2020 Features Identified	2020 Mitigation Approved Habitat Features	2022 Significant Features Identified[1, 2]	2022 Supplemental Mitigation Proposed
S1	1 and 2	Upland food plants Dense herbaceous vegetation	Lowbush blueberry and black huckleberry plantings and woody seed mix; two brush piles	None	None required
S2	2 and 3	Upland food plants	Plantings and woody seed mix; one brush pile	None	None required
S3	5	Upland food plants Standing dead tree (1 snag) Large woody debris (scattered, minimal) Overhanging veg (12 trees)	Woody seed mix; 5 brush piles	Significant snags (1) Overhanging veg (4)	Reuse two significant snags as fallen logs
S4	5 and 6	Upland food plants Large woody debris (minor and insignificant) Overhanging veg (35 trees)	Woody seed mix; tree and shrub plantings	Significant snags (2) Overhanging veg (22)	Work with contractor to determine if snag on southern limit of work can be saved as standing dead tree. Other significant snag to be reused as fallen log.

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Wetland Impact Area ID	Map Sheet # (Attachment A)	2020 Features Identified	2020 Mitigation Approved Habitat Features	2022 Significant Features Identified[1, 2]	2022 Supplemental Mitigation Proposed
S5	6	Upland food plants Standing dead trees (10 snags) Tree cavity (1) Large woody debris (minor and insignificant) Fall log near water (2) Overhanging veg (45 trees)	Tree and shrub plantings; woody seed mix; two fallen logs to be placed	Significant snags (3) Overhanging veg (19) Overhanging veg with cavity (1) Large woody debris/ brush pile/ fallen log (3)	Work with contractor to determine if snag on northern limit of work can be saved as standing dead tree. Other two significant snags to be used as the two 2020 approved fallen logs.
S6	6	Upland food plants Standing dead trees (2 snags) Large woody debris (scattered, limited) Overhanging veg (5 trees)	Woody seed mix; two fallen logs	Significant snags (1) Overhanging veg (2) Large woody debris/ brush pile/ fallen log (1)	None required (significant snag to be reused as one of the two 2020 approved fallen logs)
S7	6, 7, and 8	Upland good plants Standing dead trees (7 snags) Large woody debris (limited/scattered)	Woody seed mix; shrub plantings; 5 brush piles	Significant snags (3) Overhanging veg (2) Large woody debris/ brush pile/ fallen log (1)	Work with contractor to determine if any significant snags can remain as dead standing trees or reuse as fallen logs placed near the vernal pools.
S8	10 and 11	Upland food plants Standing dead trees (4 snags) Tree cavities (1) Small mammal burrows (1) Dense herbaceous cover Large woody debris (abundant)	Woody seed mix; shrub plantings; 6 brush piles	Significant snags (1) Tree cavities (1)	None required

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Wetland Impact Area ID	Map Sheet # (Attachment A)	2020 Features Identified	2020 Mitigation Approved Habitat Features	2022 Significant Features Identified[1, 2]	2022 Supplemental Mitigation Proposed
S9	11 and 12	Upland food plants Standing dead trees (3 snags) Small mammal burrows (1) Large woody debris (abundant)	Woody seed mix; shrub plantings; 6 brush piles	Significant snags (3) Significant snag with cavity (1) Tree cavities (2) Large woody debris/ brush pile/ fallen log (1)	Work with contractor to determine if any significant snags can remain as dead standing trees or reuse as fallen logs placed near vernal pools.
S10	12 and 13	Upland food plants Standing dead trees (2 snags) Tree cavities (1) Small mammal burrows (1) Large woody debris (scattered and abundant)	Woody seed mix; shrub plantings; 4 brush piles	Significant snags (2)	None required
S11	15 and 16	Upland food plants Standing dead trees (1 snag) Dense herbaceous cover Large woody debris (scattered, limited)	Woody seed mix; 3 brush piles	Significant snags (2) Tree cavities (2) Overhanging veg (3)	Work with contractor to determine if any significant snags can remain as dead standing trees or reuse as fallen logs placed near vernal pools.
S12	18	Upland food plants Small mammal burrows (1) Dense herbaceous cover Large woody debris (limited, scattered)	Woody seed mix; 2 brush piles	Overhanging veg (2)	None required
S13	19-21	Upland food plants Small mammal burrows (1) Large woody debris	Woody seed mix; shrub plantings; 7 brush piles	None	None required

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Wetland Impact Area ID	Map Sheet # (Attachment A)	2020 Features Identified	2020 Mitigation Approved Habitat Features	2022 Significant Features Identified[1, 2]	2022 Supplemental Mitigation Proposed
S14	21	Upland food plants Standing dead trees (1 snag)	Woody seed mix; shrub plantings	Significant snags (1)	None required
S15	21-23	Upland food plants Standing dead trees (13 snags) Large woody debris (limited, scattered)	Woody seed mix; shrub plantings; 5 brush piles	Significant snags (4)	None required
S16	23-24	Upland food plants Standing dead trees (10 snags) Tree cavities (16) Large woody debris (moderate, scattered) Overhanging veg (9 trees)	Woody seed mix; shrub plantings; 6 brush piles	Significant snags (2) Significant snag with cavities (2) Tree cavities (4) Overhanging veg (19) Overhanging veg with cavity (1) Large woody debris/ brush pile/ fallen log (1)	None required
S17	24	Upland food plants Standing dead trees (6 snags) Tree cavities (8) Overhanging branches Overhanging veg (25 trees) Standing water during growing season	Woody seed mix; shrub and tree plantings	Significant snags (1) Overhanging veg with cavity (1) Overhanging veg (9)	None required

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Wetland Impact Area ID	Map Sheet # (Attachment A)	2020 Features Identified	2020 Mitigation Approved Habitat Features	2022 Significant Features Identified[1, 2]	2022 Supplemental Mitigation Proposed
S18	24 and 25	Upland food plants Standing dead trees (1 snag) Logs near water (3) Overhanging veg (8 trees) Standing water during growing season	Woody seed mix; shrub and tree plantings; 2 fallen logs	Significant snags (1) Overhanging veg (8)	Significant snag to be reused as one of the two fallen logs
S19	25-28	Upland food plants Standing dead trees (13 snags) Tree cavities (8) Large woody debris (scattered, abundant) Overhanging veg (29 trees)	Woody seed mix; shrub plantings; 11 brush piles	Significant snags (8) Significant snag with cavities (2) Overhanging veg (38) Large woody debris/ brush pile/ fallen log (4)	Work with contractor to determine if any significant snags can remain as dead standing trees or reuse as fallen logs placed near vernal pools.
S20	29-30	Upland food plants Standing dead trees (4 snags) Dense herbaceous vegetation Large woody debris (limited, scattered) Standing water during growing season	Woody seed mix; Shrub plantings; wetland replication area; 3 brush piles	Significant snags (4)	Work with contractor to determine if any significant snags can remain as dead standing trees or reuse as fallen logs placed near vernal pools.

1 Cavity numbers in table may differ slightly from what appears on maps, because multiple cavities may be located in the same tree.

2 SWCA's counts are based on GPS survey of features identified within geo-referenced wetland impact areas.

ATTACHMENT B

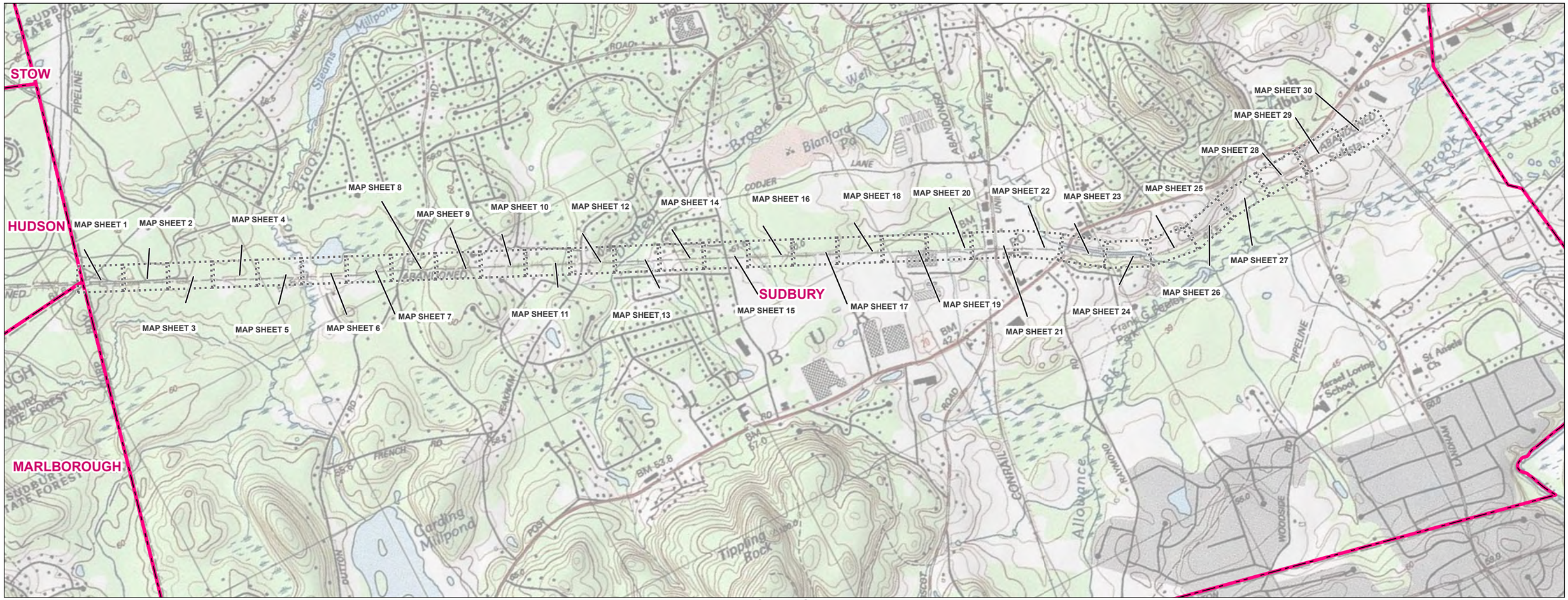
SIGNIFICANT HABITAT FEATURES MAP

Sudbury to Hudson Construction Compliance Monitoring

SUDBURY, MA

Wildlife Habitat Features Map

Date: March 1, 2022



Legend

Map Sheet Matchline

Existing Right-Of-Way (ROW)

PREPARED FOR:

EVERSOURCE ENERGY

107 Selden Street
Berlin, CT 06037

0 0.25 0.5 Miles

INDEX OF FIGURES

Title Sheet / Index Map
Map Sheets 1-30

NO.	DATE	REVISIONS

PREPARED BY:

SWCA ENVIRONMENTAL CONSULTANTS

15 Research Drive
Amherst, MA 01002

S1 2020 Approved Habitat Mitigation:
Plantings; woody seed mix; two brush piles
S1 2021-2022 Proposed Supplemental Habitat Mitigation: None required

HUDSON

SUDBURY

Wetland Impact Area S1

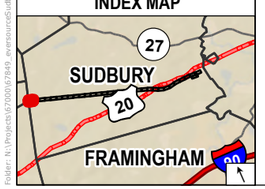
MAP SHEET 2

OLD CONCORD ROAD

MARLBOROUGH

Note: Mapsheets depict significant wildlife habitat features surveyed in wetland impact areas on January 27, 2022 to address Special Condition L of Part II of the Order Conditions (DEP File No. 301-1287). If no features are depicted on a mapsheet, then none were identified during the field survey.

INDEX MAP



Legend

- Significant Snag
- Significant Snag With Cavities
- Tree With Cavities
- Overhanging Tree
- Overhanging Tree With Cavities
- Existing Woody Debris/Brush Pile/Other
- Existing Road/Cart Path
- Approved Project Limits Of Work (LOW)
- Map Sheet
- MBTA ROW Boundary
- Wetland Impact Area
- Wetland Resource Area
- Sudbury Vernal Pool Area
- Municipal Boundary

N

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 1 OF 30

Date: March, 2022

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INDEX MAP

Legend

- Significant Snag
- Significant Snag With Cavities
- Tree With Cavities
- Overhanging Tree
- Overhanging Tree With Cavities
- Existing Woody Debris/Brush Pile/Other
- Existing Road/Cart Path
- Approved Project Limits Of Work (LOW)
- Map Sheet
- MBTA ROW Boundary
- Wetland Impact Area
- Wetland Resource Area
- Sudbury Vernal Pool Area
- Municipal Boundary

N

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 2 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

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MAP SHEET 2

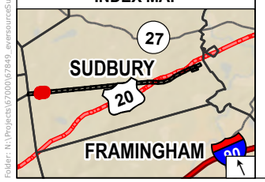
MAP SHEET 4

SUDBURY

Wetland Impact Area S2

Note: Mapsheets depict significant wildlife habitat features surveyed in wetland impact areas on January 27, 2022 to address Special Condition L of Part II of the Order Conditions (DEP File No. 301-1287). If no features are depicted on a mapsheet, then none were identified during the field survey.

INDEX MAP



Legend

- Significant Snag
- Significant Snag With Cavities
- Tree With Cavities
- Overhanging Tree
- Overhanging Tree With Cavities
- Existing Woody Debris/Brush Pile/Other
- Existing Road/Cart Path
- Approved Project Limits Of Work (LOW)
- Map Sheet
- MBTA ROW Boundary
- Wetland Impact Area
- Wetland Resource Area
- Sudbury Vernal Pool Area
- Municipal Boundary

N

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 3 OF 30

Date: March, 2022

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Note: Mapsheets depict significant wildlife habitat features surveyed in wetland impact areas on January 27, 2022 to address Special Condition L of Part II of the Order Conditions (DEP File No. 301-1287). If no features are depicted on a mapsheet, then none were identified during the field survey.

INDEX MAP

Legend

- Significant Snag
- Significant Snag With Cavities
- Tree With Cavities
- Overhanging Tree
- Overhanging Tree With Cavities
- Existing Woody Debris/Brush Pile/Other
- Existing Road/Cart Path
- Approved Project Limits Of Work (LOW)
- Map Sheet
- MBTA ROW Boundary
- Wetland Impact Area
- Wetland Resource Area
- Sudbury Vernal Pool Area
- Municipal Boundary

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1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson Construction Compliance Monitoring Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 4 OF 30

Date: March, 2022

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S3 2020 Approved Habitat Mitigation:
woody seed mix; five brush piles
S3 2021-2022 Proposed Supplemental Habitat Features:
Reuse two significant snags as fallen logs

S4 2020 Approved Habitat Mitigation Features:
woody seed mix; tree and shrub plantings
S4 2021-2022 Proposed Supplemental Habitat Features:
Reuse significant snags as one fallen log and
work with contractor to determine snag on southern limit
of work can be saved as standing dead tree

MAP SHEET 4

MAP SHEET 6

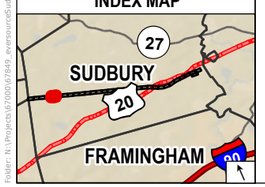
SUDBURY

Wetland Impact Area S3

Wetland Impact Area S4

Note: Mapsheets depict significant wildlife habitat features surveyed in wetland impact areas on January 27, 2022 to address Special Condition L of Part II of the Order Conditions (DEP File No. 301-1287). If no features are depicted on a mapsheet, then none were identified during the field survey.

INDEX MAP



Legend

- Significant Snag
- Significant Snag With Cavities
- Tree With Cavities
- Overhanging Tree
- Overhanging Tree With Cavities
- Existing Woody Debris/Brush Pile/Other
- Existing Road/Cart Path
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- MBTA ROW Boundary
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N

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA

MAP SHEET 5 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

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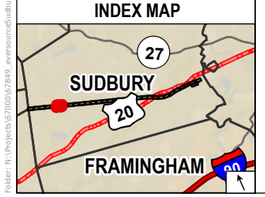
INDEX MAP



Legend

- Significant Snag
- Significant Snag With Cavities
- Tree With Cavities
- Overhanging Tree
- Overhanging Tree With Cavities
- Existing Woody Debris/Brush Pile/Other
- Existing Road/Cart Path
- Approved Project Limits Of Work (LOW)
- Map Sheet
- MBTA ROW Boundary
- Wetland Impact Area
- Wetland Resource Area
- Sudbury Vernal Pool Area
- Municipal Boundary

N

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 6 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

Folder: N:\Projects\67000\67849_eversource\SudburyHudson\arcx\67849SudburyHudsonProject\

MAP SHEET 6

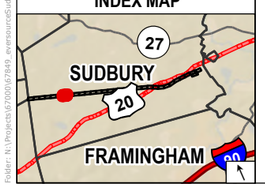
MAP SHEET 8

SUDBURY

Wetland Impact Area S7

Note: Mapsheets depict significant wildlife habitat features surveyed in wetland impact areas on January 27, 2022 to address Special Condition L of Part II of the Order Conditions (DEP File No. 301-1287). If no features are depicted on a mapsheet, then none were identified during the field survey.

INDEX MAP



Legend

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- Significant Snag With Cavities
- Tree With Cavities
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- Overhanging Tree With Cavities
- Existing Woody Debris/Brush Pile/Other
- Existing Road/Cart Path
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- Wetland Impact Area
- Wetland Resource Area
- Sudbury Vernal Pool Area
- Municipal Boundary

N

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson Construction Compliance Monitoring Wildlife Habitat Features Map

SUDBURY, MA

MAP SHEET 7 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

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INDEX MAP

Legend

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- Existing Woody Debris/Brush Pile/Other
- Existing Road/Cart Path
- Approved Project Limits Of Work (LOW)
- Map Sheet
- MBTA ROW Boundary
- Wetland Impact Area
- Wetland Resource Area
- Sudbury Vernal Pool Area
- Municipal Boundary

N

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

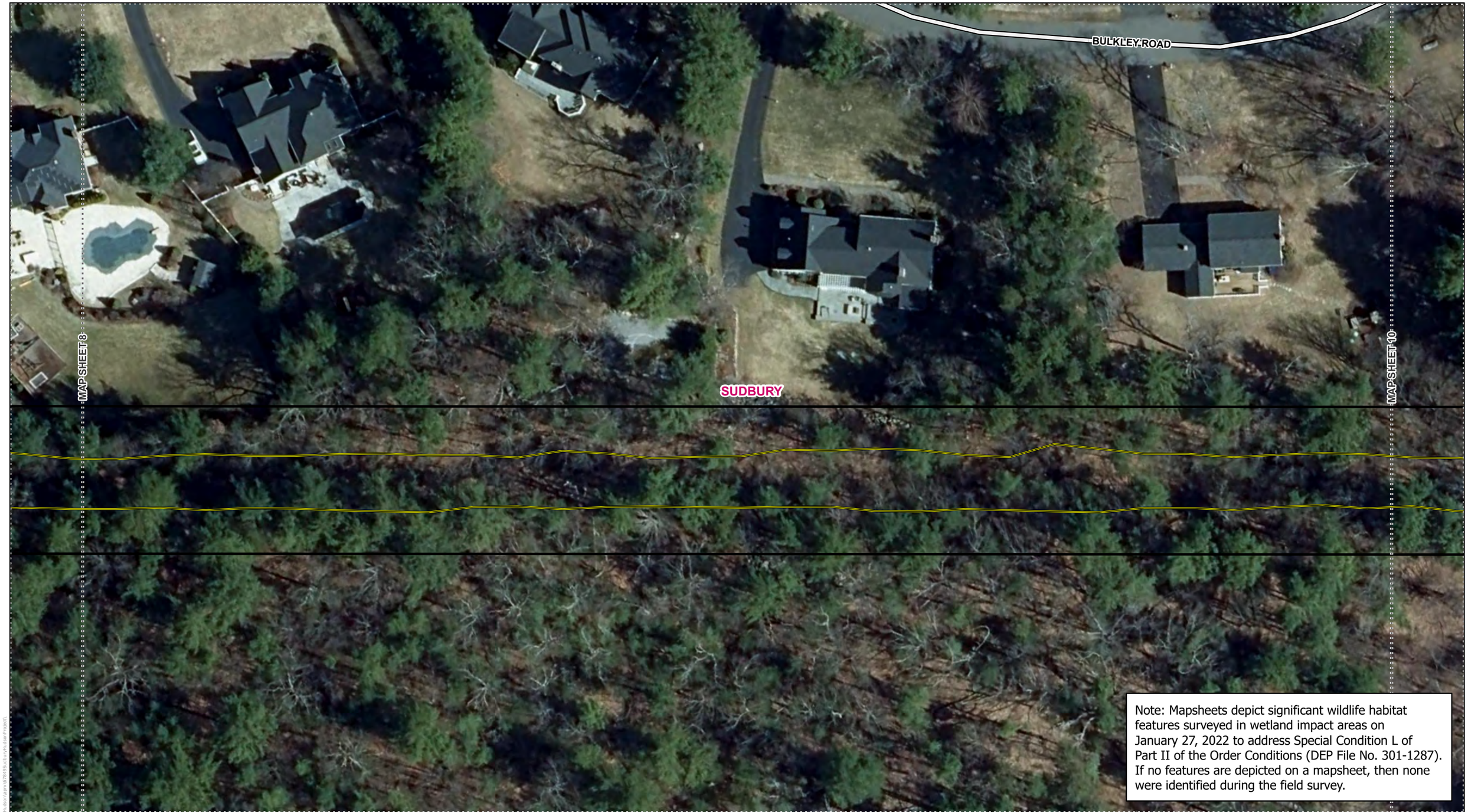
Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 8 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

Folder: N:\Projects\67000\67849_eversource\Sudbury\Hudson\arcs\67849SudburyHudsonProject\



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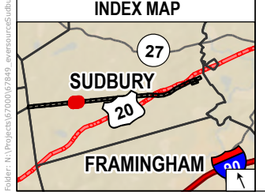
INDEX MAP



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- Municipal Boundary

N

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0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 9 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

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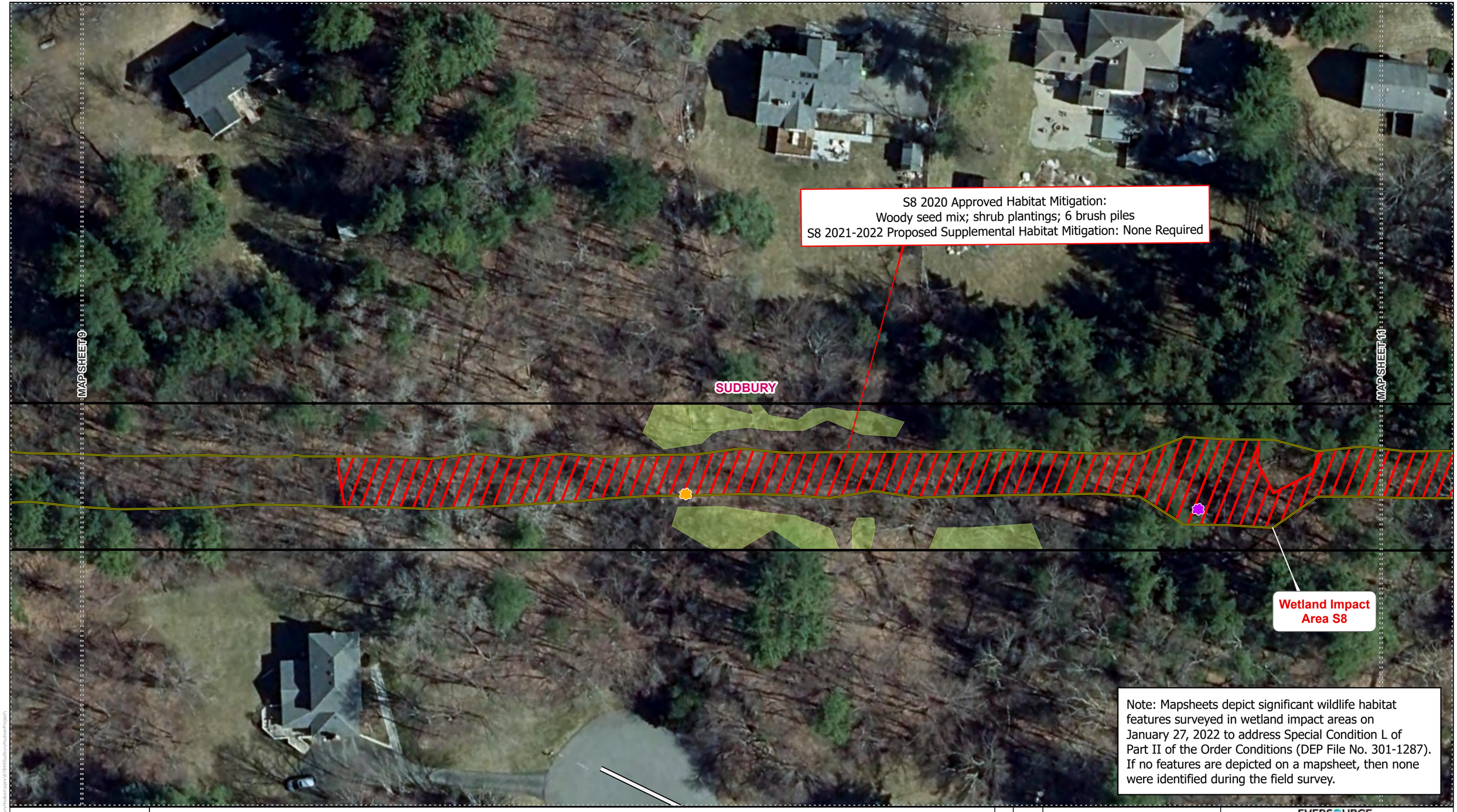

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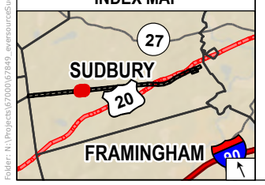
INDEX MAP



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N

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

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EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 10 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

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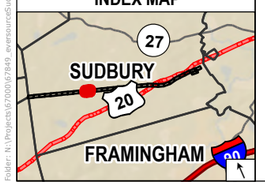
INDEX MAP



Legend

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- Wetland Resource Area
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- Municipal Boundary

N

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 11 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

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AUSTIN ROAD

MAP SHEET 11

MAP SHEET 13

SUDBURY

S10 2020 Approved Habitat Mitigation:
woody seed mix; shrub plantings; 4 brush piles
S10 2021-2022 Proposed Supplemental Habitat Mitigation: None Required

Wetland Impact Area S9

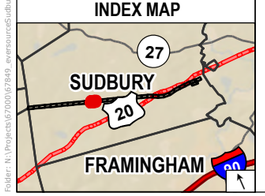
Wetland Impact Area S9

Wetland Impact Area S10

PEAKHAM ROAD

Note: Mapsheets depict significant wildlife habitat features surveyed in wetland impact areas on January 27, 2022 to address Special Condition L of Part II of the Order Conditions (DEP File No. 301-1287). If no features are depicted on a mapsheet, then none were identified during the field survey.

INDEX MAP



Legend

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- Wetland Resource Area
- Sudbury Vernal Pool Area
- Municipal Boundary

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA

MAP SHEET 12 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

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INDEX MAP

Legend

- Significant Snag
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- Tree With Cavities
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- Overhanging Tree With Cavities
- Existing Woody Debris/Brush Pile/Other
- Existing Road/Cart Path
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- Sudbury Vernal Pool Area
- Municipal Boundary

N

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0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 13 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

Folder: N:\Projects\67000\67849_eversource\Sudbury\Hudson\arcv\67849SudburyHudsonJare\67849SudburyHudsonProject\

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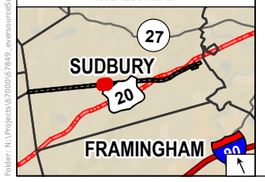
INDEX MAP



Legend

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- Municipal Boundary

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0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 14 OF 30

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STONEBROOK ROAD

HORSE POND ROAD

MAP SHEET 14

MAP SHEET 16

SUDBURY

Wetland Impact Area S11

Note: Mapsheets depict significant wildlife habitat features surveyed in wetland impact areas on January 27, 2022 to address Special Condition L of Part II of the Order Conditions (DEP File No. 301-1287). If no features are depicted on a mapsheet, then none were identified during the field survey.

INDEX MAP

Legend

- Significant Snag
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- Tree With Cavities
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- Existing Woody Debris/Brush Pile/Other
- Existing Road/Cart Path
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- Wetland Resource Area
- Sudbury Vernal Pool Area
- Municipal Boundary

N

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 15 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

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MAP SHEET 15

MAP SHEET 17

MAP SHEET 16

SUDBURY

S11 2020 Approved Habitat Mitigation:
woody seed mix; 2 brush piles
S11 2021-2022 Proposed Supplemental Habitat Mitigation:
Work with contractor to determine if any significant snags can remain as dead standing trees, or reuse as fallen logs placed near vernal pool

Wetland Impact Area S11

Note: Mapsheets depict significant wildlife habitat features surveyed in wetland impact areas on January 27, 2022 to address Special Condition L of Part II of the Order Conditions (DEP File No. 301-1287). If no features are depicted on a mapsheet, then none were identified during the field survey.

INDEX MAP

Legend

- Significant Snag
- Significant Snag With Cavities
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- Overhanging Tree With Cavities
- Existing Woody Debris/Brush Pile/Other
- Existing Road/Cart Path
- Approved Project Limits Of Work (LOW)
- Map Sheet
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- Wetland Impact Area
- Wetland Resource Area
- Sudbury Vernal Pool Area
- Municipal Boundary

N

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA

MAP SHEET 16 OF 30

Date: March, 2022

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MAP SHEET 16

MAP SHEET 18

SUDBURY

MAP SHEET 17

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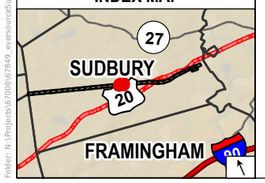
INDEX MAP



Legend

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- Municipal Boundary

N

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson Construction Compliance Monitoring Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 17 OF 30

Date: March, 2022

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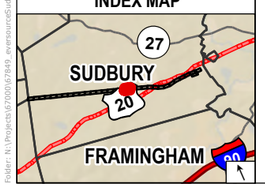

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- Sudbury Vernal Pool Area
- Municipal Boundary

N

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson Construction Compliance Monitoring Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 18 OF 30

Date: March, 2022

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MAP SHEET 18

MAP SHEET 20

SUDBURY

MAP SHEET 19

Wetland Impact Area S13

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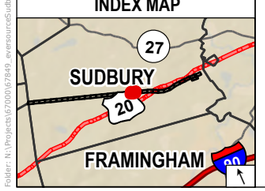
INDEX MAP



Legend

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- Wetland Impact Area
- Wetland Resource Area
- Sudbury Vernal Pool Area
- Municipal Boundary

N

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson Construction Compliance Monitoring Wildlife Habitat Features Map

SUDBURY, MA

MAP SHEET 19 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

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MAP SHEET 19

MAP SHEET 21

SUDBURY

S13 2020 Approved Habitat Mitigation:
woody seed mix; shrub plantings; 7 brush piles
S13 2021-2022 Proposed Supplemental Habitat Mitigation: None Required

Wetland Impact Area S13

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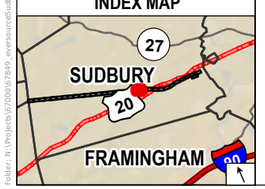
INDEX MAP



Legend

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- Municipal Boundary

N

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 20 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

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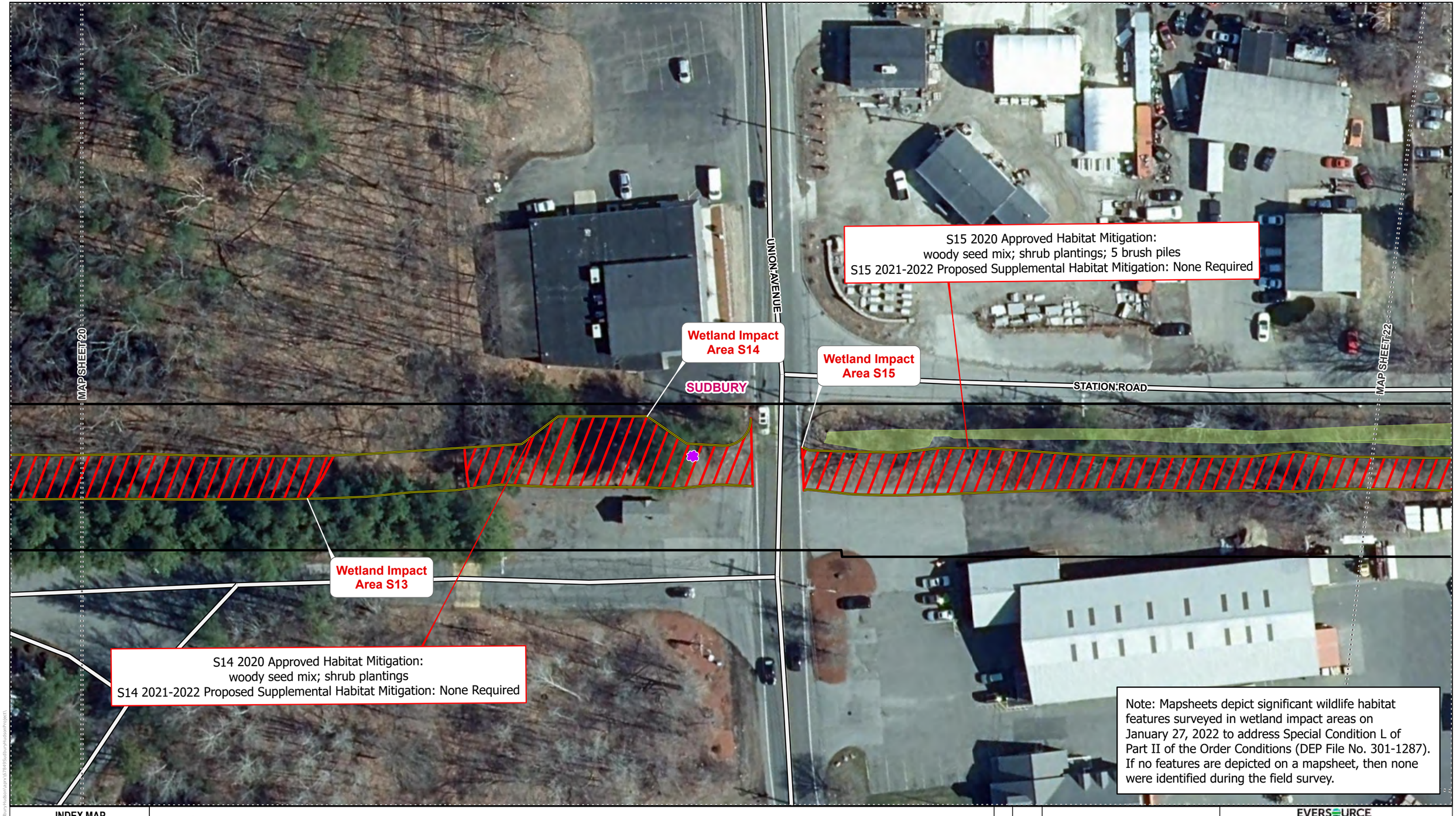

INDEX MAP

Legend

- Significant Snag
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- Municipal Boundary

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 21 OF 30

Date: March, 2022

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MAP SHEET 22

MAP SHEET 21

SUDBURY

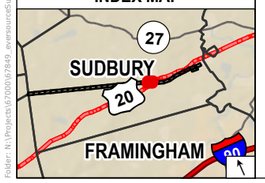
STATION ROAD

MAP SHEET 23

Wetland Impact Area S15

Note: Mapsheets depict significant wildlife habitat features surveyed in wetland impact areas on January 27, 2022 to address Special Condition L of Part II of the Order Conditions (DEP File No. 301-1287). If no features are depicted on a mapsheet, then none were identified during the field survey.

INDEX MAP



Legend

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- Municipal Boundary

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1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA

MAP SHEET 22 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

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INDEX MAP

Legend

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- Municipal Boundary

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1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 23 OF 30

Date: March, 2022

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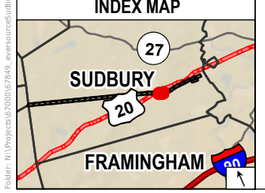
INDEX MAP



Legend

- Significant Snag
- Significant Snag With Cavities
- Tree With Cavities
- Overhanging Tree
- Overhanging Tree With Cavities
- Existing Woody Debris/Brush Pile/Other
- Existing Road/Cart Path
- Approved Project Limits Of Work (LOW)
- Map Sheet
- MBTA ROW Boundary
- Wetland Impact Area
- Wetland Resource Area
- Sudbury Vernal Pool Area
- Municipal Boundary

N

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 24 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

Folder: N:\Projects\670\06\67849_eversource\Sudbury\Hudson\arcv\67849SudburyHudsonProject\

S19 2020 Approved Habitat Mitigation:
woody seed mix; shrub plantings; 11 brush piles
S19 2021-2022 Proposed Supplemental Habitat Mitigation:
Work with contractor to determine if any significant snags can remain as dead standing trees, or reuse as fallen logs placed near vernal pools

MAP SHEET 24

MAP SHEET 26

Wetland Impact Area S18

Wetland Impact Area S19

SUDBURY

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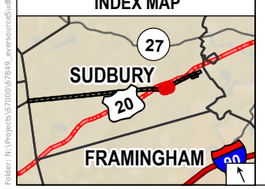

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NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 25 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

Folder: N:\Projects\67000\67849_eversource\SudburyHudson\arcs\67849SudburyHudsonProject\

MAP SHEET 25

MAP SHEET 27

MAP SHEET 26

SUDBURY

Wetland Impact Area S19

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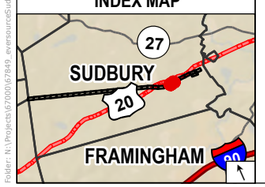

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NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 26 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

Folder: N:\Projects\67000\67849_eversource\Sudbury\Hudson\arcv\67849SudburyHudsonProject\

MAP SHEET 26

MAP SHEET 28

SUDBURY

Wetland Impact Area S19

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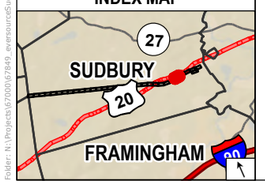

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NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 27 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

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MAP SHEET 27

MAP SHEET 29

SUDBURY

Wetland Impact Area S19

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1:600

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Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

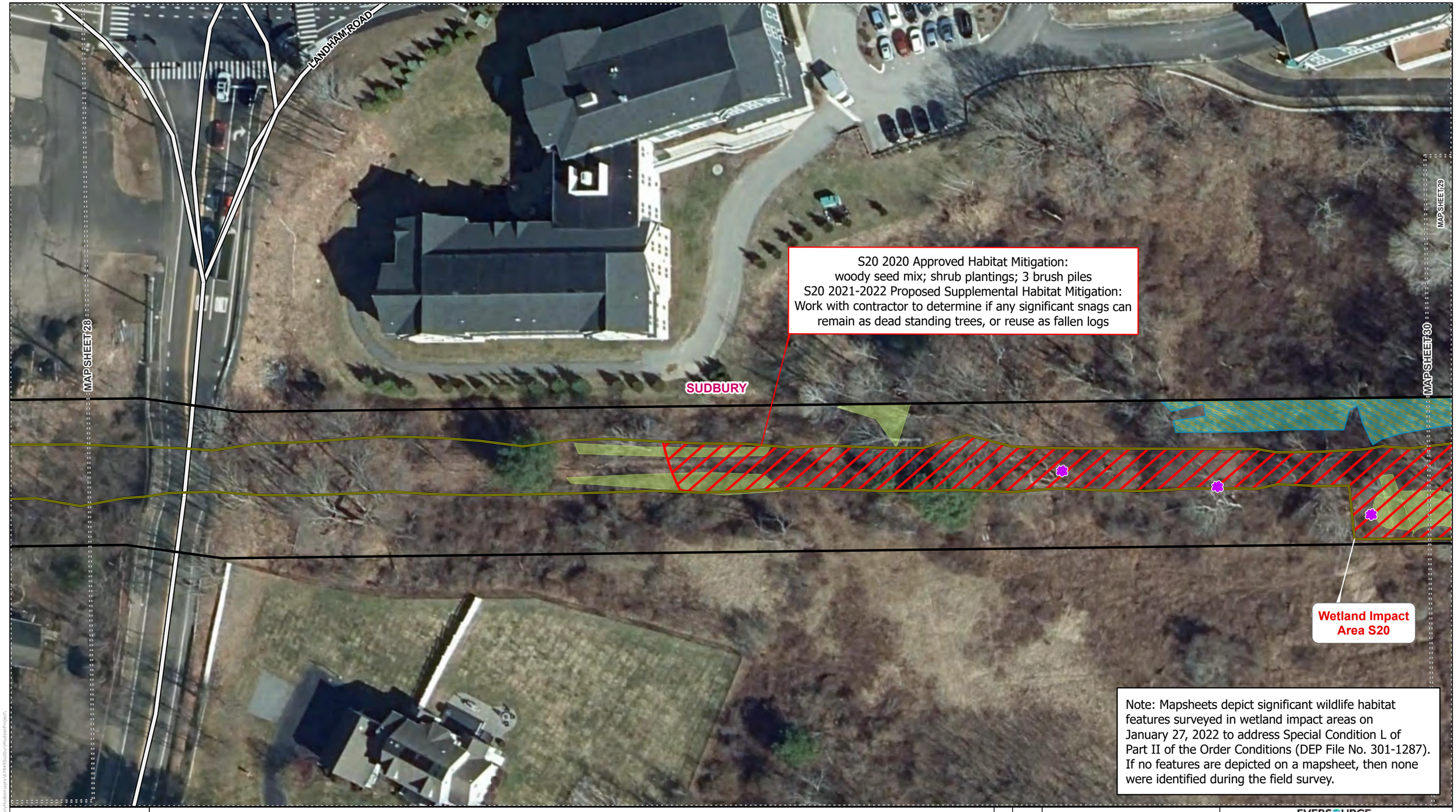
Sudbury to Hudson Construction Compliance Monitoring Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 28 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

Folder: N:\Projects\67000\67849_eversource\Sudbury\Hudson\arcr\67849SudburyHudsonProject\



INDEX MAP

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1:600

0 25 50 Feet

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NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA | MAP SHEET 29 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

Folder: N:\Projects\67000\67849_eversource\Sudbury\Hudson\Jacs\67849SudburyHudsonProject\

MAP SHEET 29

MAP SHEET 29

Wetland Impact Area S20

SUDBURY

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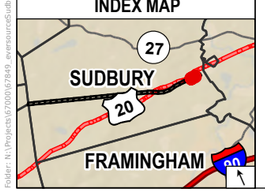

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N

1:600

0 25 50 Feet

Base Map: MassGIS Ortho 2019, accessed March 2022

NO.	DATE	REVISIONS

EVERSOURCE ENERGY

Sudbury to Hudson
Construction Compliance Monitoring
Wildlife Habitat Features Map

SUDBURY, MA

MAP SHEET 30 OF 30

Date: March, 2022

SWCA ENVIRONMENTAL CONSULTANTS

Folder: N:\Projects\67000\67849_eversource\Sudbury\Hudson\Jarvis\67849SudburyHudsonProject\

ATTACHMENT C

HABITAT FEATURES PHOTOGRAPHS

Photo #1: View of two significant snags located within Wetland Impact Area 5. Both snags are located near the southern bank of Hop Brook. Considering the diameter of the tree, the height, and location, these snags were identified as significant. *Facing southeast and southwest.*

Photo #2: View of snag located within Wetland Impact Area 20. There are four dead trunks connected at one base and therefore identified on the map as one significant snag. Each of the trunks is approximately 10" dbh or greater and contains woodpecker holes. The snags are very tall and located near a wetland area. *Facing west.*

Photo #3: View of snag located within Wetland Impact Area 6. The snag is tall and shows signs of bird use. Facing west.

Photo #4: View of snag located within Wetland Impact Area 3. Snag is a pine growing along the Rail Road bed. *Facing west.*

Photo #5: View of snag located within Wetland Impact Area 15. Snag is estimated to be greater than 10" dbh, has at least two visible cavities and a nest at the top of the tree. Asian bittersweet has engulfed the snag. *Facing northeast.*

Photo #6: View of a snag near edge of the water within Wetland Impact Area 17. Snag has branches that are overlooking the water. Eversource will work with the contractor to determine if the snag at the edge of the impact area can remain. *Facing northwest.*

Photo #7: View of snags located outside the Wetland Impact Area 17 and 18, at the Hop Brook crossing. Many snags are available within the resource area that are more suitable for perching and nesting, due to their location. These snags will not be impacted by the project. *Facing south.*

Photo #8: View of overhanging tree examples in Wetland Impact Area 4. Tree or tree limbs that overhang a wetland or waterbody have been identified. *Facing northwest.*

Photo #9: View of overhanging tree located just on the edge of Wetland Impact Area 19. Tree has branches overhanging a wetland (located downgradient on the left). Eversource will work with the contractor to determine if overhanging trees at the edge of the impact area can remain. *Facing west.*

Photo #10: View of large woody debris/ brush pile located within Wetland Impact Area 16. *Facing northeast.*

Photo #11: View of large woody debris/ brush pile located within Wetland Impact Area 19. The brush pile appears to consist of a downed pine tree that was cut up and left in pace. *Facing east.*

Photo #12: View of brush pile located outside Wetland Impact Area 8. Brush pile will remain and continue to provide wildlife habitat value. *Facing east.*

Photo #13: View of cavity in a live tree located along the southern side of Wetland Impact Area 11, within the Wetland Impact Area. Eversource will work with the contractor to determine if trees at the edge of the impact area can remain. *Facing north.*

Photo #14: View of cavity in a snag within the Wetland Impact Area 9. *Facing north.*

Photo #15: View of cavity at the base of a live standing tree in Wetland Impact Area 16. Facing north.

Photo #16: View of small mammal burrow located within Wetland Impact Area 18. Facing west.

Photo #17: View of small mammal burrow within Wetland Impact Area 18 near the bank. Facing west.

Photo #18: View of small mammal burrow located within Wetland Impact Area 19. Facing west.

Photo #19: View of small mammal burrow within Wetland Impact Area 16 at the base of a live tree trunk. This particular tree also contained several small cavities that could potentially be used by small mammals. Facing north.

Attachment D

Invasive Species Removal and Mitigation

Attachment E

TOWN OF SUDBURY ENVIRONMENTAL PERMITS

ATTACHMENT E-1: ORDER OF CONDITIONS (CONSERVATION COMMISSION)

ATTACHMENT E-2: STORMWATER MANAGEMENT PERMIT (PLANNING BOARD)

ATTACHMENT E-3: EARTH REMOVAL PERMIT (EARTH REMOVAL BOARD)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 - Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:301-1287
eDEP Transaction #:1188427
City/Town:SUDBURY

A. General Information

1. Conservation Commission: SUDBURY
2. Issuance: a. ☑ OOC b. ☐ Amended OOC
3. Applicant Details

a. First Name	b. Last Name
c. Organization	NSTAR ELECTRIC COMPANY D/B/A EVERSOURCE ENERGY / DEPARTMENT OF CONSERVATION AND RECREATION
d. Mailing Address	247 STATION DRIVE, SE270 / 251 CAUSEWAY STREET, SUITE 600
e. City/Town	WESTWOOD/ BOSTON f. State MA g. Zip Code 02090/02114

4. Property Owner

a. First Name	b. Last Name
c. Organization	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
d. Mailing Address	10 PARK PLAZA
e. City/Town	BOSTON f. State MA g. Zip Code 02116

5. Project Location

a.Street Address	MBTA ROW FROM TOWN OF HUDSON TO 183 BOSTON POST ROAD (SUDBURY SUBSTATION)		
b.City/Town	SUDBURY	c. Zip Code	01776
d. Assessors Map/Plat#	H03, J05, J06, K07, K08, K09 K11; K08; K10; K11	e. Parcel/Lot#	5100; 5000; 0014; 0402
f. Latitude	42.36001N	g. Longitude	71.39733W

6. Property recorded at the Registry of Deed for:

a. County	b. Certificate	c. Book	d. Page
SOUTHERN MIDDLESEX		11317 / 7734	113 / 426

7.Dates

a. Date NOI Filed : 3/9/2020 b. Date Public Hearing Closed: 2/3/2021 c. Date Of Issuance: 2/4/2021

8.Final Approved Plans and Other Documents

a. Plan Title:	b. Plan Prepared by:	c. Plan Signed/Stamped by:	d. Revised Final Date:	e. Scale:
EVERSOURCE SUDBURY-HUDSON TRANSMISSION RELIABILITY PROJECT SUDBURY NOTICE OF INTENT PLANS (205 PAGES)	VANASSE HANGEN BRUSTLIN, INC.	KENNETH STAFFIER, P.E.	JAN 2021	1 INCH = 20 FEET

MASS CENTRAL RAIL TRAIL IN THE TOWNS OF HUDSON, STOW, MARLBOROUGH & SUDBURY (41 PAGES)	VANASSE HANGEN BRUSTLIN, INC.	JOSHUA C. CONE-RODDY P.E.	JANUARY 7, 2021	1 INCH = 20 FEET
DRAFT SUDBURY-HUDSON TRANMISSION TRLIABILITY PROJECT STORMWATER POLLUTION PREVENTION PLAN	VANASSE HANGEN BRUSTLIN, INC.		MAY 2020	N/A
DRAFT MASSCENTRALRAIL TRAIL - WAYSIDE STORMWATER POLLUTION PREVENTION PLAN	VANASSE HANGEN BRUSTLIN, INC.		MAY 2020	N/A
TIME OF YEAR (TOY)RESTRICTIONS AND GUIDELINES FIGURES (SHEETS 1-10)	VANASSE HANGEN BRUSTLIN, INC.		OCTOBER 14, 2020	1 INCH = 200 FEET
EASTERN BOX TURTLE PROTECTION PLAN	VANASSE HANGEN BRUSTLIN, INC.		Undated	N/A
DRAFT CORRIDOR MANAGEMENT PLAN FOR MASS CENTRAL RAIL TRAIL - WAYSIDE SECTION AND THE SUDBURY-HUDSON TRANSMISSION RELIABILITY PROJECT	DEPARTMENT OF CONSERVATION AND RECREATION		AUGUST 7, 2020	N/A

MASSCENTRAL RAIL TRAIL (MCRT) - WAYSIDE SECTION STORMWATER MANAGEMENT SYSTEM OPERATION AND MAINTENANCE PLAN	DEPARTMENT OF CONSERVATION AND RECREATION	JUNE 2020	N/A
LONG TERM POLLUTION PREVENTION PLAN	DEPARTMENT OF CONSERVATION AND RECREATION	JUNE 2020	N/A

B. Findings

1.Findings pursuant to the Massachusetts Wetlands Protection Act
Following the review of the the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act.

Check all that apply:

a. ☑ Public Water Supply	b. ☑ Land Containing Shellfish	c.☑ Prevention of Pollution
d. ☑ Private Water Supply	e. ☑ Fisheries	f. ☑ Protection of Wildlife Habitat
g. ☑ Ground Water Supply	h. ☑ Storm Damage Prevention	i. ☑ Flood Control

2. Commission hereby finds the project, as proposed, is:

Approved subject to:

a.☑ The following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

Denied because:

b.☐ The proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c.☐ The information submitted by the applicant is not sufficient to describe the site, the work or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the interests of the Act , and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3.☐ Buffer Zone Impacts:Shortest distance between limit of project disturbance and the wetland resource area specified in 310CMR10.02(1)(a).

_____
a. linear feet

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 - Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:301-1287
eDEP Transaction #:1188427
City/Town:SUDBURY

Inland Resource Area Impacts:(For Approvals Only):

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☑ Bank	246 a. linear feet	246 b. linear feet	246 c. linear feet	246 d. linear feet
5. ☑ Bordering Vegetated Wetland	613 a. square feet	613 b. square feet	784 c. square feet	784 d. square feet
6. ☑ Land under Waterbodies and Waterways	1146 a. square feet	1146 b. square feet	1146 c. square feet	1146 d. square feet
	0 e. c/y dredged	0 f. c/y dredged		
7. ☑ Bordering Land Subject to Flooding	10435 a. square feet	10435 b. square feet	7749 c. square feet	7749 d. square feet
Cubic Feet Flood Storage	54.43 e. cubic feet	54.43 f. cubic feet	136.88 g. cubic feet	136.88 h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. ☑ Riverfront Area	235668 a. total sq. feet	235668 b. total sq. feet		
Sq ft within 100 ft	181600 c. square feet	181600 d. square feet	110020 e. square feet	110020 f. square feet
Sq ft between 100-200 ft	54054 g. square feet	54054 h. square feet	32385 i. square feet	32385 j. square feet

Coastal Resource Area Impacts:

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	c. c/y nourishment	d. c/y nourishment
14. ☐ Coastal Dunes	a. square feet	b. square feet	c. c/y nourishment	d. c/y nourishment

15.☐ Coastal Banks
a. linear feet b. linear feet

16.☐ Rocky Intertidal Shores
a. square feet b. square feet

17.☐ Salt Marshes
a. square feet b. square feet c. square feet d. square feet

18.☐ Land Under Salt Ponds
a. square feet b. square feet
c. c/y dredged d. c/y dredged

19.☐ Land Containing Shellfish
a. square feet b. square feet c. square feet d. square feet

20.☐ Fish Runs
Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above
c. c/y dredged d. c/y dredged

21.☐ Land Subject to Coastal Storm Flowage
a. square feet b. square feet

22.
☐ Restoration/Enhancement (For Approvals Only)
If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c & d or B.17.c & d above, please entered the additional amount here.

a. square feet of BVW b. square feet of Salt Marsh

23.
☐ Streams Crossing(s)
If the project involves Stream Crossings, please enter the number of new stream crossings/number of replacement stream crossings.

a. number of new stream crossings b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:

a. the work is a maintenance dredging project as provided for in the Act; or
b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.

5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not exceed the issuance date of the original Final Order of Conditions.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.
9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work..
10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

" Massachusetts Department of Environmental Protection"
[or 'MassDEP"]
File Number :"301-1287"

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before Mass DEP.
12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
13. The work shall conform to the plans and special conditions referenced in this order.
14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.
15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.
16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.
17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.
18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During

construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

19. The work associated with this Order(the "Project") is (1) ☑ is not (2)☐ subject to the Massachusetts Stormwater Standards. If the work is subject to Stormwater Standards, then the project is subject to the following conditions;

a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollutant Discharge Elimination System Construction General Permit as required by Stormwater Standard 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that: *i.* all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures; *ii.*. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized; *iii.* any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10; *iv.* all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition; *v.* any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 19(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement") for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following: i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollutant Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the

proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 19(f) through 19(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 19(f) through 19(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions:
SEE ATTACHED

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☑ Yes ☐ No

2. The Conservation Commission hereby(check one that applies):

a. ☐ DENIES the proposed work which cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw specifically:

1. Municipal Ordinance or Bylaw _____ 2. Citation _____

Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order or Conditions is issued. Which are necessary to comply with a municipal ordinance or bylaw:

b. ☑ APPROVES the proposed work, subject to the following additional conditions.

1. Municipal Ordinance or Bylaw: SUDBURY ADMINISTRATIVE WETLAND BYLAW
2. Citation: XXII

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

The special conditions relating to municipal ordinance or bylaw are as follows:
SEE ATTACHED

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 - Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:301-1287
eDEP Transaction #:1188427
City/Town: SUDBURY

E. Signatures

This Order is valid for three years from the date of issuance, unless otherwise specified pursuant to General Condition #4. If this is an Amended Order of Conditions, the Amended Order expires on the same date as the original Order of Conditions.

February 4, 2021
1. Date of Original Order

Please indicate the number of members who will sign this form. This Order must be signed by a majority of the Conservation Commission.

4
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

Thomas R. Friedlander-Chairman

Dave Henkels- Vice Chairman

Kenneth Holtz

Richard Morse

Bruce Porter

Kasey Rogers

Mark Sevier

☐ by hand delivery on

Date

☒ by certified mail, return receipt requested, on

February 4, 2021
Date

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

(M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

G. Recording Information

This Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

SUDBURY
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

SUDBURY
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

MBTA ROW FROM TOWN OF HUDSON TO 183 BOSTON POST ROAD (SUDBURY SUBSTATION)
Project Location

301-1287
MassDEP File Number

Has been recorded at the Registry of Deeds of:

County | Book | Page

for:

Property Owner

and has been noted in the chain of title of the affected property in:

Book | Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

ORDER OF CONDITIONS
State Wetlands Protection Act &
Sudbury Wetlands Administration Bylaw

DEP FILE #301-1287
Address: MBTA ROW and 183 Boston Post Road
Applicants: Eversource and Department of Conservation and Recreation
Issued: February 4, 2021

The Sudbury Conservation Commission hereby finds that the following conditions are necessary, in accordance with the Performance Standards set forth in the Wetlands Protection Act, its corresponding regulations, and the Sudbury Wetlands Administration Bylaw to protect those interests checked above. To aid in implementation, compliance, and enforcement the specific conditions are divided into several broad categories for reference.

The Sudbury Conservation Commission orders that all work shall be performed in accordance with said conditions and with the Notice of Intent referenced. To the extent that the following conditions modify or differ from the plans, specifications or other proposals submitted with the Notice of Intent, the conditions shall control.

This Decision of the Sudbury Conservation Commission under the Wetlands Protection Act may be appealed to the MA Department of Environmental Protection, Northeast Region.

This Decision of the Sudbury Conservation Commission under the Sudbury Wetlands Administrative Bylaw may be appealed to the Superior Court in accordance with G.L. Ch. 249 §4.

Findings:

The Notice of Intent was filed for the installation of a new 115kV underground electrical transmission line and the construction of a portion of the Mass Central Rail Trail, from the existing Sudbury Substation to the Hudson town line, along the inactive Massachusetts Bay Transportation Authority Right-of-Way, in Sudbury, MA, under the State Wetlands Protection Act and the Sudbury Wetlands Administrative Bylaw.

The Commission finds that portions of the project, as designed and mitigated for, qualifies as a limited project under 310CMR 10.53(3)(d) for Phase I and under 310CMR 10.53(6) for Phase II.

The Commission finds that the stormwater management has been designed in accordance with 310CMR 10.05 (m), as the end use is a non-motorized multi-use trail and Eversource inspection vehicles only need to access the transmission line facility once every three years.

The Commission finds that alternative routes with fewer adverse environmental impacts may exist. However, given the Energy Facilities Siting Board (EFSB) Decision (EFSB 17-02/D.P.U. 17/82/17/83) the Commission was not permitted to evaluate alternative routes under the Wetlands Protection Act. Since this EFSB Decision is currently under Appeal by the Town of Sudbury, if there is a change in the route for the Eversource transmission line as a result of the appeal process, the Applicants shall return to the Commission for further review of any changes to either phase of the project and a determination of the need for potential modifications of this Order.

All wetland resource areas within the Project Locus were reviewed and approved as part of the Abbreviated Notice of Resource Area Delineation (ANRAD) process with the Sudbury Conservation Commission in 2018 through the Order of Resource Area Delineation (ORAD) issued on August 27, 2018. The ORAD included Bordering Vegetated Wetland (BVW), Bank, Land Under Water Bodies and Waterways (LUWW), Bordering Land Subject to Flooding (BLSF), Riverfront Area (RA), and vernal pools, in

accordance with Wetlands Protection Act and Sudbury Wetland Bylaw definitions. During the ANRAD review process, the BLSF boundary was established in the field by ground survey by using the 100-year floodplain (i.e., BLSF) base flood elevation. Under the Act, Hop Brook and Dudley Brook are considered perennial and have an associated 200-foot Riverfront Areas. Under the Sudbury Bylaw, all remaining streams on the Project Locus are defined to be perennial and their associated 200-foot Riverfront Area are jurisdictional under the Bylaw Regulations only. In addition, the Sudbury Bylaw regulates activities within the Adjacent Upland Resource Area (AURA), which generally consists of land within 100 feet of wetland resource areas and land within 200 feet from the top of bank of perennial streams and rivers. The AURA for vernal pools, or Vernal Pool Habitat, extends 100 feet from the mean annual high-water line defining the depression. There are also isolated wetlands on the Project Locus that are subject to local and federal jurisdiction. Portions of the project site are also located within Estimated and Priority Habitat for Rare Species, within Coldwater Fishery Resources, and within a Zone II Wellhead Protection Zone. There are 13 wetland areas that would qualify as vernal pools under the state regulations (one is currently certified and 12 contain biological criteria for certification). There are an additional seven wetland areas that are presumed to be vernal pools under the local bylaw only.

The project and conditions and requirements set forth in this Order of Conditions are specific for each phase of construction: Phase I being under the responsibility of Eversource for the installation of the underground transmission line, all major earthwork, installation of the stormwater management system, construction of a 14-foot gravel road, construction/renovation of Bridges 128 and 127, site restoration, and implementation of all mitigation; and Phase II being under the responsibility of the Department of Conservation and Recreation for the paving of the Mass Central Rail Trail, installation of safety plantings and other trail amenities, and long-term maintenance of the corridor, including culverts and drainage structures.

The project proposes disturbance to four acres of land within estimated and priority habitat for four species: Eastern Box Turtle, Eastern Whip-poor-will, Gerhard's Underwing Moth, and Coastal Swamp Metarranthus Moth. As such, the Natural Heritage and Endangered Species Program has reviewed the project and imposed conditions to prevent the "take" of state-listed species in determination letters to the Applicants dated October 19, 2018, and May 17, 2019. These conditions are incorporated herewith.

The Commission finds that this project is designed to meet the performance standards of the Wetlands Protection Act and the Sudbury Wetlands Administration Bylaw. Mitigation under the Bylaw for the proposed project actions within the locally regulated Adjacent Upland Resource Area, will be achieved by installation of restoration and mitigation plantings within the limits of work (total of 0.9 acres), debris removal outside the limit of work, creation of strategic brush piles for wildlife habitat, installation of an osprey platform at the existing substation off Boston Post Road, and implementation of a 3.3-acre invasive species management program within the MBTA ROW but outside the limits of work proposed for the Project. The Commission finds the Project, as conditioned in this Order is sufficient to meet the requirements of the state and local wetland regulations.

Final Record Documents:

1. Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project Notice of Intent dated March 2020.
2. Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project Wildlife Habitat Evaluation, dated March 2020, with supplemental Wildlife Habitat Evaluation Summary dated October 15, 2020.
3. Eversource Sudbury Notice of Intent Plans March 5, 2020, as revised through January 2021
4. Mass Central Rail Trail Notice of Intent Plan March 5, 2020, as revised through January 7, 2021
5. Draft Eversource Stormwater Pollution Prevention Plan dated May 2020
6. Draft DCR Stormwater Pollution Prevention Plan dated May 2020
7. Sudbury – Soil and Groundwater Analytical Memo dated June 12, 2020

8. Time of Year Restrictions Figures June 24, 2020
9. Draft Turtle Protection Plan (undated)
10. Draft Corridor Management Plan dated August 7, 2020
11. MCRT Operation and Maintenance June 2020
12. Long Term Pollution Prevention Plan June 2020

All work must conform to the plans referenced, the Notice of Intent, and this Order. In case of conflict, the requirements in this Order shall prevail. By accepting this Order, the Applicants confirms submission all relevant documentation, reports, and information available to Applicants, in the application submitted and that this information is true and valid to the best of the Applicants' knowledge.

SPECIAL CONDITIONS:
PART I: GENERAL PROJECT CONDITIONS:
For Phase I and Phase II

These conditions apply to all projects permitted by the Sudbury Conservation Commission. They shall remain in force until issuance of a Certificate of Compliance by the Commission. A violation of any of these conditions shall constitute reason for enforcement action by the issuing authority:

a. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.

b. This Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.

c. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, by-laws, or regulations.

d. The work authorized hereunder, except for that work which has specific timeframes indicated, shall be completed within three years from the date of issuance of this Order unless either of the following apply:
   1) the work is a maintenance dredging project as provided for in the Act; or
   2) the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance and both that date and the special circumstances warranting the extended time period are set forth in this Order.

e. This Order may be extended by the issuing authority for one or more periods of up to one year upon application to the issuing authority at least thirty days prior to the expiration date of this Order. In determining whether or not to grant an Extension Permit, the Sudbury Conservation Commission shall review and apply the criteria for extensions of time as set forth in the Regulations.

f. No work shall be undertaken until all administrative appeal periods from the date of issuance of this Order have elapsed or, if such an appeal has been filed, until all proceedings have been completed.

g. **No work shall be undertaken until the Final Order has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property**. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor index under the name of the owner of the land upon which the proposed

work is to be done. In the case of registered land, the final Order shall also be noted on the Land Court Certificate of title of the owner of the land upon which the proposed work is to be done.

h. The recording information shall be submitted to the Commission on the form at the end of the Order, or other form acceptable to the Commission, within thirty days of the issuance of this Order or prior to the start of construction, whichever is sooner.

i. Where the Department of Environmental Protection is requested to make a determination and to issue a Superseding Order, the Sudbury Conservation Commission shall be party to all agency proceedings and hearings before the Department.

j. The work shall conform to the plans and special conditions incorporated in this document.

k. The project engineer, contractors, and all subcontractors must be informed of the conditions in this Order.

l. The Applicants are held responsible for compliance with this Order of Conditions. The Sudbury Conservation Commission shall be notified, in writing, within forty-eight hours of any transfers of title on this property.

m. This Order of Conditions shall apply to any successor in control, or successor in interest, of the property described in the Notice of Intent and accompanying plans.

n. Members and agents of the Sudbury Conservation Commission shall have the right to enter and inspect the property to evaluate compliance with the conditions stated in this Order. When possible prior to project site access, reasonable advance notice will be made. Compliance with health and safety protocols for the project site will be followed.

o. Prior to commencement of work, the Applicants shall provide the executed Memorandum of Understanding between Eversource and the Department of Conservation and Recreation and the agreements between the Massachusetts Bay Transportation Authority and the Applicants, to ensure the obligations of the project are fulfilled.

p. All Time-of-Year restrictions and sweeps required by the Natural Heritage and Endangered Species Program shall be followed. Time-of-Year restrictions for work within 450 feet of all vernal pools shall be March 1 through June 1. Between March 1 and June 1, the Applicants' Environmental Monitor shall conduct sweeps prior to vehicles traveling down the project site within vernal pool buffers (including certified, certifiable, and presumed vernal pools). Between April 1 and October 31, the Applicants' environmental monitor shall conduct turtle sweeps prior to initiation of work each day, or prior to vehicles travelling through the Box Turtle Protection Area.

q. The baseflow and baseline water quality of all Cold Water Fisheries shall be established pre-construction. Baseline monitoring shall be accomplished to ensure there is no degradation of water quality over time from this project. The Applicants shall submit a detailed plan, subject to the Commission's approval, to specify water quality monitoring parameters, including times, methodology, analyses and reporting. Post construction, monitoring may be required and may continue in the Certificate of Compliance based on monitoring result up to that time.

r. Prior to commencement of each Phase, the Conservation Commission or its Agent shall map the corridor for the presence of invasive species within and adjacent to the limit of work. The

information generated from this mapping shall be used to identify any new invasive species populations or significant expansions of invasive species that are a direct result from the Project. Mapping shall be used by the Applicants to implement a program to control invasive species populations to ensure the functions of wetland resource areas in the limits of work that have been restored with native vegetation are not subject to degradation by expansion of invasive species. If the Commission or its agent determines that the Project resulted in new or significantly expanded invasive populations, the Applicants shall implement a program to control these populations to ensure the project does not result in additional degradation of wetland resource areas.

s. The site shall be accessed predominantly from public ways. If alternative access points are needed, the Applicants will first direct the contractor to use previously disturbed areas outside wetlands jurisdiction. If alternative access is found to be needed within wetlands jurisdiction, access may be permitted within previously disturbed areas that will not require additional vegetation removal or additional impacts to wetland resource areas, with approval from the Commission's representative. No equipment turnaround locations outside the limit of work are permitted.

t. Laydown areas shall be located predominantly outside resource areas subject to the Commission's jurisdiction. If any construction laydown area is proposed outside of the currently proposed work limits and in an area subject to the Commission's jurisdiction, an erosion control plan shall be submitted in advance to the Commission's representative for review and approval.

u. Any fill used in connection with this project shall be clean fill, containing no trash, refuse, rubbish or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles or parts of any of the foregoing.

v. No equipment cleaning or refueling may occur within a wetland or upland resource area, with the exception of the crane. For cranes positioned within wetland jurisdiction for more than one day, the Applicant shall provide secondary containment to contain any leaks that may emanate from equipment.

w. All equipment, including timber mats, shall be cleaned and certified invasive species free, prior to entering the site. Such certification shall be provided to the Commission prior to commencement of mobilization into the site and when remobilized within the project site.

x. Heavy mechanical equipment (exerting a ground pressure of 3 psi or greater) will not be allowed in areas where final grading, aeration, and vegetation restoration/mitigation have been completed, including restored and replicated wetland resource areas. Following completion of restoration areas, erosion controls or other method of demarcation shall be implemented to prevent further alteration of restoration areas.

y. All areas of disturbance shall be monitored for invasive species, which shall be manually removed if encountered, for the duration of the project and until such time as a minimum of 90% native vegetative cover is established.

z. The wetland replication area and land adjacent thereto shall be monitored for invasive species, and manually removed when found, for the life of the Order. The wetland replication area shall be considered substantially restored when it contains a minimum of 90% cover with native species. Replications that do not properly restore the functions and values of altered resource areas will not be deemed acceptable no matter how closely they adhere to approved engineered plans.

aa. There shall be no drafting of water from wetland resource areas for dust control, for watering plantings, or any other activity.

bb. Every effort shall be made to reduce soil compaction. Compacted soils shall be aerated prior to being revegetated.

cc. Upon completion of the work associated within each phase, the Applicants shall forthwith request in writing that a Certificate of Compliance be issued stating that the work has been satisfactorily completed and clearly documenting any deviations or deficiencies from the approved plans.

CONDITIONS RELATED TO ENDANGERED SPECIES MANAGEMENT
For Phase I and Phase II

a. Prior to implementation, the Final Corridor Management Plan for Massachusetts Central Rail Trail and Sudbury-Hudson Transmission Reliability Project that will be provided to the Division of the Fisheries and Wildlife ("the Division") shall be provided to the Commission for review and approval and must be implemented as approved. If changes to said Plan are proposed, the revised Plan to be submitted to the Division shall be submitted to the Commission for review and approval. Vegetated areas over the duct bank and water quality swales (within wetland jurisdictional areas) shall not be mown between April 1 and November 1, unless needed for safety purposes, without prior approval of the Conservation Commission.

b. Prior to the start of work, the Applicants must submit to the Division and the Commission, for review and approval, a signage plan for the shoulder and duct bank mowing areas, which must describe sensitive dates for the Eastern Box Turtle.

c. Measures shall be implemented to protect Eastern Box Turtles during construction. Prior to the start of work, a final Eastern Box Turtle Protection Plan must be submitted to the Division and Commission for review and approval, and must be implemented as approved. Said Plan must include detailed turtle protection measures to be implemented by the Applicants. If changes to said Plan are proposed, a revised Plan must be submitted to the Division for review and prior written approval. The Commission shall be provided a copy of the final Eastern Box Turtle Protection Plan along with any modifications thereto.

d. Prior to the start of work, the Applicants must submit to the Division and Commission, for review and approval, a native seed mix proposed for any planting or loam and seed activities.

e. Unless otherwise approved by the Division and Commission, proposed wood railings must leave, at a minimum, a 10-inch space beneath the lowest rail for wildlife passage.

f. Unless otherwise approved by the Division, construction activities within Priority Habitat must not occur during the Eastern Whip-poor-will breeding season (May 1 – August 1), as proposed. The Applicants shall endeavor to refrain from construction activities within Priority Habitat from April 15 to August 1.

g. Within thirty (30) days of the completion of work, or as otherwise approved by the Division, the Applicants shall submit a compliance report to the Division and Commission documenting the completion of the project and compliance with all conditions herein, including a summary of construction timelines and photographs.

h. Work within 450 feet of vernal pools is prohibited between March 1 and June 1. The Applicants shall have a qualified Environmental Monitor on site to monitor vehicular traffic during this Time of Year restriction, should a suitable alternative route not be available.

PART II: CONDITIONS SPECIFIC TO
Phase I: Eversource Underground Transmission Line

a. An independent Environmental Monitor, hired by the Conservation Commission and paid for by the Applicant, shall be provided to oversee the following activities:
    1. Review the erosion control barrier following installation but prior to any land disturbance and each year prior to vernal pool species migration. Conduct spot inspections of vernal pools during construction and/or review reports provided by the Applicant's environmental monitor to ensure no negative impact to vernal pools during construction.
    2. Be on site during initial tree removal and invasive species clearing activities, within the limit of work.
    3. Review and ensure appropriate reporting of all activities associated with construction scheduling, erosion control monitoring, compliance with the project's SWPPP, and environmental monitoring activities including ensuring adherence to time of year restrictions.
    4. Be on site during bridge platform installation and spot inspections during bridge construction.
    5. Be notified of all dewatering activities and be on site during dewatering in sensitive locations, i.e. whenever excavation is proposed within 50 feet of a wetland, or when extensive dewatering will be needed. Specific oversight locations will be determined with the contractor, prior to commencement of work.
    6. Review restoration/mitigation areas including being on site during the construction of the wetland replication area.
    7. Be on site to oversee excavation/construction activities over culverts and drainage structures.
    8. Be available to respond to emergency situations, should they arise.

b. At least four weeks prior to any land disturbance, an Invasive Species Management Plan shall be developed and submitted to the Conservation Commission for review and approval. Said Management Plan shall involve removal of invasive species and revegetation with native species for a period of five (5) years from a minimum of 3.3 acres of land within the MBTA Right-of-Way, but outside the proposed limit of work, and shall focus efforts on improving wildlife habitat in areas identified through the Wildlife Habitat Evaluation and peer review thereof as being most impacted from proposed work. Following implementation, the Invasive Species Management Area shall be managed in accordance with Perpetual Condition b. contained within this Order.

c. At least two weeks prior to any land disturbance, a Soil and Groundwater Management Plan (SGMP) prepared in conjunction with the selected contractor shall be submitted to the Conservation Commission for review and comment. The Applicant shall give due consideration to address comments received from the Commission that are needed to protect wetland resource areas functions and values. The SGMP will develop means and methods to manage soils and groundwater encountered during project construction activities including soil excavation, groundwater dewatering, and railroad tie and track removal. If conditions are encountered that suggest soil may require additional evaluation or special handling based on visual, olfactory, or field screening results, excavation activities in that area will immediately be stopped and Eversource, their Licensed Site Professional, and the Conservation Commission will be contacted immediately to evaluate the observations and recommend requirements for proper handling. The Commission shall be copied on all related correspondence.

d. At least two weeks prior to any land disturbance, a structural engineer and wildlife biologist shall inspect the culverts and drainage structures within the Project Site to determine whether they are structurally sound to (a) function hydrologically, (b) withstand the planned construction activities, and (c) evaluate their wildlife migration functions, and shall provide a report of the finding to the Commission. If any culverts do not meet these requirements or is damaged during construction, it shall be repaired or replaced with a culvert that meets current MA Stream Crossing Standards to the maximum extent practicable, as determined by the Commission or its Agent. Any recommended improvements to these structures, not included in this Notice, shall be required to submit a separate Notice of Intent and/or an Amendment to this Order to the Commission for further evaluation. Following completion of Phase I and Phase II a similar structural evaluation shall be conducted to confirm work did not affect culverts and drainage structures.

e. At least three weeks prior to any land disturbance, a Project Compliance Manual that includes the requirements from compliance from the various permits for the Project, including this Order and Conditions herein, shall be submitted to the Conservation Commission for review to confirm that the requirements of this Order are accurately stated.

f. At least two weeks prior to the start of Phase I, the Applicant shall provide a construction schedule detailing construction activities and sequencing. This shall be amended as necessary throughout construction. Weekly reports shall be submitted to the Commission that details work completed each week and anticipated work for the coming week, including identifying when work is located in areas of potential elevated levels of soil and groundwater contamination. These reports shall include anticipated dewatering activities so that oversight can be provided by the Commission or its Agent, if found necessary, and include the location of active stockpiles with confirmation that appropriate erosion control measures are being implemented.

g. At least two weeks prior to the start of Phase I, the Applicant shall provide the final Stormwater Pollution Prevention Plan (SWPPP) to the Commission for review and approval. Any use of permanent infiltration BMPs for temporary construction-related stormwater management shall be specifically addressed in the SWPPP and protocol for removal of fine silt and sediment from these BMPs shall be conducted at the completion of Phase I. If a response is not received by the Conservation Commission within 10 days of receipt, the SWPPP shall be deemed approved. Any changes made to the SWPPP during the course of the project shall be submitted and approved by the Commission prior to implementation.

h. Prior to land disturbance, the Applicant shall provide a signed illicit discharge statement.

i. The Applicant shall ensure there is a qualified Environmental Monitor(s) on site at all times overseeing work that is subject to this Order. The Environmental Monitor(s) shall send weekly erosion control inspection reports and reports following any storm event of ½ inch of rain or greater, to the Conservation Commission.

j. The Limit of Work/erosion control location shall be survey located in the field and certified by a Mass Registered Professional Land Surveyor, installed under the oversight of the Applicant's Environmental Monitor, and reviewed by the Commission and/or its Agent prior to commencement of any site work.

k. Prior to any site disturbance, with the exception of the installation of the erosion control barrier, the Applicant shall schedule a pre-construction site visit with the Conservation Coordinator as least one week prior to commencement of work. At a minimum, those in attendance at this site visit should include the Applicant, construction supervisor, and environmental monitors involved in the project.

l. The Applicant's wildlife biologist or other qualified individual shall document the location of all important habitat features that will be removed (such as brush piles, snags, overhanging trees, logs within or near the water, large woody debris, etc.) to quantify the number of features removed and provide confirmation that work did not result in the loss of important wildlife habitat features. Brush, large woody debris, and logs shall be replaced within or near the water, generally in the location of where they were removed. Reports shall be provided to the Conservation Commission at least every six (6) months, for the life of the Order, documenting wildlife habitat removal and restoration efforts implemented, including monitoring of vernal pools.

m. During initial vegetation removal, trunks shall be retained but cut as close to the ground as possible. Following installation and approval of erosion controls, stumps and roots may be grubbed, if necessary. Stumping and grubbing activities shall not adversely affect woody vegetation or soils outside the erosion control barrier. Logs, stumps, and other large woody debris in and/or overhanging the resource areas shall be left undisturbed to maximize food source and habitat.

n. Tree/limb clearing shall be minimized to only that which is required to access the project site with equipment and to conduct the approved work. Equipment shall be chosen which minimizes required clearing to the maximum extent practicable. The Applicant shall retain as many limbs overhanging the limit of work as possible. Prior to tree felling, the Applicant shall walk the corridor with the Commission or its Agent to determine the extent of canopy that can be retained.

o. Vegetation removed from the site shall be chipped directly into a truck and removed from the project site. Woody material for reuse on site for the creation of wildlife habitat features shall be identified and retained.

p. The contractor shall provide detailed plans of the crane mat location and installation a minimum of one week prior to installation. All work and impacts associated with installation, removal, and stabilization of the crane areas shall be conducted in strict compliance with the Project Plans and Details and shall be reviewed and approved by the Commission and/or its Agent prior to installation and shall be installed under the supervision of the independent Environmental Monitor.

q. Dewatering activities shall be located as far as possible from wetland resource areas and shall be prohibited from discharging to Bordering Vegetated Wetlands, Isolated Vegetated Wetlands, Land Under Water Bodies and Waterways, or within the inner Riverfront Area. Dewatering may only occur in other upland resource areas provided adequate control measures are implemented and locations are identified by the contractor and review and approved by the Commission and/or its agent prior to implementation.

r. The Conservation Commission and their representative shall be notified at least three (3) business days in advance of the removal of the crane mats at Bridge 127.

s. Other than the grading of minor amounts of soil within the immediate vicinity of the Hudson/Sudbury town boundary, no soil excavated from Hudson may be used in Sudbury. The Sudbury Conservation Commission shall be copied if the Hudson Conservation Commission is notified of any remedial activities or changes to the work plans required due to the potential presence of PFAS in jurisdictional areas in Hudson.

t. The Applicant shall ensure that any reuse of on-site soils shall not result in the degradation of soil or groundwater in the area.

u. Stockpiling of materials within the ROW shall be limited in size and duration (one-week maximum) and shall be located as far from sensitive areas as possible. Soil stockpiles shall be covered with tarp or plastic sheet and surrounded by erosion controls. Excess soil not reused within the Project site shall be stockpiled outside the ROW and wetland jurisdiction. Weekly reports prepared by the Environmental Monitors throughout construction will identify the locations of active stockpiles and will confirm that the appropriate erosion control measures are being implemented

v. Additional test pits/borings at the location of each proposed "area of increase infiltration" shall be conducted during construction to verify soil conditions, infiltration rates, and groundwater levels, and provided to the Conservation Commission for review. At a minimum, soil tests shall be conducted in the vicinity of Stations 502+00, 511+00, 570+00, and 579+00. A report of the findings, comparison with expectations, and a statement on the appropriateness of the design shall be provided to the Conservation Commission for review. If findings are not consistent with the assumptions made for the stormwater management design, revisions to the design and approval of modifications to the Plan may be required.

w. Infiltration basins shall not be used as sediment basins during construction. Additional erosion controls shall be installed to protect infiltration basins from sedimentation until contributing areas are stable.

x. The Conservation Commission and/or their agent shall inspect all permanent stormwater infiltration BMPs for acceptance prior to construction demobilization to a new location within the ROW.

y. Mitigation, and restoration efforts within the limit of work, shall be implemented during the first growing season following commencement of work. Written reports shall be submitted by December 1 of each year the Order is active that details mitigation efforts that have been implemented, success of implementation, and anticipated activities the following growing season. Mitigation and Restoration areas shall be deemed substantially in compliance when there is a minimum of 90% cover with native species and free of invasive species.

z. Areas adjacent to vernal pools shall be revegetated immediately following the completion of all necessary grading in these area, and the revegetation in these areas shall be monitored so erosion controls can be removed as soon as field conditions allow. Mitigation plantings around the vernal pool margins shall be monitored for successful establishment for a minimum of two growing seasons and annual reports documenting establishment shall be submitted to the Commission.

aa. Prior to planting, the Applicant's Environmental Monitor shall inspect, approve, and provide photo documentation of all plant stock. Any species substitutions must be provided to the Commission, in writing, including a justification for substation, for review and approval prior to implementation.

bb. The wetland replication area shall be constructed during vegetation removal in the vicinity of the replication area and prior to the construction of structures in that vicinity.

cc. All plantings must survive for at least two growing seasons or be replaced at the expense of the Applicant.

dd. Loam borrow brought to the site to stabilize the work area after completing Phase 1 shall be sourced appropriately. Use of impacted soils (from contamination or invasive seed) shall be prohibited.

ee. No spoils of construction, construction material, or equipment shall be stored, placed or operated in the wetland resource areas or the wetland buffer zone except as may be permitted by this Order for

work in the riverfront and upland resource area. These activities may not occur within the bordering vegetated wetland or within bordering land subject to flooding.

ff. In any part of the Project work limits within 200 feet of a road crossing where the MBTA ROW crosses a Zone II for the Sudbury Water District supply wells, if a clay layer is encountered in the excavation for the transmission line and the excavation will extend below the bottom of the clay layer, the clay shall be stockpiled and reused to backfill and line the excavation before the transmission line duct bank is placed in that location.

gg. There shall be no disturbance beyond the limits of activities permitted as part of this Order.

hh. Every effort shall be made to restore disturbed area with a similar soil composition to that which is was removed.

ii. No deicing products shall be used within the project site. Snow may be stockpiled within the limit of work only or shall be removed from the site to an appropriate facility outside wetlands resource areas.

jj. Should Phase II not commence within three years of completion of Phase I, the Applicant shall file an Amendment to bring the stormwater management into full compliance with the Town of Sudbury Stormwater Regulations.

kk. All wildlife habitat replication and restoration shall be completed during the first growing season of Phase I to avoid a significant adverse project/site-specific impact or an adverse cumulative impact on wildlife for more than two growing seasons. Should Phase II not commence within two years of completion of Phase I, erosion controls or other methods of demarcation shall be implemented to prevent further alteration of restored areas. No important wildlife habitat features restored during Phase I shall be removed during Phase II.

PART II CONDITIONS SPECIFIC TO
Phase II: DCR Mass Central Rail Trail

a. Prior to commencement of Phase II, erosion controls shall be inspected. Erosion controls shall be removed from all areas that have stabilized from Phase I and will not be re-disturbed as part of Phase II. All degraded erosion controls shall be replaced. Areas requiring re-installation of erosion controls for Phase II shall be installed at the limit of work for Phase II.

b. At least two weeks prior to the start of Phase II, the Applicant shall provide a construction schedule detailing construction activities and sequencing. This shall be amended as necessary throughout construction. Weekly reports shall be submitted to the Commission that details work completed each week and anticipated work for the coming week.

c. At least two weeks prior to the start of Phase II, the Applicant shall provide the final Stormwater Pollution Prevention Plan (SWPPP) to the Commission for review and approval. Any changes made to the SWPPP during the course of the project shall be submitted and approved by the Commission prior to implementation. If a response is not received by the Conservation Commission within 10 days of receipt, the SWPPP shall be deemed approved.

d. The Applicant shall ensure there is a qualified Environmental Monitor(s) on site at all times overseeing work that is subject to this Order. The Environmental Monitor(s) shall send weekly erosion control reports and reports following any storm event of ½ inch of rain or greater, to the Conservation Commission.

e. The Phase II limit of work/erosion control location shall be located in the field with survey grade equipment that produces sub-foot accuracy installed under the oversight of the Applicant's Environmental Monitor, and reviewed by the Commission and/or its Agent prior to commencement of any site work.

f. Prior to any site disturbance, with the exception of the installation of the erosion control barrier, the Applicant shall schedule a pre-construction site visit with the Conservation Coordinator as least one week prior to commencement of work. At a minimum, those in attendance at this site visit should include the Applicant, construction supervisor, and environmental monitors involved in the project.

g. There shall be no disturbance beyond the limits of activities permitted as part of this Order.

h. Other than road crossings and pullouts, the paved multi-use trail shall not exceed ten (10) feet in width. Any pavement that exceed 10 feet in width shall be required to be removed.

i. Stockpiling of materials shall be within the Phase II limit of work and shall be located as far from sensitive areas as possible.

j. No spoils of construction, construction material, or equipment shall be stored, placed or operated in the wetland resource areas or the wetland buffer zone except as may be permitted by this Order for work in the riverfront and upland resource area. These activities may not occur within the bordering vegetated wetland or within bordering land subject to flooding.

k. The corridor shall be maintained in compliance with the MassCentral Rail Trail (MCRT) – Wayside Section Stormwater Management System Operation and Maintenance Pan (O&M) and the Long Term Pollution Prevention Plan.

l. Japanese knotweed shall be managed within the limit of work. Chemical treatment, via spot treatment, may be permitted as a last measure to manage knotweed. Herbicide use shall be prohibited within any certified, certifiable, or presumed vernal pool, vegetated wetlands or waterways.

m. DCR shall notify the Commission in advance if herbicides are to be used for vegetation control within jurisdictional areas, indicating the target control species, the type(s) of herbicide to be used, the proposed application rate, and the on-going maintenance plan for the targeted area for review and approval. This Condition is ongoing and does not expire with the expiration of the Order of Conditions or the issuance of a Certificate of Compliance.

PART III: EROSION, SEDIMENTATION, STABILIZATION CONDITIONS
For Phase I and Phase II

a. Erosion control shall be installed per the approved plan and maintained as necessary to prevent erosion and sedimentation from entering the resource areas. It is the Applicants' responsibility to take appropriate measures to control sedimentation into the wetland resource areas.

b. Perimeter erosion controls shall be installed along the down gradient side of disturbed areas where topography is directed towards other portions of the existing/proposed trail work area.

c. Stabilization of slopes shall be accomplished as soon as possible. Biodegradable jute netting shall be properly anchored in place, secured with non-chemically treated biodegradable materials. Should non-biodegradable fasteners be needed, with prior approval by the Commission and/or its agent, the

Applicants may use non-biodegradable fasteners with the condition that the Applicants shall provide confirmation that all fasteners have been removed once the area is deemed fully stabilized by the Commission and/or its representative.

d. Appropriate netting shall be installed under the bridge 128 during bridge work to prevent debris from entering the stream. The Applicants shall contact the Conservation Office once installed for review prior to commencement of bridge work.

e. Following Land Under Water Restoration, erosion controls shall be removed once fully stabilized and the Conservation Commission or its representative has confirmed stabilization, to protect the long-term water quality of the adjacent wetland waterways.

f. During Phase I, Eversource shall be responsible for installing and maintaining erosion controls within the project site. Following completion of Phase I, Eversource shall continue to maintain erosion controls until DCR commences Phase II, provided that Eversource shall remove erosion controls from areas stabilized at the completion of Phase I, as confirmed by the Commission or its agent. Every effort shall be made during Phase I to stabilize areas within vernal pool habitat immediately following final grade.

g. During Phase II, DCR shall be responsible for installing and maintaining erosion controls on the project site. Following completion of Phase II and inspection by the Commission or its Agent, DCR shall be responsible to remove all erosion control barriers.

h. Should the time between Phase I and Phase II exceed one year, the site shall be assessed every six months, in the presence of the Commission or its Agent, to determine if erosion controls containing areas that are stable which will not be destabilized during Phase II, can be removed.

PART IV: PLAN MODIFICATIONS:

a. Any changes during construction due to soil types found or other conditions discovered during construction shall require immediate notification of the Conservation Commission for a determination if the changes require revisions to this Order or the filing of a new Notice of Intent. Any modifications or revisions to the plans referenced, or any new plans, must be submitted to the Commission for review and a determination as to whether a new Notice of Intent is required. If this procedure is not followed, this Order may not be amended. No additional work not specifically allowed by this Order shall be accomplished on the site without the approval of the Sudbury Conservation Commission and the appropriate new filings or amendment requests are approved. Amendment procedures as described in the Wetlands Protection Act, the regulations, and the Department of Environmental Protection's Wetlands Program Policies shall be followed.

b. No additional new construction or disturbance of a wetland resource area, as defined in the Wetlands Protection Act and its regulations, or within the 100' wetland resource area buffer zone, not covered by this Order of Conditions, shall be permitted on this site until a determination has been made by the Commission as to whether a new Notice of Intent is required, and the new work or disturbance is incorporated into a new or amended Order of Conditions. An adequate stockpile of unused erosion controls shall be available at or near the site.

c. Should the Sudbury Conservation Commission become aware of work on site being accomplished that was not approved as part of the Order of Conditions or subsequent amendments, the Commission reserves the right to require a new Notice of Intent. The plan filed with the new Notice of Intent must be based on an interim as-built plan prepared by a registered engineer. The new Notice must provide

a detailed description of the discrepancies between the approved plan and the site conditions to date. The Commission reserves the right to require as part of the interim as-built plan, but not be limited to requiring, new topography survey, new drainage calculations, and details or all disturbance within the wetland resource and the 100' wetland buffer zone.

PART V: CERTIFICATE OF COMPLIANCE REQUIREMENTS:

a. Following completion of Phase I, Eversource shall request a Partial Certificate of Compliance. This Request shall be accompanied by as-built plans, stamped by a professional land surveyor or other qualified professional, detailing all elements of Phase I including all restoration plantings, wetlands replication, all stormwater management elements, post construction structural report, provide a cut/fill analysis for the project by stream reach and elevations to confirm adequate compensatory storage is provided and affidavit from all site professionals that all aspects of this Order were adhered to, along with reports associated with mitigation activities. Any deviations from the approved plans shall be specifically called out on the as-built plan. A report on the restoration/mitigation plantings and invasive species management program shall be provided that includes an assessment of the plant community composition in the context of the wildlife habitat restoration. Vegetation outside the limit of work shall also be evaluated to confirm no negative impacts occurred outside the limit of work.

b. Following completion of Phase II and full stabilization of the site, a full Certificate of Compliance shall be requested, accompanied by an as-built plan of Phase II elements overlain the Phase I as-built plan, final report on restoration/mitigation efforts, and post construction structural report. Any deviations from the approved plans shall be specifically called out on the as-built plan.

PART VI: CONDITIONS IN PERPETUITY:

The following conditions shall be recorded at the Registry of Deeds as part of this Order of Conditions and shall continue in perpetuity and be included on the Certificate of Compliance. Owners of this property shall be made aware of restrictions in perpetuity on the activities allowed on this property. If the property owner has good cause to request an amendment to the conditions in perpetuity, he/she shall have the right to make a request for an amendment to the issuing authority. If, in the judgment of the issuing authority, the proposed activities will not detrimentally impact the wetland resource area functions, this Order, or the Certificate of Compliance shall be amended.

a. Wetlands are located on this property that are subject of the Massachusetts Protection Act (Chapter 131, section 40) and the Sudbury Wetlands Administration Bylaw. Any work within a wetland resource area (including the 200' riverfront area) or within 100' of a wetland resource area requires review and approval by the Sudbury Conservation Commission prior to the commencement of such work.

b. To ensure the environmental integrity of the site is maintained to offset the permitted activity, after the initial management period of five (5) years, the 3.3-acre invasive species management areas shall be monitored annually for the presence of invasive species and annual reports shall be submitted to the Conservation Office. Any areas found to contain concentrations of invasive species and/or should the plant community within the management area exceed 10% invasive species, the management area shall be managed by DCR in accordance with a program developed in consultation with the Commission's representative.

c. Fertilizers shall not be used within jurisdictional areas.

d. No pesticides or herbicides are allowed within a wetland resource area, including the 200-foot riverfront area, or within 100-foot of a wetland resource area (the adjacent upland resource area under the local bylaw), except for spot treatment of Japanese knotweed, without additional review by the Conservation Commission.

e. Underground storage of petroleum products is prohibited within a wetland resource area and within the 100' buffer zone of a wetland resource area.

f. No coal tar-based sealants may be applied to any area draining into the upland or wetland resource areas of the property.

g. All components of the stormwater management system shall be maintained in accordance with the MassCentral Rail Trail (MCRT) – Wayside Section Stormwater Management System Operation and Maintenance Pan (O&M) and the Long Term Pollution Prevention Plan, and as necessary to function as designed. Inspection checklists shall be maintained and be made available for review by the Conservation Commission or staff on request.

h. There shall be no snow removal activities or de-icing products used on site, except as required for emergency situations.

i. The five-foot maintained area over the transmission line, outside the two-foot shoulders that will be regularly maintained, may be mown once per year, before April 1 or after November 1 Mowing outside this timeframe may be allowed in accordance with the Final Corridor Management Plan, with the objective of allowing vegetation to go to seed and propagate.

j. When maintaining the rail trail, no debris, including natural debris such as leaves, shall be blown or swept into areas within 25 feet of vernal pools. Signage or other means of demarcating this management requirement shall be provided to and approved by the Conservation Commission prior to issuance of a Certificate of Compliance.

k. The culverts and drainage structures shall be inspected at least annually and cleared of debris as needed. If culverts become damaged or no longer function as required, they shall be repaired or replaced according to most current MA Stream Crossing Standards. This work will require review and approval by the Conservation Commission under a Notice of Intent.

l. If herbicide use by DCR is permitted under a future Vegetation Management Plan, as approved by the Department of Agricultural Resources, herbicide use shall be prohibited within any certified or certifiable vernal pool, vegetated wetlands or waterways. Invasive species removal by DCR will be by mechanical means when possible and spot treatment of herbicide by a licensed herbicide applicator when other approaches are ineffective. DCR shall notify the Commission in advance, if herbicides are to be used within wetland jurisdictional areas, indicating the target control species, the type(s) of herbicide to be used, and the on-going maintenance plan for the targeted area.

m. All trail amenities, such as benches and kiosks, shall be located outside wetland jurisdictional areas, except as shown on the approved plans.

Middlesex South Registry of Deeds

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Middlesex South Registry of Deeds
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A TRUE COPY, ATTEST:
TOWN CLERK

January 27, 2021

DECISION
STORMWATER MANAGEMENT PERMIT
Eversource Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project
183 Boston Post Road, Sudbury, MA
SWMP #20-07

DECISION of the Planning Board of the Town of Sudbury, Massachusetts (the "Board") on the petition of NSTAR Electric Company d/b/a Eversource of 247 Station Drive, SE270 Westwood, MA 02090 and Department of Conservation and Recreation (DCR) of 251 Causeway Street, Suite 600, Boston, MA 02114 ("Applicants") and Massachusetts Bay Transportation Authority (MBTA) of 10 Park Plaza, Boston, MA 02116 ("Owner") for approval of a Stormwater Management Permit to construct a new 115-kV underground transmission line and a multi-use path within an existing inactive railroad right-of-way, which will require removal of the existing rails and ties; vegetation clearing; grading; installation of the underground transmission line, duct bank, and manholes; installing a 14-foot-wide gravel base; paving of the 10-foot-wide rail trail, multi-use path; installation of stormwater management features; and site restoration, (the "Project") on the property (the "Property") located at 183 Boston Post Road and within the 4.3 mile long MBTA Right-of-Way subject to a lease agreement with the DCR in Sudbury, MA. The Project proposes alteration of approximately 643,985 sq. ft. (14.8 acres) of land, including approximately 221,410 sq. ft. of land area on slopes greater than 10% and a total increase in impervious area of 226,556 sq. ft., on a 54.4 acre parcel located at 183 Boston Post Road and the MBTA Right-of-Way, Sudbury, MA, Town Assessor Maps K10-0014, K11-5000, K09-5000, K08-5000, K07-5000, J06-5000, J05-5000, and H03-5000, zoned Residential A, Residential C, Business, and Limited Industrial, Water Resource Protection Overlay District Zone II and III, and Flood Plain Overlay District.

This Decision is issued in response to an application submitted to the Board on July 15, 2020 by the Applicants for a Stormwater Management Permit (the "Permit") under Article V (F), Section 5.C of the Town of Sudbury Bylaws (the "Bylaw") and the Town of Sudbury Stormwater Management Bylaw Regulations (the "Regulations").

After causing notice of the time and place of the public hearing and of the subject matter thereof to be published, posted, and mailed to the Applicants, Owners, abutters, and other parties in interest, as required by law, the public hearing was opened on August 12, 2020 and continued on September 9, 2020, September 23, 2020, October 28, 2020, November 18, 2020, December 9, 2020, January 13, 2021, and January 27, 2021, when it was closed. The project was deliberated on August 12, 2020, October 28, 2020, November 18, 2020, December 9, 2020, January 13, 2021, and January 27, 2021. The following members of the Board were present throughout the proceedings: Stephen Garvin, Charles Karustis, John Hincks, Justin Finnicum, and John Sugrue. The record of the proceedings and submissions upon which this Decision is based may be referred to in the office of the Town Clerk or the Planning and Community Development Department.

Documents submitted for the Board's consideration and collectively referenced as the "Plan", include:

1) Sudbury Stormwater Bylaw Permit Application for the Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project, issued to Sudbury Planning Board, prepared by VHB, dated July 15, 2020 (1,356 pages).
2) Sudbury Stormwater Management Plan Narrative for the Sudbury Hudson Transmission Reliability Project and Mass Central Rail Trail Project, Sudbury Massachusetts (Stormwater Management Report), dated March 7, 2018, last revised October 21, 2020, received January 13, 2021 (1,349 pages).
3) Site Plans Eversource, Sudbury-Hudson Transmission Reliability Project, Sudbury Stormwater Permit Plans, prepared by VHB, dated July 2020, (181 pages), last revised January 13, 2020, received January 13, 2021 (206 pages). This Plan set represents Project Phase I.
4) Site Plans Commonwealth of Massachusetts, Department of Conservation and Recreation, Division of Planning and Engineering, prepared by VHB, dated July 2020, (52 pages), last revised January 13, 2020, received January 13, 2021 (52 pages). This Plan set represents Project Phase II.
5) Stormwater Pollution Prevention Plan (SWPPP) Manual Sudbury-Hudson Transmission Reliability Project, Sudbury, Marlborough, Stow, Hudson, prepared by VHB and dated May 2020
6) Stormwater Pollution Prevention Plan (SWPPP) Manual Mass Central Rail Trail – Wayside, Sudbury, Marlborough, Stow, Hudson, prepared by VHB and dated May 2020.
7) Letter to the Sudbury Conservation Commission, regarding the Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project, prepared by BETA Group, Inc., dated May 11, 2020 (27 pages).
8) Letter to the Sudbury Conservation Commission, in response to BETA's stormwater peer review, prepared by VHB, dated July 30, 2020 (11 pages).
9) Letter to the Sudbury Conservation Commission, regarding the Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project, prepared by BETA Group, Inc., dated August 31, 2020 (20 pages).
10) Peer Review Memo from Horsley Witten, dated September 18, 2020.
11) Memorandum regarding the Underground Transmission Line Stormwater Management Standards Compliance for Hypothetical Development Scenario, prepared by VHB, dated November 10, 2020 (5 pages).
12) Memorandum regarding the response to comments from Horsley Witten Peer Review of the Stormwater Management, prepared by VHB, dated November 10, 2020 (10 pages).
13) Letter to the Sudbury Planning Board, in response to HW's Comment Letter, prepared by VHB, dated October 21, 2020 (14 pages).
14) MassCentral Rail Trail (MCRT) – Wayside Section Stormwater Management System Operation and Maintenance (O&M) Plan and Long-Term Pollution Prevention Plan (LTPPP), dated June 2020.
15) Stormwater Pollution Prevention Plan (SWPPP) Construction Site Inspection Report – form template (5 pages).
16) Email from Lori Capone, Sudbury Conservation Coordinator regarding Conservation Commission review of the Stormwater Standards, dated November 3, 2020.
17) Peer Review Memo (#2) from Horsley Witten, dated November 23, 2020.
18) Letter to the Sudbury Planning Board, Supplemental Submission, in response to HW's Comment Letter, prepared by VHB, dated December 2, 2020 (67 pages).
19) Peer Review Memo (#3) from Horsley Witten, dated December 4, 2020.
20) Corridor Management Plan for Massachusetts Central Rail Trail and Sudbury-Hudson Transmission Reliability Project, dated August 7, 2020, received January 26, 2021.

I. BASIS FOR DECISION

The Board bases its Decision on the following:

A. The Applicants filed for approval of a Stormwater Management Permit to construct a new 115-kV underground transmission line and a multi-use path within an existing inactive railroad right-of-way, which will require removal of the existing rails and ties; vegetation clearing; grading; installation of the underground transmission line, duct bank, and manholes; installing a 14-foot-wide gravel base; paving of the 10-foot-wide rail trail; installation of stormwater management features; and site restoration, (the "Project") which will disturb on the property (the "Property") located at 183 Boston Post Road and within the 4.3 mile long MBTA Right-of-Way, in Sudbury, MA on a 54.4 acre parcel located at Boston Post Road and the MBTA Right-of-Way, Sudbury, MA, Town Assessor Maps K10-0014, K11-5000, K09-5000, K08-5000, K07-5000, J06-5000, J05-5000, and H03-5000.

B. Granting the Permit is in harmony with the general purpose and intent of the Bylaw in that the proposed drainage system design and controls will protect and maintain the public health, safety, environment and general welfare by controlling the adverse effects of increased post-development stormwater runoff and nonpoint source pollution associated with the proposed development; and shall protect the health, safety, environment and general welfare by controlling runoff and preventing soil erosion and sediment resulting from construction/alteration and development.

C. The Project complies with the applicable regulations and performance standards of the most recent version of the Massachusetts Department of Environmental Protection (DEP) Stormwater Management Policy and Standards.

D. The development and related activities shall maintain the after-development runoff characteristics as equal to or less than the pre-development runoff characteristics from the site in order to avoid flooding, stream bank erosion, siltation, nonpoint source pollution, property damage and to maintain the integrity of stream channels and aquatic habitats.

E. The Project is designed to minimize or avoid damages due to increases in volume, velocity, frequency, duration and peak flow rate of stormwater runoff. The project conforms to the general criteria of the Bylaw and Regulations to the maximum extent feasible.

F. The Plan establishes provisions for the long-term responsibility for and maintenance of structural stormwater control facilities and nonstructural stormwater management practices to ensure that they continue to function as designed, are maintained, and pose no threat to public safety.

G. In addition to structural components, the Project design uses nonstructural stormwater management, stormwater better site design practices, and/or "low impact development practices", such as the use of bio-retention basins, to the maximum extent practicable.

H. The Project represents a two-phased project with Phase I the Eversource Transmission Reliability Project and Phase II the DCR Mass Central Rail Trail. Additional development upon the Project Site and Property that does not relate to the Project or the Plan may require separate approval and is not subject to this Permit.

I. The Stormwater Management Standards shall apply to the maximum extent practicable to footpaths, bike paths and other paths for pedestrian and/or nonmotorized vehicle access. The

Planning Board finds the completed Project as presented will meet the Stormwater Management Standards to the maximum extent practicable. After construction is complete, the 14-foot wide gravel path will be utilized by Eversource once every three years and the primary purpose of the path will be for a multi-use rail trail.

J. The proposed design will include best management practices and pre-treatment of runoff for water quality improvement. Erosion and sedimentation control are proposed on the Plan. Long term maintenance, operation and reporting will be required.

K. The Applicants have submitted a Stormwater Management and Erosion Control Plan and project description and Operation and Maintenance Plan, which are satisfactory.

THEREFORE, the Board hereby GRANTS the requested Stormwater Management Permit, as requested in the application and shown on the Plan, located in Sudbury, Middlesex County, Massachusetts, with the benefit of the following Plan modifications, conditions and limitations. The approval herein granted is based on the Plan as described above.

II. CONDITIONS AND REQUIREMENTS

The following conditions of this approval shall be strictly adhered to. Failure to adhere to these conditions or to comply with all applicable laws and Permit conditions shall give the Town the rights and remedies set forth in Section 12 of the Regulations.

A. Conformity: All construction at the Project Site shall be in substantial conformity with the Plan, which is on file with the Board, and representations made by the Applicant during the public hearing.

B. Access During Construction: The Applicant shall ensure safe and convenient vehicular access to the Project Site during the entire duration of the construction period. The Board and its representatives shall be permitted access to the Project Site to observe and inspect the site and construction progress until such time as the Project has been completed. When possible prior to Project Site access, reasonable advance notice will be made. Compliance with health and safety protocols for the Project Site will be followed.

C. Conditions prior to any vegetation removal, site disturbance, or construction activities:

1) The Applicant shall submit $10,000.00 for the purpose of the Town hiring a construction monitor to perform the inspections set forth in Section II. R. below for compliance with the stormwater management permit, design, and plans. If prior to completion of the Project, the Board finds that this initial deposit is not sufficient to cover actual costs incurred by the Town for these purposes, the Applicant shall be required to submit forthwith such additional amount as is deemed required by the Board to cover such costs. If the actual cost incurred by the Town for such purposes is less than the amount on deposit as specified above, the Board shall authorize that such excess amount be refunded to the Applicant concurrently upon issuance of a Certificate of Completion.

2) The Project will disturb more than one acre of land and is therefore required to obtain coverage under the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit. Draft Stormwater Pollution Prevention Plans (SWPPP) have been included in the application. The draft SWPPP includes recommended construction period pollution prevention and erosion and sedimentation

controls. For each Project Phase, the final SWPPPs with all applicable attachments shall be submitted to the Board for review and approval prior to commencement of any work in connection with the Project. If a response is not received within 10 days of receipt, the Plan shall be deemed approved. All work on the Project Site shall be conducted in accordance with the requirements of those permits and plans. Any changes made to the SWPPP during the course of the project shall be submitted and approved by the Planning Board or its representative prior to implementation.

3) Erosion control methods shall be installed as shown on the Plan and any updates shall be provided to the Planning Board's representative as work progresses on the Project Site.

4) A performance bond shall be submitted and held by the Planning Board until the paved rail trail, multi-use path is constructed, the Premises are fully stabilized with vegetation, and the stormwater structures have been cleaned and deemed functional by the Director of Public Works. The initial bond amount shall be established by the Town Engineer and may be adjusted at the discretion of the Town Engineer based on a detailed estimate provided by the Applicant. The bond amount may be reduced as progress is made during construction subject to review by the Town Engineer and approval of the Planning Board

5) The Applicant shall provide for review and approval by the Planning Board or a representative a construction schedule detailing construction activities and sequencing, that limits the area of the Site disturbed at any one time to the extent possible to mitigate environmental impacts and risk of erosion. If a response is not received within 10 days of receipt, the Schedule shall be deemed approved. The schedule shall be updated as necessary throughout construction and provided to the Planning Board.

6) At least two weeks prior to any land disturbance, a structural engineer shall inspect the culverts and drainage structures within the Project Site to determine whether they are structurally sound to (a) function hydrologically and (b) withstand the planned construction activities and shall provide a report of the findings to the Planning Board. If any culvert does not meet these requirements or is damaged during construction, it shall be replaced with a culvert that meets current MA Stream Crossing Standards to the maximum extent practicable, as determined by the Sudbury Conservation Commission or its Agent. Any recommended improvements to these structures, not included in this Permit, shall be required to submit a separate permit application and/or permit amendments for further evaluation.

7) This Decision and the Operations and Maintenance Plan shall be recorded in the Middlesex South District Registry of Deeds, within the chain of title of the affected property. The recording information shall be submitted to the Planning Board.

8) An Illicit Discharge Compliance Statement, signed by the Applicant, shall be submitted to the Planning Board.

9) The Soil and Groundwater Management Plan (SGMP) prepared in conjunction with the selected contractor and meeting the requirements of the Sudbury Conservation Commission as conditioned in the Order of Conditions shall be submitted to the Planning Board.

10) A Project Compliance Manual shall be submitted to the Planning Board for review and approval. The document shall include the requirements for compliance with the various permits for the Project, including this Decision and Conditions herein. If a response is not received from the Planning Board or its representative within 10 days of receipt, the Project

Compliance Manual shall be deemed approved.

11) The Applicant shall provide to the Planning Board copies of both the executed Memorandum of Understanding between Eversource and Department of Conservation and Recreation and the lease agreement between Eversource and the MBTA to ensure the obligations of the project are fulfilled.

12) The project engineer, contractors, and all subcontractors must be informed of the conditions in this Decision.

D. A Stormwater Construction Site Inspection Report (Stormwater Pollution and Prevention Plan Inspection Report) shall be generated by the Applicant or its representative for this Project, at a minimum, every two weeks during construction, and after every major storm event.

E. Access to the drainage structures for inspection and maintenance shall be kept clear of obstruction.

F. Additional soil testing shall be conducted during construction in the vicinity of "areas of increased infiltration" to verify soil conditions, infiltration rates, and groundwater levels. At a minimum, soil tests shall be conducted in the vicinity of Station 502+00, Station 511+00, Station 570+00, and Station 579+00. A report of the findings, comparison with expectations, and a statement on the appropriateness of the design shall be provided to the Planning Board by the design engineer for review. If findings are not consistent with the assumptions made for the stormwater management design, revisions to the design and approval of modifications to the Plan may be required.

G. Construction reports with a summary of past week activities and look ahead at anticipated activities with advanced notification of anticipated phasing transitions shall be provided to Planning and Community Development on a weekly basis. On-site meetings shall be provided throughout construction, as needed and indicated by the Planning and Community Development Environmental Planner. Site stabilization measures should be reviewed for adequacy and adjustments to the sediment and erosion control plan may be considered to optimize site stabilization. Reports shall include the location of active stockpiles with confirmation that appropriate erosion control measures are being implemented.

H. Soil stockpiles shall be covered with tarp or plastic sheet and surrounded by erosion controls.

I. Responsibility of sediment and erosion control will depend on project phasing.

1) During Phase I, Eversource shall be responsible for installing and maintaining erosion controls within the project site. Eversource may remove erosion controls from areas restored and revegetated as part of Phase I work if the Planning Board representative has inspected those areas and confirmed they are stabilized sufficiently. In the period between Phase I and Phase II, any erosion controls removed in areas that have been properly stabilized shall be reinstalled prior to commencement of Phase II.
2) During Phase II, DCR shall be responsible for installing and maintaining erosion controls on the Project Site during the performance of all Phase II construction activities, which may include utilizing erosion controls that were installed and maintained by Eversource if those erosion controls remain in proper condition and demarcate the limit of Phase II work. Otherwise, DCR shall install new erosion controls as required for Phase II, including in any restored and revegetated areas where Eversource was authorized to remove erosion controls.
3) Following completion of Phase II and inspection by a Planning Board representative, DCR shall be responsible for removal of all erosion control barriers.

J. Proposed infiltration basins shall not be used as sediment basins during construction. Additional erosion controls shall be installed to protect infiltration basins from sedimentation until contributing areas are stable.

K. Evaluation of appropriate screening for adjacent properties has not been completed. Alterations to the Landscape Plan shall be submitted to Planning and Community Development for review and approval. If a response is not received within 10 days of receipt, the Plan shall be deemed approved.

L. Native plants should be used for plantings throughout the site.

M. All equipment, including timber mats, shall be cleaned and certified invasive species free, prior to entering the site. Such certification shall occur prior to commencement of mobilization into the site and when remobilized within the project site. All areas of disturbance shall be monitored for invasive species, which shall be manually removed if encountered.

N. The Applicant, DCR, and its successors and assigns shall be responsible for maintaining the stormwater management system for the development in accordance with the Operation and Maintenance (O&M) Plan submitted and applicable DEP regulations. An annual Operation and Maintenance inspection shall be conducted by a certified inspector who will prepare an annual status report for delivery to the Board demonstrating compliance with the O&M Plan. Revisions to the O&M Plan may be proposed to and accepted by the Planning Board or its representative.

O. The following source control and pollution prevention measures shall be employed on the site to prevent contamination of stormwater runoff:

1) Debris shall be removed from the paved path regularly, ideally swept with a vacuum or regenerative air sweeper.
2) Measures shall be taken to control litter on the site.
3) No chemicals or hazardous wastes shall be stored on the property.
4) Slow release nitrogen and low phosphorus fertilizers shall be applied sparingly to prevent wash off.
5) No fertilization, herbicide, or pesticide application shall occur within any vernal pool, vegetated wetland or waterway. Eversource, as part of their operations, shall not conduct fertilization, herbicide, or pesticide application. DCR shall not use herbicides within any vernal pool, vegetated wetland or waterway. Invasive species removal by DCR will be by mechanical means when possible and spot treatments of herbicide by a licensed applicator when other approaches are not effective. This Condition is ongoing and does not expire with the expiration of the Order of Conditions or the issuance of a Certificate of Compliance.
6) Hazardous wastes shall be used and disposed of properly.
7) No vehicle washing shall be allowed on the property.
8) Vehicles shall be maintained and clean up fluid spills/drips shall occur with absorbent materials immediately.
9) Personnel shall be educated on implementation of spill abatement and containment procedures.
10) No de-icing products shall be used on the site.
11) No coal tar-based pavement sealants are to be used on site.

P. If developed by DCR, and as approved by the Department of Agricultural Resources, any Vegetation Management Plan/Integrated Pest Management Plan shall be submitted to the Planning Board annually, and if chemicals will be used, the Board shall be notified in advance.

Q. The Applicant, DCR, has indicated no snow and ice management will occur on the multi-use path and such operations are not included in this permit. Any change to snow and ice operations shall require a modification to the permit. As needed during construction, the Applicant shall designate areas for snow storage in upland locations where meltwater can drain onto pervious surfaces away from water resources, infiltration BMPs, bio-retention areas, and wells.

R. Inspections: In accordance with Section 9.B of the Regulations, the Board, or its designee, may inspect the Project Site at the following stages, at a minimum. The Applicant shall inform the Board of these stages in construction at least two days prior to commencement or completion, whichever is applicable, for scheduling of an inspection:

1) Pre-Construction Site Inspection – prior to commencement of construction for each Project phase, during which the construction schedule and acceptance of erosion control barriers can be finalized.
2) Erosion and Sediment Control Inspection – to ensure erosion control practices during and after construction are in accordance with the approved Plan.
3) Construction Inspection – multiple inspections will be made of the stormwater management system facilities, including but not limited to infiltration systems, BMPs, and connections to existing pipes, prior to backfilling of underground drainage or stormwater conveyance structures. It is recommended the Planning Boards designee inspect all permanent stormwater infiltration BMPs for acceptance prior to construction demobilization to a new location within the ROW. The Applicant and Planning Board designee will develop and agree to an inspection plan at the Pre-Construction Site Inspection.
4) Phase I Completion Inspection - after Phase I has been constructed, once the as built plan is prepared, and before partial Certification of Completion is issued.
5) Final Inspection – after the Phase II has been constructed, once the final as built plan is prepared, and before the final Certificate of Completion has been issued.

S. As-built Plan: The Applicant shall submit an as-built plan, containing all elements listed in Section 11.A.2 of the Regulations, to the Board upon completion of this Project and prior to the issuance of the Certificate of Occupancy. The plan shall be signed by a land surveyor or other qualified professional. A registered engineer shall certify that the work has been completed in accordance with the approved Plan and the Stormwater Management Permit.

1) Since the project is phased, the submission of current status, as-built plans shall be presented at the phasing transition
2) Following completion of Phase I, Eversource shall request a Partial Certificate of Completion. This Request shall be accompanied by as-built plans, stamped by a professional land surveyor or other qualified professional, detailing all elements of Phase I including all stormwater management elements, post construction structural report, and affidavit from all site professionals that all aspects of this Decision were adhered to. Any deviations from the approved plans shall be specifically called out on the as-built plan. Vegetation outside the limit of work shall also be evaluated to confirm no negative impacts occurred outside the limit of work.

T. No use or occupancy (except in connection with the construction activity authorized by this Permit) shall be conducted on the Project Site until a Certificate of Completion is issued by the Board in accordance with Section 11.0 of the Regulations. A Partial Certificate of Completion will be issued

upon the satisfactory completion of Phase I. To the extent that the requirements of this Permit have been met with respect to such completed phase of the Project on the Project Site, the Board may permit the use and occupancy of the completed phase in accordance with Section 11.0 of the Regulations.

U. It is DCR's intention to initiate Phase II as soon as possible following completion of Phase I. Should Phase II not commence within three years of completion of Phase I, the Applicant shall file an Amendment to bring the stormwater management into full compliance with the Town of Sudbury Stormwater Regulations.

V. The Planning Board shall be notified, in writing, within forty-eight hours of any transfers of title on this property. In the event the Property ownership or trail, multi-use path management transfers to a non-public entity, a covenant requiring maintenance of the stormwater management system in accordance with Best Management Practices and the Operation and Maintenance Plan shall be recorded on the Project Site. This covenant shall allow for the placement of municipal liens on the Project Site if the Applicant fails to maintain the system and the Town needs to do so. The Town shall be granted an easement to access the site in case emergency maintenance is needed. The Applicant shall submit the covenant for review and approval of the Select Board prior to recording at the Middlesex South District Registry of Deeds. A template will be provided by the Town.

W. The culverts and drainage structures shall be inspected at least annually and cleared of debris as needed. If culverts become damaged or no longer function as required, they shall be replaced according to most current MA Stream Crossing Standards to the maximum extent practicable, as determined by the Sudbury Conservation Commission or its Agent. Any recommended improvements to these structures, not included in the application for this Permit, shall be subject to a separate permit application and/or permit amendments for further evaluation.

X. The corridor and all components of the stormwater management system shall be maintained in compliance with the Mass Central Rail Trail (MCRT) – Wayside Section Stormwater Management System Operation and Maintenance Pan (O&M) and the Long Term Pollution Prevention Plan.

Y. The Project is subject to an Energy Facility Site Board (EFSB) Decision (EFSB 17-02/D.P.U. 17/82/17/83). Since this EFSB Decision is currently under Appeal by the Town of Sudbury, any changes to the project as a result of the appeal process may cause the need for project modifications to undergo further review by the Planning Board, in which case the applicant shall return to the Board to seek the necessary modifications.

Z. Violation of Conditions: Violation of any of the conditions of this Stormwater Management Permit may be grounds for revocation of this Permit, or of any building or occupancy permit granted hereunder, or both. In the case of violation of the continuing obligations of this Permit, the Town shall notify the Owner and Applicant of such violation and give the Owner and Applicant reasonable time, not to exceed thirty days, to cure the violation. If at the end of said thirty-day period, the Applicant has not cured the violation, or, in the case of violations requiring more than thirty days to cure, has not commenced the cure and prosecuted the cure expeditiously, the Board may, after notice to the Applicant or owner of the Project Site, conduct a hearing in order to determine whether the failure to abide by the conditions contained herein should result in revocation of the Permit. As an alternative, the Town may enforce compliance with the conditions of this Permit by an action for injunctive relief before any court of competent jurisdiction. The Applicant agrees to reimburse the Town for its reasonable costs in connection with the enforcement of the conditions of this Permit.

AA. The Applicant by accepting this Permit warrants that the Applicant has included all relevant documentation, reports, and information available to Applicant, in the application submitted and that this information is true and valid to the best of the Applicant's knowledge.

BB. If the project requires an Earth Removal Permit, an application should be submitted to and permit issued by the Earth Removal Board prior to any site disturbance. The project also requires an Order of Conditions from the Sudbury Conservation Commission. Inconsistencies between plans approved by and conditions issued by other permitting authorities may require the Applicant to return to the Planning Board to review and approve the modifications.

III. LIMITATIONS

The authority granted to the Applicant by this Permit is limited as follows:

A. Applicability of Permit: This Permit applies only to the proposed construction of a new 115-kV underground transmission line and a multi-use path within an existing inactive railroad right-of-way, which will require removal of the existing rails and ties; vegetation clearing; grading; installation of the underground transmission line, duct bank, and manholes; installing a 14-foot-wide gravel base; paving of the 10-foot-wide rail trail, multi-use path; installation of stormwater management features; and site restoration, on the Project Site, as shown on the Plan. This Permit does not apply to other portions of the Property. Construction of the Project shall be conducted in accordance with the terms of this Permit and shall be limited to improvements shown on the Plan referenced above as amended by the conditions of this Decision. Any change of use for the Project or change to the Plans shall require notice to the Board and may require a new or amended Stormwater Management Permit from the Board.

B. Limitations of Further Development: There shall be no further development, material increase in intensity of use, change in use as per the Sudbury Zoning Bylaw, modification of the approved development plan of the Project without either a new Permit or the written consent of this Board. This does not absolve the Applicant from securing any permits required by other governmental boards, agencies or bodies having jurisdiction related to water quality or quantity.

C. Other Permits or Approvals: This decision applies only to the requested Stormwater Management Permit. Other permits or approvals required by the Bylaw, other governmental boards, agencies or bodies having jurisdiction shall not be assumed or implied by this decision.

D. Bylaw Compliance: The foregoing restrictions are stated for the purpose of emphasizing their importance but are not intended to be all inclusive or to negate the remainder of the Bylaw.

E. Lapse of Permit: Should the land-disturbing activity approved under this Permit not begin within 12 months following Permit issuance, the Board may evaluate the existing stormwater management plan to determine whether the plan still satisfies local program requirements and to verify that all design factors are still valid. If the Board finds the previously filed plan to be inadequate, a modified plan shall be submitted and approved prior to the commencement of land-disturbing activities. If the Project associated with an approved Stormwater Management Permit granted under the Bylaw has not been substantially completed within three years of Permit issuance, a new Permit or a Permit extension will be required by the Board.

F. Appeals: Any person aggrieved by this decision may appeal pursuant to the General Laws, Chapter 249, Section 4.

The provisions of this Permit shall be binding upon every owner or owners of the lots and the executors, administrators, heirs, successors and assigns of such owners, and the obligations and restrictions herein set forth shall run with the land, as shown as the Property on the Subdivision Plan, in full force and effect for the benefit of and enforceable by the Town of Sudbury.

This Permit shall not take effect until a copy of this Decision has been recorded with the Middlesex South District Registry of Deeds and until a certified copy of the recorded document is submitted to the Board.

Witness our hands this 27th day of January, 2021.

SUDBURY PLANNING BOARD

Stephen Garvin, Chair

Charles Karustis, Vice Chair

John Hincks, Clerk

Justin Finnicum

John Sugrue

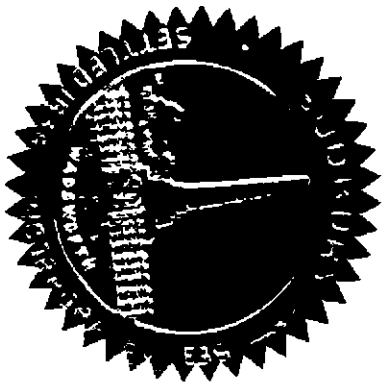
A TRUE COPY, ATTEST:
Bett R.
TOWN CLERK

This is to certify that no notice of an appeal against the Planning Board's Stormwater Management Permit Decision for 183 Boston Post Road, SWMP #20-07, was filed in the Town Clerk's office within 60 days after such decision was filed on February 3, 2021.

A True Copy Attest:

Rose M. Miranda
Assistant Town Clerk

June 29 2021
Date



MassCentral Rail Trail (MCRT) – Wayside Section
Stormwater Management System
Operation and Maintenance Plan (O&M)
and
Long Term Pollution Prevention Plan (LTPPP)

June 2020
(Revised April 2021)

This Stormwater Management System Operation and Maintenance Plan provides for the inspection and maintenance of structural Best Management Practices (BMPs) and for measures to prevent pollution associated with the Stormwater Management System on the MassCentral Rail Trail Wayside Section (in Hudson, Stow and Sudbury).

This document has been prepared in accordance with the requirements of the Stormwater Regulations included in the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.05(6)(k)).

Figure of stormwater management features is attached.

Responsible Party

Department of Conservation and Recreation (DCR) office will be responsible for the maintenance of the shared-use facility and associated stormwater management features, in accordance with DCR standards. The facility will be maintained by DCR maintenance staff from:

DCR's Maintenance Facility
Hopkinton Complex
164 Cedar St,
Hopkinton MA 01748
Jeff Cate
Field Operation Team Leader
(508) 435-4303

Maintenance Measures

The stormwater management system covered by this Operation and Maintenance Plan consists of the following components:

- Swales – Dry with check dams
- Areas of increased infiltration
- Drainage structures
  Hudson
  - Sta. 119+25 LT – Catch basin (Str 3)
  - Sta. 119+25 RT – Headwall (Str 4)
  - Sta. 119+25 – 18" RCP - New crossing drainage pipe

- Sta. 119+45 - 6' by 6' Conc. Box - Cattle Crossing
- Sta. 126+70 RT – Catch basin (Str 5)
- Sta. 126+70 LT – Headwall (Str 6)
- Sta. 126+70 – 24" DIP – New crossing drainage pipe
- Sta. 182+55 RT – Catch basin (Str 8)

Sudbury

- Sta. 368+84 - 2' by 2.5' Stone Box (Drainage Structure 129A)
- Sta. 410+25 - 2' by 2' Stone Box (Drainage Structure 127J)
- Sta. 517+96 - 1' by 2' Stone Box (Drainage Structure 127I)
- Sta. 521+64 - 1.5' by 3' Stone Box (Drainage Structure 127H)
- Sta. 527+30 - 2' by 2' Stone Box (Drainage Structure 127G)
- Sta. 530+80 RT – Catch basin (Str 9)
- Sta. 533+46 RT – Flared End Section (Str 10)
- Sta. 713+63 LT – Headwall (Str 12)
- Sta. 713+63 RT – Headwall (Str 13)
- Sta. 577+31 - 1' by 2' Stone Box (Drainage Structure 127D)
- Sta. 704+56 - 24" Cast Iron (Drainage Pipe 127B)
- Sta. 713+63 - 24" Cast Iron (Drainage Pipe 127A)
- Sta. 738+77 - 18" Cast Iron (Drainage Pipe 126D)
- Sta. 752+17 - 12" Corrugated Metal (Drainage Pipe 126A)

DCR Operations to maintain swales and the drainage pipes.

DCR Engineering to maintain listed catch basins, flared end section, headwalls, drainage pipes. Engineering can assist with blocked culverts if major blockage or structural concern.

Maintenance of these components will be conducted biannually at a minimum in accordance with DCR standard maintenance practices, as noted in the attached Operation and Maintenance table summarizing the pertinent inspection and maintenance activities.

DCR Operations will also inspect and clear culverts conveying streams as needed. Inspection will identify any deterioration of headwalls, culverts, bridge structures, abutments and erosion. Any identified issues will be immediately brought to the attention of DCR Engineering.

- Stream culverts/bridges

  Hudson
  - Sta. 107+92 – 2' by 3' stone box (Culvert 132A)
  - Sta. 148+81 – Fort Meadow Brook Bridge (Bridge 132)
  - Sta. 206+10 – 24" Clay Culvert (Culvert 129C)

  Sudbury
  - Sta. 400+31 – Hop Brook Bridge (Bridge 132)
  - Sta. 539+40 – Twin 36" Corrugated Metal – Dudley Brook (Culverts 127F)
  - Sta. 560+82 - 3'x2' Concrete Box (Culvert 127E)
  - Sta. 593+18 - 2'x2' Stone Box (Culvert 127C)
  - Sta. 747+39 - 2.5'x2' Stone Box (Culvert 126B)

- Sta. 764+60 - 12" Reinforced Concrete (Culvert 125B)
- Sta. 725+31 – Hop Brook Bridge (Bridge 130)

If inspection indicates the need for major repairs of structural components, the inspector should contact the DCR maintenance supervisor to initiate procedures to effect repairs in accordance with DCR standard construction practices.

Practices for Long Term Pollution Prevention

In general, long term pollution prevention and related maintenance activities will be conducted consistent with DCR's NPDES Stormwater MS4 Permit(s), and the measures outlined in the Stormwater Management Plans (SWMP). Information about the DCR permit and the SWMP are available at the following website:

http://www.mass.gov/eea/agencies/dcr/conservation/stormwater-mgmnt/

For the facilities covered by this Operation and Maintenance Plan, long term pollution prevention includes the following measures:

Litter Pick-up
DCR will conduct litter pick-up from the stormwater management facilities in conjunction with routine maintenance activities.

Routine Inspection and Maintenance of Stormwater BMPs
DCR will conduct inspection and maintenance of the stormwater management practices in accordance with the guidelines discussed above.

Spill Prevention and Response
DCR will implement its standard response procedures in the unlikely event of releases of significant materials such as fuels, oils, or chemical materials onto the ground or other areas that could reasonably be expected to discharge to surface or groundwater.

- Reportable quantities will immediately be reported to the applicable Federal, State, and local agencies as required by law. The applicable DCR office should also be notified.
- Applicable containment and cleanup procedures will be performed immediately. Impacted material collected during the response must be removed promptly and disposed of in accordance with Federal, State, and local requirements. A licensed emergency response contractor may be required to assist in cleanup of releases depending on the amount of the release and the ability of the responsible party to perform the required response.
- Reportable quantities of chemical, fuels, or oils are established under the Massachusetts Contingency Plan (MCP) and enforced through MassDEP.

Maintenance of Landscaped Areas
DCR will mow and/or weed whack the shoulders adjacent to the rail trail bi-weekly or as needed between Memorial Day and Columbus Day. Outside of the 2-foot shoulders, DCR will mow the 5-foot herbaceous area over the duct bank no more than once annually. Outside of the 19-foot

maintained area (paved rail trail, 2-foot shoulders on either side and 5-foot area over the duct bank) woody vegetation will be allowed to naturally revegetate and DCR will not implement vegetation management unless it poses a risk to MCRT users The vegetated shoulders/slopes outside the maintained area will help to disperse and infiltrate disconnected drainage although no stormwater management benefit is identified. The swales and areas of increased infiltration outside of the 19-foot area will be inspected and mowed as needed or biannually at a minimum to maintain proper water quality treatment function. If maintenance activities anywhere disturb the ground and removes the vegetated surface, the disturbed area will be restored with loam and seed to reestablish a vegetated surface.

Per the Sudbury Order of Conditions, Condition VI j, in Sudbury grass cuttings, leaves or twigs and sticks will not be blown off the paved path within 25 feet of a vernal pool. Pavement markers have been installed to indicate the 25-foot offset from a vernal pool.

Eversource inspection vehicles will use the paved MCRT to access the transmission line facility approximately once every three years, or as needed for maintenance of the transmission line.

Within the Priority Habitat areas, the vegetation will not be trimmed lower than 10 inches along the shoulders or over the duct bank.

Fertilizers will not be used.

If DCR finds it necessary to use chemical treatment for invasive species vegetation control, this work will be done in compliance with MDAR regulations at 333 CMR 11.00, which will limit impacts to sensitive areas such as groundwater and drinking water wells. If needed in the future, the DCR will develop a Yearly Operational Plan regarding vegetation maintenance along their bike path and recreational corridors, which will include the MCRT.

Erosion Control

Portions of the MCRT are on elevated former railroad embankment with steep side slopes. Review the MCRT alignment for any evidence of erosion on slopes, within swales, at check dams or at inlets and outlets of drainage pipes or stream culverts during the biannual inspection of the corridor and the stormwater BMPs. If erosion is observed, note on the inspection form. Include the location and extent of erosion (width and length), which side of the path or pipe/culvert, if the erosion is toward or away from the path, and if any resource areas are at risk of impact. Include photographs is possible. Note location on the attached figure as accurately as possible. Notify the Field Operations Team Leader.

Any observed erosion will be repaired, and reseeded or otherwise stabilized as needed to prevent continued erosion. Notify the local conservation commission if erosion impacts a resource area or requires reconstruction within a resource area or within 100 feet of a resource area. A regulatory filing may be required.

Snow and Ice Management

There are no plans for snow and ice removal, nor de-icing (i.e., sanding, salting) of the bike path surface during winter months.

Prohibition of Illicit Discharges

The DEP Stormwater Management Standards prohibit illicit discharges to the storm water management system. Illicit discharges are discharges that do not entirely consist of stormwater, except for certain specified non-stormwater discharges.

Discharges from the following activities are not considered illicit discharges:

- firefighting
- water line flushing
- landscape irrigation
- uncontaminated groundwater
- potable water sources
- water used to clean residential buildings without detergents
- foundation drains
- footing drains
- individual resident car washing
- flows from riparian habitats and wetlands
- dechlorinated water from swimming pools
- water used for street washing
- air conditioning condensation

There are no known or proposed illicit connections associated with this project. If a potential illicit discharge to the facilities covered by this plan is detected (e.g., dry weather flows at any pipe outlet, evidence of contamination of surface water discharge by non-stormwater sources), the DCR shall be notified for assistance in determining the nature and source of the discharge, and for resolution through DCR's IDDE program.

Public Access

The MCRT Wayside Section is a public access facility. The facility is typically open dawn to dusk every day. Members of the Sudbury Planning Board or Conservation Commission are free to access the rail trail at any time the facility is open. Periodically the facility may be closed for maintenance construction (repairs, resurfacing, etc.) and for the safety of the public, access to the rail trail will be restricted.

Lease/Easements

The DCR holds a lease for construction and operation of the MCRT over the Massachusetts Department of Transportation – MBTA rail corridor. Within the rail corridor there are the following existing easements or license agreements by others:

- NSTAR Electric Company d/b/a Eversource Energy ("Eversource") to construct and operate the transmission powerline.
- Sudbury Lumber for access and storage of materials (off Union Avenue).
- Tennessee Gas Transmission Company to install and operate an underground natural gas transmission pipeline (east of Marlborough/Hudson town line).
- Town of Sudbury (east of Route 20 – building license).
- Douglas P. Webb lease for South Sudbury Station (off Union Avenue).

Record Keeping

The DCR shall maintain an operation and maintenance log for the inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location). The maintenance Inspection checklists shall be maintained and be made available for review by the MassDEP or Conservation Commissions or staff on request

Appendix: MCRT Maintenance and Best Management Practices: Operation & Maintenance Measures Schedule

Maintenance Practice or Best Management Practice[1]	Sweep	Mow	Inspect	Clean	Repair
Shoulder Maintenance (2-foot area either side of pavement)	As needed	Biweekly or as needed during growing season	Biweekly	As needed	As needed
Over duct bank[1] (5-foot area outside shoulders)	N/A	Once yearly in fall	Yearly	As needed	As needed
Pavement Surface	As needed[2]	N/A	Biweekly	As needed[2,3]	As needed
Swales[1]	N/A	Mow swales as needed or biannually (minimum)	Biannually at a minimum	As needed	As needed
Check Dams[1]	N/A	String trim as needed (Not to be mowed) or biannually (minimum)	After every significant rainfall event	As needed	As needed
Areas of increased infiltration[1]	N/A	Mow or string trim as needed or biannually (minimum)	Biannually at a minimum	As needed	As needed
Drainage structures	N/A	NA	Biannually at a minimum	As needed	As needed

[1]If mowing occurs between April 1 and November 1, then areas within mapped priority habitat for state-listed turtles will require "turtle sweeps" by trained individuals ahead of the mower and mower deck heights shall be set lower than 10 inches above the ground or string trimmers can be used.
[2]No blowing of grass clippings, leaves or twigs and sticks within 25 feet of a vernal pool. Pavement markers indicate 25 feet from a vernal pool.
[3]Snow removal will not be conducted.

MCRT Best Management Practices – Inspection and Maintenance/ Evaluation Checklist

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed	Date of Cleaning/Repair	Performed by
Swales	Biannually at a minimum			• Accumulated sand and sediment • Accumulated debris • Erosion of swale • Mow biannually (minimum)	☐yes ☐no ☐yes ☐no ☐yes ☐no ☐yes ☐no		
Check Dams	After significant rain fall events			• Accumulated sand and sediment • Accumulated debris • Erosion of surface • Cut grass biannually (minimum) (string trimmer)	☐yes ☐no ☐yes ☐no ☐yes ☐no ☐yes ☐no		
Areas of increased infiltration	Biannually at a minimum			• Accumulated sand and sediment • Mow as needed or biannually (minimum)	☐yes ☐no ☐yes ☐no		
Drainage structures, drainage pipes and stream culverts	Biannually at a minimum			• Accumulated sand and sediment • Floatable/Trash • Inlets free of debris • Damage to headwalls or wingwalls	☐yes ☐no ☐yes ☐no ☐yes ☐no ☐yes ☐no		
Erosion (Provide location and detailed description in notes below. Include photographs)	Biannually at a minimum			• Slope erosion observed • Erosion within a swale or at check dam • Erosion/Siltation onto the path surface • Erosion/Siltation away from the path surface • Erosion at a drainage pipe or stream culvert	☐yes ☐no ☐yes ☐no ☐yes ☐no ☐yes ☐no ☐yes ☐no		

Notes on Stormwater / Drainage / Erosion Issues:

_____

_____

_____

Stormwater Control Manager _____

Figure of Stormwater BMPs Attached

Case #: 21-1
May 17, 2021

TOWN OF SUDBURY
EARTH REMOVAL BOARD
NOTICE OF DECISION

Location of Property:
183 Boston Post Road and the Massachusetts Bay Transportation Authority Corridor
Sudbury, MA 01776

Name and Address of Applicant:
NSTAR Electric Company d/b/a Eversource Energy
247 Station Drive
Westwood, MA 02090

Name and Address of Owner:
Massachusetts Bay Transportation Authority (MBTA)
10 Park Plaza
Boston, MA 02116

DECISION of the Earth Removal Board (the "Board") on the application of NSTAR Electric Company d/b/a Eversource Energy (the "Applicant") under Article V(A) of the Town Bylaws, to allow removal of 24,123 cubic yards ("CY") of soil for construction of a construct a new 115- kilovolt ("kV") underground electric transmission line, access driveway, and appurtenances at Massachusetts Bay Transportation Authority Corridor from the Marlborough Hudson Town Line up to and including 183 Boston Post Road, Sudbury, Massachusetts and identified as Assessors Map p K10-0014, K11-5000, K09-5000, K08-5000, K07-5000, J06-5000, J05-5000 and H03-5000 (the "Property").

This Decision is in response to an Application filed with the Board on March 9, 2021. After causing notice of the time and place of the public hearing and of the subject matter thereof to be published in the Sudbury Town Crier on April 1 and April 8, 2021, posted and mailed to the Applicant, abutters and other parties of interest as required by law, the public hearing was conducted on April 26, 2021 and continued to May 17, 2021 when it concluded. The record of the proceedings and submissions upon which this Decision is based may be referred to in the office of the Planning and Community Development office.

Michael Hager, Eversource, Project Manager; Denise Bartone, Eversource, Manager Licensing & Permitting; Mike Shamon, VHB; Paul McKinley, Weston and Sampson, LSP; Dean Bebis, Eversource, Licensing & Permitting Specialist; and Barry Fogel, Keegan Werlin, Applicant's Counsel appeared at the hearing to represent the Applicant. The Applicant sought approval to remove soil and gravel materials to construct a new 115- kV underground electric transmission line, access driveway, and appurtenances.

Members present and voting at the hearing were Jonathan W. Patch, Chair; David Booth, William Ray, Jeffrey Rose, and Benjamin Stevenson.

The Board, after considering the materials submitted with the application, together with the information developed at the hearing, finds that:

1. The Applicant seeks a Removal Permit under Article V(A) of the Town Bylaws to remove of up to 24,123 CY of soil for construction of a new 115-kV underground electric transmission line at the Massachusetts Bays Transportation Authority Corridor from the Marlborough Hudson Town Line to 183 Boston Post Road.
2. As identified in the Sudbury Soil Removal Table submitted by the Applicant on April 23, 2021, the total quantity of soil permanently removed off-site from the right-of-way (ROW) to the temporary stockpile location and then to a soil receiving facility shall be limited to 10,453 CY, which is the difference between the total proposed quantity of 24,123 CY of in-situ soil to be excavated along the ROW as a "cut" and the 13,670 CY of soil which will be reused along the ROW as a "fill".
3. The proposed activity which is the subject of this application is described in the Application, including revised material submitted to the Board on April 22, 2021, April 23, 2021 and May 10, 2021.
4. Subject to the conditions set forth below, the request is in harmony with the general purpose and intent of the bylaw.
5. Subject to the conditions set forth below, the request will be completed in a way that is not detrimental to the neighborhood.
6. Subject to the conditions set forth below, adequate and appropriate transportation of materials will be provided for the proper operation of the proposed request.
7. The Board has imposed restrictions which are necessary for the general welfare of the Town, noted below.

Therefore, the Board, after reviewing the available materials and based upon the above findings, voted unanimously to **GRANT** the **REMOVAL PERMIT** subject, to the following conditions:

1. The proposed activity shall be conducted substantially in accordance with the Application submitted and materials contained in the file.
2. This permit is non-transferable, and pursuant to the Earth Removal Bylaw Section 7, will expire in one year on May 17, 2022. The Board will consider permit renewal upon receipt of proper application on or before that date.
3. Construction activities will be performed between the hours of 7:00 a.m. to 6:00 p.m. Monday through Friday. No work shall take place on Saturday or Sunday.
4. Vehicular and heavy equipment access shall be minimized on roadways to the maximum extent possible. In particular, the use of tractor/trailer trucks accessing the right-of-way (ROW) on Dutton Road, Peakham Road, and Horse Pond Road shall be minimized. Eversource shall work with the Sudbury Department of Public Works Director, who will coordinate with the Police and Fire Departments to ensure safe passage of vehicles, bicycles, and pedestrians at all points during construction in the Public Ways. Particular care will be given to the safe passage of children to and from schools near the construction in the Public Way. A police detail shall be present as needed and upon request by Town representatives.
5. Appropriate measures shall be taken to prevent tracking of material onto any public way. Soil on outgoing trucks shall be stabilized via the use of covers.
6. Street sweeping of the adjacent streets will be conducted as needed or as directed by Town representatives, but no less frequent than weekly.

7. General precautionary measures shall be taken to prevent erosion on the site into adjacent wetlands.
8. A copy of the SWPPP will be prepared and submitted to the Town with documentation of receipt by the EPA.
9. Proposed off-site stockpile locations in the Town of Sudbury shall be submitted to the Board for review and approval.
10. Any stockpiled soil must be surrounded by siltation fencing to minimize sedimentation during construction. The contractor shall take appropriate measures to minimize dust impacts to abutters and vehicular traffic, including wetting of stockpiles, temporarily covering them, or seeding them, as required.
11. At least two weeks prior to any blasting, if proposed, a blasting plan shall be submitted to the Board for record. Blasting Permits are issued by the Sudbury Fire Department.
12. At least two weeks prior to any land disturbance, a Soil and Groundwater Management Plan (SGMP) prepared in conjunction with the selected contractor shall be submitted to the Board for review and approval. The Applicant shall give due consideration to address comments received from the Board to minimize potential impacts to project abutters and the Town as a whole. The SGMP will develop means and methods to manage soils and groundwater encountered during project construction activities including soil excavation, groundwater dewatering, soil stockpiling, soil hauling, dust management, and railroad tie and track removal to avoid and minimize the risk of exposure to potential contaminants. If conditions are encountered that suggest soil may require additional evaluation or special handling based on visual, olfactory, or field screening results, excavation activities in that area will be immediately stopped and Eversource, their Licensed Site Professional (LSP), and the Board will be contacted immediately to evaluate the observations and review and comment on their proposed procedures for proper handling. Furthermore, as part of the SGMP, Eversource shall implement a tracking system to document the approximate origin of soil along the ROW that is hauled to the off-site temporary stockpile location. The Board shall be copied on all related correspondence.
13. The Applicant shall, at a minimum, perform additional chemical testing of soil and groundwater samples from the ROW and surrounding properties a minimum of four weeks prior to significant disturbance of the soil. This shall include, at a minimum, the following scope of sampling and testing:
    a. Performing chemical testing of in-situ shallow soil samples along the former track bed for the presence of total arsenic in Segment 3 of the project (defined herein as the residential, rural, undeveloped corridor located approximately between the Sudbury-Hudson border to near the northwest corner of the Meadow Walk Sudbury) at every approximately 500 linear feet prior to commencing excavation of soil, after the railroad ties are removed and the erosion controls are in place. This is anticipated to require approximate 30 total samples.
    b. Furthermore, at a minimum, testing of soil and/or groundwater shall be performed at seven (7) of the properties of potential environmental concern located in Sudbury where soil and/or groundwater testing was previously not performed on behalf of Eversource which are listed in the table entitled "Summary of Properties of Concern, MBTA ROW, Transmission Line Project, Sudbury to Hudson, Massachusetts" contained in a memorandum entitled "Summary of Hazardous Materials Assessment, Proposed Transmission Line Project, Sudbury to Hudson, Massachusetts prepared by VHB dated September 29, 2017.

i. The testing of soil and/or groundwater samples at each of these specific sites shall be performed for the constituents of concern within the proposed depth of excavation for the project.

c. The results of all testing shall be submitted to the Board, along with all documentation prepared by their LSP, for its record.

14. Conditions number 9, 12 and 13 above may require the Board to hold a public meeting with the Applicant to review and discuss the proposed plan and stockpile location(s) and results of chemical testing. The public meeting will not require abutter notification or a public hearing but will be an open public meeting. The Town will endeavor to convene a quorum of members for a meeting to be scheduled within 10 days of the soil test results, proposed plan and stockpile location being submitted to the Board.
15. At least two weeks prior to the loading and hauling of stockpiled soil to a licensed soil receiving facility, Eversource shall submit to the Board for its records the results of the chemical testing performed on the stockpiled soils along with all documentation prepared by their LSP and the soil receiving facility.
16. The applicant shall submit to the Board monthly the total quantity of soil that has been loaded and hauled from the temporary stockpile location to licensed soil receiving facilities.
17. The total quantity of soil permanently removed off-site from the ROW to the temporary stockpile location and then to a soil receiving facility shall be limited to 10,453 CY, which is the difference between the total proposed quantity of 24,123 CY of in-situ soil to be excavated along the ROW as a "cut" and the 13,670 CY of soil which will be reused along the ROW as a "fill". The Board shall be notified of any changes to the earth removal plan and quantities to be removed.
18. Prior to commencing the work, the Town shall be given the name of a contact person who will be available should problems arise associated with construction.
19. The requirement for a performance guarantee is waived given that the project has received a Stormwater Management Permit approval from the Sudbury Planning Board and subject to the Stormwater Management Permit Decision, prior to occupancy any conditions unfulfilled will be subject to a performance guarantee.
20. Clearing shall only be allowed upon review by and to the extent approved by the Sudbury Conservation Commission and Planning Board.
21. This Removal Permit shall not take effect until a copy of the Decision has been recorded in Middlesex County South District Registry of Deeds.
22. The Decision rendered herein is concerned only with the Town Bylaw noted above, and not with the Building Code or any other Town Bylaw. The Applicant is responsible for determining and complying with Town, State, and Federal regulations in using the authorization granted.

TOWN OF SUDBURY EARTH REMOVAL BOARD

By, Jonathan M. Gossels, Chair

I certify that copies of this Decision have been filed with the Sudbury Town Clerk and Planning Board on

Barbara Piney.
May 24, 2021

2021 MAY 24 PM 2:55
TOWN CLERK
SUDBURY, MASS

Attachment F

TOWN OF STOW ENVIRONMENTAL PERMITS

ATTACHMENT F-1: ORDER OF CONDITIONS
(CONSERVATION COMMISSION)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
299-677
MassDEP File #

eDEP Transaction #

Stow
City/Town

A. General Information

Please note: this form has been modified with added space to accommodate the Registry of Deeds Requirements

1. From: Stow
Conservation Commission

2. This issuance is for (check one): a. ☒ Order of Conditions b. ☐ Amended Order of Conditions

3. To: Applicant:

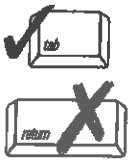
a. First Name | b. Last Name

Eversource / MA DCR
c. Organization

NSTAR Electric Company d/b/a Eversource Energy, 247 Station Drive / Massachusetts Department of Conservation and Recreation, 251 Causeway St, 9th Floor
d. Mailing Address

Westwood / Boston | MA / MA | 02090/02114
e. City/Town | f. State | g. Zip Code

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



4. Property Owner (if different from applicant):

a. First Name | b. Last Name

Massachusetts Bay Transportation Authority
c. Organization

10 Park Plaza
d. Mailing Address

Boston | MA | 02116
e. City/Town | f. State | g. Zip Code

5. Project Location:

MBTA ROW/Central Mass Line Railroad | Stow
a. Street Address | b. City/Town

U7 | 3
c. Assessors Map/Plat Number | d. Parcel/Lot Number

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
299-677
MassDEP File #

eDEP Transaction #

Stow
City/Town

Latitude and Longitude, if known: d m s (d. Latitude) d m s (e. Longitude)

A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):
Middlesex South : N/A ROW
a. County
b. Certificate Number (if registered land)
c. Book
d. Page

7. Dates: 2-3-2020 a. Date Notice of Intent Filed; 6-2-2020 b. Date Public Hearing Closed; 7-10-2020 c. Date of Issuance

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):
Eversource Sudbury-Hudson Transmission Reliability Project Stow Notice of Intent Plans
a. Plan Title
Vanasse Hangen Brustlin, Inc.
b. Prepared By
Mark Edward Shamon
c. Signed and Stamped by
March 4, 2020
d. Final Revision Date
Varies
e. Scale
f. Additional Plan or Document Title
g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a. ☒ Public Water Supply b. ☐ Land Containing Shellfish c. ☒ Prevention of Pollution
d. ☒ Private Water Supply e. ☐ Fisheries f. ☒ Protection of Wildlife Habitat
g. ☒ Groundwater Supply h. ☒ Storm Damage Prevention i. ☒ Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

B. Findings (cont.)

Denied because:

b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3. ☒ Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) — >35 a. linear feet

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☐ Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. ☐ Bordering Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6. ☐ Land Under Waterbodies and Waterways	a. square feet	b. square feet	c. square feet	d. square feet
	e. c/y dredged	f. c/y dredged		
7. ☐ Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. ☒ Riverfront Area	5,111 a. total sq. feet	5,111 b. total sq. feet		
Sq ft within 100 ft	0 c. square feet	0 d. square feet	e. square feet	f. square feet

Sq ft between 100-200 ft	3.240 temp/1,751	3.240 temp/1,751	1,489 i. square feet	1,489 j. square feet

B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	c. nourishment cu yd	d. nourishment cu yd
14. ☐ Coastal Dunes	a. square feet	b. square feet	c. nourishment cu yd	d. nourishment cu yd
15. ☐ Coastal Banks	a. linear feet	b. linear feet		
16. ☐ Rocky Intertidal Shores	a. square feet	b. square feet		
17. ☐ Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. ☐ Land Under Salt Ponds	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19. ☐ Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. ☐ Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	a. c/y dredged	b. c/y dredged		
21. ☐ Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		

B. Findings (cont.)

*** #22.** If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

22. ☐ Restoration/Enhancement *:

a. square feet of BVW | b. square feet of salt marsh

23. ☐ Stream Crossing(s):

a. number of new stream crossings | b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. the work is a maintenance dredging project as provided for in the Act; or
   b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on 7/10/2023 unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]

"File Number 299-677 "

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation

Commission.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

19. **The work associated with this Order (the "Project") is** (1) ☒ **is not** (2) ☐ **subject to the Massachusetts Stormwater Standards. If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:**

a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;
iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;
v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following: *i.*) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and *ii.*) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):

see attached

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☒ Yes ☐ No

2. The Stow (Conservation Commission) hereby finds (check one that applies):

   a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

   _____ (1. Municipal Ordinance or Bylaw) _____ (2. Citation)

   Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

   b. ☒ that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

   Stow Wetlands Bylaw (1. Municipal Ordinance or Bylaw) _____ (2. Citation)

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

   The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

   see attached

ORDER OF CONDITIONS #299-677
Massachusetts Wetlands Protection Act and Town of Stow Wetland Bylaw
Off Marlboro Road, Stow, MA
Assessors Map U7, Parcel 3

List of Submittals for the Record

From the Applicant:

- Notice of Intent with Stormwater Management Report
- Mass Central Rail Trail Plans, last revised 3/4/20, 9 sheets
- Transmission Line Plans along MTBA Right of Way, last revised 3/4/20,19 sheets
- Cover Letter and Supplemental Riverfront Area Narrative Submitted for Eversource by VHB dated 3/4/20
- Memo from VHB re: Sudbury-Hudson Soil and Groundwater Analytical Results, dated 3/18/20
- Email from VHB re Soil and Groundwater Sampling Results dated 3/23/20
- Response to Questions about Soil and Groundwater Sampling Results, dated 3/30/20

From Members of the Public, Organizations and Officials

- Email from Laurel Cohen dated 2/28/20 re project concerns
- Email from Laurel and Steve Cohen dated 4/7/20 re project concerns
- Email from Margaret Costello with attached public hearing statement dated 3/6/20
- Email from Rebecca Cutting (Sudbury) dated 3/5/20
- Email from David Gray regarding project hearing dated 3/4/20
- Email with letter from Bhaird Campbell dated 4/6/20 re procedural questions
- Copy of Letter from Sen. James Eldridge, Rep. Kate Hogan, Rep Carmine Gentile to Jim Montgomery, Commission of Department of Conservation and Recreation re project concerns, dated 5/14/20 and email transmitting letter
- Email/Letter from Bhaird Campbell dated 4/6/20 re procedural concerns.
- Letter from Sudbury Valley Trustees dated 4/2/20 re project concerns
- Letter from Protect Sudbury Inc. dated 4/2/20 re project concerns with seven attachments
- Email from Gleasondale Steering Committee dated 5/28/20 re project concerns
- Statement from Margaret Costello for the record, dated 6/2/20
- Email and List of Questions from Rebecca Cutting of Sudbury dated 6/2/20

From Regional Conservation Commissions

- Peer Review for the Town of Hudson Conservation Commission by WDA Design Group, dated 3/11/20
- Letter from VHB responding to Hudson Peer Review on behalf of Applicants, dated 3/13/20
- Follow up Peer Review Letter from the Town of Hudson Conservation Commission by WDA Design Group, dated 4/9/20
- Peer Review for the Town of Sudbury Conservation Commission by BETA, dated 5/11/20

- "Conservation Commission and Public Comments on the Eversource/DCR Notice of Intent Application", undated, from the Sudbury Conservation Commission

Other Materials

- DEP Best Management Practices for Controlling Exposure to Soil during the Development of Rail Trails, undated.
- Energy Facilities Siting Board Decision, dated 12/18/19
- Letter from Mass DEP to MEPA Commenting on Draft EIR, dated 12/8/17

Conservation Commission Findings:

1. The applicants have filed a Notice of Intent for work proposed within an area subject to regulation under the Massachusetts Wetlands Protection Act and the Town of Stow Wetlands Protection Bylaw and Regulations.

2. NSTAR Electric Company d/b/a Eversource Energy ("Eversource") and the Mass Department of Conservation and Recreation ("DCR") are applying jointly for Eversource to install a 115 kV underground electric transmission line and for DCR to complete construction of a 10 foot wide multi-use path along a portion of the Massachusetts Bay Transportation Authority right-of-way, an inactive railroad right of way. The stated goal of the transmission line is to improve reliability of electric service in the region and the goal of the multi-use path is to advance a regional multi-use trail project. The construction would extend from Sudbury, through Stow and Marlboro and into Hudson. The portion of the project in Stow is approximately 350 feet long and entirely within the railroad right of way between Wilkins Street and Chestnut Street.

3. The project will be built in two phases: Phase 1 will be completed by Eversource and will entail vegetation clearing, installation of erosion controls, removal of existing railroad track and ties, site preparation, installation of the underground transmission line, grading, stormwater controls, installation of a final gravel base and site stabilization. Eversource will be responsible for the property until Phase 2 commences. Phase 2 will be completed by the MA Department of Conservation and Recreation and would entail paving of the multi-use recreational path, grading, final seeding, signage and access controls. The timing of commencement of both phases is unclear at this time, given pending appeals and funding issues.

4. The Eversource portion of the project has received approval from the Energy Facilities Siting Board in a decision dated 12/18/19.

5. Riverfront Area Impacts: Portions of the proposed work are within the Riverfront Area to an unnamed perennial stream which flows into the Assabet River, the 100' buffer zone to Bordering Vegetated Wetlands (BVW), and within the 100' buffer zone to Bordering Land Subject to Flooding under the Town of Stow Wetlands Protection Bylaw. The total Riverfront Area alteration is 5,111 square feet, all of which is in the Outer Riparian Zone. Of this, 1,751 sq. ft. is permanent disturbance and 3,360 sq. ft. is temporary disturbance. There is a total of 13,925 square feet of Riverfront Area on the property. This means that the amount of total alteration (and permanent alteration) is greater than the 10% performance standard in the Wetlands Protection Act.

6. Buffer Zone Impacts: The amount of disturbance to the 100' buffer to BVW is a total of 3,602 sq. ft. of which 1,357 sq. ft. is permanent disturbance and 2,245 sq. ft. is temporary disturbance.

7. BLSF Buffer Zone Impacts (Bylaw): The amount of disturbance to the 100' buffer to BLSF is a total of 9,246 sq. ft., of which 3,399 sq.ft. is permanent disturbance and 5,847 sq. ft. is temporary disturbance. The Town of Stow Wetlands Bylaw and Regulations contain no performance standards for this resource area. No work will occur within Bordering Land Subject to Flooding.

8. Both the underground transmission line and the rail trail qualify as limited projects under the Wetlands Protection Act Regulations. Reference is made to Sections 310 CMR 10.53(3)(d) [Construction of underground and overhead public utilities] and 10.53 (6) [bikepaths to or along Riverfront Areas]. The Commission has the authority to waive strict compliance with the performance standards and require compliance to the maximum extent feasible for such limited projects.

9. The Commission finds that the two phases of the project as proposed are limited projects and that the applicant has complied with the Riverfront Area performance standards to the maximum extent feasible.

10. The applicant has also argued that portions of the Riverfront Area are previously developed pursuant to the meaning of that term in 310 CMR 10.58(5) of the Wetlands Protection Act regulations. The Commission makes no finding as to whether the Riverfront Area on the project site is "previously developed" within the meaning of the regulations, as no such finding is needed to allow the project to proceed in Stow given the previous finding relative to limited projects.

11. There is no Estimated Habitat of Rare Species within the project locus in Stow and no certified or potential vernal pools.

12. No work will occur within the 35' undisturbed buffer area required by the Town of Stow Wetlands Protection Bylaw and Regulations.

13. Concern was expressed at the public hearing by members of the public that contaminated soils may be disturbed during project construction. No documentation was provided as to actual contamination at the project locus and none are listed on DEP's online inventory of waste sites in Massachusetts. Eversource performed limited soil testing, however none of this testing was completed in Stow. The applicant is required to comply with DEP's Massachusetts Contingency Plan requirements, where applicable, as well as DEP Best Management Practices for Controlling Exposure to Soil during the Development of Rail Trails (undated).

14. Information submitted by the applicant indicates that groundwater flow in the area is roughly from north to south. No evidence was provided at the public hearings to the contrary.

15. Concern has been expressed by some members of the public about the use of herbicides for vegetation management along the right of way. In Phase 1, and until the initiation of Phase 2, no herbicides will be used, and all vegetation removal will be strictly mechanical. The Department of Conservation and Recreation will be responsible for long-term vegetation management along the rail trail right of way following the Completion of Phase 2. They have indicated that most vegetation management along the right of way will be done mechanically, but are seeking to use herbicides selectively, as a tool of last resort to address difficult to manage species such as bittersweet in tree canopies, poison ivy and Japanese knotweed. All herbicide application would be by a licensed pesticide applicator using commonly available general (not restricted) use pesticides and in accordance with a Vegetation Management Plan.

16. The Commission held a duly noticed public hearing on March 4, 2020 at which testimony was taken on the project. The hearing was subsequently continued without further testimony to April 7, 2020, April 21, 2020, and May 19, 2020. On May 19, 2020, the hearing was continued to June 2, 2020 at which time a second public hearing was held. The hearing was held by remote participation pursuant to Governor Baker's March 12, 2020 Order Suspending Certain Provisions of the Open Meeting Law, Chapter 53 of the Acts of 2020, G.L. c. 30A, §18, and the Governor's March 15, 2020 Order imposing strict limitation on the number of people that may gather in one place. The hearing was closed on June 2, 2020. Interested parties were given ample opportunities for written and verbal comments on the project.

17. The Commission has voted to issue an Order of Conditions with the above findings and the following special conditions, together with DEP's general conditions, all of which are necessary to enable the project to be in compliance with the Wetlands Protection Act and regulations and the Town of Stow Wetlands Bylaw and regulations.

Special Conditions for Phases 1 and 2

Pre-Construction Conditions – Phases 1 and 2

21. The form provided at the end of this Order shall be completed and stamped at the Middlesex Registry of Deeds. This form shall be returned to the Commission in accordance with General Condition #8, and prior to the commencement of Phase 1.

22. All work shall be performed in accordance with the final plans as described in the Notice of Intent or as specified in this Order of Conditions. No filling or excavating of land beyond the limits or above the grades on the submitted plans is authorized. Any deviation from the approved plans shall require prior approval from the Stow Conservation Commission. This may require resubmission or modification of the Notice of Intent.

23. At least 45 days prior to the anticipated start of Phase 1 construction, the following final documents shall be provided for review and approval of the Stow Conservation Commission or their designee:

a) Two copies of the final dated and stamped construction plans (all pages shall be stamped) for the Stow portion of the Eversource transmission line with the following revisions made to the plans:

i) The location of any construction stockpiles shall be shown on the plans along with a detail for protecting stockpiles from erosion by water and wind at the end of each workday. All stockpiles shall be within the limit of work.

ii) A note shall be added to the dewatering detail indicating that the Conservation Commission shall be notified in advance of any planned dewatering and must approve this work in the field prior to commencing dewatering.

iii) Erosion control barriers shall either be shown as continuous, with straw wattle used to demarcate the limit of work in all areas where the plans do not show erosion controls, or plastic construction fencing shall be used to mark the limit of work in these areas. The plans shall show a continuous physical barrier along the right of way which shall serve as a limit of work.

iv) A note shall be added indicating that the Conservation Commission shall be notified in the event that dust controls beyond water spraying is required on the project site.

b) Two copies of the final stamped plans (all pages shall be stamped) of the DCR Rail Trail construction plans. If these plans are subsequently modified, updated plans shall be provided at least 45 days prior to the start of Phase 2 for the Commission's review and approval.

i) The location of any construction stockpiles shall be shown on the plans along with a spec for stockpile management.

ii) Erosion control barriers shall either be continuous, with straw wattle used to demarcate the limit of work in all areas where the plans do not show erosion controls or plastic construction fencing shall be used to mark the limit of work in these areas.

c) A copy of the final Stormwater O&M Plan.

d) A copy of the final Soil and Groundwater Management Plan.

e) A copy of the MOU between Eversource and DCR on Corridor Maintenance and Management.

The review of these plans and documents shall be limited to a determination of consistency with prior submittals and the conditions of this decision.

24. **At least one week prior to the anticipated start of Phase 1 construction by Eversource, the Stow Conservation Commission shall be notified and given the opportunity to inspect the erosion controls and participate in a pre-construction site meeting. The following shall be provided at or prior to the pre-construction meeting:**

a) The applicant shall advise the Commission of the name(s) and contact numbers(s) of the person(s) responsible on site for compliance with this Order, including the on-site Environmental Monitor.

b) A copy of this Order including final plans shall be on the site upon commencement and during any site work for contractors to view and adhere to.

c) The Certificate of Understanding for this project must be signed by Eversource and the on-site supervisor responsible for the project(s).
d) A project schedule must be provided to the Commission.
e) If wetland flagging is no longer obvious in the field, these flags shall be replaced prior to the pre-construction site meeting.
f) The DEP file number sign shall be posted as required by the general conditions.

25. **At least one week prior to the anticipated start of Phase 2 construction by the Department of Conservation and Recreation (DCR), the Stow Conservation Commission shall be notified and given the opportunity to inspect the erosion controls and participate in a Phase 2 pre-construction site meeting. The following shall be provided at or prior to the pre-construction meeting:**
a) The applicant shall advise the Commission of the name(s) and contact numbers(s) of the person(s) responsible on site for compliance with this Order, including the on-site Environmental Monitor.
b) A copy of this Order including final plans shall be on the site upon commencement and during any site work for contractors to view and adhere to.
c) The Certificate of Understanding for this project must be signed by DCR and the on-site supervisor responsible for the project(s).
d) A project schedule must be provided to the Commission.
e) If wetland flagging is no longer obvious in the field, these flags shall be replaced prior to the pre-construction site meeting.
f) The DEP file number sign shall be posted as required by the general conditions.

During Construction Conditions – Phases 1 and 2

26. The Stow Conservation Commission shall be notified of the time and location of regular project meetings relative to construction within the Town of Stow and provided with copies of meeting notes as applicable.

27. Sediment and erosion control devices shall be installed in accordance with the final plan by Eversource prior to the beginning of Phase 1 construction, and shall be maintained for the duration of construction on the site. **If there is a gap between Phase 1 and Phase 2, Eversource shall be responsible for monitoring and maintaining erosion controls and site stabilization until Phase 2 commences or until a Partial Certificate of Compliance is issued for Phase 1 in accordance with the condition below. A second erosion control barrier inspection shall be required prior to the commencement of Phase 2, and the Commission may require that erosion controls be replaced or repaired by the Department of Conservation and Recreation at this time in order to maintain their full functionality.**

28. The erosion controls shall serve as a limit of work and no activity, including stockpiling or storage of material, is permitted beyond the sediment controls. The sediment and erosion control specifications in this Order and on the final plans will be the minimum standards for this project; the Commission may require additional measures. These will be maintained in good repair until the disturbed area is re-vegetated and stabilized to the

satisfaction of the Stow Conservation Commission at which time they must be removed. **The Stow Conservation Commission shall be contacted and approval obtained prior to removal of sediment and erosion controls.**

29. The areas of construction shall remain in a stable condition at the close of each construction day. All trenches shall be backfilled or secured at the completion of each work day. Sediment and erosion controls shall be inspected daily and repaired or reinforced or replaced as necessary, with any accumulated sediments removed as needed. A stockpile of additional sediment and erosion controls shall be maintained on the site for this purpose.

30. The Commission shall be notified if dewatering is deemed necessary during construction activities and given an opportunity to review the proposed location and method of dewatering prior to the commencement of dewatering activities. No direct discharge to a waterbody is permitted. No overland discharge of water is allowed within 100 feet of vegetated wetlands.

31. Concrete wash-out water shall not be discarded within the 100' buffer or within 100' of any drainage system that may discharge to wetlands or outside of the limit of work. All washout materials will be managed with an appropriate BMP. If concrete is spilled during construction, spilled materials shall be removed from the buffer zone and disposed of properly.

32. SWPPP Inspection reports shall be provided to the Commission electronically within 48 hours of completion. The Commission shall be kept apprised of any corrective actions needed and taken.

33. If on-site excavation or other site work during Phase 1 or Phase 2 reveals any soil contamination in reportable concentrations or quantities, the Stow Conservation Commission shall received notification concurrent with Mass DEP and shall be copied on all correspondence relating to site investigation and remedial actions. Remedial activities may require filing of an additional Notice of Intent in accordance with the Wetlands Protection Act and Stow Wetlands Bylaw.

34. If disturbed areas are not permanently stabilized by the end of the growing season, the owner must monitor the area and install or repair sediment and erosion controls to protect the resource area until the site is stabilized.

35. There shall be no outside storage of chemicals, oil, fuel, fertilizer, or other potentially hazardous materials within the limit of work. No refueling shall occur within the 100' buffer. A spill containment kit shall be kept on site at all times.

36. All waste and excavated material including railroad ties and tracks shall be disposed of in accordance with applicable laws. Any fill or borrow material brought onto the project site in Stow from outside of Stow shall be 1) re-located from qualified immediately adjacent residential areas per DEP's *Best Management Practices for Controlling Exposure to soil during the Development of Rail Trails*; 2) certified as clean fill by the supplier; or 3) subject to analytical testing.

37. All imported soils shall be clean and reasonably free of invasive species. No soil contaminated with Japanese knotweed and/or knotweed rhizomes may be reused in Stow. The Environmental Monitor shall identify and document any areas contaminated with Japanese knotweed within 500' of the eastern and western Town of Stow line prior to commencing construction.

Closing the Project

38. Eversource shall notify the Commission upon the completion of the work in Phase 1. Eversource shall be required to maintain erosion controls and site stabilization until a Phase 1 Partial Certificate of Compliance is received by Eversource or the Conservation Commission receives formal notification via DCR that they are commencing Phase 2 and a Certificate of Understanding is received from DCR per Condition #25.

39. **Certificates of Compliance:**

Phase 1:
If Eversource desires a Partial Certificate of Compliance, it may submit the following to the Stow Conservation Commission:

a. A letter from the applicant requesting a Partial Certificate of Compliance.
b. A written statement from a registered professional engineer of the Commonwealth and as-built plan signed and stamped by a registered professional engineer or land surveyor certifying that the project has been constructed as shown on the plan(s) and documents referenced above, and as conditioned by the Commission.
c. A letter from the Department of Conservation and Recreation assuming responsibility for the management of the site beginning on the date of issuance of the Partial Certificate of Compliance.

Phase 2:
At time that the Department of Conservation and Recreation desires to receive a final Certificate of Compliance, the following must be submitted:

a. A letter from the applicant requesting a Final Certificate of Compliance.
b. A written statement from a registered professional engineer of the Commonwealth and as-built plan signed and stamped by a registered professional engineer or land surveyor certifying that the project has been constructed as shown on the plan(s) and documents referenced above, and as conditioned by the Commission.
c. A plan for the long-term maintenance and vegetation management of the project site consistent with the Perpetual Conditions in this Order of Conditions.

Alternatively, if Phase 2 is abandoned, and the site is fully stabilized, Eversource may submit a request for a Final Certificate of Compliance at the conclusion of Phase 1 with the following:

a. A letter from the Department of Conservation and Recreation indicating that Phase 2 has been abandoned
b. A plan for the long-term maintenance and vegetation management of the project site consistent with the Perpetual Conditions in this Order of Conditions and any other restrictions applicable.

Perpetual Conditions

The following conditions will be included in the Certificate of Compliance and will continue in perpetuity:

40. No dumping of leaves, woody debris, dog waste, excessive snow and any other materials is permitted in or within 100' of wetland resource areas, including the Riverfront Area.

41. Herbicide may be applied by the owner/operator or its agents and contractors under an approved Vegetation Management Plan and annual Yearly Operating Plan authorized by the Massachusetts Department of Agricultural Resources. The Stow Conservation Commission shall be provided a copy of these Plans. Mechanical treatment shall be preferred with herbicide used only to control difficult species such as bittersweet, Japanese knotweed, poison ivy or other similar species which may occur along the recreational trail. Any herbicide use shall be limited to general use herbicides applied by a licensed pesticide applicator. If the Town of Hudson restricts the use of herbicides within the Zone 2 of the Cranberry water supply well, these restrictions shall also apply within the Stow portion of the Zone 2.

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

7/10/2020
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

4
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

☐ by hand delivery on

Date

☑ by certified mail, return receipt requested, on

7-10-2020

Date

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request of Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal

ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Stow
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Stow
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

N/A MBTA ROW/Central Mass Line Railroad

299-677
MassDEP File Number

Has been recorded at the Registry of Deeds of:

Middlesex
County

NA
Book

NA
Page

for:
Property Owner

and has been noted in the chain of title of the affected property in:

Book

Page

In accordance with the Order of Conditions issued on:

7-10-2020
Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Attachment G

TOWN OF HUDSON ENVIRONMENTAL PERMITS

ATTACHMENT G-1: ORDER OF CONDITIONS
(CONSERVATION COMMISSION)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 - Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:190-0647
eDEP Transaction #:1218293
City/Town:HUDSON

A. General Information

1. Conservation Commission: HUDSON
2. Issuance: a. ☑ OOC b. ☐ Amended OOC
3. Applicant Details

a. First Name	N/A	b. Last Name	N/A
c. Organization	NSTAR ELECTRIC COMPANY D/B/A EVERSOURCE ENERGY AND DEPT OF CONSERVATION AND RECREATION		
d. Mailing Address	SEE ATTACHED		
e. City/Town	f. State MA		g. Zip Code

4. Property Owner

a. First Name	N/A	b. Last Name			
c. Organization	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY				
d. Mailing Address	10 PARK PLAZA				
e. City/Town	BOSTON	f. State	MA	g. Zip Code	02116

5. Project Location

a.Street Address	N/A MBTA ROW/CENTRAL MASS LINE RAILROAD		
b.City/Town	HUDSON	c. Zip Code	01749
d. Assessors Map/Plat#	16-23	e. Parcel/Lot#	MULTIPLE
f. Latitude	42.39629N	g. Longitude	71.52249W

6. Property recorded at the Registry of Deed for:

a. County	b. Certificate	c. Book	d. Page
SOUTHERN MIDDLESEX		13156	34

7.Dates

a. Date NOI Filed : 1/2/2020 b. Date Public Hearing Closed: 8/6/2020 c. Date Of Issuance: 8/24/2020

8.Final Approved Plans and Other Documents

a. Plan Title:	b. Plan Prepared by:	c. Plan Signed/Stamped by:	d. Revised Final Date:	e. Scale:
SEE ATTACHED				

B. Findings

1.Findings pursuant to the Massachusetts Wetlands Protection Act
Following the review of the the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act.

Check all that apply:

a. ☑ Public Water Supply	b. ☑ Land Containing Shellfish	c. ☑ Prevention of Pollution
d. ☑ Private Water Supply	e. ☑ Fisheries	f. ☑ Protection of Wildlife Habitat
g. ☑ Ground Water Supply	h. ☑ Storm Damage Prevention	i. ☑ Flood Control

2. Commission hereby finds the project, as proposed, is:

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 - Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:190-0647
eDEP Transaction #:1218293
City/Town:HUDSON

Approved subject to:

a. ☑ The following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

Denied because:

b. ☐ The proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ The information submitted by the applicant is not sufficient to describe the site, the work or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the interests of the Act , and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3. ☐ Buffer Zone Impacts:Shortest distance between limit of project disturbance and the wetland resource area specified in 310CMR10.02(1)(a). _____ a. linear feet

Inland Resource Area Impacts:(For Approvals Only):

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☐ Bank	_____ a. linear feet	_____ b. linear feet	_____ c. linear feet	_____ d. linear feet
5. ☑ Bordering Vegetated Wetland	1936 a. square feet	_____ b. square feet	1936 c. square feet	_____ d. square feet
6. ☐ Land under Waterbodies and Waterways	_____ a. square feet	_____ b. square feet	_____ c. square feet	_____ d. square feet
	_____ e. c/y dredged	_____ f. c/y dredged		
7. ☑ Bordering Land Subject to Flooding	16400 a. square feet	_____ b. square feet	11208 c. square feet	_____ d. square feet
Cubic Feet Flood Storage	0 e. cubic feet	_____ f. cubic feet	435.5 g. cubic feet	_____ h. cubic feet
8. ☑ Isolated Land Subject to Flooding	760 a. square feet	_____ b. square feet		
Cubic Feet Flood Storage	0 c. cubic feet	_____ d. cubic feet	99.07 e. cubic feet	_____ f. cubic feet
9. ☑ Riverfront Area	64790	_____		

	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

Coastal Resource Area Impacts:

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10.☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11.☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12.☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13.☐ Coastal Beaches	a. square feet	b. square feet	c. c/y nourishment	d. c/y nourishment
14.☐ Coastal Dunes	a. square feet	b. square feet	c. c/y nourishment	d. c/y nourishment
15.☐ Coastal Banks	a. linear feet	b. linear feet		
16.☐ Rocky Intertidal Shores	a. square feet	b. square feet		
17.☐ Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18.☐ Land Under Salt Ponds	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19.☐ Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20.☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	c. c/y dredged	d. c/y dredged		
21.☐ Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		

22.
☐ Restoration/Enhancement (For Approvals Only)

If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c & d or B.17.c & d above, please entered the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

23.

☐ Streams Crossing(s)

If the project involves Stream Crossings, please enter the number of new stream crossings/number of replacement stream crossings.

a. number of new stream crossings

b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. the work is a maintenance dredging project as provided for in the Act; or
   b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not exceed the issuance date of the original Final Order of Conditions.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.
9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work..
10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

" Massachusetts Department of Environmental Protection"

[or 'MassDEP"]
File Number :"190-0647"

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before Mass DEP.
12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
13. The work shall conform to the plans and special conditions referenced in this order.
14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.
15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.
16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.
17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.
18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

19. The work associated with this Order(the "Project") is (1) ☑ is not (2)☐ subject to the Massachusetts Stormwater Standards. If the work is subject to Stormwater Standards, then the project is subject to the following conditions;

a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollutant Discharge Elimination System Construction General Permit as required by Stormwater Standard 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that: *i.* all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures; *ii.*. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized; *iii.* any illicit discharges to the stormwater management system have been removed, as per

the requirements of Stormwater Standard 10; *iv.* all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition; *v.* any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 19(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement") for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following: i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollutant Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 19(f) through 19(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 19(f) through 19(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

g) The responsible party shall:
   1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
   2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
   3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as

defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions:
SEE ATTACHED

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☐ Yes ☑ No

2. The Conservation Commission hereby (check one that applies):

a. ☐ DENIES the proposed work which cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw specifically:

1. Municipal Ordinance or Bylaw _____ 2. Citation _____

Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order or Conditions is issued. Which are necessary to comply with a municipal ordinance or bylaw:

b. ☐ APPROVES the proposed work, subject to the following additional conditions.

1. Municipal Ordinance or Bylaw _____ 2. Citation _____

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

The special conditions relating to municipal ordinance or bylaw are as follows:

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
190-0647
MassDEP File #
121893
eDEP Transaction #
HUDSON
City/Town

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

8/24/2020
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

5
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

By vote on April 2, 2020 the individuals listed below have authorized the Conservation Agent to sign on their behalf pursuant to the signature authorization recorded with the Middlesex South Registry of Deeds Book 74456 Page 40. They also intend for the typed names below to serve as their electronic signature for any entity (MassDEP) that accepts electronic signatures.

Signatures:

David Mercer

James Martin

Debbi Edelstein

Emilie Wilder

Brandon Parker

☐ by hand delivery on

Date

☒ by certified mail, return receipt requested, on
8/24/2020
Date

8/24/2020

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
190-0647
MassDEP File #
1218293
eDEP Transaction #
HUDSON
City/Town

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

(M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

G. Recording Information

This Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

HUDSON
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

HUDSON
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

N/A MBTA ROW/CENTRAL MASS LINE RAILROAD — Project Location
190-0647 — MassDEP File Number

Has been recorded at the Registry of Deeds of:

County | Book | Page

for:

Property Owner N/A

and has been noted in the chain of title of the affected property in:

Book | Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

***MBTA ROW*/Central Mass Line Railroad**
MassDEP File #190-0647
Applicants and Property Owners

Applicants:

Denise Bartone
NSTAR Electric Company d/b/a Eversource Energy
247 Station Drive, SE270
Westwood MA 02090

Priscilla Geigis
Department of Conservation and Recreation
251 Causeway Street, Suite 600
Boston MA 02114

Property Owners:

Massachusetts Bay Transit Authority
10 Park Plaza
Boston MA 02116

Town of Hudson
78 Main Street
Hudson MA 01749

Special Conditions Under Massachusetts Wetlands Protection Act

***MBTA ROW*/Central Mass Line Railroad**

MassDEP File #190-0647

Findings of Fact

Existing Conditions

The Project extends from Sudbury, through small portions of Stow and Marlborough, and into Hudson. The site within Hudson is 4.7 miles in length, of which 3.3 miles is along the existing inactive MBTA ROW from the Hudson/Sudbury municipal border to Wilkins Street. Crossing Wilkins Street, it continues within Town of Hudson–owned property for approximately 230 feet, to connect to the existing Assabet River Rail Trail (ARRT). It also continues southwest within Wilkins Street and Forest Avenue for approximately 1.4 miles to the Hudson Light and Power Substation, which is exempt pursuant to 310 CMR 10.02(2)(b)1.

The following freshwater wetland resource areas are present within or proximate to the Project Site: Bank, LUWW, BVW, BLSF, ILSF, and RFA. Major features consist of wetlands associated with the Assabet River and Fort Meadow Brook. In addition, there are two certified vernal pools within the site and the project passes through a Zone II Wellhead Protection Area associated with Hudson's public water supply. A portion of the Project Site within the MBTA ROW east of White Pond Road to the Hudson/Sudbury town line is within Priority and Estimated Habitat of rare species.

All wetland resource areas within the Project Site, except for the MCRT Connection to the ARRT, were reviewed and approved in an ORAD, 190-0611, issued February 6, 2018. The additional Resource Areas near the MCRT Connection to the ARRT are approved as part of this Order of Conditions.

The bridge spanning Fort Meadow Brook within the Project Site is severely damaged and is a historic location of beaver dams. Two streams, one perennial (Stream 1) and one intermittent (Stream 3), cross beneath the Project Site through stone and clay culverts, both of which are over 100 years old.

Proposed Conditions

The Project includes installation of a 115 kilovolt underground electric transmission line (Phase 1), followed by completion of a portion of the regional Massachusetts Central Rail Trail (MCRT) (Phase 2) in the same footprint. In addition to the work in the MBTA ROW, the project will include a connection to the existing ARRT alongside the existing parking lot on Wilkins Street and installation of underground transmission line within public roadways for connection to the Hudson Light and Power substation.

Phase 1 of the Project will be implemented by Eversource and will include all major earthwork, bridge reconstruction, construction of the Chestnut Street underpass, installation of the underground transmission line, and the majority of the restoration work. Phase 2 of the Project will be under the control and responsibility of DCR and will include installation of road crossings, paving the MCRT, and final restoration. Long-term, ongoing maintenance shall be the responsibility of DCR.

The limits of work will mostly be 22 feet in width. The final paved bike path will be 10 feet wide. The graded platform will also contain a 5-foot corridor that contains the

underground duct bank. Two-foot shoulders on either side of the path will be loamed and seeded. The remainder of the 22-foot work area will be restored to a naturally vegetated state. In some sensitive environmental areas the work area will be reduced to 18 feet in width, with the duct bank beneath the paved bike path. There will be an access manhole approximately every 1500 feet, which will require a work area 40 feet wide by 50 feet in length. There will be ten such manholes in Hudson, three of which are in jurisdictional areas: one in River Front Area and two in Buffer Zone.

The only BVW disturbance will be at Fort Meadow Brook. The existing bridge is burned and badly damaged and must be replaced. Crane mats will be used to allow cranes to remove the old bridge and install a new single span bridge in its place. Areas disturbed by the crane mats will be restored.

There are some Time-Of-Year (TOY) restrictions set by Natural Heritage and Endangered Species Program (NHESP). Wildlife habitat in critical areas will be restored by replacing dead snags and brush piles that are removed for construction and revegetating the areas. TOY restrictions within Vernal Pool migration areas have been extended to include March 1 through June 1.

Storm water management on the bike path will mostly rely on sheet flow through a vegetated filter strip. There will be some drainage swales with check dams, one leaching catch basin and an infiltration basin at the ARRT trail head.

Maintenance of the bike path will include mowing or weed-whacking the 2-foot shoulders biweekly during the growing season, or as needed, and mowing the 5-foot corridor over the duct bank once a year. Invasive species removal will be by mechanical means when possible and spot treatments of herbicide by a licensed applicator when other approaches are not effective. Trash on the bike path shall be removed and disposed of. Natural debris such as leaves and twigs may be blown off the sides of the bike path except in areas near vernal pools.

Mitigation Plantings

There will be significant reseeding of disturbed Riverfront Area with a seed mix containing both herbaceous and woody vegetation. In addition, 600 woody plantings shall be installed in five areas along the Project corridor. In the Riverfront Area associated with Fort Meadow Brook, approximately 19 trees and 122 shrubs shall be planted in addition to the seed mix, and 40 aquatic plugs shall be installed in the area of BVW disturbed by the crane mats. Shrubs shall also be planted along the 2500 linear feet of Priority Habitat Areas.

Compliance with Applicable Performance Standards:

Both the transmission line and the rail trail qualify as Limited Projects under the Wetlands Protection Act Regulations. The Project complies with all applicable performance standards for BVW, BLSF, and ILSF, but exceeds the 10 percent threshold in the RFA performance standards due to the long, linear nature of the project and disturbs vegetation within the inner 100-foot RFA. This is permitted for Limited Projects if the applicant meets the Performance Standards to the maximum extent practicable. The Commission

was satisfied that this requirement has been met and that mitigation has been provided in the form of restoration plantings in Riverfront Area. There will be no permanent impact to BVW and there will be a minimal increase in flood storage area.

Documents:

- Notice of Intent: Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project, Hudson, MA; prepared by VHB; dated January 2020
- Stormwater Report: Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project, Hudson, MA; prepared by VHB; dated January 2020
- Wildlife Habitat Evaluation: Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project, Hudson, MA; prepared by VHB; dated January 2020
- Eversource Sudbury-Hudson Transmission Reliability Project: Hudson Notice of Intent Plans; prepared by VHB; dated January 2020; revised July 24, 2020; signed and stamped by Mark Edward Shamon, PE# 35329; scale 1"=20'
- Commonwealth of Massachusetts Department of Conservation and Recreation, Division of Planning and Engineering; Mass Central Rail Trail in the towns of Hudson, Stow, Marlborough & Sudbury; prepared by VHB; dated Jan 2020; signed and stamped by Trace A. Lenhardt, PE# 47612; scale 1"=20'
- NSTAR Electric Company d/b/a Eversource Energy Sudbury to Hudson 115kV Underground Transmission Line; prepared by Power Engineers; dated 12/30/2020; signed and stamped by Todd S. Goyette PE#45181; scale 1"=20'
- Wetland Peer Review – Notice of Intent Sudbury-Hudson Transmission Reliability and MA Central Rail Trail Project; prepared by WDA Design Group; dated 3/11/2020
- Questions for Hearing on 6-4; submitted by Hudson Conservation Commission
- Hudson ConCom_RTC_6-11-20; submitted by VHB Associates
- Letter from WDA Design Group dated July 14, 2020
- WDA Design Group Peer Review – Applicants' Response to Additional Comments Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project; prepared by VHB; dated July 27, 2020
- Peer Review – Notice of Intent (DEP File #190-0647) Sudbury-Hudson Transmission Reliability and MA Central Rail Trail Project Eversource and DCR - Hudson, Massachusetts; prepared by WDA; dated 8/3/2020
- Corridor Management Plan for Massachusetts Central Rail Trail-Wayside Section and Sudbury-Hudson Transmission Reliability Project

Special Conditions

GENERAL:

19. The Findings of Fact are incorporated as a special condition and given equal status as a special condition of this Order.

20. No excavated material shall be disposed of in violation of any local, state, or federal laws. All stumps must be removed from the site; no burying of stumps on site is permitted.
21. Plantings must be native plants or substitutions only as identified on the approved plans. No invasive vegetation shall be planted.

PRECONSTRUCTION:

22. Within thirty (30) days of the issuance of this Order of Conditions, the applicant, property owner, project representative, or other applicable party must record the original copy of the Order with the Registry of Deeds. Proof of recording is required to be submitted to the Commission or Conservation Agent prior to the pre-construction site visit and commencement of work.
23. Erosion controls shall consist of (a) silt fence or (b) silt fence with compost filter tubes, double-staked straw bales, or wattles, as shown on the plans. Only invasive seed free erosion controls shall be used. Syncopated fencing shall be used within 450 feet of vernal pools. A silt curtain shall be used in Fort Meadow Brook near the bridge if conditions warrant.
24. Prior to the beginning of each Phase, the applicant shall:
    a. Provide the Conservation Commission with the name and telephone number in writing, of the person who will be immediately responsible for supervision of all work on the project site and compliance with this Order of Conditions. The Conservation Commission shall be notified in the event that the site supervisor or contractor is changed.
    b. Clearly mark the limits of work in the field and instruct all workers not to work beyond the limits.
    c. Notify Conservation Commission of the date upon which work will commence and provide the commission with the most up-to-date project timeline and project workflow.
    d. Properly install all siltation controls according to the plans approved by the Conservation Commission and arrange with the Commission to have a site visit after installation, before work begins.
25. Environmental Monitoring:
    a. Resumes of Environmental Monitors being considered for the project shall be submitted to the Commission for review.
    b. If the chosen Environmental Monitor does not have a qualified Vernal Pool Biologist or equivalent, a separate Vernal Pool Specialist shall be hired by the applicant to approve and supervise work within 450 feet of Vernal Pools during the TOY restriction of March 1 to June 1. A qualified Vernal Pool Specialist will have at least three years of experience

conducting vernal pool assessments or surveys in the northeastern United States.

26. A structural engineer shall inspect the culverts conveying Streams 1 and 3 beneath the MBTA ROW within the Project Site to determine whether they are structurally sound to (a) function hydrologically and (b) withstand the planned construction activities, and shall provide a report of the findings to the Commission. If either culvert does not meet these requirements or is damaged during construction, it shall be replaced with a culvert that meets current MA Stream Crossing Standards to the maximum extent practicable, as determined by the Commission or its Agent, during construction.
27. The following final documents shall be provided for review and comment by the Conservation Commission:
    a. Final Stormwater O&M Plan
    b. Final Stormwater Pollution Prevention Plan
    c. Final MOU between Eversource and DCR on Corridor Maintenance and Management
    d. Soil and Groundwater Management Plan
    e. Structural Engineer report on culvert conditions

DURING CONSTRUCTION

28. All Time-Of-Year (TOY) construction restrictions and sweeps required by the Natural Heritage and Endangered Species Program shall be followed. Time-of-Year restrictions for work within 450 feet of vernal pools shall be March 1 through June 1. Between March 1 and June 1, the Environmental Monitor shall conduct sweeps prior to vehicles traveling down the Project Site within vernal pool buffers. Between April 1 and Oct 31, the Environmental Monitor shall conduct turtle sweeps prior to initiating work in, or prior to vehicles traveling through, the Box Turtle Protection Area.
29. There shall be a qualified Environmental Monitor on site at all times that work is being performed in jurisdictional wetland areas. The Environmental Monitor shall send weekly reports and reports following any storm events of ½ inch or greater electronically to the Conservation Agent.
30. Detailed construction sequencing and schedules shall be submitted to the Commission electronically, as they are completed or whenever they are revised.
31. The applicant shall endeavor to locate a supplier of pesticide-free seed mixes. All restoration seed mixes shall be pesticide-free if practicable. Documentation of seed sources shall be provided to the Commission, prior to purchase if practicable.
32. Detailed sequencing of the bridge removal work based on water levels and other conditions at the time of removal shall be provided to the Commission prior to commencement of work in this area. A silt curtain shall be used if conditions

warrant. The Conservation Agent shall be notified when bridge removal is to begin and perform a site inspection before work commences. The Conservation Agent shall be kept informed on a daily basis of bridge work to be performed and when the work is complete, and shall perform site inspections before any phase of work as the Commission or Agent deems appropriate.

33. Trash removal shall be performed along the ROW, even outside the limits of work, as practicable. Locations of trash removal shall be determined by a site walk of the applicant and Conservation Agent and/or Commissioner.
34. If dewatering is necessary, water will not be discharged directly into any waterbodies, BVW, or inner 100' of RFA. The Conservation Commission shall be notified in advance if dewatering is required within jurisdictional areas and shall inspect the work site before dewatering commences if such inspection can occur within 24 hours of notification.
35. If on-site excavation or other work reveals any soil contamination in reportable concentrations or quantities, the Conservation Commission shall be notified and shall be copied on all related correspondence.
36. The Conservation Commission shall be notified of any remedial activities or changes to the work plans required due to the potential presence of PFAS in the Zone II wellhead area or other jurisdictional areas.
37. The catch basin at stations 119 shall be a leaching catch basin.
38. All equipment and timber mats shall be cleaned prior to use on the site to prevent the introduction of invasive species. If it is necessary to clean construction equipment while on site, it must be cleaned outside of the 100-foot Buffer Zone, Riverfront Area, or any other Resource Area.

CONSTRUCTION GAP BETWEEN PHASE 1 PHASE II

39. If there is a gap between Phase 1 and Phase 2, erosion controls shall be maintained by Eversource. Erosion control in Priority and Estimated Habitat of Rare Species and within 450 feet of Vernal Pools may require removal. This shall be determined by a site walk with the applicant and Conservation Agent.
40. If there is a gap between Phase 1 and Phase 2, Eversource shall be responsible for the health of the restoration areas and the control of invasive species in these areas.

POSTCONSTRUCTION

41. Prior to the issuance of a Certificate of Compliance the site shall be stabilized with vegetation or other measures approved by the Conservation Commission.
42. Prior to the issuance of a Certificate of Compliance and after the site has been stabilized, all erosion controls shall be removed from the site.
43. Two (2) full growing seasons shall be required to determine that any plantings within buffer zones and/or resource areas or as part of any mitigation plan have successfully

established or may require replanting in case of significant failure.

a. During this 2-year period, the applicant/property owner shall submit a report from a qualified wetlands scientist or landscape specialist at the end of each growing season describing the condition of the plantings following installation. If greater than 25% of plantings are not in good health then replacement plantings are required.
b. The consultant shall prepare a final report on the status of the plantings as part of the Request for a Certificate of Compliance. Successful establishment of the plantings will mean that at least 75% of the plantings have survived and are in good health and that the planting is free of invasive species. Successful establishment is a requirement for the issuance of a Certificate of Compliance.

44. Prior to the issuance of a Certificate of Compliance, the applicant shall submit to the Conservation Commission for review and approval an as-built plan and a letter of compliance stamped by a registered professional engineer. Said plan and letter shall show that all conditions of this Order have been complied with in substantial compliance with the Order and explain any differences from the approved plans.

CONDITIONS IN PERPETUITY

45. When maintaining the path, no debris including natural debris such as leaves and twigs shall be blown or swept from the bike path into areas within 25 feet of vernal pools. The boundaries of these areas shall be indicated with a method to be determined before the Certificate of Compliance is granted. This Condition is ongoing and does not expire with the expiration of the Order of Conditions or the issuance of a Certificate of Compliance.
46. The culverts beneath the ROW shall be inspected and cleared of debris at least annually. If the culverts become damaged or no longer function as required, they shall be replaced according to the most current MA Stream Crossing Standards. This Condition is ongoing and does not expire with the expiration of the Order of Conditions or the issuance of a Certificate of Compliance.
47. DCR shall notify the Commission in advance if herbicides are to be used for vegetation control within wetland jurisdictional areas, indicating the target control species, the type(s) of herbicide to be used, and the on-going maintenance plan for the targeted area. This Condition is ongoing and does not expire with the expiration of the Order of Conditions or the issuance of a Certificate of Compliance.

Attachment H

MA ENERGY FACILITIES SITING BOARD CERTIFICATE

COMMONWEALTH OF MASSACHUSETTS
ENERGY FACILITIES SITING BOARD

Petition of NSTAR Electric Company d/b/a Eversource Energy for Approval to Construct a New 115 kV Transmission Line in the Towns of Sudbury, Hudson, and Stow, and the City of Marlborough and to Make Modifications to Existing Substations in Sudbury and Hudson, Massachusetts, Pursuant to G.L. c. 164, § 69J	EFSB 17-02
Petition of NSTAR Electric Company d/b/a Eversource Energy for Exemptions from the Operation of the Sudbury, Hudson and Stow Massachusetts Zoning Bylaws, Pursuant to G.L. c. 40A, § 3	D.P.U. 17-82
Petition of NSTAR Electric Company d/b/a Eversource Energy for Approval to Construct and Use a New 115 kV Transmission Line in the Towns of Sudbury, Hudson, and Stow, and the City of Marlborough, Massachusetts Pursuant to G.L. c. 164, § 72	D.P.U. 17-83

FINAL DECISION

On the Decision:

Stephen August
Charlene de Boer
Ashley Ferrer
Andrew Greene
Dean Hazle
Lavinia LaBonte
Barbara Shapiro
John Young

Joan Foster Evans
Presiding Officer
December 18, 2019

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Intervenor

Limited Participants (see Appendix A)

TABLE OF CONTENTS

ABBREVIATIONS

Alliance	Alliance to Protect Nantucket Sound v. Department of Public Utilities, 461 Mass. 190 (2011)
ANRAD	Abbreviated Notice of Resource Area Delineation
ASTM	American Society for Testing and Materials
Berkshire Power	Berkshire Power Development, Inc., D.P.U. 96-104 (1997)
BLSF	bordering land subject to flooding
Box Pond	Box Pond Association v. Energy Facilities Board, 435 Mass. 408 (2001)
BMP	best management practices
Braintree	Planning Board of Braintree v. Department of Public Utilities, 420 Mass. 22 (1995)
BVW	bordering vegetated wetland
CCGT	combined-cycle gas turbine
CELT	Capacity, Energy, Loads, and Transmission (report)
CHG	Commonwealth Heritage Group, Inc.
CMR	Code of Massachusetts Regulations
CPP	critical peak pricing
CPR	critical peak rebate
Company	NSTAR Electric Company d/b/a Eversource Energy
dBA	A-weighted decibels
DCR	Massachusetts Department of Conservation and Recreation

DCR Lease	a 99-year lease between the Massachusetts Bay Transportation Authority and the Massachusetts Department of Conservation and Recreation for the construction of a multi-use trail along a Massachusetts Bay Transportation Authority right-of-way
Department	Massachusetts Department of Public Utilities
DEIR	Draft Environmental Impact Report
DG	distributed generation
DOMSB	Decisions and Orders of Massachusetts Energy Facilities Siting Board
DR	demand response
East Eagle	NSTAR Electric Company d/b/a Eversource Energy, EFSB 14-04/D.P.U. 14-153/14-154 (2017)
EE	energy efficiency
EFSB	Energy Facilities Siting Board
EIR	Environmental Impact Report
EJ	environmental justice
EMF	electric and magnetic fields
ERIS	environmental risk information services database
FCA	Forward Capacity Auction
FEIR	Final Environmental Impact Report
FEMA	Federal Emergency Management Agency
GCA	Green Communities Act
GHG	greenhouse gas

Greater Boston Area	a portion of the electric system including the Northeast Massachusetts load zone, and portions of the New Hampshire, Southeastern Massachusetts, and Western Central Massachusetts load zones
G.L. c.	Massachusetts General Laws chapter
GWSA	Global Warming Solutions Act
HLPD	Hudson Light & Power Department
Hudson Substation	electrical substation owned by the Hudson Light & Power Department located at Forest Avenue in the town of Hudson, Massachusetts
ISO-NE	ISO-New England
kV	kilovolts
LCOE	levelized cost of entry
LEI	London Economics International, LLC
LSP	Licensed Site Professional
LTE	long-time emergency rating
MAPA	Massachusetts Administrative Procedure Act
Marlborough Subarea	a portion of the electric grid serving customers in Marlborough, Hudson, Stow, Berlin, Northborough, Westborough, Southborough, Framingham, Grafton, and Shrewsbury
MassDEP	Massachusetts Department of Environmental Protection
MassDEP Rail Trail BMP	MassDEP Best Management Practices for Controlling Exposure to Soil During the Development of Rail Trails guidance document
MassDFW	Massachusetts Division of Fisheries and Wildlife
MassDOER	Massachusetts Department of Energy Resources
MBTA	Massachusetts Bay Transportation Authority

MCP	Massachusetts Contingency Plan
MCRT	The Mass Central Rail Trail – a proposed 104-mile-long multi-use path between Boston and Northampton on the former Massachusetts Central Railroad corridor
MEPA	Massachusetts Environmental Policy Act
mG	milligauss
MHC	Massachusetts Historical Commission
MLS	Multiple Listing Service
MODF	mineral oil dielectric fluid
MOU	Memorandum of Understanding
MVA	megavolt-amperes
MVRP	New England Power Company d/b/a National Grid, D.P.U. 15-44/15-45 (2016)
MW	megawatts
Mystic-Woburn	NSTAR Electric Company d/b/a Eversource Energy, EFSB 15-03/D.P.U. 15-64/15-65 (2017)
Needham-West Roxbury	NSTAR Electric Company d/b/a Eversource Energy, EFSB 16-02/D.P.U. 16-77 (2018)
NERC	North American Electric Reliability Corporation
New Line	the proposed 115 kV transmission line between the Sudbury and Hudson Substations
NHESP	Natural Heritage & Endangered Species Program
NPCC	Northeast Power Coordinating Council
NY Central Railroad	New York Central Railroad v. Department of Public Utilities, 347 Mass. 586 (1964)
NRG	NRG Canal 3 Development LLC, EFSB 15-06/D.P.U. 15-180 (2017)

NTA	non-transmission alternative
Option Agreement	an agreement between the Massachusetts Bay Transportation Authority and NSTAR Electric Company d/b/a Eversource Energy granting Eversource Energy the right and option to acquire an easement along an existing Massachusetts Bay Transportation Authority right-of-way
PAs	program administrators
PAHs	polycyclic aromatic hydrocarbons
Petitions	Siting Petition, Section 72 Petition, and Zoning Petition
PPA	Proposed Plan Application
PP-4	ISO-NE Planning Procedure No. 4
Project	proposed 115 kV transmission line between the Sudbury and Hudson Substations and associated substation facilities
PSC	Public Service Corporation
Public Comment Hearing Notice	Notice of Public Comment Hearing/Notice of Adjudication
ROW	right-of-way
Russell	Russell Biomass, LLC, 17 DOMSB 1; EFSB 07-4/D.P.U. 07-35/07-36 (2009)
Salem Cables	New England Power Company d/b/a National Grid, 20 DOMSB 129; EFSB 13-2/D.P.U. 13-151/13-152 (2014)
Save the Bay	Save the Bay v. Department of Public Utilities, 366 Mass. 667 (1975)
Section 72 Petition	Eversource petition pursuant to G.L. c. 164, § 72
SF_6	sulfur hexafluoride
Siting Board	Massachusetts Energy Facilities Siting Board
Siting Board Petition	Eversource petition pursuant to G.L. c. 164 § 69J
SJC	Supreme Judicial Court

solar PV	solar photovoltaic
STE	short-time emergency rating
Sudbury Motion	June 13, 2019, motion by the Town of Sudbury requesting reopening of the record and hearing in this proceeding
SWPPP	stormwater pollution prevention plan
TMPs	Traffic Management Plans
TPP	Turtle Protection Plan
Town of Truro	Town of Truro v. Department of Public Utilities, 365 Mass. 407 (1974)
ULSD	ultra-low sulfur diesel
URAM	Utility-Related Abatement Measure (310 CMR 40.0460)
USACE	U.S. Army Corps of Engineers
USEPA	U. S. Environmental Protection Agency
Vineyard Wind	Vineyard Wind LLC, EFSB 17-05/D.P.U. 18-18/18-19 (2019)
VMP	vegetation management plan
Walpole-Holbrook	NSTAR Electric Company d/b/a Eversource Energy, EFSB 14-2/D.P.U. 14-73/14-74 (2017)
WHO	World Health Organization
Woburn-Wakefield	NSTAR Electric Company d/b/a Eversource Energy and New England Power Company d/b/a National Grid, EFSB 15-04/D.P.U. 15-140/15-141 (2018)
Worcester	New England Power Company d/b/a National Grid, 18 DOMSB 173; EFSB 09-1/D.P.U. 09-52/09-53 (2011)
WPA	Wetlands Protection Act
Zoning Petition	Eversource petition pursuant to G.L. c. 40A § 3

ZBA	Zoning Board of Appeals
2015 Needs Assessment	Greater Boston Updated Transmission Needs Assessment (2015)

Pursuant to G.L. c. 164, § 69J, the Massachusetts Energy Facilities Siting Board ("Siting Board") hereby approves, subject to the conditions set forth below, the Petition of NSTAR Electric Company d/b/a Eversource Energy ("Eversource" or "Company") to construct a new approximately nine-mile-long 115 kilovolt ("kV") underground transmission line in Sudbury, Hudson, Stow, and Marlborough, Massachusetts. Pursuant to G.L. c. 164, § 72, the Siting Board hereby approves, subject to the conditions set forth below, the Petition of Eversource for a determination that the proposed transmission line is necessary, serves the public interest, and is consistent with the public interest. Pursuant to G.L. c. 40A, § 3, the Siting Board hereby approves, subject to the conditions set forth below, the Petition of Eversource for individual and comprehensive zoning exemptions from the Sudbury, Hudson, and Stow Zoning Bylaws in connection with the proposed transmission facilities, including improvements to the Sudbury Substation, as described herein.

I. INTRODUCTION

A. Description of the Proposed Project

Eversource proposes to construct a new approximately nine-mile-long 115 kV underground transmission line between the Company's Sudbury Substation in Sudbury, Massachusetts, and the Hudson Light & Power Department's ("HLPD") Hudson Substation in Hudson, Massachusetts ("New Line") (Exh. EV-2, at 1-1). In order to accommodate the New Line, both Eversource and HLPD would need to make modifications to their respective substations, including the installation of new breakers and other equipment (together, the "Project")[1] (Exh. EV-2, at 1-1, 3-2 to 3-3, 5-5, 5-8). According to the Company, the Project is

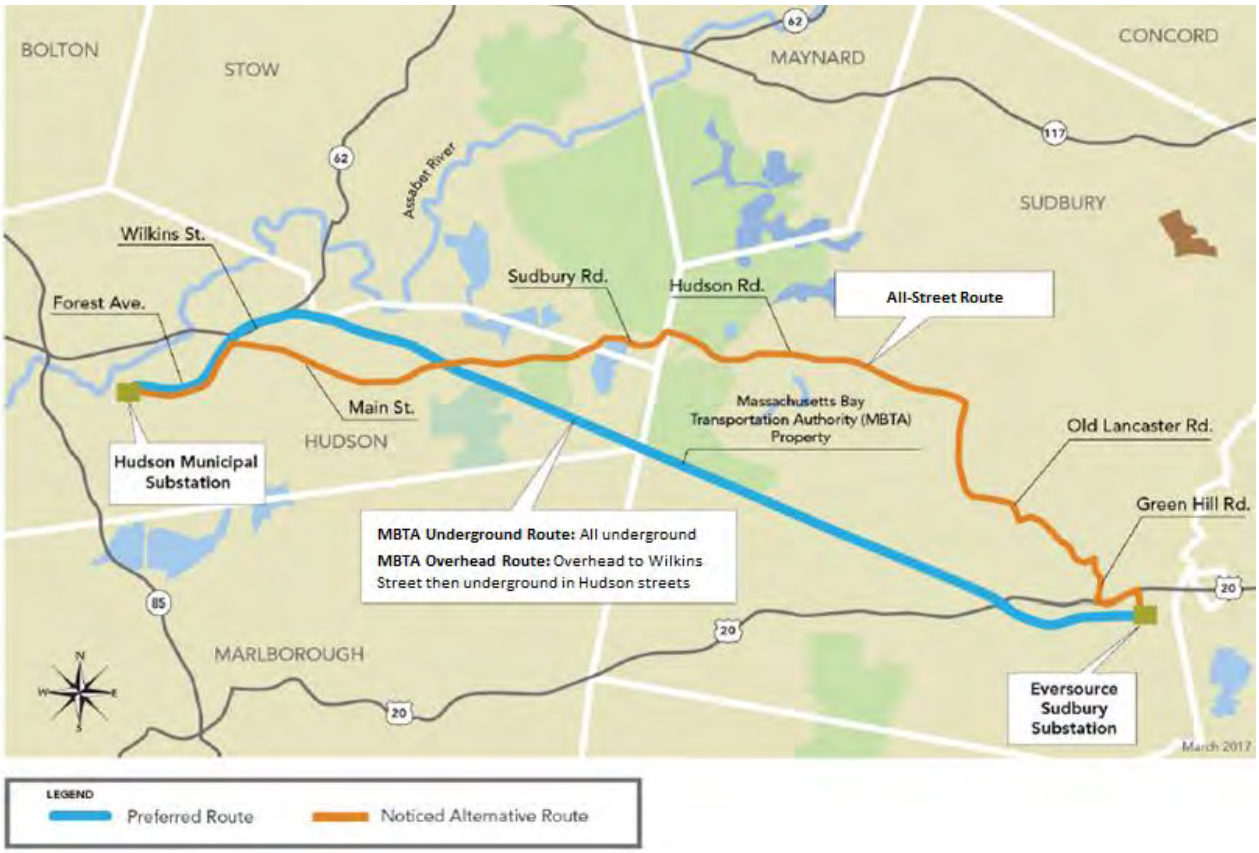
[1] In its Petition, the Company described the scope of "the Project" as including only the New Line and Sudbury Substation facilities (Exh. EV-2, at 1-1). HLPD supports this position and argues that work at the Hudson Substation is outside of the scope of the Siting Board's review (HLPD Brief at 5). The Siting Board views the facilities at both the Sudbury and Hudson Substations as ancillary facilities to the New Line that are essential components of the Project, and as such includes work at both substations within the scope of its review. This is consistent with the Siting Board's responsibilities under G.L. c. 164, § 69J to review the proposed construction of a "facility," which includes relevant ancillary structures which are integral parts of the operation of any transmission line which is a facility, such as the substations at either end of a jurisdictional transmission facility. See G.L. c. 164, § 69G, definition of "facility." While HLPD is

needed to maintain a reliable supply of electricity to customers in the municipalities of Marlborough, Hudson, Stow, Berlin, Northborough, Westborough, Southborough, Framingham, Grafton, and Shrewsbury, Massachusetts (the "Marlborough Subarea") (Exh. EV-2, at 2-1). The Company's estimate for the cost of the Project is approximately $95.8 million (RR-EFSB-50(1)).

Eversource proposes three alternative routes for the New Line: (1) its Preferred Route (aka the Primary Route), an approximately nine-mile-long route including a 7.6 mile underground segment within an inactive Massachusetts Bay Transportation Authority ("MBTA") right-of-way ("ROW") in Sudbury, Stow, Marlborough, and Hudson, and a 1.4-mile underground in-street segment in Hudson ("MBTA Underground Route"); (2) a Noticed Variation along the same route as the Preferred Route, instead using overhead transmission line construction along the MBTA ROW and the same underground, in-street segment in Hudson ("MBTA Overhead Route"); and (3) an approximately 10.3-mile-long Noticed Alternative Route, which would avoid use of the MBTA ROW entirely and be located underground within roadways in Sudbury and Hudson ("All-Street Route") (Exh. EV-2, at 5-3 to 5-4). A map of the MBTA Underground Route, the MBTA Overhead Route, and the All-Street Route is presented in Figure 1 below.

not a co-petitioner here and is not requesting approval of the work to be performed at the Hudson Substation, the Siting Board reviews the impacts of the Project as a whole, including impacts from Project-related work at the Hudson Substation.

Figure 1. MBTA Underground and Overhead Routes, and All-Street Route



Source: Exh. Protect-2-52(1) at 6, with the route names changed to match those memorialized in this Decision.

As part of the proposed MBTA Underground Route for the Project, the Company has partnered with the Massachusetts Department of Conservation and Recreation ("DCR") in the co-development of a segment of the Mass Central Rail Trail ("MCRT"), a DCR-proposed multi-use rail trail (Exh. EV-2, at ES-2).[2] The Company proposes coupling the Project and the

[2] The MCRT is a proposed 104-mile-long multi-use path between Boston and Northampton on the former Massachusetts Central Railroad corridor, including a 23-mile segment of inactive railroad ROW between Waltham and Berlin owned by the MBTA, and leased to the DCR for development of this segment of the MCRT (Exhs. EFSB-LU-36(2) at 1; EFSB-3; SUD-G-19(1)). DCR's lease of the ROW provides 19 feet for development of the rail trail itself, but allows DCR to use the remainder of the ROW for ancillary uses, and to access, construct, and maintain/landscape the ROW, subject to MBTA approval (Exh. SUD-G-19(1) at 3). The MBTA lease to DCR also retains all existing easements and the MBTA's right to lease any and all areas of the

MCRT by constructing the Project's 14-foot-wide access road, required for construction and future maintenance work, as the gravel base for the MCRT, and refurbishing and repairing existing rail bridges needed for both the Project and the MCRT (Exh. EV-1, at ES-2). Under a Memorandum of Understanding ("MOU") between Eversource and DCR, after completion of the Project, DCR would construct the final elements of the MCRT, paving a ten-foot width of the access road and installing a two-foot-wide seeded and loamed shoulder on each side (Exh. EV-18, at 107, fig. 2-4). In its initial petitions, the Company also presented design options for co-locating the MCRT with the MBTA Overhead Route, if that route were selected (Exh. EV-1, at 5-46 to 5-47; 5-83). However, DCR indicated that its support for co-development of the MCRT with the Project relates specifically to the MBTA Underground Route, and it noted that the MBTA lease to Eversource is for underground construction of the Project (Exh. EFSB-5).

B. Procedural History

On April 20, 2017, Eversource filed three petitions with the Siting Board and the Massachusetts Department of Public Utilities ("Department") relating to the Project. In these petitions, the Company seeks: (1) approval to construct the Project, pursuant to G.L. c. 164, § 69J ("Siting Petition"); (2) approval to construct and use the Project, pursuant to G.L. c. 164, § 72 ("Section 72 Petition"); and (3) individual and comprehensive exemptions from the zoning bylaws of Sudbury, Hudson, and Stow for the Project, pursuant to G.L. c. 40A, § 3 ("Zoning Petition") (together, "Petitions").

The Siting Petition was docketed as EFSB 17-02, the Zoning Petition as D.P.U. 17-82, and the Section 72 Petition as D.P.U. 17-83. Pursuant to the Company's motion, on April 27, 2017, the Chairman of the Department issued a Consolidation Order, referring the Section 72 and Zoning Petitions for review by the Siting Board pursuant to G.L. c. 164, § 69H (2). The consolidated proceeding was docketed as EFSB 17-02/D.P.U. 17-82/17-83. The Siting

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ROW to third parties (including any utility or other entity) for revenue (Exh. EFSB-C-12(R)(2)). Thus, the respective MBTA leases to DCR and Eversource allow for overlapping areas and joint uses of the ROW (Exh. EFSB-5, at 1; Exhs. SUD-G-19(1)); EFSB-C-12(R)(2) at 3).

Board conducted a single adjudicatory proceeding and developed a single evidentiary record for the consolidated Petitions.

Pursuant to the Presiding Officer's instructions, the Company published the Notice of Public Comment Hearing/Notice of Adjudication ("Public Comment Hearing Notice") for the Project once per week for two consecutive weeks in the Boston Globe and the MetroWest Daily News. The Presiding Officer directed the Company to place copies of the Public Comment Hearing Notice and a copy of the Petition in the Sudbury, Hudson, Stow, and Marlborough clerk's offices, and to serve the Public Comment Hearing Notice on the planning boards of the Towns of Sudbury, Hudson, and Stow, and the City of Marlborough (as well as the planning board of each city or town abutting any of these four municipalities). The Presiding Officer also directed the Company to place a copy of the Public Comment Hearing Notice and a copy of the Petition in public libraries of Sudbury, Hudson, Stow, and Marlborough. In addition, the Presiding Officer directed the Company to send a copy of the Public Comment Hearing Notice to the property owners abutting the MBTA Underground and Overhead Routes and the All-Street Route, and to abutters-to-abutters within 300 feet.[3]

The Siting Board conducted public comment hearings in Sudbury on May 25, 2017, and in Hudson on June 1, 2017. Commenters raised a variety of concerns about alleged impacts relating to use of the MBTA ROW for both the proposed Underground Route and the Overhead Route alternative, including: adverse impacts on drinking water supplies in Sudbury and Hudson; the need to cut down a large number of trees in the corridor; disruption and harm to the surrounding conservation land; adverse impacts to water resources; adverse impacts from application of herbicides to maintain the transmission corridor, and adverse impacts to property values for homes abutting the ROW.

The Presiding Officer's rulings of June 26, 2017 and June 27, 2017 granted intervenor status to the Town of Sudbury, the Town of Hudson, the Town of Stow, Protect Sudbury, Inc., and HLPD, and granted limited participant status to the individuals listed in Appendix A.

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[3] The Project does not trigger either the enhanced public participation or enhanced analysis of impacts and mitigation provisions of the Commonwealth's Environmental Justice ("EJ") Policy. See also Section VII.B, below.

The Company presented the testimony of the following thirteen witnesses in support of the Petitions: Robert D. Andrew, Eversource Director of System Solutions; William H. Bailey, Principal Scientist, Exponent; Denise M. Bartone, Eversource Senior Environmental Engineer; Marc Bergeron, Senior Wetland Scientist, Vanasse, Hangen, Brustlin, Inc.; James A. Chalmers, Chalmers & Associates, LLC; Julia Frayer, Managing Director, London Economics International, LLC ("LEI"); Elizabeth Leonard, Eversource Senior Engineer; Paul McKinlay, Director Remediation and Assessment, Vanasse, Hangen, Brustlin, Inc.; Brian J. Rice, Eversource Senior Analyst; Demetrios Sakellaris, Eversource Transmission Line Engineer; Jawahar Shah, Senior Consultant, LEI; Christopher P. Soderman, Eversource Lead Engineer; and John M. Zicko, Eversource Director of Massachusetts Substation Engineering.

The Town of Sudbury presented the testimony of seven witnesses: Paul L. Chernick, President, Resource Insight, Inc.; Deborah M. Dineen, Conservation Coordinator, Town of Sudbury; Mark Herweck, Building Inspector and Zoning Enforcement Agent, Town of Sudbury; Ruth M. Geoffroy, Director of Environmental Permitting and Planning, Nover-Armstrong Associates, Inc.; Daniel F. Nason, Town of Sudbury Public Works Director; Marta J. Nover, Principal, Senior Wetland Scientist and Permitting Expert, Nover-Armstrong Associates, Inc.; and William R. O'Rourke, Town of Sudbury Deputy Public Works Director.

The Town of Hudson presented the testimony of two witnesses: Pam Helinek, Conservation Agent, Town of Hudson; and Eric Ryder, Director, Hudson Department of Public Works. Protect Sudbury presented the testimony of four witnesses from Comprehensive Environmental Inc.: Richard Cote, Principal-in-Charge and Manager of Remedial Engineering; Robert Hartzel, Principal and Project Manager; Matthew Lundsted, Principal and Project Manager; and Michael Ohl, Principal and Project Manager. HLDP presented the testimony of two witnesses: Brian Choquette, General Manager, HLPD; and Michael Barrett, Principal, PLM.

The Siting Board issued three sets of Information Requests to the Company and one set of information requests each to the Town of Sudbury, the Town of Hudson, Protect Sudbury and HLPD. The Town of Sudbury issued three sets of Information Requests to the Company, while Protect Sudbury issued two sets and the Town of Hudson issued one set. The Company issued one round of Information Requests to the Town of Sudbury. The Siting Board conducted 16 days of evidentiary hearings. The evidentiary record consists of approximately 1840 exhibits.

Eversource, the Town of Sudbury, Protect Sudbury, and Hudson Power and Light Department filed initial briefs on March 2, 2018. Town of Sudbury, Protect Sudbury, and Town of Stow[4] filed reply briefs on March 16, 2018, and the Company filed a reply brief on March 30, 2018.[5]

Subsequent to briefing, Eversource filed its Final Environmental Impact Report ("FEIR") on the Project with the Massachusetts Environmental Policy Act ("MEPA") Office on July 2, 2018. The Secretary issued a Certificate on Eversource's FEIR on September 14, 2018.[6]

On June 13, 2019, the Town of Sudbury filed a motion requesting that the Siting Board reopen the record and hearing in this proceeding to admit into evidence: (1) current load and energy efficiency forecast data from ISO-NE; (2) current Massachusetts Department of Energy Resources ("MassDOER") solar photovoltaic ("solar PV") data; and (3) new information relating to non-transmission alternatives ("Sudbury Motion") (Sudbury Motion at 1). Sudbury requested that the Siting Board allow for limited additional discovery, cross-examination, or rebuttal with respect to such evidence (Sudbury Motion at 1). Contemporaneously, Sudbury filed a memorandum in support of its motion ("Sudbury Memorandum"), as well as an affidavit of Paul L. Chernick ("Chernick June 13 Affidavit"). In the Sudbury Motion and supporting documentation, Sudbury argues that this additional evidence is necessary for the Siting Board's

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4 The Town of Stow filed an amended brief on March 28, 2018. References to the Town of Stow brief are to its amended brief.

5 Ms. Hewitt, Ms. Nelson, and Mr. O'Neill – individual limited participants in this proceeding – each submitted briefs questioning the need for the Project and the environmental impacts thereof. Issues raised, generally, included alleged impacts to drinking water, wildlife habitat, and wetlands; historical contamination from use as a railroad, community opposition, flawed cost estimates and preference for the All-Street Route. While none of these briefs contained references to record evidence in the proceeding, these topics are addressed generally by the Siting Board in this Decision. The Board notes that the need for the Project is assessed in Section III, below, and that the environmental impacts of the Project and mitigation measures proposed by the Company are discussed in Section VI.D, below.

6 The Town of Sudbury and Protect Sudbury have each filed a notice of intent to commence an action alleging the improper determination that the FEIR complies with MEPA. The appeal of the Secretary's Certificate would commence no later than 30 days following the issuance of the first agency permit, which in this case would be Siting Board's decision in this proceeding. 301 CMR 11.14.

review of the Project. On July 12, 2019, Protect Sudbury, HLPD, and the Company filed written responses to the Sudbury Motion. The Company's response ("Eversource Opposition") included two affidavits in support of its opposition to the Sudbury Motion: (1) a joint affidavit of Robert D. Andrew and Elizabeth Leonard ("Andrew/Leonard Affidavit"); and (2) an affidavit of Julia Frayer ("Frayer Affidavit"). On July 26, 2019, Sudbury filed a reply to the Eversource Opposition, which included a second affidavit of Mr. Chernick ("Chernick July 26 Affidavit").

Siting Board staff prepared a Tentative Decision and distributed it to the Siting Board members and all parties for review and comment on December 2, 2019. The parties were given until December 10, 2019 to file written comments. The Siting Board received timely written comments from parties Town of Sudbury, Town of Hudson, Protect Sudbury, and Eversource, and from limited participants Brian O'Neill and Christine Nelson. The Board conducted a public meeting to consider the Tentative Decision on December 17, 2019, at which the parties and limited participants presented oral arguments. After deliberation, the Board directed staff to prepare a Final Decision approving the Petitions, subject to certain conditions set forth below.

C. Due Process

The Town of Sudbury and Protect Sudbury contend that the Siting Board did not provide due process to parties in this proceeding as required by the Massachusetts Administrative Procedures Act ("MAPA"), G.L. c. 30A, §§ 10, 11.

1. Positions of the Parties

a. Town of Sudbury and Protect Sudbury

The Town of Sudbury asserts that the MAPA "obligates the Siting Board to afford all parties to Proceedings the right to a full and fair hearing" (Sudbury Brief at 6-7, citing G.L. c. 30A, §§ 10, 11). Sudbury argues that the Siting Board must provide every party the right to call and examine witnesses, introduce exhibits, cross examine witnesses who testify, and submit rebuttal testimony (Sudbury Brief at 7). Sudbury contends that the Siting Board did not provide the parties with sufficient notice of the issues to afford the parties a reasonable opportunity to prepare and present evidence and argument (Sudbury Brief at 7). According to

Sudbury, the Siting Board deprived the town of due process during the proceedings (Sudbury Brief at 6-11).

Sudbury maintains that the Presiding Officer's July 10, 2017, Procedural Schedule unreasonably limited discovery to two rounds, did not provide intervenors the right to written surrebuttal, and restricted the entire adjudication to a period of less than six months (Sudbury Brief at 7-8). Sudbury notes that there is significant precedent for longer procedural schedules in Siting Board cases (Sudbury Brief at 8, n.1). The town also asserts that the Company repeatedly failed to adequately respond to discovery and that the Company's supplemental filings failed to adequately respond to the town's discovery requests and/or adhere to the Presiding Officer's instructions (Sudbury Brief at 8). Sudbury notes that it had to divert considerable town resources in order to enforce its due process rights in the Siting Board proceeding (Sudbury Brief at 7, 9).[7] Sudbury also alleges that the Company waited until after completion of the evidentiary hearings to file responses to several key outstanding record requests from the Siting Board (Sudbury Brief at 11).[8]

b. Company Response

The Company maintains that the Intervenors[9] have been fully accorded due process rights during the proceeding and argues that the sheer number of filings in this proceeding (e.g., 922 information requests, 117 record requests, 18 submissions of direct, supplemental and rebuttal testimonies, and 16 days of evidentiary hearings) belies the Intervenors' claims of due process violations (Company Reply Brief at 5). The Company argues that the Intervenors must

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[7] Additionally, Sudbury identifies various rulings issued by the Presiding Officer that the town disagrees with and essentially argues that such rulings denied the town due process (Sudbury Brief at 8-11).

[8] Protect Sudbury also notes its concerns with the procedure and process in this case, and states that many of the issues raised by the Town of Sudbury "implicate" Protect Sudbury as well (PS Reply Brief at 1, n.1). Protect Sudbury states that it shares and supports the town's position regarding the unfairness of the process (PS Reply Brief at 1, n.1).

[9] The Company identifies Town of Sudbury and Protect Sudbury as the "Intervenors" for purposes of arguments regarding due process.

be given "an opportunity to be heard at a meaningful time and in a meaningful manner," and maintains that the Intervenors were afforded a full and fair hearing and that parties were provided with more than sufficient opportunity to participate actively throughout the proceeding (Company Reply Brief at 5-6, citing Alliance to Protect Nantucket Sound Inc. v. Energy Facilities Siting Bd., 448 Mass. 45, 52 (2006)).

In response to Sudbury's argument that the procedural schedule was constrained to a five-month period, the Company argues that neither the proposed procedural schedule, nor any schedule proposed thereafter, contemplated anything less than a twelve-month adjudication process (Company Reply Brief at 7). The Company states that it filed its petitions on April 20, 2017, and the initial procedural schedules were developed to enable the Siting Board to issue a decision within one year, in accordance with the Legislative charge to the Siting Board to endeavor to complete its statutory reviews of petitions within twelve months (Company Reply Brief at 7, citing G.L. c. 164, §69J). The Company maintains that "[t]here is nothing unfair or unfounded about a schedule that complies with a legislative directive," nor is there anything "unusual or unduly compressed about the course of the Siting Board's proceeding" (Company Reply Brief at 7). The Company notes that the schedule was extended on several occasions, providing months of discovery and numerous additional evidentiary hearings, and that approximately eleven months passed between the Company's filing of its petitions and the Intervenors' filing of reply briefs (Company Reply Brief at 7). Indicating that the Intervenors were actually afforded three rounds of discovery, the Company argues that the Intervenors have failed to provide a legal basis to support a claim that they are entitled to a specified number of rounds of discovery (Company Reply Brief at 8).

The Company notes that the Intervenors filed ten procedural motions in this proceeding requesting extensions, stays and compulsion of discovery, and that the Presiding Officer ruled judiciously on these motions, demonstrating flexibility in exercising discretion to adjust the schedule, providing reasonable extensions where appropriate, and in many cases requiring further responses to discovery (Company Reply Brief at 6). According to the Company, its response to certain record requests after hearings concluded is typical in a Siting Board proceeding, and the Intervenors could have moved for additional hearings had they so chosen (Company Reply Brief at 9).

2. Analysis and Findings on Due Process

During this proceeding, the Siting Board has endeavored to conduct its review of the proposed Project in a manner consistent both with applicable principles of due process, such as those reflected in the MAPA, and with the timeframe for Siting Board proceedings set out in the Siting Board statute.[10] The procedural schedule established in the case reflected a balancing of these two interests by the Presiding Officer. Specifically, it represents the Presiding Officer's assessment of the appropriate balance, in this specific case, of: (1) ensuring the opportunity for full, fair, and meaningful review of the Project by the parties; and (2) the goal from G.L. c. 164, § 69J, of conducting Siting Board proceedings as efficiently as possible.[11]

With respect to the specific requirements of the MAPA, G.L. c. 30A, § 11(3) states that "every party shall have the right to call and examine witnesses, to introduce exhibits, to cross-examine witnesses who testify, and to submit rebuttal evidence." The Intervenors were given the opportunity in this case to do so, propounding three rounds of discovery consisting of nearly 600 information requests to the Company (many with multiple subparts). The Intervenors submitted the prefiled testimony of thirteen witnesses; were given the opportunity to provide oral surrebuttal testimony and conduct extensive cross-examination of the Company's witnesses during the 16 days of evidentiary hearings; and had the opportunity to submit both initial and

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[10] See G.L. c. 164, § 69J provides that: "If the board determines the standards set forth above have not been met, it shall within twelve months of the date of the filing reject in whole or in part the petition, setting forth in writing its reasons for such rejections, or approve the petitions subject to stated conditions." G.L. c. 164, § 69J. The SJC has stated that the twelve month language is directory, not mandatory. Box Pond Association v. Energy Facilities Siting Board, 435 Mass. 408, 415 n.7 (2001) ("Box Pond").

[11] The Siting Board acknowledges that this proceeding has, in fact, taken much longer than twelve months, despite the Board's initial efforts and expectations to remain within the period prescribed in the statute. Among other things, the complexity of the case, the numerous and novel issues involved, staffing constraints, and developments in separate but related cases (e.g., MEPA, MBTA, and Natural Heritage and Endangered Species ("NHESP") appeals) were all contributing factors in the Board's extended review. See Section VI.D.

reply briefs.[12] In addition, all of the parties in this proceeding were given advance notice of the anticipated schedule; the procedural schedule was revised several times at the request of parties, and issued to the parties expeditiously.[13] The Siting Board's review of the Project in this proceeding has been extensive, as evidenced by the number of exhibits, witnesses, hearing days, and rulings issued. In short, we see no merit to Sudbury's argument regarding lack of due process.

Sudbury is correct that there has been a history of Siting Board procedural schedules that extended beyond the one-year timetable in G.L. c. 164, § 69J. However, a review of past procedural schedules shows that the schedule for a Siting Board proceeding is highly case-specific and, moreover, that each schedule changes to some extent, as the case in question unfolds. The Intervenor's attempt to rely on schedules in other cases to support an objection to the schedule in this proceeding has no basis in statutes or regulations of the Siting Board, and is not a compelling argument.

The Presiding Officer's rulings on a variety of motions that sought extensions or stays of the proceeding were also guided by the combined goals of fairness and efficiency. Under the Siting Board's regulations, a Presiding Officer "shall have the authority to take all actions necessary to ensure a fair, orderly and efficient proceeding." 980 CMR 1.04(2). Such actions include, among other things, "regulating the course of the proceeding," "disposing of procedural questions," and "hearing and ruling upon motions." Accordingly, the Presiding Officer is

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12 Regarding record requests, the Siting Board notes that its regulations contemplate the ability to issue record requests during the course of evidentiary hearings. 980 CMR 1.1.06(6)(g). Typically, in Siting Board proceedings, some responses to record requests issued during evidentiary hearings are filed after the conclusion of evidentiary proceedings. On occasion, parties have sought additional process with respect to post-hearing record request responses. See e.g., NSTAR Electric Company d/b/a Eversource Energy, EFSB 16-02/D.P.U. 16-77, Presiding Officer Ruling on Motion to Re-open Evidentiary Hearings (April 13, 2018). In this case, in response to a record request filing by the Company after hearings, the Presiding Officer allowed additional Intervenor written testimony, and an additional two days of hearings.

13 The procedural schedules issued to the parties indicated that oral surrebuttal testimony would be allowed. There is no requirement that the Siting Board allow only written surrebuttal testimony.

afforded wide discretion in establishing the course of the proceeding.[14] In this case, motions that were submitted were ruled on by the Presiding Officer, and such rulings reflect the necessary balance that must take place between allowing for additional process and considerations of efficiency, as reflected in G.L. c. 164, § 69J. Although the Siting Board recognizes that Sudbury disagrees with the outcome of several motions seeking additional time or stays of the proceeding, or additional information from the Company, the Board views each such ruling to reflect a proper regard for both fairness and efficiency.

Neither the Town of Sudbury nor Protect Sudbury provided any legal citation or citation to precedent for their assertion that the Siting Board was obligated to provide more process than what was provided in this case. "The hallmarks of due process are notice and an opportunity to be heard at a meaningful time and in a meaningful manner." Daniels v. Board of Registration in Medicine, 418 Mass. 380, 383 (1994) (citations omitted). The Siting Board concludes that all of the Intervenors in this case were afforded a full and fair hearing, within the meaning of the MAPA and applicable legal precedent. Each of the Intervenors in this case was provided with appropriate notice and an extensive opportunity to be heard; the procedural schedule for the case appropriately balanced fundamental considerations of due process and efficiency; and the proceeding was conducted in all respects in a fair and efficient manner. Accordingly, the Siting Board dismisses claims of lack of due process in this proceeding by Sudbury and Protect Sudbury.

II. JURISDICTION AND STANDARD OF REVIEW UNDER G.L. C. 164, § 69J

G.L. c. 164, § 69J provides that the Siting Board should approve a petition to construct if the Siting Board determines that the petition meets certain requirements, including that the plans for the construction of the applicant's facilities are consistent with the policies stated in G.L. c. 164, § 69H to provide a reliable energy supply for the Commonwealth with a minimum

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[14] The SJC has confirmed the broad discretion of the Presiding Officer with respect to the schedule and other procedural aspects of Siting Board proceedings. See Box Pond (decision whether to grant a motion to continue lies within the sound discretion of the hearing officer or the board (citations omitted); refusal to grant a continuance will not constitute error absent an abuse of that discretion).

impact on the environment at the lowest possible cost, and are consistent with current health, environmental protection, and resource use and development policies of the Commonwealth. Pursuant to G.L. c. 164, § 69J, a project applicant must obtain Siting Board approval for the construction of proposed energy facilities before a construction permit may be issued by another state agency.

G.L. c. 164, § 69G defines a "facility" to include "a new electric transmission line having a design rating of 115 [kV] or more which is ten miles or more in length on an existing transmission corridor, except [for] reconductoring or rebuilding of transmission lines at the same voltage" or "a new electric transmission line having a design rating of 69 [kV] or more and which is one mile or more in length on a new transmission corridor." The Company's proposed 115 kV underground transmission line would be approximately nine miles long and run along a new transmission corridor. Therefore, the proposed 115 kV transmission line is a "facility" with respect to Section 69J and, therefore, the Project is subject to Siting Board review under Section 69J.

The Siting Board requires that an applicant demonstrate that its proposal meets the following requirements: (1) that additional energy resources are needed (see Section III, below); (2) that, on balance, the proposed project is superior to alternative approaches in terms of reliability, cost, and environmental impact, and in its ability to address the identified need (see Section IV, below); (3) that the applicant has considered a reasonable range of practical facility siting alternatives and that the proposed facilities are sited in locations that minimize costs and environmental impacts while ensuring a reliable energy supply (see Section V, below); (4) that environmental impacts of the project are minimized and the project achieves an appropriate balance among conflicting environmental concerns as well as among environmental impacts, cost, and reliability (see Section VI, below); and (5) that plans for construction of the proposed facilities are consistent with the current health, environmental protection, and resource use and development policies of the Commonwealth (see Section VII, below).

III. NEED FOR THE PROPOSED PROJECT

A. Standard of Review

The Siting Board reviews the need for proposed transmission facilities to meet reliability, economic efficiency, or environmental objectives. G.L. c. 164, §§ 69H, 69J. When demonstrating the need for a proposed transmission facility based on reliability considerations, a petitioner applies its established planning criteria for construction, operation, and maintenance of its transmission and distribution system. Compliance with the applicable planning criteria can demonstrate a "reliable" system. NSTAR Electric Company d/b/a Eversource Energy, EFSB 16-02/D.P.U. 16-77, at 8-9 (2018) ("Needham-West Roxbury"); NSTAR Electric Company d/b/a Eversource Energy and New England Power Company d/b/a National Grid, EFSB 15-04/D.P.U. 15-140/15-141, at 9-10 (2018) ("Woburn-Wakefield"); NSTAR Electric Company, EFSB 14-04/D.P.U. 14-153/14-154, at 8, 9 (2017) ("East Eagle").

Accordingly, to determine whether system improvements are needed, the Siting Board: (1) examines the reasonableness of the petitioner's system reliability planning criteria; (2) determines whether the petitioner uses reviewable and appropriate methods for assessing system reliability over time based on system modeling analyses or other valid reliability indicators; and (3) determines whether the relevant transmission and distribution system meets these reliability criteria over time under normal conditions and under certain contingencies, given existing and projected loads. Needham-West Roxbury at 8-9; Woburn-Wakefield at 9; East Eagle at 9.

When a petitioner's assessment of system reliability and facility requirements is, in whole or in part, driven by load projections, the Siting Board reviews the underlying load forecast. The Siting Board requires that forecasts be based on substantially accurate historical information and reasonable statistical projection methods that include an adequate consideration of conservation and load management. See G.L. c. 164, § 69J. To ensure that this standard has been met, the Siting Board requires that forecasts be reviewable, appropriate, and reliable. A forecast is reviewable if it contains enough information to allow a full understanding of the forecast method. A forecast is appropriate if the method used to produce the forecast is technically suitable to the size and nature of the company to which it applies. A forecast is considered reliable if its data, assumptions, and judgments provide a measure of confidence in what is most likely to occur. Needham-West Roxbury at 8-9; Woburn-Wakefield at 10; East Eagle at 9.

B. Description of the Company's Demonstration of Need

As part of its role as the independent system operator of New England, ISO-New England ("ISO-NE") carries out a regional system planning process, wherein it conducts periodic needs assessments on a system-wide or specific-area basis, and develops an annual regional transmission plan using a ten-year planning horizon (Exh. EV-2, at 2-5 to 2-6). In 2015, ISO-NE issued one such assessment, the "Greater Boston Area Updated Transmission Needs Assessment" ("2015 Needs Assessment") (Exh. EV-2, at 2-6 to 2-7, app. 2-1). The Company's assertion of need for the Project is based largely on this ISO-NE needs assessment, including the planning standards and criteria, and demand forecast contained therein. Eversource also undertook an "Updated Analysis" to confirm the need for the Project in light of more recent supply and demand projections (Exh. EV-2, at 2-15). ISO-NE's 2015 Needs Assessment and the Company's Updated Analysis are described below.[15]

1. ISO-NE's 2015 Needs Assessment

The Marlborough Subarea is located within the broader transmission area referred to as the "Greater Boston Area," which includes Boston and surrounding suburbs, and for which ISO-NE issued its 2015 Needs Assessment (Exh. EV-2, at 2-3, 2-7, and app. 2-1, at 12).[16,17] According to the Company, this assessment evaluated the reliability performance of the transmission system serving the Greater Boston Area under 2018 and 2023 projected system

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15 The Siting Board addresses a motion by the Town of Sudbury relating to the question of need in Section XII, below.

16 Specifically, the 2015 Needs Assessment defined the Greater Boston Area as including all of the Northeast Massachusetts load zone, and portions of the New Hampshire, Southeastern Massachusetts, and Western/Central Massachusetts load zones (Exh. EV-2, app. 2-1, at 12).

17 The development of the 2015 Needs Assessment and attributes of the assessed base cases are described in NSTAR Electric Company d/b/a Eversource Energy, EFSB 15-03/ D.P.U. 15-64/15-65, at 7-12 (2017) ("Mystic-Woburn"), and New England Power Company, D.P.U. 15-44/15-45, at 8-10 (2016).

conditions, and assessed the system for compliance with planning standards and criteria established by the North American Energy Reliability Corporation ("NERC"), the Northeast Power Coordinating Council ("NPCC"), and ISO-NE (Exh. EV-2, at 2-4). These reliability criteria require that transmission system thermal and voltage levels remain within applicable limits following certain representative contingencies (Exh. EV-2, at 2-1).[18]

a. Load Forecast Methodology

Eversource stated that the 2015 Needs Assessment relied on the summer peak 90/10 load forecast from ISO-NE's 2013 Capacity, Energy, Loads, and Transmission ("CELT") Report to develop the 2018 and 2023 forecasted load levels for the Greater Boston Area (Exh. EV-2, at 2-8, app. 2-1, at 19).[19] Demand response ("DR") resources that had cleared Forward Capacity Auction ("FCA") 7, and energy efficiency ("EE") resources, as forecast in the 2013 CELT Report, were modeled as reductions to load to establish the net demand for the area (Exh. EV-2, at 2-8 to 2-9, app. 2-1, at 31-32). The CELT Report contains a ten-year econometric forecast and is the source of many of the assumptions used in ISO-NE's regional planning studies (Exh. EFSB-N-1). Eversource indicated that the CELT Report demand forecast is updated annually and takes into consideration factors such as regional economic indicators (e.g., predictions of gross state product as provided by Moody's Analytics, Inc.), and customer behavior (e.g., behind-the-meter generation and passive DR participation) (Exhs. EFSB-N-1a(2); EFSB-N-1b(1)). Eversource further indicated that the CELT forecast is reviewed through an extensive stakeholder process, including review by the ISO-NE Planning Advisory Committee and ISO-NE's energy efficiency working group (Tr. 1, at 20-24).

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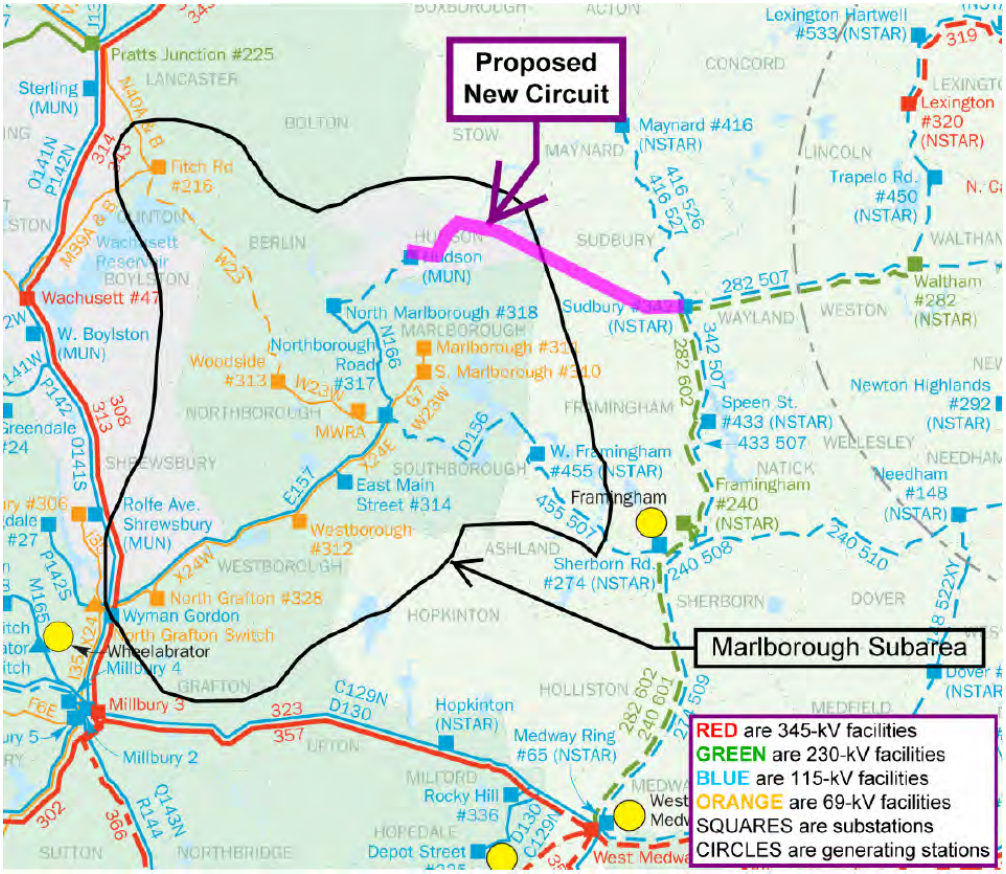
[18] For the transmission system to meet the established reliability criteria, there cannot be any instances of equipment exceeding its Long-Time Emergency ("LTE") or Short-Time Emergency ("STE") rating, or unacceptably high or low voltages following an N-1 contingency (loss of a single transmission element) or N-1-1 contingency (loss of a subsequent non-related transmission element following an initial N-1 event) (Exhs. EV-2, at 2-7 to 2-8, app. 2-1, at 44).

[19] The 90/10 peak load represents a load level that has a ten percent chance of being exceeded because of weather conditions in any one year (Exh. Protect-85(2) at 14, 63).

b. Greater Boston Area Reliability Needs

ISO-NE's 2015 Needs Assessment identified numerous reliability concerns throughout the Greater Boston Area, including criteria violations in Subarea D, which ISO-NE further divided into the Marlborough and Sudbury Subareas (Exh. EV-2, at 2-2, 2-10 to 2-14, app. 2-1, at 6-8, 68-69, app. 3-3 at 63). Figure 2, below, shows the general geographic location of Subarea D, and outlines in black the smaller Marlborough Subarea contained within.

Figure 2. Greater Boston Subarea D and the Marlborough Subarea



Source: Exh. EV-2, at 2-3.

According to the Company, the Marlborough Subarea is currently supplied by two 115 kV transmission lines (the E-157W and 455-507 Lines) and three 69 kV transmission lines (the X-24, N-40, and W-23 Lines) (Exhs. EV-2, at 2-2; SUD-G-10(S-1)). Originally built as a 69 kV system, 115 kV lines were added as demand in the area grew (Tr. 1, at 85-86).

Eversource described the Marlborough Subarea as a "load pocket," where demand for electricity greatly exceeds any local generation and, as such, power flows into the area on the five high-voltage transmission lines from elsewhere on the transmission grid (Tr. 1, at 18).

The 2015 Needs Assessment identified numerous post-contingency thermal overloads and low-voltage violations in the Marlborough Subarea following certain N-1 and N-1-1 contingencies (Exh. EV-2, at 2-11). Eversource stated that while the N-1 violations identified in the area would be addressed by other planned transmission system investments,[20] N-1-1 post-contingency thermal overloads and low voltage violations would remain unresolved (Exh. EV-2, at 2-11).

Focusing solely on these remaining criteria violations, Eversource indicated that, by 2018, post-contingency thermal overloads could occur on each of the five transmission lines serving the Marlborough Subarea, with worst-case overloads exceeding 178 percent of the transmission line's LTE rating (and 171 percent of the STE rating) (Exhs. EFSB-N-7(1); EV-2, at 2-12). Modeling also showed post-contingency voltages well below acceptable limits; Eversource identified a substantial risk of post-contingency voltage collapse in the Marlborough Subarea, which would result in a loss of power to more than 72,000 customers (Exhs. EV-2, at 2-13 to 2-14, 2-19; EFSB-N-10; EFSB-N-11; Tr. 1, at 52-53, 72; RR-EFSB-109).[21]

The 2015 Needs Assessment found that transmission lines in the Marlborough Subarea already failed to meet thermal criteria under N-1-1 contingency conditions prior to 2013 (Exh. EV-2, at 2-15; Tr. 1, at 27, 29).[22] As such, the Company stated that there is an immediate

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20 According to the Company, two National Grid projects – the W-23W Reconductoring Project and the X-24W/E-157W Double Circuit Tower Project – would address the N-1 violations identified in the Marlborough Subarea (Exh. EV-2, at 2-11).

21 Eversource reported that approximately 60 percent of the customers in the Marlborough Subarea are served by National Grid, 27.4 percent by local municipal light plants, and 12.6 percent by the Company (RR-EFSB-109).

22 While a similar year-of-need analysis was not undertaken for voltage violations in the 2015 Needs Assessment, Eversource stated that, based on the severity of the low voltage violations identified, it would be reasonable to conclude that the year of need for these criteria violations was also prior to 2013 (Exhs. EFSB-N-9; EV-EL-1 at 3; Tr. 1, at 82-84).

need for transmission system upgrades in the area, and that this need is not dependent on any future load growth (Exhs. EV-2, at 2-15; EV-EL-1, at 3; Tr. 1, at 27-29).

2. Eversource Updated Analysis

Given the passage of time since the completion of the 2015 Needs Assessment, Eversource conducted an Updated Analysis of the need for the Project in the year 2023 using the 2016 CELT demand forecast (the most recent CELT forecast available at the time), and the updated EE and solar PV forecasts contained therein (Exh. EV-2, at 2-15; Tr. 1, at 40). Generation and DR resources that cleared FCA 10, as well as transmission reinforcements (aside from the Project) that had been recommended by ISO-NE in response to the 2015 Needs Assessment were also included in the Company's assessment (Exh. EV-2, at 2-16 to 2-17; RR-EFSB-6). Eversource indicated that its Updated Analysis confirmed the need for the Project, with modeling continuing to show post-contingency thermal overloads and low voltage violations in the Marlborough Subarea (Exh. EV-2, at 1-4, 2-17 to 2-18; RR-EFSB-15; RR-EFSB-16).[23] Accordingly, the Company stated that there remains an immediate need for additional capacity to reliably serve electric customers in the area (Exh. EV-2, at 1-4).

C. Positions of the Parties

1. Town of Sudbury

The Town of Sudbury argues that the demand forecasts underlying the Company's assertion of need are neither reviewable nor reliable (Sudbury Brief at 21-27). Sudbury describes the Company's Updated Analysis as a "black box," and argues that insufficient information has been provided to allow a full understanding of the Company's forecast methodology (Sudbury Brief at 22, citing Exh. SUD-PLC-1, at 17).[24] Sudbury further asserts

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[23] Based on the 2016 CELT demand forecast and National Grid plans to transfer 17 MW of load to the North Grafton Substation within the Marlborough Subarea, voltage collapse in the subarea would result in the loss of power to approximately 412 MW of load under 2023 peak load conditions (Exh. Protect-2-62(S-1)(1); Tr. 1, at 49-53).

[24] For example, the Town of Sudbury expresses concerns with a lack of specific detail on the method and justification for how substation-level forecasts prepared by the electric

that, while some examination of the Company's Updated Analysis was possible through the discovery process, it has had no meaningful opportunity to replicate or confirm Eversource's methodology (Sudbury Brief at 21, citing Exh. SUD-PLC-1, at 18).

Regarding the reliability of the ISO-NE forecast, Sudbury argues that ISO-NE consistently overestimates future growth in electrical demand (Sudbury Brief at 23). According to Sudbury, a review of ISO-NE's normal weather and extreme weather CELT forecasts for the Boston Subarea since 2003 shows forecasts have always (for 90/10 forecasts) or mostly (for 50/50 forecasts) exceeded both weather-normalized and actual peak electrical demand (Sudbury Brief at 23, citing Exh. SUD-PLC-1, at 7). Sudbury suggests that failing to consider all EE reductions achieved by the utilities, and instead reflecting only those EE savings that have cleared ISO-NE's FCA, may be one reason for ISO-NE's tendency to overestimate load growth (Sudbury Brief at 23-24, citing Exh. SUD-PLC-1, at 14).

Sudbury also argues that the forecast Eversource relies on is overstated because: (1) the 2016 CELT forecast grossly underestimates the rate at which solar PV has been added in the Marlborough Subarea; and (2) the Company did not update its analysis to reflect 2017 CELT Report forecast data, which predicted peak demand for Massachusetts in 2023 would be 191 MW lower than previously forecast (Sudbury Brief at 25; Sudbury Reply Brief at 3). Sudbury argues that the 2017 CELT Report does not support the need for the Project (Sudbury Brief at 24-25; Sudbury Reply Brief at 3).[25] Finally, Sudbury argues that the Company erroneously based its need analysis on load levels in the Boston regional system plan subarea, when a majority of the Marlborough Subarea is outside the Boston planning zone (Sudbury Reply Brief at 2-4, citing Exhs. SUD-N-1; SUD-N-37(1)).

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utilities were adjusted by ISO-NE to produce ISO-NE's subarea forecasts (Sudbury Brief at 21-23).

[25] Sudbury references updated load, EE and PV forecast reports in its brief (Sudbury Brief at 24-25). The Siting Board notes that these reports are not part of the record in this proceeding, and as such are not considered by the Siting Board in its determination of need for the Project. 980 CMR 1.06. The Siting Board notes that subsequent to filing its briefs, Sudbury filed a motion to reopen the record to admit updated forecast reports. The Siting Board addresses this motion to reopen in Section XII, below.

Sudbury submits that, in response to the above forecast concerns, Eversource and ISO-NE incorrectly argue that the need for the Project is not dependent on the load forecast (Sudbury Brief at 26, citing Exh. EV-EL-1, at 3; RR-EFSB-1). Sudbury rejects this argument for two reasons, arguing first that because the 2015 Needs Assessment and the Company's Updated Analysis used load forecasts to assess transmission system reliability and facility requirements, the Siting Board's standard of review requires the Board to review the forecasts to ensure that they are based on substantially accurate historical information and reasonable statistical methods that include consideration of conservation and load management (Sudbury Brief at 26). Second, Sudbury argues that, even if Eversource was correct that transmission lines in the Marlborough Subarea were vulnerable to post-contingency overloads under certain pre-2013 conditions, this does not necessarily indicate that the transmission lines would be subject to overloads in the future (Sudbury Brief at 26). According to Sudbury, recent system improvements by National Grid, and a lack of clarity around the exact magnitude of the 2013 load level the Company refers to, mean any pre-2013 scenario may not be applicable in the future (Sudbury Brief at 26-27).

2. Protect Sudbury

Protect Sudbury argues that Eversource has ignored record evidence and credible testimony that the Project is not needed (PS Reply Brief at 1). Protect Sudbury argues further that Eversource has not substantiated its claim that the proposed Project (using underground as opposed to overhead construction along the MBTA ROW) is the result of a transmission system study process undertaken by ISO-NE and its working group to "identify and address" transmission reliability requirements and develop solutions (PS Brief at 5, citing Exh. EV-2, at 1-3).[26]

3. ISO-NE

Although ISO-NE is not a party to the proceeding, it did respond to a request from staff to address the Town of Sudbury's concerns with the CELT forecast. ISO-NE indicated that the

[26] Protect Sudbury's arguments relating to ISO-NE's consideration of an underground Project are evaluated in Section IV, below.

CELT forecast is prepared annually through an open stakeholder process, which is designed to ensure that prudent and up-to-date assumptions regarding the region's economic, policy, and load trends are used when evaluating transmission system adequacy (RR-EFSB-1).

ISO-NE stressed that the reliability issues addressed by the Project could occur at existing load levels, and that the need for the Project is not dependent on forecast growth in electrical demand (RR-EFSB-1). ISO-NE asserted that while it continues to refine its forecasting methods and assumptions, Sudbury's concerns with the CELT forecast are overstated (RR-EFSB-1). With respect to the accuracy of the CELT forecast, ISO-NE stated that Sudbury inappropriately compared forecast gross load levels with actual and normal weather demand, which are net loads (RR-EFSB-1). According to ISO-NE, when net 50/50 forecast loads are compared to actual and weather normal values, the difference between the ISO-NE forecast and actual loads is greatly reduced (RR-EFSB-1).[27]

ISO-NE agreed with the Town of Sudbury that EE performance in recent years has outpaced the original FCA results, suggesting that conservative bidding behavior by Program Administrators ("PAs") and the early delivery of EE measures are the likely cause of underestimated performance (RR-EFSB-1). ISO-NE stated that it works closely with PAs and other key stakeholders to develop the EE forecast, indicating that trends such as these recent underestimates are reviewed and considered within the EE forecast process (RR-EFSB-1).

4. Company Response

The Company argues that the forecasts relied upon to support the need for the Project are based on substantially accurate historical information and reasonable statistical projection methods that include an appropriate consideration of conservation and load management (Company Reply Brief at 10). With respect to whether the forecasts are reviewable, the

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[27] Sudbury acknowledged this error, and revised the prefiled testimony of Mr. Chernick on January 23, 2018. According to Sudbury's updated prefiled testimony, the average difference between actual peak load and the ISO-NE median weather forecast in the 2010 to 2017 CELT Reports was two percent (Exhs. SUD-PLC-1, at 8; SUD-PLC-5, at 1). Sudbury further stated that forecasts of load more than two years into the future overestimated actual loads by an average of three percent (Exhs. SUD-PLC-1, at 8; SUD-PLC-5, at 1).

Company argues that it has provided ample documentation relative to the forecasts and forecast methods, demonstrating that use of CELT forecasts ensures system assessments use consistent load forecasts that have been reviewed through a rigorous stakeholder process (Company Reply Brief at 10-12, citing inter alia, Exhs. EV-2, at 1-3, app. 2-1; EFSB-N-1). The Company argues further that the need for a number of recent transmission projects subject to Siting Board review, namely the Woburn-Wakefield, East Eagle, NSTAR Electric Company d/b/a Eversource Energy, EFSB 14-2/D.P.U. 14-73/14-74 (2017) ("Walpole-Holbrook"), and Mystic-Woburn projects, was established based on similar forecasts and methodology (Company Reply Brief at 11).

With respect to ISO-NE estimates of demand, the Company defends ISO-NE's use of 90/10 forecasts as a conservative measure for planning purposes and argues that actual loads would generally be expected to be less than that forecast for 90/10 conditions (Company Reply Brief at 13-14). The Company states that forecast contingency overloads are as severe as 150 to 170 percent of the STE ratings of equipment, indicating that current loads are sufficient to justify the need for the Project and that only a major decline in peak load on the order of 115 MW would obviate Project need (Company Reply Brief at 16, n.11, 12, citing Tr. 1, at 27; RR-EFSB-19). The Company maintains that EE reductions achieved by the utilities are already reflected in load data, and suggests that these EE reductions may erode with time (Company Reply Brief at 12, 14-15).

The Company maintains that it did update its assessment of the need for the Project to reflect 2017 CELT Report forecast data, and that Eversource's Updated Analysis confirmed the need for the Project (Company Reply Brief at 12, citing Exhs. SUD-N-3; Protect-2-85; Tr. 1, at 60-61). With respect to the load forecasts for the Marlborough Subarea, the Company maintains that its forecast is based on individual substation loads in the Marlborough Subarea, which tie into the CELT forecast being used for the analysis; therefore, the Company argues it does not matter that parts of the Marlborough Subarea may be outside of the Boston regional system plan subarea (Company Reply Brief at 13, n.7, citing Exhs. EV-2 at 2-16; EFSB-N-41; Protect-1(S1); Protect-2-69).

D. Analysis and Findings on Need

In the 2015 Needs Assessment, ISO-NE identified numerous reliability needs within the Greater Boston Area, including deficiencies in the Marlborough Subarea. The Siting Board recognizes the responsibilities and expertise of ISO-NE and accords considerable weight to the 2015 Needs Assessment and its findings. See e.g., Needham-West Roxbury at 13; Woburn-Wakefield at 17-18; Walpole-Holbrook at 16-17; East Eagle at 26-29; Mystic-Woburn at 17-18.

The 2015 Needs Assessment's evaluation of the Marlborough Subarea demonstrated that the existing transmission system would be insufficient to reliably supply customers under both pre-existing and forecast summer peak load conditions following certain N-1 and N-1-1 contingencies. The record shows that the identified N-1 violations in the Marlborough Subarea will be resolved by other planned system reinforcements, while the N-1-1 violations in the area remain to be addressed. Eversource's Updated Analysis, which is consistent with ISO-NE's study approach used in the 2015 Needs Assessment, demonstrated that this remains the case in light of more recent supply and demand information. Furthermore, the Company presented evidence showing that even assuming proposed transmission system reinforcements elsewhere in the Greater Boston Area were constructed, with the exception of the Project, the regional transmission system would remain inadequate.

Eversource must eliminate the potential for post-contingency thermal overloads and low voltages in the Marlborough Subarea in order to comply with applicable national and regional reliability standards, and to provide a reliable supply of electricity to customers in the Greater Boston Area. The Siting Board finds that the Company's use of an N-1-1 planning criterion is reasonable, that the methods used to assess system reliability are reviewable and appropriate, and that Eversource's existing transmission system does not currently meet the established reliability criteria. See e.g., Needham-West Roxbury at 13; Woburn-Wakefield at 17-18; Walpole-Holbrook at 16-17.

The Company's assessment of need relied in part on the 2015 Needs Assessment and the demand forecast contained therein. This forecast was developed using the summer peak 90/10 load forecast from the 2013 CELT Report, adjusted to reflect the contributions of forecast DR

and EE resources.[28] The Company also reviewed the need for the Project using net load projections from the 2016 CELT Report. The Town of Sudbury argues against use of the CELT forecast on the bases that Sudbury was unable to exactly reproduce the results, and that, historically, CELT forecasts have over-predicted net load growth. The Siting Board does not find these arguments to be persuasive because: (1) conservative load forecast predictions are warranted for system planning purposes; (2) the over-predictions by ISO-NE of approximately two to three percent are relatively minor; and, most importantly; (3) the post-contingency thermal and voltage violations are already severe, were shown in the 2015 Needs Assessment to occur at pre-2013 load levels, and would remain so even with flat to declining loads. Based on these facts, the Siting Board finds that the need for the Project is not dependent on growth in electrical demand in the Marlborough Subarea, and that the level of precision in the Company's forecasting methodology is sufficient to make a proper determination on Project need.

The record demonstrates that the CELT forecast – which underlies the Company's forecasting methodology – undergoes a rigorous stakeholder review process, and the Siting Board considers it to be well suited for assessing the reliability needs of electric utilities on a consistent basis across New England.[29] In view of the above, the Siting Board finds that the Company has provided sufficient information to permit an understanding of its forecasting method, and that its forecast is reviewable, appropriate, and reliable for use in this proceeding to evaluate the Company's assertion of need.

For these reasons, the Siting Board finds that additional energy resources are needed to maintain a reliable supply of electricity in the Marlborough Subarea.

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28 The area assessed in the 2015 Needs Assessment encompassed the Boston Regional System Plan subarea plus some load to the west and south (Exh. EV-2, app. 2-1, at 12).

29 The Siting Board has found that the CELT forecast is reviewable, appropriate, and reliable in a number of recent decisions. See Needham-West Roxbury at 13; Woburn-Wakefield at 17-18; Walpole-Holbrook at 16-17; East Eagle at 26-29; Mystic-Woburn at 17-18.

IV. ALTERNATIVE APPROACHES TO MEETING THE IDENTIFIED NEED

A. Standard of Review

G.L. c. 164, § 69J requires a project proponent to present alternatives to the proposed facility, which may include: (1) other methods of transmitting or storing energy; (2) other sources of electrical power; or (3) a reduction of requirements through load management.[30] In implementing its statutory mandate, the Siting Board requires a petitioner to show that, on balance, its proposed project is superior to such alternative approaches in terms of cost, environmental impact, and ability to meet the identified need. In addition, the Siting Board requires a petitioner to consider reliability of supply as part of its showing that the proposed project is superior to alternative project approaches. Needham-West Roxbury at 13-14; Woburn-Wakefield at 18-19; East Eagle at 29; Walpole-Holbrook at 17.

B. Identification of Alternative Approaches for Analysis

On August 12, 2015, ISO-NE issued the Final Solutions Study for the Greater Boston Area, outlining the recommended transmission investments for addressing the reliability needs identified in the 2015 Needs Assessment (Exh. EV-2, app. 3-3). A new overhead 115 kV transmission line between the Sudbury and Hudson Substations was one of the recommended projects (Exh. EV-2, at 2-1, 3-1 to 3-2, app. 3-3, at 12-13).[31] Eversource asserted that its further evaluation of project alternatives confirmed that the Project, using underground construction, is the best alternative for meeting the identified need, with minimal impact to the environment, with a greater degree of reliability, and at the lowest possible cost (Exh. EV-2, at 3-2).

In assessing alternative solutions to meet the identified need, Eversource explored non-transmission alternatives ("NTAs") including generation, EE, DR, and energy storage, as

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30 G.L. c. 164, § 69J also requires an applicant to present "other site locations." This requirement is discussed in Section V, below.

31 Eversource indicated that ISO-NE has not conducted a formal evaluation of an underground version of the 115 kV transmission line between the Sudbury and Hudson Substations (Tr. 8, at 1228-1230).

well as alternative transmission facilities.[32] Each of these alternative approaches is discussed further below.

1. Non-Transmission Alternatives

Eversource engaged LEI to assess the cost and feasibility of using NTAs to address the identified need (Exh. EV-2, at 3-8). Eversource indicated that, as the first step in the process, it provided LEI with information on the necessary amounts and locations of NTA resources that would be required to address the identified need (Exhs. EV-2, at 3-8 to 3-9).[33] Initially, Eversource stated that by 2023 a minimum of 264 MW of effective capacity (237 MW connected to the Northborough Road Substation, and 27 MW connected to Woodside Substation) would be required (Exhs. EV-2, at 3-9; EFSB-PA-10). However, over the course of the proceeding, Eversource revised this figure to a total of 115 MW, with the full amount to be injected at either the Northborough Road or Hudson Substations (which LEI referred to as the "large scale" NTA case), or for the capacity additions to be spread across the West Framingham, Northborough Road, and North Marlborough Substations (which LEI referred to as the "medium scale" NTA case) (Tr. 15, at 2554-2555, 2557; RR-EFSB-19; RR-EFSB-24(R1)(1) at 4-5). Eversource stated that the decrease in the size of the injection requirement was the result of a number of factors, including the application of an improved modeling methodology and use of the 2016 CELT load forecast (rather than the 2013 CELT forecast used in the 2015 Needs Assessment) (Exh. EFSB-PA-10; Tr. 15, at 2647-2654; RR-EFSB-19).

Next, LEI identified a range of NTA technologies that could potentially meet this firm injection requirement, including thermal generation, renewable generation, storage, and EE (RR-EFSB-24(R1)(1) at 5). LEI first considered the minimum and maximum size of each NTA technology to determine whether a particular NTA option could provide the size of injection needed at a specific location (Exh. EV-2, at 3-10; RR-EFSB-24(R1)(1) at 3). Next, LEI

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[32] Eversource also explored a no-build approach. However, this approach did not address the identified reliability need (Exh. EV-2, at 3-2).

[33] LEI's assessment assumed completion of all elements of the ISO-NE recommended solution for the Greater Boston Area, excepting the Project (Tr. 3, at 358).

considered whether a specific NTA technology has the operating characteristics necessary to respond to contingency conditions (Exh. EV-2, at 3-10; RR-EFSB-24(R1)(1) at 3, 6).[34] LEI then considered practical challenges (e.g., land and infrastructure requirements) that might prevent the NTAs identified from being developed (Exh. EV-2, at 3-10; RR-EFSB-24(R1)(1) at 3, 6, 16-17).

After identifying the technically feasible NTA technologies for each location, LEI developed a least-cost set of NTA solutions based on the gross and net levelized cost of entry ("LCOE") for each technology (Exhs. EV-2, at 3-11 and app. 3-5, at 10; RR-EFSB-24(R1)(1) at 3).[35] Given its view that future market revenues are uncertain, LEI calculated the net LCOE under four scenarios with varying assumptions for revenues from the capacity and renewable energy certificate markets (Exh. EV-2, at 3-12; RR-EFSB-24(R1)(1) at 3, 18). Based on this assessment, LEI concluded that the least-cost technically feasible NTA would be a medium-scale generation solution consisting of two 57 MW frame peakers and two 18 MW reciprocating engines (to yield 115 MW of derated capacity) (Exh. EV-2, app. 3-5, at 15). LEI estimated the direct cost to ratepayers of this NTA solution would range from $16.3 million to $23.9 million annually, depending on forward capacity market revenues (Exh. EV-2, app. 3-5, at 15).[36] In

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34 The Company stated that in order to respond to an N-1-1 contingency, an NTA resource must be able to provide energy within 30 minutes of the first contingency (Exh. EV-2, at 3-10). According to the Company, the NTA resource must then be able to continue to operate for a minimum of twelve hours, which would provide sufficient time for the failed transmission system element to be repaired, or for load levels to drop sufficiently (Exh. EV-2, at 3-10; Tr. 15, at 2559-2560).

35 LEI stated that the gross LCOE is a dollars-per-kilowatt-year ($/kW-year) value that includes all investment and operating costs, and that net LCOE is derived by deducting any potential revenue streams (e.g., energy sales, capacity market revenues, etc.) from the gross LCOE (Exh. EV-2, app. 3-5, at 13).

36 LEI also presented a large scale combined-cycle gas turbine ("CCGT") solution, which it estimated would have a net direct cost to ratepayers of approximately $12.8 million annually (RR-EFSB-24(R1)(1) at 15). However, LEI stated that based on the size of the injection requirement and available CCGT technology, this solution would not capable of starting up quickly enough to address the N-1-1 reliability needs of the area, and therefore this option was eliminated from further consideration (RR-EFSB-24(R1)(1) at 15; Tr. 15, at 2614-2617).

comparison, Eversource estimated the annual revenue requirement of the Project to be approximately $11.2 million (RR-EFSB-11(S1); RR-EFSB-24(R1)(1) at 16).

In addition to a higher cost, Eversource identified significant implementation barriers for NTA solutions (Tr. 15, at 2626-2631; RR-EFSB-19; RR-EFSB-24(R1)(1) at 16-17). These barriers included the high cost and limited availability of land in the vicinity of the identified injection points, a lack of sufficient enabling infrastructure (e.g., gas pipeline and transmission system interconnections), zoning restrictions, end-of-life replacement costs, the need for sophisticated operator interventions, and lead-time concerns in light of the pre-2013 date of the reliability needs in the Marlborough Subarea (Tr. 15, at 2626-2631; RR-EFSB-19; RR-EFSB-24(R1)(1) at 16-17).

Eversource stated that, based on both the cost and practical challenges associated with the development of an NTA in the Marlborough Subarea, any technically feasible NTA solution is inferior to the Project (Exh. EV-2, at 3-12 to 3-13; Tr. 15, at 2546).[37] Eversource maintained that, overall, the Project better meets the goal of providing a robust, secure, and reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost (Exh. EV-2, at 3-13).

2. Transmission Alternatives

The Company considered two transmission alternatives with distinct approaches to meeting the reliability needs of the Marlborough Subarea: (1) the Project, which would bring a new source of supply to the area; and (2) Transmission Alternative 2, which would upgrade existing transmission lines in the area (Exh. EV-2, at 3-2 to 3-4; Tr. 1, at 97-98).

As discussed above, the Project consists of a new approximately nine-mile-long 115 kV transmission line (the New Line), and improvements at the Sudbury and Hudson Substations

[37] In addition, Eversource stated that, unlike the Project, an NTA solution would not ameliorate potential contingencies that could cause loss of service to customers served by the Hudson Substation (Exh. EV-2, at 3-13). Reliability benefits associated with the Project are discussed in Section IV.B.2, below.

(Exhs. EV-2, at 3-2 to 3-3; EFSB-PA-1; Tr. 1, at 103-105).[38] According to the Company, necessary work within the Sudbury Substation would include the installation of two new 115 kV breakers and a 115 kV shunt reactor (Exh. EV-2, at 3-2, 5-5).[39] Three new 115 kV breakers, one new underground and two new overhead transmission line terminals, and reconfiguration of the existing substation into a ring bus design, would be required at the Hudson Substation (Exhs. EV-2, at 3-2 to 3-3; EFSB-HLP-6). Upon completion, the Project would provide a capacity increase of approximately 320 megavolt-amperes ("MVA")[40] into the Marlborough Subarea (Exh. EFSB-PA-29). Eversource estimated the total cost of the Project to be approximately $95.8 million (RR-EFSB-50(1)).

Transmission Alternative 2 would be undertaken primarily by National Grid, and would involve: (1) converting the recently refurbished X-24 Line from 69 kV to 115 kV between the Millbury No. 5 and the Northborough Road Substations (14.5 miles); (2) reconductoring the E-157 Line between the Millbury No. 2 and Centech Substations (5.8 miles); and (3) reconductoring the 455-507 Line between the West Framingham and Sherborn Substations (5.8 miles) (Exh. EV-2, at 3-3; Tr. 1, at 103-105). Conversion of the X-24 Line to 115 kV operation would require installation of larger diameter conductor along the length of the line, and replacement of all of the existing support structures (Exh. EV-2, app. 3-4, at 9, 18).[41] Relocation

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38 Eversource explained that the New Line could be built using either underground or overhead construction, but that in the Company's opinion an underground transmission line is preferable (Exh. EV-2, at 3-1, n.16). For the purpose of the Company's comparison of project alternatives, underground construction is assumed for the Project. See Section VI, below, for a detailed comparison of the environmental impacts, costs, and reliability of the New Line using underground versus overhead construction.

39 Eversource indicated that a shunt reactor and associated facilities would not be required at the Sudbury Substation if the New Line were constructed using an overhead design (Exh. EV-2, at 5-4 to 5-5).

40 MVA is total power, which includes real power (MW) and reactive power (megavolt-amperes-reactive).

41 According to National Grid, 233 new steel pole structures, with roughly 136 new reinforced concrete caissons, would be installed to support the upgraded X-24 Line (Exh. EV-2, app. 3-4, at 9).

of other transmission lines within the X-24 Line ROW, and upgrades at a number of National Grid substations would also be required (Exh. EV-2, at 3-3 to 3-4, and app. 3-4, at 9, 18).[42] Reconductoring the E-157 and 455-507 Lines would require National Grid and Eversource, respectively, to install larger diameter conductor and new support structures (Exhs. EV-2, at 3-3, app. 3-4, at 11-12; EFSB-PA-4).[43] Eversource would also need to complete upgrades at its West Framingham and Sherborn Substations (Exhs. EV-2, at 3-3; EFSB-PA-4).[44] All in, the various elements of Transmission Alternative 2 would require work in Millbury, Grafton, Shrewsbury, Westborough, Southborough, Framingham, Ashland, and Sherborn (Exh. EV-2, at 3-3 to 3-4, fig. 3-2). According to the Company, Transmission Alternative 2 would provide a 300 MVA transmission capacity increase into the Marlborough Subarea, and would cost approximately $116.1 million (Exhs. EV-2, at 3-4, 3-7; EFSB-PA-29).

Eversource indicated that, while both alternatives would meet the need, the Project would provide a greater increase in capacity at a lower cost, and would provide greater flexibility over the longer term (Exhs. EV-2, at 3-4 to 3-5, 3-7; EFSB-PA-29). Additionally, Eversource stated that the Hudson Substation is currently supplied radially from the Eversource system by a single

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42 National Grid stated that reconfiguration of the existing X-24 Line ROW to accommodate Transmission Alternative 2 would require the installation of 35 new structures and 29 new reinforced concrete foundations supporting transmission lines other than the X-24 Line within the ROW (Exh. EV-2, app. 3-4, at 9). An existing, retired, 69 kV line would also need to be removed (Exh. EV-2, app. 3-4, at 9). National Grid further stated that upgrades at the Millbury No. 2, Millbury No. 5, North Grafton, Westborough, and Northborough Road Substations would be required, and would involve, among other things, the installation of 115 kV autotransformers, 115 kV circuit breakers, and changes to existing relay equipment (Exh. EV-2, at 3-3 to 3-4, and app. 3-4, at 11-17).

43 National Grid stated that reconductoring the E-157 Line would require installation of twelve reinforced concrete foundations and in-kind replacement of 26 transmission support structures (Exh. EV-2, app. 3-4, at 11). Eversource stated that reconductoring the 455-507 Line would require replacement of 50 of the existing 97 transmission support structures (Exh. EFSB-PA-4).

44 Eversource stated that work at the West Framingham and Sherborn Substations would include replacing existing disconnect switches, small sections of cable buses, and resetting current transformers, relays, and meters (Exh. EFSB-PA-4).

double-circuit 115 kV transmission line; the construction of a new transmission line between the Sudbury and Hudson Substations would provide an additional source of supply and allow the Hudson Substation to remain in service following an N-1 contingency to this existing supply line (Exh. EV-2, at 3-5). The reliability of the Hudson Substation would also be enhanced through the reconfiguration of the substation to a ring bus design (Exh. EV-2, at 3-5; Tr. 14, at 2461-2465). Finally, Eversource stated that the Project would provide a new, geographically separate source of supply to the broader Marlborough Subarea, diversifying the transmission supply to the region and protecting against extreme contingencies, such as the loss of all of the transmission lines in a single ROW (Exh. EV-2, at 3-5; RR-EFSB-17). According to the Company, Transmission Alternative 2 (which would reinforce existing transmission lines) would not improve the reliability of the Hudson Substation, nor provide a new source of supply to the Marlborough Subarea (Exh. EV-2, at 3-4 to 3-5; RR-EFSB-17).

Eversource also identified implementation issues for Transmission Alternative 2, including a long development lead time, difficulties in scheduling necessary equipment outages, greater customer outage exposure during Project construction, and complex construction requirements, including the potential need for live line work (Tr. 1, at 142-147; RR-EFSB-17). Regarding cost, Eversource stated that the Project would be roughly $20 million less than Transmission Alternative 2 and would therefore be preferable (Exh. EV-2, at 3-4).

Finally, with respect to environmental impacts, Eversource stated that a direct comparison and determination of superiority is difficult due to the distinct types of environmental impacts associated with the Project and Transmission Alternative 2 (Exh. EFSB-PA-36(R-3)). Table 1, below, provides a summary of the environmental considerations assessed by the Company for the two transmission alternatives. The Company concluded that, overall, the two transmission alternatives are comparable with regard to the potential for environmental impact (Exh. EFSB-PA-36(R-3)). However, Eversource noted that impacts from the Project would be similar to those associated with construction of the MCRT as a standalone project by DCR (Exh. EFSB-PA-36(R-3)).[45] Eversource asserted that if development of the MCRT by DCR is assumed as a baseline, the incremental environmental

[45] See Section VI.D.9 for further discussion of the proposed MCRT.

impact attributable to the New Line component of the Project would be significantly reduced (Exh. EFSB-PA-36(R-3)).

Table 1. Comparison of Potential Environmental Impacts Associated with Transmission Alternatives 1 and 2 as Presented by the Company[46]

	Project	Transmission Alternative 2
Total Circuit Miles	9.0 miles	26.05 miles
Total Unique ROW Miles	9.0 miles	23.3 miles
Highway/Road Crossings	10	66
Water Body Crossings	11	41
Total Tree Clearing	23.9 acres	0.14 acres
Tree Clearing within Forested Wetland Areas	0 acres	0 acres
Permanent Fill within Vegetated Wetland Areas	<0.01 acres	0.14 acres
Temporary Fill within Vegetated Wetland Areas	0.05 acres	25.30 acres
NHESP Priority/Estimated Habitat	4.0 acres	1.45 acres
Disturbance within an Area of Critical Environmental Concern	0 acres	1.18 acres
Disturbance within Vegetated Wetlands Areas Classified as Outstanding Resource Waters	<0.01 acres	4.33 acres
Length within Mapped Public Water Supply Areas	6.49 miles	2.4 miles
Adjacent Residential Parcels	156	290
Adjacent Sensitive Receptors	3	4
Adjacent Environmental Justice Areas	0 miles	4.9 miles
Adjacent Conservation Land	3.7 miles	2.9 miles
MHC Cultural Resource Points	23	44
MHC Cultural Resource Areas	1.7 miles	2.5 miles

Sources: Exhs. EV-2, at 3-7; EFSB-PA-36(R-3); EV-18, at 20, 22-23. Tr. 1, at 159-162; RR-EFSB-12.

[46] The Company noted that the impact figures tabulated for the Project do not net out impacts that would otherwise be incurred for the proposed MCRT as a standalone project by DCR (Tr. 1, at 162-164).

C. Positions of the Parties

1. Town of Sudbury

The Town of Sudbury argues that the Company's NTA analysis is riddled with errors, pointing to a number of corrections made by the Company during the course of the proceeding, each showing a reduction in the needed scope of an NTA solution, and divergent estimates of load apportionment in the Marlborough Subarea among National Grid, Eversource, and municipal electric companies (Sudbury Brief at 28-30, 33-35). Additionally, Sudbury points out that the analysis by LEI did not readily produce a cost-optimized NTA solution (Sudbury Brief at 33-34). Based on the multiple changes to NTA size requirements, Sudbury calls into question whether Eversource has presented reliable and adequate information to the Board (Sudbury Brief at 29, citing Exh. SUD-5).

Further, Sudbury argues that the Company should not have dismissed an NTA of EE measures (e.g., a reduction on the order of 15 percent of load) on the basis that it would be more expensive than other measures, considering that Sudbury's witness testified that EE measures are "generally the least expensive resources and usually pay for themselves in energy and capacity savings, and reductions in market prices" (Sudbury Brief at 34, citing Exh. SUD-PLC-4, at 4).

Sudbury's witness, Paul Chernick, testified as to several NTA options (rate design, distributed solar and storage, and targeted load reductions) that could be implemented individually or in combination to reduce peak load. Mr. Chernick identified rate design options for time-varying rates for peak demand and time-of-use pricing (Sudbury Brief at 36, citing Exh. SUD-PLC-1, at 21, 28-33, 36-47). In particular, Mr. Chernick identified critical peak pricing ("CPP") and critical peak rebate ("CPR") programs, citing to the successful operation of CPR programs in Maryland (Sudbury Brief at 36, citing Exh. SUD-PLC-1, at 28-30). Mr. Chernick contends implementation of time-of-use pricing is a viable rate design option for the load pocket, with minimal costs for utilities, given the assumed installation of advanced metering equipment, which he asserts was encouraged by the Department in it its Grid Modernization docket (D.P.U. 12-76-B) and is supported by National Grid (Exh. SUD-PLC-1, at 21, 28-31).[47] Mr. Chernick also presented time-of-use pricing as an option to improve the

[47] The Siting Board notes that in D.P.U. 15-120/121/122, issued May 2018, the Department declined to preauthorize any customer-facing advanced metering investments. In the

reliability of the transmission supply to the load pocket (Exh. SUD-PLC-1, at 32-33). Sudbury acknowledges that Eversource serves a low proportion of the load in the Marlborough Subarea, but argues that this does not relieve the Company of achieving the load reductions necessary for an NTA (Sudbury Reply Brief at 9).[48]

Sudbury argues that Eversource could use a number of means, including advanced metering functionality, critical peak pricing and peak time rebates, to pursue EE and rate design NTAs in the Marlborough Subarea – either on its own or in concert with National Grid and/or the municipal light plants (Sudbury Reply Brief at 9-10).[49] Sudbury argues that Eversource has also chosen not to comply with the Department's directive to implement advanced metering functionality that provides for two-way communications (Sudbury Brief at 40-41, citing Tr. 4, at 591-597). Finally, Sudbury argues that Eversource has made no effort to assess rate design, DR, targeted EE, solar, or storage resources to address the identified reliability need (Sudbury Brief at 40).

Sudbury argues that Eversource did not substantiate its assumption that a local resource solution would need to be capable of operating for a minimum of twelve hours, as if load would remain at the 90/10 peak for all twelve hours (Sudbury Reply Brief at 8, citing

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Order, the Department weighed the significant costs associated with full achievement of advanced metering functionality using advanced metering infrastructure against the considerable uncertainty regarding benefits from reduced demand, capacity savings, and customer participation in time varying rates or other forms of dynamic pricing. While the Department confirmed that advanced metering infrastructure is an important tool in meeting grid modernization objectives, it determined that, currently, the benefits of a full deployment of advanced metering functionality do not justify the costs. Grid Modernization Order, D.P.U. 15-120/121/122, at 1-2 (2018).

48 Sudbury argues that Eversource has failed to satisfy a Siting Board standard, noting that the Siting Board requires the Company to "strongly encourage" its customers to take full advantage of EE programs and explore "creative ways to use NTAs (individually or in combination) to avoid or delay the need for new transmission infrastructure" (Sudbury Brief at 33, referencing Mystic-Woburn at 25, n.28).

49 Sudbury further argues that Eversource misrepresented the proportion of load served by the Company in the Marlborough Subarea (Sudbury Brief at 29-30). The Siting Board does not view the difference between 10 and 12.1 percent as having a bearing on the feasibility of EE as a project alternative.

RR-EFSB-24(R1)(1) at 4). Sudbury notes that when questioned about this assumption during the evidentiary hearing, Eversource told the Siting Board that the twelve-hour peak load assumption is a requirement of ISO-NE Planning Procedure 7 (Sudbury Reply Brief at 8, citing Tr. 15, at 2561). Sudbury argues that there is no specific ISO-NE planning guideline that addresses the technical requirements or operating specifications of an NTA solution and that, contrary to the Company's assertions, the twelve hours is related to the LTE rating for a transmission element, not an NTA solution (Sudbury Reply Brief at 8, citing Tr. 15, at 2561, 2599). Sudbury notes that the Company nevertheless continues to argue that "to compare transmission and non-transmission alternatives on a consistent basis," NTAs would need to satisfy a twelve-hour firm capacity requirement (Sudbury Reply Brief at 8, referencing Company Brief at 57, n.42). Sudbury submits that the Siting Board should treat this argument as baseless and reject it (Sudbury Reply Brief at 8).

Sudbury proposed a distributed solar-and-storage NTA consisting of approximately 250 MW of distributed solar PV, and 160 MW of energy storage capacity (capable of providing 638 megawatt-hours, or approximately four hours of peak output) within the Marlborough Subarea (Exh. SUD-PLC-1, at 36). This solution was designed to supplement firm transmission capacity in the Marlborough Subarea following the contingency of concern in the year 2023, and the combination of solar PV and storage would be dispatched to follow load (Exh. SUD-PLC-1, at 36-38; Tr. 16, at 2786). According to Sudbury, there is adequate space on rooftops within the Marlborough Subarea to achieve this level of installed solar PV capacity (i.e., rooftop space available for a total of approximately 565 MW of solar PV), and there is potential for additional generation from ground-mounted arrays (Exh. SUD-PLC-1, at 39-40). Sudbury maintains that peak load days have weather that is conducive to solar PV generation, because sunny weather leads to higher air conditioning load due to both higher ambient temperatures and increased direct radiant heating (Tr. 16, at 2747-2748).[50]

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[50] Meteorological data presented by the Company for evaluating solar PV production was from Bedford, Massachusetts; Sudbury argues that this location is not close to the Marlborough Subarea, and that the Company did not provide a rationale for its selection (Sudbury Brief at 38).

Sudbury argues that its proposed solar PV and storage solution would not require any significant enabling infrastructure, such as improvements to distribution hardware or controls (Sudbury Brief at 37). According to Sudbury, the solar PV component of the NTA would largely be paid for through the sale of renewable power to the grid (Exhs. SUD-PLC-1, at 44-45; EFSB-SUD-17). Similarly, Sudbury proposed that the accompanying storage facility could be deployed for electricity price arbitrage (i.e., not for local reliability) for most of the year, reducing the cost of the distributed solar and storage NTA (Exh. SUD-PLC-1, at 39). Sudbury asserted that behind-the-meter solar is currently cost effective and extrapolated that 250 MW of solar PV with 160 MW of storage would break even or yield modest profits (Exh. SUD-PLC-1, at 44). Sudbury concludes that, using a combination of NTAs, the feasibility of a creative, hybrid NTA solution is unassailable (Sudbury Brief at 37-38).

With respect to the Eversource's NTA evaluation, Sudbury maintains that it has clearly called into question the scale of the Company's NTA solution, and the reasonableness of the Company's analyses (Sudbury Brief at 41). Sudbury argues that while Eversource has avoided or obstructed any effort to consider NTAs, Sudbury has presented viable NTAs that withstand scrutiny, and therefore, the Siting Board must reject the Company's Petition (Sudbury Brief at 41).

With regard to the transmission alternative presented by the Company, Sudbury notes that National Grid would have been responsible for construction of Transmission Alternative 2, but that it was absent from the proceeding, and the record is therefore inadequate with respect to the costs and environmental impacts of that alternative (Sudbury Brief at 27, citing Exh. EV-2, at 3-3 to 3-4).[51] Sudbury argues that the record contains no support for National Grid's estimate of the cost of Transmission Alternative 2,[52] and asserts that Eversource was unable to provide an

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[51] Sudbury also notes that Eversource apparently did not to review National Grid's own published EE plans, despite knowing that National Grid serves a large portion of the load pocket (Sudbury Brief at 34-35, citing Tr. 14, at 2659).

[52] Sudbury cites to record evidence that the cost estimate for Transmission Alternative 2 was developed from a desktop review of line characteristics and historical costs from other projects; that no property surveys, evaluations of soil conditions, or environmental

opinion on what the actual cost of the alternative would be (Sudbury Reply Brief at 5, citing Tr. 1, at 124).[53] Given this stated deficiency, and some overlap between cost range estimates for the Project and Transmission Alternative 2, Sudbury argues that the Siting Board must find there is no reasonable explanation for Eversource's dismissal of Transmission Alternative 2 on the basis of cost (Sudbury Reply Brief at 5-6).

Sudbury also argues that impacts on an existing utility ROW are different in kind from impacts on the MBTA ROW, due in part to ongoing vegetation management practices along the route of Transmission Alternative 2 (Sudbury Brief at 32; Sudbury Reply Brief at 6). In contrast, the MBTA ROW, which has not had railroad service in over 40 years, is characterized by Sudbury as "a pristine, largely untouched wilderness that will face significant permanent damage from construction of the Project" (Sudbury Reply Brief at 6; citing generally Exh. SUD-DMD-1; EFSB-SUD-38(1)).[54] In addition, Sudbury argues that many of the Company's metrics (e.g., a count of road crossings) are not natural environmental impact considerations (Sudbury Brief at 32). Sudbury notes that its own experts easily concluded that the environmental impacts of the Project far exceed those of Transmission Alternative 2 (Sudbury Reply Brief at 6, citing Exh. SUD-MJN/RMG-1(R) at 11). Sudbury argues that, with no reasonable cost information and a specious environmental impact comparison, Eversource has failed to establish that the

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studies were conducted; and that details such as crew sizes and specific construction equipment were not presented (Sudbury Brief at 30, citing Exh. SUD-C-6(S-1)).

53 Oral testimony, cited by Sudbury, was that Eversource believes the expected cost of Transmission Alternative 2 of $116.1 million was calculated by National Grid using a -25%/+50% methodology; however, Eversource could not confirm the exact basis of National Grid's cost estimate (Tr. 1, at 124).

54 Sudbury argues that maintaining a cleared corridor on the MBTA ROW would have relatively high impacts on 3.7 miles of adjacent conservation land (Sudbury Brief at 32, citing Exh. SUD-DMD-1). In contrast, Sudbury argues that reconductoring an overhead utility line within an existing ROW would not impact adjacent conservation land because the ROW is already cleared and vegetation management is ongoing, suggesting that the Company should have included ongoing vegetation management as a factor when comparing environmental impacts (Company Brief at 32, citing Exh. SUD-DEIR-53).

Project is superior to Transmission Alternative 2, and therefore, that the Siting Board must deny Eversource's Petition (Sudbury Brief at 33).

2. Protect Sudbury

Protect Sudbury maintains it is "axiomatic that construction on an otherwise undeveloped parcel [the MBTA ROW] will have more impacts than construction under-street or on a developed utility right of way" (PS Brief at 7). Protect Sudbury argues that Transmission Alternative 2 poses no risk to groundwater or public water supplies, wildlife habitat, rare species, conservation land uses, nor to abutting historic or archeological resources (PS Brief at 9-10). Protect Sudbury argues that the Project would have dramatic short- and long-term environmental impacts, and that these impacts are much more significant than the environmental impacts of Transmission Alternative 2 (PS Brief at 7).

With respect to comparative costs, Protect Sudbury argues that conceptual estimates used by the Company are based on limited design or engineering information, and omit key assumptions regarding material and labor costs, production rates, and construction conditions (PS Brief at 29, citing Exh. Protect-RC/RH/ML/MO-1, at 5). Protect Sudbury argues that, with the wide range and variation of the competing projects (i.e., underground, overhead, and in-street), conceptual estimates are not helpful in evaluating cost estimates for project alternatives, particularly where the project estimates are relatively close together in range of costs (PS Brief at 30, citing Exh. Protect-RC/RH/ML/MO-1, at 6). Protect Sudbury suggests that underground construction especially poses risks of cost increases (PS Brief at 30-32). Protect Sudbury notes that the ranges associated with the Company's cost estimates for the Project and Transmission Alternative 2 overlap, arguing that further refinement is necessary in order to reasonably rank the alternatives by cost (PS Brief at 33, citing Exh. Protect-RC/RH/ML/MO-1, at 16). Protect Sudbury contends that the Company has not met its burden to demonstrate that the Project is the least costly, given the Company's use of inaccurate conceptual estimates (PS Brief at 27).

Protect Sudbury argues that ISO-NE did not, in fact, compare the Project with Transmission Alternative 2, but rather compared an overhead transmission line along the MBTA ROW (the MBTA Overhead Route) with the National Grid-led alternative (PS Brief at 10-12; PS Reply Brief at 2-4). Protect Sudbury argues that, by failing to update ISO-NE when it

became clear that an overhead transmission alternative was no longer the Company's preferred option, Eversource circumvented well-established ISO-NE procedures for stakeholder review of competing projects and comparative costs (PS Brief at 12). Protect Sudbury argues that a key function of ISO-NE's planning process is to keep stakeholders apprised of the initiation and on-going status of reliability planning studies, and that this is achieved, in part, through presentations to ISO-NE's Planning Advisory Committee ("PAC") (PS Brief at 13). Protect Sudbury argues that material changes to the cost and design of the New Line, resulting from the Company's decision to pursue the MBTA Underground Route, should have been subject to the PAC's confirmation that the Project was the cost-effective solution compared to alternative options (PS Brief at 13).[55] Protect Sudbury concludes that in the absence of a required ISO-NE review the Siting Board should reject the Company's Petition outright (PS Brief at 26). Protect Sudbury concludes that the Siting Board should reject the Company's proposed Project (PS Brief at 3).

3. HLPD

HLPD argues that, in addition to other system reliability benefits, the Project would provide significant reliability and cost benefits to HLPD customers, and that these benefits would not be achieved if any of the alternative approaches explored in this proceeding were pursued in place of the Project (HLPD Brief at 3). According to HLPD, the existing supply arrangement at the Hudson Substation leaves HLPD customers exposed to potential supply interruptions

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55 Protect Sudbury also argues that the Siting Board "has correctly assumed that any transmission project proposal would be reviewed and evaluated by ISO-NE before it is submitted for its review" (PS Brief at 11, 20, citing East Eagle at 8-20). Protect Sudbury argues further that Eversource failed its obligation to keep ISO-NE informed about changes to the Project and that "Eversource failed to submit its Preferred Route for review by ISO-NE as required" (PS Brief at 20). In fact, the Siting Board has no statutory or regulatory requirement that transmission facilities must be approved by ISO-NE prior to filing with the Siting Board, nor is the Siting Board responsible for ISO-NE's interpretation of its procedures. Furthermore, the Siting Board performs its own evaluation between the Project and Transmission Alternative 2 and concludes that the Project is superior. See Section IV.D. Therefore, Protect Sudbury's argument is not addressed further.

following certain N-1 contingencies (HLPD Brief at 4). Following construction of the Project, an additional, geographically distinct, transmission supply would be brought to the Hudson Substation, eliminating the reliability risk associated with the substation's radial supply (HLPD Brief at 4, citing Tr. 14, at 2461-2462). In addition, a single contingency at the Hudson Substation would no longer result in the loss of more than one of the substation's three transformers (HLPD Brief at 4). According to HLPD, neither an NTA nor the type of existing transmission system reinforcement proposed as Transmission Alternative 2 would provide either of these reliability benefits (HLPD Brief at 4, citing Tr. 14, at 2465-2466). As such, HLPD urges the Siting Board to approve Eversource's Petitions, and to do so as soon as practicable (HLPD Brief at 4).

4. Company Response

Eversource argues that Sudbury's proposed NTAs are unrealistic and conceptual, and that all technically feasible NTAs are more costly than the Project (Company Reply Brief at 28, 33-36). The Company argues that Sudbury's NTA witness did not substantiate how its proposed alternatives could be implemented cost effectively, practically, or on an expeditious basis, to address the immediate reliability need in the Marlborough Subarea (Company Reply Brief at 28, citing Tr. 15, at 2544; RR-EFSB-24(R1)(1)). Further, the Company argues that it is not in a position of ensuring that NTAs such as those proposed by Sudbury would occur in a timely manner, if at all, whether by private project developers or end-use customers (Company Reply Brief at 28, citing Exh. EV-EL-1, at 4, 7).

The Company argues that it cannot force customers to participate more actively in EE, to buy advanced metering, to subscribe to different forms of time-of-use rates, to shift their consumption to off-peak periods, or add solar systems or related storage systems to their homes or businesses (Company Reply Brief at 29, citing Exh. EV-EL-1, at 7-8, RR-EFSB-101, at 3).[56]

[56] The Town of Sudbury objects to the Company's response to RR-EFSB-101, arguing that it was filed late, constitutes improper rebuttal testimony, and should be stricken from the record (Sudbury Brief at 40; Sudbury Reply Brief at 10-11). The Company contends that the response is not rebuttal testimony, but rather information relevant to the topic of the record request and as such there is no basis to strike it (Company Reply Brief at 35 n.22). As an initial matter, we note that the Board's regulations require that any objections to

The Company argues that it has a long history of successfully and aggressively implementing EE programs, and has implemented EE programs to the best of its ability and to the extent of customers' willingness to participate, receiving national recognition for these programs (Company Reply Brief at 30, citing Exh. SUD-N-26, Tr. 1, at 151, Tr. 4, at 587).

The Company reiterates that, even in the unlikely event that EE could achieve as much as a 15 percent peak load reduction around specific substation locations (above and beyond the EE reductions already included in the load forecast), it would not be sufficient to resolve the identified criteria violations (Company Reply Brief at 30-31, citing RR-EFSB-24(R1)(1) at 6). The Company maintains that achieving incremental EE gains, beyond what it is already implementing, and beyond what is already planned and included in the ISO-NE load forecast, would be far more expensive than the Project (Company Reply Brief at 31, citing Exh. EV-EL-1, at 7).

The Company argues that Sudbury failed to appreciate the cost and practical implementation impediments to its proposed rate design measures (Company Reply Brief at 32). Eversource states that the ability to respond to time-varying rate pricing signals is modest for most customers, and that the Company has historically found it difficult to sustain customer participation and response under time-varying rate programs (Company Reply Brief at 33, citing Exh. EV-BJR-1, at 4-5). Eversource submits that, based on its experience, the Company would not expect to achieve significant load reductions from a time-varying rate or CPP program (Company Reply Brief at 33, citing Exh. EV-BJR-1, at 4).[57]

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record requests responses be filed within seven days of the response. 980 CMR 1.06(6)(g). Notwithstanding the lateness of Sudbury's objection, a review of the Company's response indicates that pages 1-3 provide the information requested by the Siting Board, but that pages 3-11 include information beyond that required to respond to staff's request. While the information may be relevant to the general topic of the record request, it goes beyond the scope of the question. As such, the Siting Board does not rely on the out-of-scope information in the Company's response to RR-EFSB-101 (on page 3 starting with "We are concerned with Mr. Chernick…" and concluding on page 11).

[57] Eversource estimated a total peak demand reduction of less than one percent under expected program participation rates (Company Brief at 33, citing Exh. EV-BJR-1, at 4).

Regarding DR, Eversource argues that there has been a more than a 50 percent reduction in active DR between the 2013 CELT Report and the 2016 CELT Report because of recent changes in environmental regulations (Company Reply Brief at 32, citing RR-EFSB-5). The Company further argues that active DR is dispatched by ISO-NE only when required by system-wide conditions and cannot be counted upon when a load pocket may be lost under N-1-1 contingency conditions (Company Reply Brief at 32, citing RR-EFSB-6). The Company concludes that the need is far too big and immediate to be met by targeted load reductions (Company Reply Brief at 31-32).

With respect to the number of hours an NTA must be available, the Company asserts that, while Planning Procedure 7 does not specifically address the technical requirements of an NTA (because it is a transmission planning document), the procedure is grounded on the principle that a contingency could occur over an extended time frame when loads are high enough to require at least twelve hours of backup resources, and that this requirement is equally applicable to transmission and non-transmission alternatives (Company Reply Brief at 36-37, citing Tr. 3, at 448-450, 454, 461-463, 477; Tr. 15, at 2561-2562; RR-EFSB-24(R1)(1) at 4, 19).

The Company acknowledges that engineering for Transmission Alternative 2 was not advanced to the same degree as for the Project, but argues that the Siting Board is nevertheless able to compare alternatives, even when, as is typical, the confidence level of estimates for project alternatives is less than that for the proposed project (Company Reply Brief at 26). The Company argues that it used standard industry practices to develop its costs estimates, and that its estimates drew from the knowledge and expertise of design engineers and managers of prior construction projects (Company Reply Brief at 69-71).[58] Overall, Eversource argues that it has provided ample information showing that, on balance, the Project is superior to alternative approaches, including Transmission Alternative 2 (Company Reply Brief at 26).

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[58] Further, the Company submits that, although National Grid was not a party to this proceeding, National Grid's absence did not hamper the flow of information regarding the costs of Transmission Alternative 2, and that, as necessary, the Company contacted National Grid, which provided information in full (Company Reply Brief at 25, citing Exh. EFSB-PA-22).

D. Analysis and Findings on Alternative Approaches

The Company's assessment of alternative approaches to the proposed Project included a review of potential non-transmission and transmission alternatives. The Company argues that both of these options are inferior to the Project because they would provide a lower level of reliability at a higher cost. The Company described a centralized generation NTA solution to resolve the identified reliability needs; the Company's NTA solution would be less reliable and more costly than the Project.[59,60]

The Town of Sudbury proposes a different NTA solution, wherein the local utilities would somehow induce area customers to both provide for more of their own power consumption (e.g., with solar PV and storage), and to reduce their consumption at the time of a transmission system contingency. Eversource disputes that there is potential to sufficiently reduce customers' electricity consumption, or that such an approach would be reliable or cost-effective.

The record does not support Sudbury's contention that there are untapped, inexpensive measures readily available that would sufficiently reduce load in the Marlborough Subarea by more than 15 percent – beyond EE savings already included in the load forecast – either alone or in combination.[61] Without compelling evidence that a substantial cut in peak power demand in the Marlborough Subarea is feasible, and likely to occur, relying on such an expectation is not an

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59 The Siting Board notes that the Company's assessment of the amount of NTA resources required to address the identified reliability need shifted markedly over the course of the proceeding, necessitating an updated NTA assessment. Comments by parties helped identify the need for these refinements. The Siting Board recognizes that there are technical difficulties in establishing optimized NTA injection requirements; nonetheless, applicants should ensure that such technical details are resolved prior to filing with the Board.

60 None of the parties supported the Company's centralized generation NTA solution.

61 The Siting Board notes that the Department has no rate-setting authority for municipal light department customers, generally, or for a substantial portion of the Marlborough Subarea, and therefore has no mechanism to effect Sudbury's proposal to reduce peak load through rate-design.

appropriate response to the identified, and immediate, need.[62] Furthermore, the record does not support a conclusion that implementation of the combined decentralized solar PV and energy storage concept proposed by Sudbury is a feasible or cost effective alternative to the Project, especially in light of the time-sensitive nature of the reliability needs in the Marlborough Subarea.[63,64] The record shows that such an approach would require a significant mobilization of new infrastructure – including a means of incentivizing customer participation (e.g., new specific programmatic support), and a centralized system for monitoring and dispatching the DG resources – the costs, practicality and timing of which are unknown. The record does not include an assessment of when specific quantities of capacity would in fact be installed under Sudbury's approach, nor when control system infrastructure would be available. The solar plus storage solution offered by Sudbury appears to suffer from two additional critical deficiencies. First, this concept assumes that solar PV generation would be available during the contingency, or other times when the energy storage systems need to be charged to be prepared to withstand such a contingency. Given that solar PV is an intermittent technology, and not dispatchable, there can

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62 The CELT forecast reflects ISO-NE's estimate of peak load reductions, including reductions from EE programs that Eversource described as having received national recognition. Eversource noted that most customers have a limited ability to respond to electricity pricing signals and predicted a less-than-one-percent reduction in total peak demand from its time-varying rate programs. Eversource also noted that it cannot force customers to reduce or shift their electricity consumption. As such, the Siting Board concludes that incremental peak load reduction measures are not a practical element to a Project alternative in this instance.

63 Additionally, the record shows that reliability improvements to customers supplied by the Hudson Substation would not be achieved if an NTA solution, such as the one proposed by the Town of Sudbury, were implemented in place of the Project.

64 The Siting Board notes that the demand forecast underlying the Company's Updated Analysis includes ISO-NE's expectation of future solar PV uptake across New England, including the Marlborough Subarea. The Siting Board expects that significant amounts of uptake beyond this level would require additional programmatic and financial support, and notes that municipal light plant customers, which make up a significant portion of the Marlborough Subarea, are not eligible to participate in the Commonwealth's current solar PV incentive program (i.e., the Solar Massachusetts Renewable Target (SMART) Program). See Tr. 3, at 521.

be no such assurance, even though there may be a statistical likelihood that solar PV could serve this function. A key role of reliability planning is to address contingencies that may be statistically unlikely, but such significant threats to reliable energy supply that they necessitate a certain remedy. Solar PV does not provide the certainty necessary to obviate contingencies that can occur at any time.

Second, Sudbury presumes that energy storage systems are made more economical and competitive to the Project by means of their ability to perform "energy arbitrage" while also providing the capacity when needed during a system contingency. This too, is an unrealistic assumption. Absent perfect knowledge of when, and for how long, a system contingency will occur, there can be no assurance that energy storage systems that are part of a solution strategy will have sufficient energy reserves available at that time needed to respond to a contingency that threatens system reliability. Energy arbitrage activity could deplete a battery energy storage system to a low state-of-charge just prior to a system contingency and would therefore render that storage system an unreliable solution for that contingency. There may be remedies for this shortcoming, but Sudbury has not demonstrated what they are, or how they would affect the cost and feasibility of an energy storage solution. Given the reliability needs currently present in the Marlborough Subarea, the Siting Board concludes that the NTAs proposed by the Town of Sudbury are inferior alternatives to the Project.

The Company and the Town of Sudbury also disagree on the minimum duration of an NTA alternative. ISO-NE Planning Procedure 7 requires that transmission elements have a twelve-hour rating in the summer, or LTE rating, to provide the needed supply under various contingencies. The Siting Board has evaluated and accepted use of LTE ratings (which are a twelve-hour maximum rating) in gauging whether the system has the resilience to withstand one or more contingencies. The Company has proposed to continue use of this practice in this case, which the Siting Board continues to find an appropriate criterion when considering transmission solutions, like the Project.

However, with the advent of new and increasingly practical utility-scale NTA technologies, such as energy storage systems, the use of the twelve-hour, LTE-based, minimum duration requirement for the evaluation of NTA solutions warrants review. In this regard, the Siting Board is not wholly persuaded by the Company's argument that the necessary duration for

an effective energy storage system solution must be based on the twelve-hour definition of the LTE rating of a transmission line. In fact, to avoid loss of load, an NTA would only have to provide supplemental power for the actual number of hours that post-contingency transmission components would be insufficient. The Siting Board recognizes that such close alignment would require perfect information and foresight, along with considerable operator action to match changes in load for the duration of the outage with transmission capability and NTA output, the management of which is likely to have cost and reliability implications.

For planning purposes, it is the Board's view that a conservative approach on NTA adequacy is appropriate for ensuring reliability and is consistent with our past practice. Nevertheless, the record in this proceeding leaves open the question whether twelve hours of backup power is necessarily required for NTAs to reliably supplant typical transmission investments, as a general planning criterion. The Siting Board directs the Company to review its approach and develop a methodology for determining reasonable and appropriate duration requirements for use in future NTA assessments. Such a determination will need to address the unique circumstances of the applicable contingencies and system characteristics in study areas and could result in minimum required NTA durations that are either less than, or greater than, the current twelve-hour planning approach.[65]

Overall, the record shows that the NTA alternatives identified in the record are inferior to the Project with respect to reliability and cost. While at least some of the NTA alternatives may be preferable to the Project with respect to environmental impacts, on balance, considering environmental impacts, reliability and cost, the Siting Board finds that the Project is preferable to NTA alternatives.[66]

Regarding transmission alternatives, the Company showed that the Project, which would bring a new source of supply to the Marlborough Subarea and provide redundancy to HLPD's

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[65] The Siting Board recommends that the Company confer with ISO-NE and other transmission utilities in developing its methodology.

[66] The Siting Board continues to expect that Eversource will strongly encourage its customers, both existing and new, to take full advantage of EE programs. Eversource should also continue to explore creative ways to use NTAs (individually or in combination) to avoid or delay the need for new transmission infrastructure.

supply, overall, would provide more reliable electric service to the subarea than Transmission Alternative 2. While the cost estimate ranges for the two alternatives do overlap, the Company's best estimate of the cost of Transmission Alternative 2 is substantially higher than its best estimate of the cost of the Project, and it is unlikely that the ranking of the respective transmission alternative costs would reverse.[67] Thus, the Project would provide a more reliable and cost effective solution than Transmission Alternative 2.[68]

Eversource's position is that the environmental impacts of the Project and Transmission Alternative 2 are comparable. Because the type of work proposed for each alternative is different, it is difficult to directly assess the relative impacts of the two options, but the Project would require a considerably greater level of tree clearing and NHESP habitat disturbance. Furthermore, impacts along the existing active utility corridors used in Transmission Alternative 2 may be somewhat diminished due to differences in potential habitat disturbance. However, there are valuable environmental resources along these corridors that could be negatively impacted by new construction along these routes, and the scope of work required for Transmission Alternative 2 is significant. On this basis, the Siting Board finds that both transmission alternatives have the potential for environmental disruption, but that the Project has a somewhat greater potential for adverse environmental impacts than Transmission Alternative 2. Based on the enhanced reliability and likely lower cost of the Project compared to Transmission Alternative 2, the Siting Board finds that the overall benefits of the Project outweigh the environmental advantages of the alternative.[69]

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67 See also, Section VI.E, below.

68 The Siting Board accepts the evidence presented by Eversource on behalf of National Grid regarding the cost and environmental impacts of Transmission Alternative 2 as a reasonable basis for comparing the alternative transmission approaches. Siting Board staff and intervenors were able to seek information from National Grid through Eversource during the proceeding (see, for example, RR-SUD-6). While it would have been welcome, direct participation of National Grid is not necessary for the Board's review of the Project.

69 The Siting Board notes that if construction of the MCRT is assumed, many of the environmental impacts associated with the Project would occur regardless of Project construction. See Section VI.D.9., for discussion of the MCRT.

Based on its review of non-transmission and transmission alternatives, the Siting Board finds that the Project is superior to the other alternatives identified with respect to providing a reliable energy supply for the Commonwealth with minimum impact on the environment at the lowest possible cost.

V. ROUTE SELECTION

A. Standard of Review

G.L. c. 164, § 69J requires a petition to construct to include a description of alternatives to the facility, including "other site locations." Thus, the Siting Board requires an applicant to demonstrate that it has considered a reasonable range of practical siting alternatives and that its proposed facilities are sited in locations that minimize cost and environmental impacts while ensuring a reliable energy supply. To do so, an applicant must meet a two-pronged test. First, the applicant must establish that it developed and applied a reasonable set of criteria for identifying and evaluating alternative routes in a manner that ensures that it has not overlooked or eliminated any routes that, on balance, are clearly superior to the proposed route. Second, the applicant generally must establish that it identified at least two noticed sites or routes with some measure of geographic diversity. Vineyard Wind LLC EFSB 17-05/D.P.U. 18-18/18-19 at 19 (2019) ("Vineyard Wind"); Needham-West Roxbury at 21; Woburn-Wakefield at 34-35. But see Colonial Gas Company d/b/a National Grid, EFSB 16-01, at 28 (2016), Colonial Gas Company d/b/a National Grid, EFSB 18-01/D.P.U. 18-30, at 40-41 (2019), where the Siting Board found the company's decision not to notice an alternative route to be reasonable.

B. Company's Approach to Route Selection

Eversource stated that its route selection methodology is an iterative approach that included the following steps: identifying a geographic study area (the "Study Area"); identifying viable routes and design options (the "Universe of Routes"); evaluating and scoring environmental and constructability constraints for the Universe of Routes; comparing estimated costs; and selecting as the candidate routes for further analysis: (1) the MBTA Underground Route as the Primary Route; (2) the MBTA Overhead Route as the Noticed Variation; and (3) the All-Street Route as the Noticed Alternative Route (Exh. EV-2, at 4-3).

The Company identified a Study Area by reviewing potential routes between the Sudbury and Hudson Substations, which included areas within the municipalities of Sudbury, Wayland, Framingham, Marlborough, Hudson, and Stow, roughly bounded to the north by Route 27 and to the south by U.S. Route 20 (Exh. EV-2, at 4-6). The Company stated that a majority of the land uses within its Study Area are conservation, recreation, agriculture, and water supply protection areas; however, there are residential and commercial areas at the eastern end of the Study Area in Sudbury, the western end of the Study Area in Hudson, and along the public roadways (Exh. EV-2, at 4-6).

The Company used United States Geological Survey maps, Massachusetts Geographic Information System data, aerial photography, and field reconnaissance to identify its Universe of Routes (Exh. EV-2, at 4-7). Eversource looked to site the Project in an existing linear corridor, such as an existing utility ROW (e.g., rail, gas, electric) or public roadway (Exh. EV-2, at 4-6). The Company met with federal, state, and municipal officials; Protect Sudbury; residents; business owners; and other stakeholders to discuss route options and to obtain input on the Universe of Routes (Exh. EV-2, at 4-4). Further, Eversource reported that it incorporated suggested routes from stakeholders into its Universe of Routes, specifically routes identified by the Town of Sudbury, Protect Sudbury, and Northeast Logistics, LLC (Exhs. EV-2, at 4-4, 4-6; EFSB-RS-3; EFSB-RS-4).

The Company stated that its initial Universe of Routes included 21 geographically distinct routes (Exh. EV-2, at 4-7). Eversource completed an initial screening that considered abutting land uses; proximity of wetlands, waterways, and rare species habitat; existing traffic patterns and volumes; constructability considerations such as bends or the presence of existing underground utilities; easements and property ownership; and feedback from stakeholders (Exh. EV-2, at 4-7). Based on its initial assessment, Eversource eliminated nine routes that it considered unsuitable for the Project (Exhs. EV-2, at 4-7 to 4-9; EFSB-RS-3).

The Company identified design variations and/or hybrid designs for five of the remaining twelve routes, yielding a total of 20 options along twelve unique route corridors (Exh. EV-2, at 4-7, 4-13 to 4-14). Of the twelve routes, six (and one design variation) would be located entirely within public roadways, providing geographically distinct routing alternatives; further, two were identified by the Town of Sudbury and two were identified by Protect Sudbury

(Exhs. EV-2, at 4-29; EFSB-RS-3).[70] The Company's scoring process consisted of the following: (1) identifying evaluation criteria to identify impacts of each route; (2) calculating a ratio score for each criterion for each route; (3) assigning individual weights to each criterion to reflect its potential for impact; and (4) determining a total raw ratio score and total weighted ratio score for each route (Exh. EV-2, at 4-15 to 4-16).

Eversource scored the 20 options based on 17 environmental and constructability criteria that fell into three categories: (1) developed environment criteria (seven criteria); (2) natural environment criteria (six criteria); and (3) constructability criteria (four criteria) (Exh. EV-2, at 4-15). Within the developed environment category, the criteria included a comparison of the existing conditions and impacts to residential land uses, sensitive receptors, traffic conditions, commercial and industrial land uses, scenic roadways, cultural resources, and the potential to encounter subsurface contamination (Exh. EV-2, at 4-16 to 4-20).[71] Criteria within the natural environment category included tree clearing, wetland resource areas, state-listed rare species habitat, public water supplies, conservation land uses, and public shade trees (Exh. EV-2, at 4-20 to 4-23). Criteria within the constructability criteria included trenchless crossings, existing utility density, length of route, and hard angles (greater than 30 degrees) (Exh. EV-2, at 4-23 to 4-25). The Company stated that the environmental and constructability criteria in this proceeding are similar to the criteria it has presented to the Siting Board in other transmission line proceedings; however, Eversource also developed three unique criteria for route scoring of the Project (i.e., scenic roadways, public water supplies, and conservation lands) (Exhs. EFSB-RS-1; EFSB-RS-7; EFSB-RS-10).

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[70] The six routes that would be located entirely within public roadways are: Routes 4, 5, 5A, 6, 7, 8, and 11 (Exh. EV-2, at 4-10 to 4-14; 4-31). Protect Sudbury proposed Routes 5A, and 11, and the Town of Sudbury proposed Routes 7 and 8 (Exh. EFSB-RS-3).

[71] The Company quantified the potential to encounter subsurface contamination based on the number of sites, on or adjacent to each route option, where a documented release of oil and/or hazardous materials occurred, or where past land uses have been documented as "Disposal Sites" under the Massachusetts Contingency Plan ("MCP") (Exhs. EV-2, at 4-20; EFSB-RS-11). Eversource indicated that, unless there was a documented release or disposal site in the MCP database, it did not include potential subsurface contamination in its route scoring approach (Exh. EFSB-RS-11; Tr. 5, at 791-792).

Next, the Company calculated ratio scores to reflect potential impacts (Exh. EV-2, at 4-16). Eversource assigned a value of "1" to the criterion on the route with the highest potential for the corresponding impact; other routes received a ratio score between "0" and "1" indicating their relative potential impact for the particular criterion (Exh. EV-2, at 4-16).[72] The Company added scores for each criterion together to get a total raw ratio score for each candidate route (Exh. EV-2, at 4-16).

The Company then selected weights (1 to 5) for each scoring criterion (with higher weights having greater impact), intended to reflect the Company's assessment of: (1) the potential temporary and permanent impacts that could result from construction; (2) the availability of best management practices or construction techniques to minimize these temporary or permanent impacts; and (3) public input (Exhs. EV-2, at 4-15, 4-16, 4-25; EFSB-RS-1; EV-MB-2, at 5-6). Table 2 presents the weights that the Company assigned to the 17 criteria.

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[72] For example, if a hypothetical Route X with ten proximate residential structures has the highest potential residential unit impact, then the residential unit impact score of Route X is 10 structures/10 structures or "1" (Exh. EV-2, at 4-16). A hypothetical Route Y with five proximate residential structures has a residential structure impact score of 5 structures/10 structures or "0.5" (Exh. EV-2, at 4-16).

Table 2. Routing Analysis Criteria Weights Summary

	Criterion	Assigned Weight
Natural Environment	Public Shade Trees	1
	Tree Clearing Area	5
	Wetland Resource Area	5
	Public Water Supplies	3
	State-Listed Rare Species Habitat	5
	Conservation Land Use	3
Developed Environment	Residential Land Use	5
	Commercial/Industrial Land Use	4
	Sensitive Receptors	5
	Cultural Resources	2
	Scenic Roadways	4
	Potential for Traffic Congestion	5
	Potential to Encounter Subsurface Contamination	1
Constructability	Route Length	1
	Trenchless Crossings	3
	Utility Density	3
	Hard Angles	1

Source: Exh. EV-2, at 4-25.

Eversource stated that it assigned weights that are generally consistent with previous Siting Board cases for criteria such as residential land use, potential for traffic congestion, and commercial/industrial land uses (Exh. EFSB-RS-1). However, the Company increased the weights for the criteria of protected habitats, wetland resource areas, and trenchless crossings (Exh. EFSB-RS-1). Further, the Company chose to use a "1 to 5" scale, rather than a "1 to 3" scale as in previous proceedings, to provide more granularity in comparing the benefits and impacts of each option (Exh. EFSB-RS-1; Tr. 5, at 757-761). Eversource indicated that it designed its criteria and weights to reflect unique components of the Project and Study Area, and public feedback (Exhs. EFSB-RS-1; EFSB-RS-7).

Considering each option in turn, the Company multiplied the raw ratio score for each criterion by the assigned weight to develop a weighted score, then added the weighted scores of all the criteria to calculate a total weighted ratio score for each candidate route (Exh. EV-2,

at 4-16, 4-27 to 4-29). The lowest total weighted ratio scores indicate routes with the lowest potential impacts (Exh. EV-2, at 4-16).

For each of the remaining twelve geographic routes and related design options, the Company completed a reliability analysis and a conceptual (-25 percent/+50 percent) cost analysis (Exh. EV-2, at 4-33 to 4-35). Eversource determined that there were no substantial differences in the reliability risks of any of the options; and therefore, reliability was not a determining factor when comparing the Universe of Routes (Exh. EV-2, at 4-35). Table 3, below, provides weighted ratio scores and cost estimates along with the corresponding rankings for the twelve routes and their design variations. Following Table 3 is Figure 3 depicting the geographic location of each route.

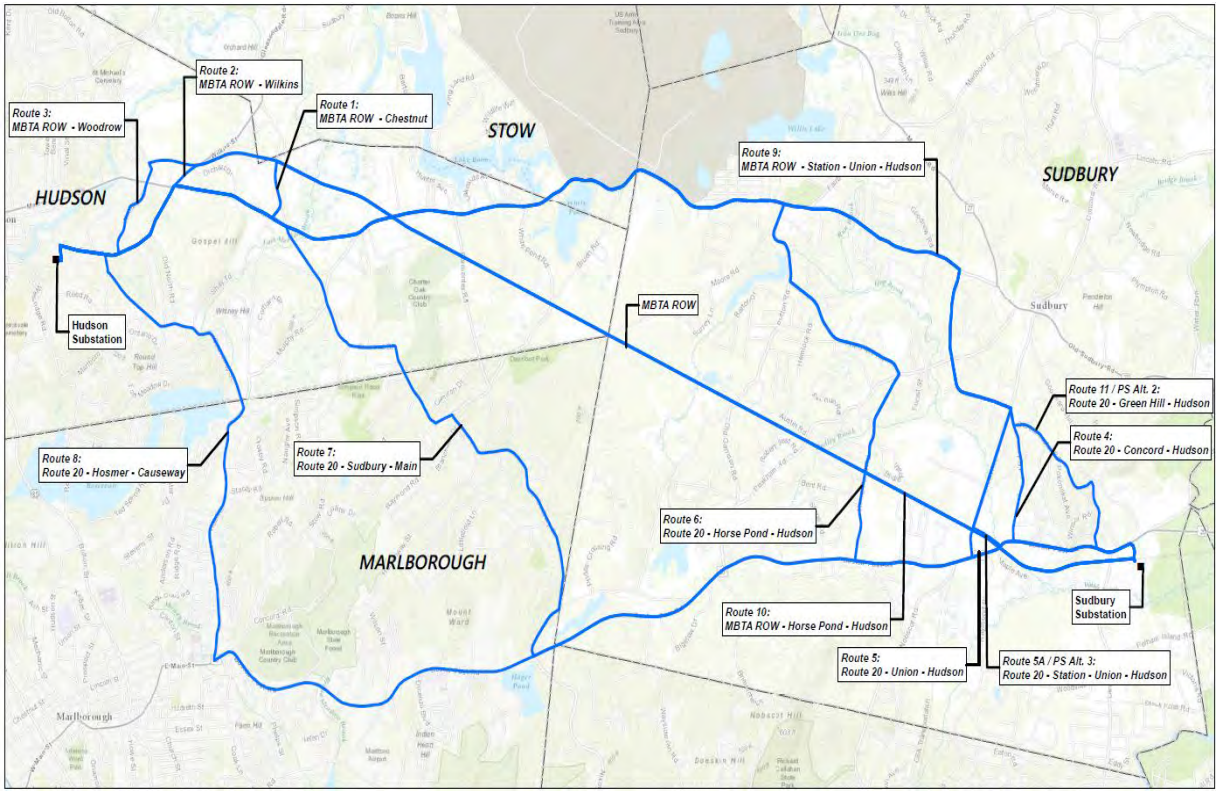
Table 3. Eversource Route Scoring Matrix

Route Options	Weighted Environmental Ratio Score	Weighted Env'l Ratio Ranking	Cost Estimate (Millions)*	Cost Ranking
1A: MBTA ROW Overhead to Chestnut	29.52	19	$50.5	3
1B: MBTA ROW Underground to Chestnut	20.76	4	$95.4	9
1C: MBTA ROW Hybrid to Chestnut	20.22	3	$88.1	6
2A: MBTA ROW Overhead to Wilkins ***(MBTA Overhead Route)***	29.03	16	$44.2	2
2B: MBTA ROW Underground to Wilkins ***(MBTA Underground Route)***	19.37	1	$91.0	7
2C: MBTA ROW Hybrid to Wilkins	20.83	5	$83.5	4
3A: MBTA ROW Overhead to Woodrow	29.27	17	$43.3	1
3B: MBTA ROW Underground to Woodrow	19.44	2	$94.5	8
3C: MBTA ROW Hybrid to Woodrow	20.91	6	$85.4	5
4: Route 20 to Concord to Hudson	25.49	8	$113.7	14
5: Route 20 to Union to Hudson	27.94	13	$119.7	17
5A: Route 20 to Station to Union to Hudson	26.45	11	$118.1	16
6: Route 20 to Horse Pond to Hudson	27.91	12	$120.2	18
7: Route 20 to Sudbury to Main	29.68	20	$127.0	19
8: Route 20 to Hosmer to Causeway	26.07	10	$132.9	20
9A: MBTA ROW Overhead to Station to Union to Hudson	29.43	18	$106.1	11
9B: MBTA ROW Underground to Station to Union to Hudson	28.09	15	$114.5	15
10A: MBTA ROW Overhead to Horse Pond to Hudson	27.99	14	$95.9	10
10B: MBTA ROW Underground to Horse Pond to Hudson	25.94	9	$109.4	12
11: Route 20 to Green Hill to Hudson ***(All-Street Route)***	25.41	7	$110.4	13

*costs do not include work at the Hudson Substation (approximately $5 million) (Exh. EV-2, at 5-84)

Source: Exh. EV-2, at 4-29, 4-34.

Figure 3. Universe of Routes



Source: Exh. EV-2, fig. 4-2.

Based on the consideration of environmental impacts, cost, and reliability, the Company selected Route 2B (the MBTA Underground Route) as its Primary Route for the Project (Exh. EV-2, at 4-36). Eversource stated that the MBTA Underground Route has the overall lowest weighted environmental score (Exh. EV-2, at 4-29). Eversource noted that Route 2A (MBTA Overhead Route) has a lower cost than the MBTA Underground Route, but greater potential for environmental impacts, so it selected the MBTA Overhead Route as a Noticed Variation to the Project (Exh. EV-2, at 4-36). The Company stated that, of the public roadway routes, Route 11 (the All-Street Route, using Route 20 to Green Hill to Hudson) has the lowest environmental score and the lowest conceptual cost (Exh. EV-2, at 4-29). This route – initially proposed by Protect Sudbury – was therefore selected as the Noticed Alternative Route (Exh. EV-2, at 4-37; EFSB-RS-3).

The Company indicated that in the early stages of the Project's development, the MBTA Overhead Route was presented to the towns and the public as the Company's preferred route for the Project (Tr. 5, at 823-829). Although it determined that the MBTA Underground Route had a lower environmental score compared to the MBTA Overhead Route, the Company initially selected the MBTA Overhead Route as its preferred route primarily on the basis of cost (Tr. 5, at 828-829). After meetings with towns and stakeholders, and further consideration of the greater environmental impacts of an overhead route, the Company decided to present the MBTA Underground Route as the Primary Route for the Project in its Petitions (Tr. 5, at 828-829).

C. Geographic Diversity

The Company stated that it developed and assessed a wide variety of routes within the Study Area (Exh. EV-2, at 4-37). Figure 3 shows the diversity of routes. The Company maintains that its selection of a route that follows the MBTA ROW and a route located entirely in public roadways represents geographically diverse alternatives (Exh. EV-2, at 4-2, 4-29).

D. Positions of the Parties

1. Town of Sudbury

The Town of Sudbury argues that the Company failed to demonstrate that it developed and applied a reasonable set of criteria for identifying and evaluating potential routes (Sudbury Brief at 41; Sudbury Reply Brief at 18). Sudbury states that the Company's route selection procedure is deficient in several ways (Sudbury Brief at 41).

First, Sudbury argues that during its initial screening, Eversource eliminated routes from its Universe of Routes prior to undertaking a quantitative assessment (Sudbury Brief at 41-42 citing Exh. EV-2, at 4-7, 4-9; Tr. 5, at 843-844). Sudbury asserts that the Company eliminated five routes based on "certain generalizations" of factors such as abutting land uses, historic resources, traffic conditions, and constructability constraints, and did not rely on a quantitative assessment or fixed procedures (Sudbury Brief at 43-44 citing Exh. EV-2, at 4-7; Tr. 5, at 771-772; RR-SUD-7). Further, Sudbury argues that the same factors that eliminated routes during the initial screening were quantitatively assessed during the second stage of the route selection process (Sudbury Brief at 43-44, citing Exh. EV-2, at 4-3; Tr. 5, at 843-844). The town

concludes that this approach subsequently affected the results of the route selection process by excluding routes with higher potential impacts, which it claims enabled the Company to control the strength of the criteria (Sudbury Brief at 42-43).

Second, Sudbury faults the Company's choice of criteria, and argues that constructability criteria should not be included as part of the route selection process (Sudbury Brief at 44). Citing the pre-filed testimony of Protect Sudbury, the town agrees that constructability criteria are temporary, site-specific factors that affect construction costs rather than environmental impacts (Sudbury Brief at 44, citing Exh. Protect-RC/RH/ML/MO-2). Sudbury contends that constructability factors should be included in the cost analysis of the routes, and not as a category in the environmental scoring process because they detract from a proper review of whether Eversource selected a route with minimal environmental impacts (Sudbury Brief at 44-45, citing Exh. Protect-RC/RH/ML/MO-2).

Additionally, Sudbury states that the design and weighting methods for the criteria are unreasonable (Sudbury Brief at 45). Sudbury claims that the Company's scoring unjustifiably treats impacts on the built environment as more important than impacts on the natural environment (Sudbury Brief at 45 citing Exh. EV-2, at 4-27). Specifically, Sudbury asserts that a weight of "3" for conservation land use does not reflect the permanent nature of impacts to the open space corridor (Sudbury Brief at 46, citing Exhs. EV-2, at 4-27; SUD-MJN/RMG-1, at 36). The town also states that calculating conservation land use by linear foot of frontage does not adequately quantify the impact to those resources (Sudbury Brief at 46, citing Exhs. EV-2, at 4-27; SUD-MJN/RMG-1, at 36). Sudbury argues that temporary impacts to the developed environment, such as traffic, are overstated by being assigned the highest weight of "5" (Sudbury Brief at 46, citing Exh. SUD-MJN-RMG-1(R) at 58). Further, Sudbury states that the four criteria that Eversource added to the routing analysis based on public input (scenic roadways, public water supplies, conservation lands, and tree clearing) did not result in a meaningful consideration of the stakeholder interests, as those criteria ranked poorly for the MBTA Overhead Route (Sudbury Reply Brief at 19, citing Exh. EV-2, at 4-27).

Sudbury outlines its concerns with the use of a ratio score (Sudbury Brief at 47). Sudbury presented exhibits during evidentiary hearings that it claimed illustrate how a ratio score allows the route with the highest environmental impact to skew the magnitude of the ratio scores

for the other routes within a category (Exhs. SUD-2; SUD-3; SUD-4; Tr. 5, at 856-875; Sudbury Brief at 47-50; Sudbury Reply Brief at 18). According to the town, this approach could result in routes with objectively equivalent environmental impacts scoring differently, or clearly superior routes being overlooked (Sudbury Brief at 47-50).[73]

Overall, on environmental grounds, Sudbury asserts that Eversource's scoring system: (1) fails to capture the intensity and importance of the permanent adverse impacts to the town; and (2) overstates the importance of impacts to the developed environment while understating the importance of permanent adverse impacts to the natural environment (Sudbury Brief at 46, citing Exh. Protect-RC/RH/ML/MO-2, at 12; Sudbury Reply Brief at 18, citing Exh. EV-2, Section 4). To illustrate its point, Sudbury asserts that the MBTA Underground Route would result in significant impacts to the natural environment, such as rare species and wildlife habitat, water resources, vernal pools, and conservation land, and argues that the scoring fails to reflect the route's impact to those types of natural resources (Sudbury Brief at 45-46, citing Exh. SUD-DMD-1).

Sudbury concludes that the Company's route selection methodology is unsound, unreliable, and fatally flawed, and that the Siting Board should deny the Project because the Company has not demonstrated that it minimized environmental impacts or ensured that clearly superior routes were not overlooked during the route selection process (Sudbury Brief at 50-51; Sudbury Reply Brief at 18).

2. Protect Sudbury

Protect Sudbury asserts that the Company's routing analysis is biased and that Eversource manipulated the weights and criteria, such that the All-Street Route, which Protect Sudbury

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[73] Sudbury suggests two alternatives to the Company's scoring approach (Sudbury Brief at 50). Rather than using the maximum data observed in each category as the denominator, Sudbury proposed either the use of the median or the lowest non-zero observation as the denominator, both resulting in the MBTA Underground Route scoring substantially lower/less impactful (Sudbury Brief at 50). Sudbury attached to its brief a chart purporting to show the resulting rankings using its alternative methods. To the extent that Sudbury is including evidence or analysis not included in the record of this matter, the Siting Board will not rely on such extra-record evidence. 980 CMR 1.06.

claims has virtually no environmental impacts, receives a worse score than the MBTA Underground Route (PS Brief at 38, 47). Protect Sudbury contends that the Company's route analysis unreasonably included constructability factors, failed to distinguish between short-term and long-term impacts, and failed to consider stakeholder input, and therefore, should be rejected by the Siting Board (PS Brief at 38-39, citing Exh. Protect-RC/RH/ML/MO-2, at 7-8; PS Reply Brief at 4-6, 11-12).

Protect Sudbury contends that constructability criteria are temporary, site-specific construction considerations that: (1) primarily impact cost; and (2) are already included in the conceptual cost estimates used in the route selection evaluation (PS Brief at 39, citing Exh. Protect-RC/RH/ML/MO-2, at 7-8). By including the constructability criteria within the environmental scoring component of the route selection analysis, Protect Sudbury contends that Eversource, in effect, double counts these costs in its evaluation (PS Brief at 39).[74] Protect Sudbury also argues that Eversource's analysis overstates construction considerations and places less weight on true environmental impacts of the routes by diluting the importance of the other environmental criteria it regards as valid (PS Brief at 39-40, citing Exh. Protect-RC/RH/ML/MO-2, at 8-9). Protect Sudbury concludes that there is no basis for including constructability as a subset of the environmental scoring analysis (PS Brief at 39, citing Exh. Protect-RC/RH/ML/MO-2, at 8-9).

Protect Sudbury also argues that Eversource's scoring does not adequately distinguish between temporary, short-term impacts and long-term, post-construction impacts (PS Brief at 41; PS Reply Brief at 11). Protect Sudbury asserts that the Company overstated temporary impacts and undervalued permanent impacts by: (1) assigning the same numerical weight ("5") to temporary, construction-phase disturbances (e.g., traffic, residential land use, sensitive receptors) as to permanent, natural environment disturbances (e.g., tree clearing); and (2) assigning

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74 As an example, Protect Sudbury points to the trenchless crossing criteria (included in the constructability category), which includes trenchless crossings in wetland resource areas; however, in the natural environment category, there is also a separate criterion for wetland resources (PS Brief at 39). Therefore, Protect Sudbury states that trenchless crossings should be included only in the wetland resource category rather than also being included as a construction category (PS Brief at 39, citing Exh. Protect-RC/RH/ML/MO-2, at 7-8).

unjustifiably low weighting values for impacts associated with long-term impacts (e.g., "1" for subsurface contamination, "3" for conservation land use) (PS Brief at 41, citing Exhs. Protect-RC/RH/ML/MO-2, at 11-15; Hudson-PH-1, at 3-7).[75]

Protect Sudbury conducted its own route scoring calculations to demonstrate the influence of the constructability criteria and to develop a method it views as more accurately reflecting potential long-term impacts. Table 4, below, summarizes the three different approaches that Protect Sudbury used in its route scoring calculations and the results.[76]

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75 Protect Sudbury characterizes the potential impacts to conservation land and potential impacts from subsurface contamination as permanent due to what it believes to be the permanent loss of open space, and a permanent risk of contamination and associated impacts, respectively (PS Brief at 41).

76 In Protect Sudbury Analysis III, two underground routes that follow a portion of the MBTA ROW ranked lower (less impactful) than the MBTA Underground Route (Routes 9B and 10B, and their overhead variations, 9A and 10A, respectively) (Exh. Protect-RC/RH/ML/MO-2). Route 9 (A or B) would leave the MBTA ROW at the intersection of Route 20 and Station Road in Sudbury, follow Union Avenue and Old Lancaster Road to Hudson Road, where it would then follow the same route as the All-Street Route (Exh. EV-2, at 4-11). Route 10 (A or B) would leave the MBTA ROW at Horse Pond Road in Sudbury, and follow Horse Pond Road, Pratts Mill Road, and Dutton Road to Hudson Road, where it would then follow the same route as the All-Street Route (Exh. EV-2, at 4-11).

Table 4. Protect Sudbury's Routing Analyses

	Description of Analysis	Results Compared to Eversource's Analysis
Protect Sudbury Analysis I	• Removed constructability criteria	• Reduced all total ratio scores and weighted scores • Environmental Rankings: 1: All-Street Route 2: MBTA Underground Route 19: MBTA Overhead Route See Exh. Protect-RC/RH/ML/MO-2, at 10, Table CEI-3
Protect Sudbury Analysis II	• Removed constructability criteria • Adjusted the weight of the residential, commercial/industrial land use, sensitive receptors, traffic impacts, and scenic roadway categories to be "0" for only the MBTA Underground and All-Street Routes to reflect the assumption that those categories would have minimal or no post-construction impacts to develop a "representative long-term impact" score. For the MBTA Overhead Route, only traffic impacts were assigned a "0" • Characterized Eversource's weighted ratio score as a "representative short-term impact" score • Developed a duration impact weighting for short-term impacts (5%) and long-term impacts (95%) based on Protect Sudbury's classification of the duration of construction activities and service life of the Project[77] • Multiplied the representative long-term and short-term scores by the percentage above to obtain weighted scores, and then added the short-term and long-term weighted scores to arrive at a total weighted score	• Protect Sudbury only conducted this analysis on the MBTA Underground Route, MBTA Overhead Route, and the All-Street Route, and therefore did not provide a revised ranking of all the routes • Stated that the total environmental score would be lower for the All-Street Route compared to the MBTA Underground Route • Protect Sudbury stated that by creating two separate scores, one for short-term impacts and one for long-term impacts, the analysis could represent a "trade-off" and balance between short-term and long-term impact • Protect Sudbury argued that the weights (5% and 95% in its example) could be adjusted to reflect stakeholder interests See Exh. Protect-RC/RH/ML/MO-2, at 13-14, 16, 17, Tables CEI-4, CEI-5

[77] Protect Sudbury refers to these as "duration impact weighting factors." Mathematically, Protect Sudbury calculated weights for long-term impacts (at 40 years) relative to short-term impacts (at two years) yielding a relative long-term impact weighting of 95 percent versus a short-term impact weighting of 5 percent (or a 19-to-1 ratio of long-term to short-term impact weightings) (PS Brief at 43).

	Description of Analysis	Results Compared to Eversource's Analysis
Protect Sudbury Analysis III	• Removed constructability criteria • Developed a duration impact weighting factor (1 to 5 scale) based on a 40-year project life-cycle • Multiplied each criteria by the weighting factor based on Protect Sudbury's assumption of the duration of impacts, while keeping all other weights from Eversource's analysis the same	• Increased all total weighted scores; changed the relative ranking of the routes • Environmental Ranking: 1: All-Street Route 14: MBTA Underground Route 19: MBTA Overhead Route See Exh. Protect-RC/RH/ML/MO-2, at 6, 19-20, Table CEI-7

Source: Exhs. Protect-RC/EH/ML/MO-2; EV-PS-8.

Protect Sudbury concludes that the modifications it performed to the Company's route scoring approach present a more accurate reflection of short-term and long-term impacts (PS Brief at 43-44, citing Exh. Protect-RC/EH/ML/MO-2). Protect Sudbury asserts that its analysis demonstrates that the All-Street Route would better mitigate short-term and long-term environmental impacts compared to either the MBTA Underground Route or the MBTA Overhead Route (PS Brief at 43-45, citing Exh. Protect-RC/EH/ML/MO-2). Protect Sudbury argues that selection of the All-Street Route would be consistent with previous Siting Board findings that underground projects in existing roadways avoid long-term environmental impacts and are a preferred approach (PS Brief at 44-45, citing East Eagle at 146).

Protect Sudbury states that the Company did not present a specific comparison of the environmental impacts of Transmission Alternative 2 to the routes included in the Universe of Routes (PS Brief at 46, citing Tr. 5, at 929). Further, Protect Sudbury argues that impacts of Transmission Alternative 2 should be considered incrementally, since Transmission Alternative 2 would be constructed in an existing utility ROW, which would reduce the severity of environmental impacts (PS Brief at 46, citing Exh. Protect-RC/EH/ML/MO-2, at 21). Protect Sudbury states that the Company's assertion that the Project compares favorably to Transmission Alternative 2 is without merit because the Company did not accurately consider the difference in short-term and long-term impacts between the two routes (PS Brief at 47, citing Exhs. EFSB-PA-36(R-2); Protect-RC/EH/ML/MO-2, at 21-23).

Finally, Protect Sudbury argues that the Company's assertion of "extensive community outreach" and its determination of "clear advantages of constructing the Project underground along the MBTA corridor" ignores the fact that, in Protect Sudbury's opinion, there is no

community support for the Project (PS Brief at 48-49; PS Reply Brief at 4-5). Protect Sudbury asserts that this shows that the Company has totally disregarded the community and minimized stakeholder participation in its decision-making process (PS Reply Brief at 4-5).

3. Company Response

The Company contends its route selection process was rigorous, thorough, and objective, and supports its selection of the MBTA Underground Route (Company Brief at 79). The Company states it developed and assessed a wide array of potential routes and design variations, developed and applied a reasonable set of criteria to analyze impacts, and identified a Primary Route, Noticed Variation, and Noticed Alternative Route that balance environmental impacts, cost, and reliability (Company Brief at 84-86, citing Exh. EV-2, at 4-37; Company Reply Brief at 39). The Company's responses to specific arguments on aspects of the route selection process are outlined below.

a. Initial Screening Process

In response to the Town of Sudbury's arguments that the initial screening process was flawed, the Company states that it evaluated a variety of factors before it eliminated routes for further consideration during the initial screening process (Company Reply Brief at 40). Eversource states that the routes eliminated during the initial screening process had a variety of negative attributes and were therefore unsuitable for the Project, and "did not possess any positive attributes over any of the alternatives that were not eliminated" (Company Reply Brief at 40-41, citing Exhs. EV-2, at 4-6 to 4-8; EV-MB-2, at 3; Tr. 5, at 836). The Company argues that its initial screening process is consistent with Siting Board precedent, and that it did not overlook or eliminate any clearly superior routes (Company Reply Brief at 41, citing Woburn-Wakefield at 34-65; East Eagle at 63-76; Mystic-Woburn at 26-31; Walpole-Holbrook at 32-37).

b. Constructability Factors

Both Protect Sudbury and the Town of Sudbury expressed concerns regarding the use of constructability criteria in the Company's scoring analysis. The Company states that

constructability criteria provide a measurable factor to differentiate between the duration and magnitude of impacts along a given route that are not otherwise captured (or duplicated) in the environmental or cost categories (Company Brief at 76 n.53; Company Reply Brief at 42, citing Exhs. EV-MB-2, at 11; EV-DAS/DB-1, at 2).[78]

Specifically, the Company asserts that constructability factors identify components of a route that may lead to a longer construction period (i.e., a longer period of impact to abutting land uses) and a greater amount of disturbance (e.g., wider width of trench for underground lines, or increased number of splice vaults) (Company Reply Brief at 43, citing Exh. EV-MB-2, at 12). Eversource argues that the constructability criteria it selected represent factors that would result in increased impacts to the environment and abutting land uses along a route (Company Reply Brief at 43-44, citing Exh. EV-MB-2, at 12). Contrary to the Town of Sudbury and Protect Sudbury assertions, Eversource maintains that not all impacts flowing from constructability issues can be accounted for as impacts to the natural and developed environment, and that constructability should not be eliminated as an individual criterion (Company Reply Brief at 43). Finally, the Company argues that it routinely includes constructability criteria in its route selection process, and the Siting Board has previously found these criteria to be appropriate (Company Reply Brief at 44, citing Woburn-Wakefield at 39, 65; East-Eagle at 65, 74; Mystic-Woburn at 29, 32).

c. Evaluation Criteria

The Company argues that it selected criteria that allow for an appropriate analysis of the different variables, corridors, environmental features, and designs of its candidate routes

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78 The Company notes several examples of how its constructability factors can influence the duration and magnitude of environmental impacts: (1) trenchless crossings can result in a prolonged period of impact to abutting uses, and greater disturbance to abutters at exit and entry pits; (2) existing utilities, and their density, can affect construction duration and resulting impacts to abutters; (3) length of a route is closely related to construction duration and corresponding impacts to abutters; and (4) hard angles produce bends in the cable that can increase construction difficulty, require additional splice vaults, increase land areas of land disturbance, and increase construction duration (Company Reply Brief at 43).

(Company Reply Brief at 46, citing Exh. EV-MB-2, at 4-5). Eversource states that its criteria are designed to reflect natural and developed environmental characteristics in the Study Area, while also identifying temporary and permanent impacts, and differentiate between construction methods (Company Reply Brief at 46-47, citing Exh. EV-MB-2, at 4-5). The Company dismisses the Town of Sudbury and Protect Sudbury criticisms, and contends that their approach "overlooked the need for certain criteria and the need to evaluate both temporary and permanent impacts from construction along each of 20 route options" (Company Reply Brief at 47, citing Exh. EV-MB-2, at 4-5).

The Company adds that it included several additional criteria specifically recommended by stakeholders including: Scenic Roadways; Public Water Supplies; Conservation Lands; and Tree Clearing (Company Reply Brief at 47, citing Exh. EV-MB-2, at 4-5). However, the Company takes issue with Protect Sudbury's use of an additional "impact duration criterion" claiming the Company already properly accounted for the duration of temporary and permanent impacts in its choice of criteria and weights (Company Brief at 76 n.54; Company Reply Brief at 44).

In sum, Eversource states that the criteria it selected appropriately characterize and quantify relevant potential temporary and permanent impacts of each route (Company Reply Brief at 45-46). Eversource contends that the criteria it used allowed for an appropriate analysis of all the different variables encountered in a diverse array of route options, with different types of project designs, and that many of the criteria it used are consistent with the criteria reviewed and approved by the Siting Board in past projects, including other recent Greater Boston Area projects (Company Reply Brief at 46-47, citing Exhs. EFSB-RS-1; EV-MB-2, at 4-5).

d. Weighting and Scoring of Routes

The Company asserts that the criteria weights it selected and its use of ratio scoring are also consistent with past Siting Board cases (Company Brief at 78 n.55, citing East Eagle at 66-68, 74; Mystic-Woburn at 29-32; New England Power Company d/b/a National Grid, EFSB 12-1/D.P.U. 12-46/12-47 (2014) at 45; NSTAR Electric Company, EFSB 10-2/D.P.U. 10-131/10-132 (2012) at 55-57; Western Massachusetts Electric Company, EFSB 08-2/D.P.U. 08-105/08-106 (2010) at 44-47; Needham-West Roxbury;

Woburn-Wakefield; Company Reply Brief at 39). Eversource states that the selected weights for each criterion serve to represent the importance of each criterion (Company Reply Brief at 47, citing Exh. EV-MB-2, at 14).

For example, the Company notes that categories of tree clearing, public shade trees, wetland resource areas, and state-listed rate species habitat identify anticipated areas of disturbance that are permanent, and therefore given the highest level of importance with an assigned weight of 5 (Company Brief at 76 n.54, citing Exh. EV-MB-2, at 7-8). Further, the Company maintains, the following two criteria reflect temporary impacts: traffic congestion and potential for subsurface contamination, and while traffic is accorded a high level of importance with a weighting factor of 5, the Company used a weighting factor of 1 for sub-surface contamination (Company Reply Brief at 45, citing Exh. EV-MB-2, at 15-17). The Company also contends that it applied certain criteria, such as adjacent conservation lands, in a context-specific manner, with no impacts assumed for in-road construction, in contrast with inclusion of these areas (and a weighting factor of 3) for the MBTA ROW routes (Company Brief at 76 n.54, citing Exh. EV-MB-2, at 7-8).

In response to Protect Sudbury's argument that assigning a weight of "5" to construction-related impacts such as traffic, residential land use, and sensitive receptors is unreasonably high, the Company contends that Protect Sudbury completely ignores the relevance of impacts from construction and dismisses them as insignificant, overlooking the reality that construction impacts are not inconsequential to an abutting business, residence or sensitive receptor (Company Reply Brief at 48, citing Exh. EV-MB-2, at 13).

In response to Protect Sudbury's argument that a weight of "1" undervalues that long-term impacts of the potential to encounter subsurface contamination, Eversource argues that: (1) each candidate route has the potential to encounter undocumented or unknown sources of hazardous materials; and (2) the Company's extensive experience managing and monitoring potential hazardous materials, in coordination with regulatory frameworks, would minimize the potential risk of hazardous materials (Company Reply Brief at 50-51, citing Exh. EV-MB-2, at 18-19).

In response to Sudbury's argument that assigning a weight of "3" to adjacent conservation land is insufficient, Eversource argues that there would be no direct impact to or

loss of conservation land, as the MBTA ROW is not protected open space (Company Reply Brief at 48-50, citing Exhs. EV-2, at 5-43; EV-MB-2, at 15-16). In fact, Eversource contends that, rather than causing any long-term adverse impacts to adjacent conservation land, the co-development of the DCR's MCRT with the Project would greatly enhance the ROW's open space character with associated recreational attributes, and improved regional connectivity to adjacent conservation lands for greater public use, enjoyment, and appreciation (Company Reply Brief at 50, citing RR-SUD-10).[79] The Company acknowledges that there could be some potential indirect impacts to adjacent conservation lands during construction and tree-clearing in the MBTA ROW, but notes that an undisturbed buffer would remain intact between the edge of Project construction and the boundary between the MBTA ROW and adjacent conservation lands (Company Reply Brief at 50, citing RR-SUD-10). In view of these considerations, the Company argues that a weighting of 3 for this criterion is reasonable and appropriate (Company Reply Brief at 50).

With respect to the Town of Sudbury's and Protect Sudbury's arguments regarding the Company's scoring method, the Company contends that the arguments illustrate their "self-interest in the route selection process" and that different stakeholder's views on appropriate criteria and weighting would inevitably differ (Company Reply Brief at 51-52). With regard to Protect Sudbury's route scoring analyses, the Company maintains that the results differ from the Company's given that Protect Sudbury is "injecting its own subjectivity into these [criteria] assignments" (Company Reply Brief at 50, n.27). Eversource argues that Protect Sudbury's routing analysis, scoring, and matrices are unbalanced and do not reflect input from the full group of stakeholders within the Project area (Company Reply Brief at 52). In particular, the Company criticizes Protect Sudbury's elimination of constructability criteria, and use of a duration weighting factor, which the Company argues does not consider the balanced input of all stakeholders within the Project area and does not constitute an "objective, data-driven route selection process" (Company Reply Brief at 52). The Company asserts that Protect Sudbury's

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[79] The Company also notes that it did not include abutting conservation land uses in its evaluation of in-street routes, which means that only conservation land abutting the MBTA ROW is considered (Company Reply Brief at 48-50).

revised scoring matrices should be give no weight; instead, Eversource argues that its scoring approach should be accepted by the Siting Board, as it properly identifies the relative importance of each individual criterion, is appropriate, reasonable, and consistent with its past practices approved by the Siting Board (Company Reply Brief at 50-53, citing Woburn-Wakefield at 67).

e. Stakeholder Engagement

The Company asserts that it developed and supplemented its routing analysis with significant feedback from identified stakeholders (Company Reply Brief at 54-55, citing Exhs. EV-2, at 1-10 to 1-12, 4-4 to 4-5; EFSB-RS-1; Tr. 5, at 839; Protect-21; Protect-2-80; Protect-2-118). Eversource states that beginning in January 2014, it conducted more than 48 meetings with federal, state, and municipal officials; residents and business owners; and other stakeholders such as Protect Sudbury (Company Reply Brief at 54, citing Exhs. EV-2, at 1-10 to 1-12, 4-4 to 4-5; EFSB-RS-1; Tr. 5, at 839; Protect-21; Protect-2-80; Protect-2-118).[80] The Company asserts that it used input from those meetings to add routes to the Universe of Routes, increase the weight of existing criteria, add new criteria, expand the visual impact assessment, conduct an analysis of potential impacts to public water supplies, and add local historic sites to its site evaluation (Company Reply Brief at 54-55). Eversource notes that several routes within the Universe of Routes were proposed by either the Town of Sudbury or Protect Sudbury and that feedback from municipal officials significantly modified its route selection process (Company Reply Brief at 54-55). In conclusion, the Company argues that its route selection process comprehensively addresses the Siting Board's standards and that the record demonstrates that Eversource has "developed and applied a reasonable set of criteria for identifying and evaluating alternative routes" (Company Reply Brief at 55).

[80] The Siting Board notes that the Company has made references to both "more than 48 meetings'" and "almost 60 outreach meetings" when describing its outreach efforts in its brief. See Company Reply Brief at 54, 81.

E. Analysis and Findings on Route Selection

The Siting Board requires that applicants consider a reasonable range of practical siting alternatives and that proposed facilities are sited in locations that minimize cost and environmental impacts. In past decisions, the Siting Board has found various criteria to be appropriate for identifying and evaluating route options for transmission lines and related facilities. These criteria include natural resource impacts, land use impacts, community impacts, cost and reliability. Needham-West Roxbury at 21; Woburn-Wakefield at 64; Boston Edison Company d/b/a NSTAR Electric, EFSB 04-1/ D.P.U. 04-5/04-6 (2005) at 43-44. The Siting Board has also found the specific design of scoring and weighting methods for chosen criteria to be an important part of an appropriate route selection process. Needham-West Roxbury at 21; Woburn-Wakefield at 65; Boston Edison Company, EFSC 89-12A, at 34-38 (1989).

The Company developed a broad area to evaluate its routing options for a 115 kV transmission line between the Sudbury and Hudson Substations, and looked for existing linear corridors, such as rail, gas, and electric ROWs, and public roadways, which appeared feasible for construction of a new line and would provide a reasonably direct route between the two substations. The resulting Universe of Routes, which included several routes proposed by stakeholders, such as the Town of Sudbury and Protect Sudbury, consisted of 21 geographically distinct routes. The Company used an initial qualitative screening process to eliminate nine of these route alignments as inferior for a variety of reasons, leaving twelve route options, plus variations, for more detailed evaluation. The route options comprise a diverse mix including overhead and underground use of the MBTA ROW, use of a variety of public roadways, and combinations thereof.

Eversource's initial qualitative screening process considered potential impacts such as abutting land uses; proximity of wetlands, waterways, and rare species habitat; existing traffic patterns and volumes; constructability considerations; easements or other property requirements; and feedback from stakeholders. The Town of Sudbury argues that this initial screening, completed without quantitative scoring and costing analysis across routes, could skew the comparison between routes later in the route selection process. The Company asserts that the routes eliminated in its initial screening were not suitable and did not exhibit any positive attributes compared to routes that were advanced.

The Siting Board does not concur with the assertions of the Town of Sudbury that the Company's qualitative initial screening process was designed to skew route scoring more favorably towards the Company's Preferred Route. Rather, the record shows that the Company used appropriate siting considerations and established Siting Board precedent, in winnowing down the Universe of Routes to a more manageable number for rigorous quantitative analysis in its route selection process. Moreover, none of the routes eliminated in this initial screening phase demonstrated any particular advantages not otherwise captured by one or more of the remaining routes under consideration. Accordingly, the Siting Board considers the Company's process for developing its Universe of Routes, and its initial qualitative screening, to be appropriate, and notes that these initial steps for route selection are consistent with the criteria, outreach process, and analytical approaches the Siting Board has previously found acceptable.[81] See Needham-West Roxbury at 21; Woburn-Wakefield at 65.

The Company then developed and applied a quantitative scoring system for ranking the routing options. Based on its evaluation of environmental impacts, cost, and reliability, the Company selected: (1) the MBTA Underground Route as the Primary Route; (2) the MBTA Overhead Route as the Noticed Variation; and (3) the All-Street Route as the Noticed Alternative Route. The Town of Sudbury and Protect Sudbury raised various concerns about the Company's route scoring approach, including its inclusion of constructability and other criteria, weightings, and the use of ratio scores.[82]

With respect to the use of constructability criteria, the Town of Sudbury and Protect Sudbury argue that they should not be included as part of the route selection process. Both the town and Protect Sudbury view constructability criteria as temporary, site-specific factors that primarily affect construction costs rather than environmental impacts, and, in any event, would already be captured in other specific environmental criteria. Both parties contend that

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81 The Siting Board notes that the Company evaluated routes proposed by the Town of Sudbury and Protect Sudbury during its initial evaluation, with four of those intervenor-suggested routes moving on to be scored as a part of the route options.

82 The Siting Board notes that the Company added several criteria to respond to concerns raised during its stakeholder outreach process.

constructability factors detract from a proper environmental review, given that they result in less weight given to "true environmental impacts." They further argue that the use of constructability criteria essentially double counts cost in the evaluation of routes.

The Company argues that constructability issues are not adequately captured within the environmental criteria, and that constructability criteria are more granular and address the duration and magnitude of key impacts to abutting land uses. The Siting Board notes the importance of consideration of constructability in the choice of routing a needed facility. The Siting Board concurs with the Company's view that constructability criteria help inform the review of the magnitude and duration of impacts – a unique characteristic that is neither strictly cost-related nor environmental impact-related – and capture a unique attribute of construction impacts to abutters and area residents. Moreover, the Siting Board has accepted the use of constructability criteria in numerous past cases, and the logic and value of this method is well established. See Lowell-Tewksbury at 36, 40; Needham-West Roxbury at 22, 25; Woburn-Wakefield at 36, 65.

With respect to the selection of the scoring criteria and weights, there is general agreement with the principle that the proper use of weighting methods for chosen criteria is an important part of an appropriate site selection process in order to reflect the relative importance of the various criteria. However, the Town of Sudbury and Protect Sudbury argue that the weights selected by the Company unjustifiably treat impacts to the built environment as more important than impacts on the natural environment, and that impacts to the built environment are temporary while those to the natural environment are persistent.

The weighting method used by the Company, contrary to the criticisms of the Town of Sudbury and Protect Sudbury, provides a balanced consideration of both impacts to the natural and built environments, and places greater emphasis on the more impactful criteria, whether these are related to short-term or long-term effects. While the Town of Sudbury and Protect Sudbury assert that greater weight should be accorded to natural rather than built environment impacts, construction impacts, such as traffic, noise, and other disturbances, can be highly disruptive, and a source of great concern to abutters and area residents – even if limited in duration. Moreover, we do not view the Company's weighting system as neglecting or short-changing concern for the natural environment. In fact, Eversource's weighting system for

the natural and built environment criteria categories included three top-weighted criteria (that is, a weighting of 5) in each category.[83]

Furthermore, the Siting Board notes that there is not a strict distinction between natural and built environment criteria, and that a number of the criteria identified as "built environment impacts" in fact relate to the natural environment. For example, the Company's scenic roads criteria is categorized as a built environment criteria; however, the Company stated that this criteria reflects potential impacts from tree clearing and stone wall removal, which the Siting Board views as relevant to the natural environment.

The Siting Board does see some merit in the Town of Sudbury's and Protect Sudbury's arguments that certain weighting factors (such as conservation land along the routes) could have been more heavily weighted. However, we note that the Company did not evaluate conservation land along the in-street routes, which, to a great degree, offsets any under-weighting of this criterion for the routes using the MBTA ROW.[84]

With respect to ratio scoring, the Town of Sudbury states that this method could result in routes with equivalent environmental impacts scoring differently, or clearly superior routes being overlooked. The Siting Board does not agree with this assessment. First, ratio scoring serves an essential quantitative purpose, by transforming disparate measurement scales used across the various criteria into a comparable metric – a ratio of raw data for a particular criterion for a specific route (the numerator) compared to the raw data for the worst route for that criterion (the

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83 The relative importance of the natural and built environment categories in route scoring is a function of both the criteria used and their weights. In this case, the natural environment category included six criteria, with a weighting factor total of 22, while the built environment category included seven criteria, with a weighting factor total of 26. Neither the Town of Sudbury nor Protect Sudbury suggested adding or deleting any criteria used by the Company in either category.

84 A drawback of this approach is that if one in-street route is adjacent to more conservation land than another in-street route, the Company's route selection analysis would have not distinguished between them. The Siting Board notes that the record identifies a number of conservation properties abutting various in-street routes (Exhs. EV-1, figure 5-7; EFSB-LU-14). Accordingly, we conclude that the Company's route selection process would have benefitted from the inclusion of conservation land abutting in-street routes in the route selection evaluation criteria.

denominator). By achieving a normalized metric, across all routes and all criteria, ratio scoring enables the appropriate comparison and weighting of factors. Second, the use of a similar ratio scoring method, where the denominator is the maximum data observed in each category, was recently considered in Woburn-Wakefield, and, as in that decision, the Siting Board continues to find that the use of ratio scoring is appropriate. See Woburn-Wakefield at 67-68.

Protect Sudbury provided three different methods of route scoring that illustrate its criticisms of the Company's approach. In all three methods, Protect Sudbury eliminated the Company's constructability criteria. Protect Sudbury also developed two methods of impact duration weighting, which it applied following the elimination of the constructability criteria. The results of each of these methods ranked the All-Street Route with a lower environmental score than the MBTA Underground Route, and in the two methods for which Protect Sudbury provided rankings, the All-Street Route ranked as the route with the lowest (i.e., least impactful) environmental score. Protect Sudbury concluded that its analysis more accurately reflects long-term impacts and demonstrates the biasing influence of constructability criteria.

With respect to Protect Sudbury's proposed elimination of the constructability criteria, the Siting Board notes that, as discussed above, constructability criteria assist in the evaluation of the magnitude and duration of impacts and provide valuable insights. For this reason, among others, the Protect Sudbury route scoring analyses are deficient. The impact duration factors developed by Protect Sudbury in support of its Analysis III resulted in a change to the relative ranking of all the route options.[85] The Siting Board does not find the use of an impact duration factor to be warranted or an improvement to the Company's route scoring approach. Impact duration is, indeed, a relevant concern with regard to natural and built environment impacts. However, the use of weighting factors alone is a more practical and inclusive way of assessing the overall importance of a criterion's impact, including its duration, magnitude, and other

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[85] For Protect Sudbury Analysis III, the All-Street Route received the lowest environmental score and the MBTA Underground Route ranked 14th. Two routes along the MBTA ROW (Routes 9 and 10, as either underground or overhead options) score lower than the MBTA Underground Route. However, Routes 9 and 10 follow the same roadways as the All-Street Route in Stow and Hudson, and at least a portion of the All-Street Route in Sudbury and would not provide the necessary geographic diversity to the All-Street Route.

qualitative and quantitative considerations. The Siting Board further notes that, while there are certainly differences in the duration of impacts, contrary to the Town of Sudbury's and Protect Sudbury's views, a short-term impact does not necessarily equate to a less-severe impact.

The Town of Sudbury and Protect Sudbury contest various aspects of the Company's route scoring methodology and are correct that it inherently reflects certain subjective assessments – upon which the Company and the Town of Sudbury and Protect Sudbury differ sharply. However, the significance of any such differences and scoring outcomes is largely mooted by fact that in Section VI below, the Siting Board undertakes a detailed comparison of the routing choices favored by the Company and the Town of Sudbury and Protect Sudbury, respectively: the All-Street Route (favored by the Town of Sudbury and Protect Sudbury); the MBTA Underground Route (favored by the Company); and the MBTA Overhead Route, (originally preferred by the Company, but not currently favored by any party). There is no record evidence that another route would be clearly superior to all three routes analyzed in detail below, on the basis of environmental, cost, and reliability, nor that the Company precluded any party's preferred route from receiving a comprehensive review.[86] Based on the considerations above, the Siting Board concludes that the route selection process used by the Company did not overlook or eliminate any clearly superior routes.

The Siting Board encourages project applicants to engage with stakeholders early in its route selection process, in order to identify additional routes and criteria that are important to stakeholders, and to incorporate feedback into its analysis. As noted in its findings in Woburn-Wakefield, the Siting Board also encourages the applicants to pursue a good faith effort to consult jointly with affected communities and stakeholders in its route selection process. See Woburn-Wakefield at 71.

The Siting Board notes that the Company has undertaken extensive outreach, including holding 48 separate meetings with various stakeholders, and sought a collaborative approach with stakeholders in this proceeding. In fact, several of the routes in the Company's Universe of

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[86] Protect Sudbury argued that its revisions to the route selection analysis would reorder the ranking of the routes, not that the Company overlooked any specific routes that would have been superior.

Routes were suggested by stakeholders, including the Town of Sudbury and Protect Sudbury. The Siting Board notes that the Company's Noticed Alternative Route, the All-Street Route, was originally presented to the Company by Protect Sudbury. Further, the Company added evaluation criteria, such as public water supplies and conservation land, to reflect the concerns of stakeholders. The Company stated that it selected the MBTA Underground Route as its Primary Route, despite its higher cost, based on the importance of the environmental factors; a decision it claims was partially influenced by public feedback. While parties in this proceeding argued that consultation with the community and stakeholders was insufficient, the Siting Board concludes that the Company engaged with stakeholders early in its route selection process and incorporated significant public input into its analyses.

With respect to Protect Sudbury's argument that the Company did not compare Transmission Alternative 2 to the Universe of Routes, the Siting Board notes that the Transmission Alternative 2 was presented by the Company as a transmission alternative as part of the alternative project approach analysis. See Section IV.B.2. In Section IV.D, the Siting Board found that a transmission line between the Sudbury and Hudson Substations is the best project approach for meeting the identified need. In its route selection analysis, the Company is tasked with evaluating siting alternatives for the preferred project approach. Accordingly, the selected project approach is carried forward to the route selection analysis, and this did not and should not include Transmission Alternative 2 based on the findings above.

With regard to geographic diversity, the Company identified a Noticed Alternative Route (aka the All-Street Route) which utilizes a significantly different linear corridor, located completely within public roadways, between the Sudbury and Hudson Substations. The Siting Board concludes that the All-Street Route is geographically diverse from the MBTA Underground and Overhead Routes.

Based on the route selection process described above, the Siting Board finds that the Company has: (1) developed and applied a reasonable set of criteria for identifying and evaluating alternative routes in a manner that ensures that it has not overlooked or eliminated any routes that are on balance clearly superior to the proposed Project; and (2) identified a range of transmission line routes with some measure of geographic diversity. Therefore, the Siting Board finds that the Company has demonstrated that it examined a reasonable range of practical siting

alternatives and that its proposed facilities are sited in locations that minimize cost and environmental impacts while ensuring a reliable energy supply.

VI. ANALYSIS OF THE MBTA UNDERGROUND AND OVERHEAD ROUTES AND THE ALL-STREET ROUTE

In this section, the Siting Board analyzes the MBTA Underground Route, the MBTA Overhead Route and the All-Street Route based on environmental impacts, cost, and reliability. Based on the evidence and findings presented below, the Siting Board concludes that the MBTA Underground Route is superior to the MBTA Overhead Route and the All-Street Route with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

A. Standard of Review

In implementing its statutory mandate under G.L. c. 164, §§ 69H, 69J, the Siting Board requires a petitioner to show that its proposed facility is sited at a location that minimizes costs and environmental impacts while ensuring a reliable energy supply. To determine whether such a showing is made, the Siting Board requires a petitioner to demonstrate that the proposed route for the facility is superior to the alternative route on the basis of balancing environmental impact, cost, and reliability of supply. Vineyard Wind at 35; Needham-West Roxbury at 32; Woburn-Wakefield at 71.

The Siting Board first determines whether the petitioner has provided sufficient information regarding environmental impacts and potential mitigation measures to enable the Siting Board to make such a determination. The Siting Board then examines the environmental impacts of the proposed facilities and determines: (1) whether environmental impacts would be minimized; and (2) whether an appropriate balance would be achieved among conflicting environmental impacts as well as among environmental impacts, cost, and reliability. Finally, the Siting Board compares the routes to determine which is superior with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. Vineyard Wind at 35; Needham-West Roxbury at 32; Woburn-Wakefield at 71.

B. Description of the MBTA Underground and Overhead Routes, and the All-Street Route

1. MBTA Underground Route

The Company's MBTA Underground Route starts at the Sudbury Substation, located off of Route 20 in Sudbury, and travels northwest within an existing MBTA ROW for approximately 7.6 miles through the municipalities of Sudbury, Stow, Marlborough, and Hudson (Exh. EV-2, at 5-3). At the intersection of the MBTA ROW and Wilkins Street (Route 62) in Hudson, the MBTA Underground Route leaves the MBTA ROW and proceeds southwest beneath Wilkins Street and Forest Avenue for approximately 1.4 miles before terminating at the Hudson Substation on Forest Avenue (Exh. EV-2, at 5-3).

2. MBTA Overhead Route

The MBTA Overhead Route follows the same approximately nine-mile route as the MBTA Underground Route, but would use an overhead transmission design rather than underground construction along the MBTA ROW (Exh. EV-2, at 5-3).[87] As with the MBTA Underground Route, the MBTA Overhead Route would use an underground, in-street transmission design for approximately 1.4 miles in Hudson, between the intersection of the MBTA ROW and Wilkins Street, and the Hudson Substation (Exh. EV-2, at 5-3).

3. All-Street Route

The Company's All-Street Route consists of an approximately 10.3-mile-long in-street underground transmission line (Exh. EV-2, at 5-4). Beginning at the Sudbury Substation, the All-Street Route travels west under Route 20 for 1,400 feet, turns north onto Green Hill Road for 2,300 feet, and then west onto Old Lancaster Road (and a short section of Concord Road), for approximately two miles (Exh. EV-2, at 5-4; RR-EFSB-51). At the intersection of Old Lancaster Road and Hudson Street, the All-Street Route turns west onto Hudson Road, which becomes

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87 The Company would use underground transmission line construction from terminals in the Sudbury Substation to the nearby MBTA ROW, where the New Line would transition to an overhead design (Exh. EV-2, at 5-3).

Sudbury Road in Stow, and then continues west onto State Road, which becomes Main Street in Hudson, for a total of approximately 6.2 miles (Exh. EV-2, at 5-4, figure 5-3 sheet 10 of 17; RR-EFSB-51). At the intersection of Main Street and Forest Avenue in Hudson, the All-Street Route turns southwest for approximately 1.2 miles and terminates at the Hudson Substation (Exh. EV-2, at 5-4; RR-EFSB-51).

4. Substation Upgrades

A common feature of the Project, regardless of route, is that it would require upgrades at Eversource's Sudbury Substation and HLPD's Hudson Substation (Exh. EV-2, at 5-4, 5-8 to 5-9). The Company described a number of modifications to the Sudbury Substation that would be required to accommodate the Project, including the installation of 115 kV breakers, an air-core shunt reactor, surge arrestors, and a 100-foot-tall shielding mast (Exh. EV-2 at 5-5).[88] According to the Company, modifications at the Sudbury Substation would not require expansion of the existing substation fenceline regardless of whether the MBTA Underground or Overhead Routes, or the All-Street Route was selected (Exh. EV-2, at 1-6, 5-5).

Regarding the Hudson Substation, Eversource stated that modifications would include the installation of three new 115 kV circuit breakers, changes to existing bus work, and retermination of the existing H-160 and N-166 transmission lines (Exhs. EV-2, at 5-8 to 5-9; EFSB-HLP-6). The fenced enclosure at the Hudson Substation would be expanded by approximately 10,000 square feet to accommodate this work (Exh. EFSB-HLP-6). The modifications proposed at the Hudson Substation would be identical regardless of the route selected (Exh. EV-2, at 5-8; Tr. 14, at 2469-2470).

C. General Description of Project Construction

Eversource described the construction methods that would be used for the MBTA Underground Route and the MBTA Overhead Route (together the "MBTA Routes"), the

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88 Eversource stated that the shunt reactor would be required to compensate for the reactive power produced by the New Line and would not be necessary if overhead construction were used (as proposed under the MBTA Overhead Route) (Exh. EV-2, at 5-7; Tr. 1, at 99).

All-Street Route, and the two substations. While different approaches would be required for underground and overhead transmission line construction along the MBTA ROW, all three routes would use the same construction methods for the in-street portions of the New Line.

1. Underground Construction Along the MBTA ROW

Eversource indicated that underground transmission line construction along the MBTA ROW would proceed in six phases: (1) vegetation removal; (2) implementation of erosion and sedimentation controls; (3) steel rail and wooden tie removal, and access road subgrade construction; (4) construction of the duct bank and splice vault system; (5) cable pulling and splicing, testing, and commissioning; and (6) access road final grading, and site restoration (Exh. EV-2, at 5-11 to 5-13).

The MBTA ROW is generally 82.5 feet wide (Exh. EFSB-C-12(R1)(2) at 4). To prepare the MBTA ROW for its use, Eversource would remove trees from an approximately 22-foot-wide corridor along the MBTA Underground Route (Exhs. EV-2, at 5-11; EV-18, at 6). A 22-foot-wide construction platform would be established within this cleared area, consisting of a 14-foot-wide access road for construction vehicles, space for the four-foot-wide transmission duct bank (offset from the access road by two feet), and an additional four feet of space to facilitate installation of the New Line (Exh. EV-2, at 5-13; Tr. 8, at 1343).[89] Grading and leveling would be completed as necessary along the MBTA ROW to achieve final grades appropriate for the Company's access road (Exh. EV-2, at 5-12). Eversource stated that any excess soil would be removed from the construction area and transported to a temporary construction laydown area, or, following soil characterization, would be disposed of off-site (Exhs. EV-2, at 5-12; EV-16, at 375; Tr. 8, at 1400-1403).

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89 A wider construction platform would be necessary at each splice vault location, where the Company stated it would increase the width of cleared area to approximately 40 to 50 feet, for a linear distance of 50 feet (Exh. EV-2, at 5-13). Additionally, Eversource stated that in certain narrow portions of the MBTA ROW the transmission duct bank would be installed underneath the Company's access road, and an 18-foot-wide construction platform would be used (Exh. EFSB-LU-29; Tr. 8, at 1355; Tr. 9, at 1485).

Figure 4. Cross-Section of the MBTA Underground Route along the MBTA ROW (showing potential MCRT)

Source: Exh. EFSB-G-16(2).

Eversource stated that three existing bridges along the MBTA ROW would require upgrades to accommodate installation of the New Line (Exhs. EFSB-CM-2; EV-16, at 377). Of the two bridges over Hop Brook in Sudbury, one would be rehabilitated (Bridge 128), and one would be replaced with a new single-span bridge, with the new abutments landward of the existing abutments (Bridge 127) (Exh. EV-18, at 8). In addition, a new single-span bridge would be constructed in the same location as the existing Fort Meadow Brook Bridge in Hudson (Exh. EV-18, at 8; Tr. 8, at 1349-1351).[90,91] The Company provided drawings showing

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90 Eversource stated that bridge rehabilitation work would include the installation of new decking and guardrails, and some other minor repair work (Tr. 8, at 1350).

91 According to the Company, some bridge refurbishment activities (including the installation of new decking and rails) may be performed by DCR as part of the MCRT project (Exh. EV-16, at 97).

installation of the conduits underneath the bridges, but indicated that final designs had yet to be determined (Exh. EV-16, at 96-99; Tr. 8, at 1396-1397).

Actual installation of the New Line would begin with construction of the splice vaults (aka manhole vaults) (Exh. EV-2, at 5-13). According to the Company, manhole vaults are approximately 24 feet long by eight feet tall by eight feet wide and would be installed approximately every 1,500 to 1,800 feet along the MBTA ROW, for a total of 25 manhole vaults along the ROW portion of the MBTA Underground Route (Exhs. EV-2, at 5-13 to 5-14; EFSB-CM-9; Tr. 8, at 1312). Eversource stated that each manhole vault would take approximately five to seven days to install (Exh. EV-2, at 5-14).

Underground duct banks for the Project would be installed using open-cut trenching; the Company would use a backhoe to excavate a trench, and then install 300- to 400-foot segments of conduit and backfill with thermal concrete (Exhs. EV-2, at 5-14; EFSB-CM-12; EFSB-CM-16). At a typical residence or business along the route, there would be roughly three or four weeks of trench-related construction activities, including trench excavation, duct bank installation, and final grading and restoration of the access road (RR-EFSB-99).

Following conduit installation, the Company would pull cables through the conduits between consecutive manhole vaults (Exh. EV-2, at 5-15). Adjacent cable sections would then be spliced together inside the manhole vaults (Exh. EV-2, at 5-15). Eversource stated that cable pulling would typically take three eight-hour days for each pair of manholes, while cable splicing would typically take four to five extended workdays (up to twelve hours each) to complete (Exh. EV-2, at 5-15).[92] Finally, Eversource would stabilize any soils disturbed during construction of the Project with an appropriate seed mixture and/or mulch in coordination with DCR (Exh. EV-2, at 5-16).

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92 Eversource indicated that splicing solid-dielectric cables does not require continuous 24-hour activity; rather, typical work hours for Project cable splicing would be 7:00 a.m. to 7:00 p.m. (Exhs. EFSB-NO-2(S1); EFSB-NO-10; Tr. 13, at 2354-2360).

2. Overhead Construction Along the MBTA ROW

Should overhead construction along the MBTA ROW be selected, the Company indicated that such construction would proceed in seven phases: (1) vegetation removal; (2) implementation of erosion and sedimentation controls; (3) steel rail and wooden rail tie removal, and access road subgrade construction; (4) work pad preparation; (5) tower foundation and structure installation; (6) conductor and shield wire installation; and (7) access road final grading, and site restoration (Exh. EV-2, at 5-17).

The Company's construction methods for vegetation removal, the installation of erosion and sedimentation controls, and construction of the access road would be similar to those proposed for the MBTA Underground Route, except that a larger area of trees would be cleared (Exh. EV-2, at 5-16 to 5-18; Tr. 8, at 1300-1302, 1343). According to the Company, trees would be removed from the full width of the MBTA ROW (approximately 80 feet) for the length of the Project in order to maintain safe clearances for the overhead transmission line (Exh. EV-2, at 5-17).

Work pads measuring approximately 75-feet-long by 75-feet-wide would be established at each of the 90 transmission tower locations (Exh. EV-2, at 5-17 to 5-18). Following preparation of the access road and work pads, Eversource would install concrete foundations for the steel monopole transmission structures (Exh. EV-2, at 5-17 to 5-18). Eversource stated that the foundations would typically be drilled piers, which range from six feet to eight feet in diameter, and 15 to 30 feet deep, depending on the height and load specifications of a specific structure (Exh. EV-2, at 5-18). Steel monopoles would be delivered in sections and assembled on site using a crane (Exh. EV-2, at 5-19). Eversource estimated that it would take roughly four days to complete the installation of each transmission line structure (RR-EFSB-99).

Eversource stated that following the erection of the steel monopoles, the Company would install conductors and shield wire in sections ranging between one mile and three miles in length (Exhs. EV-2, at 5-19; EFSB-CM-15). A section of lightweight line known as a "pilot" or "lead" line would be installed first using either bucket trucks or helicopter installation (Exh. EFSB-CM-15). A pulling winch would be used to pull this pilot line, and then a higher strength "pulling line," through the tower section (Exh. EFSB-CM-15). The conductor would then be attached to the pulling line and a winch would be used to pull the conductor through the

section (Exh. EFSB-CM-15). Eversource stated that conductor would be installed under tension, and would not be permitted to come into contact with the ground (Exh. EFSB-CM-15). The Company would use guard structures at locations such as road crossings and distribution line crossings to protect against any potential cable falls (Exh. EFSB-CM-15). Finally, Eversource would complete the same access road grading, and site restoration activities as would be necessary for the underground alternative (Exh. EV-2, at 5-19).

3. Underground Construction Within Public Roadways

All three routes would involve some in-street construction of underground transmission line (Exh. EV-2, at 5-21). According to the Company, construction in public roadways would proceed in five phases: (1) implementation of erosion controls; (2) splice vault installation; (3) trench excavation, duct bank installation, and temporary pavement restoration; (4) cable pulling, splicing, and testing; and (5) final pavement restoration (Exh. EV-2, at 5-21 to 5-22).

The Company would install splice vaults in a similar manner to that proposed for the MBTA ROW portion of the MBTA Underground Route, with four manhole vaults for the in-street portion of the MBTA Underground Route, and 31 in-street manhole vaults along the entire All-Street Route (Exhs. EV-2, at 5-22; EFSB-CM-9). Eversource estimated that each in-street splice vault would take approximately seven to ten days to install – longer than for manhole vaults along the MBTA ROW because of construction restrictions associated with traffic and work hour limitations along streets (Exh. EV-2, at 5-22). Manhole vault installation could take longer at locations with high utility density (Exh. EV-2, at 5-22 to 5-23).

The underground duct banks for the New Line would be constructed using open-cut trenching, where the Company would cut the pavement with a saw, excavate the trench to the required depth by backhoe, then install conduit in approximately 200- to 300-foot segments, and backfill with thermal concrete and soil; the road surface would then be restored for travel (Exhs. EV-2, at 5-23; EFSB-CM-12). At a typical residence or business location along this route, there would be roughly two to three weeks of trench-related construction activities, including pavement sawing, trench excavation, duct bank installation, and temporary pavement patching (Exh. EV-2, at 5-24; RR-EFSB-99). Eversource indicated that the pace of construction may be slower in areas of higher existing utility density, where the Company encounters

unanticipated obstructions, where the depth of the trench increases, or in areas with higher traffic volumes (Exh. EV-2, at 5-24).

After conduit installation, sections of the solid-dielectric transmission cable would be installed within the conduits between consecutive manhole vaults and spliced using the same methods described for the MBTA Underground Route (Exh. EV-2, at 5-25). Eversource stated it would restore all roadway surfaces affected by the Project to pre-construction condition or better (Exh. EV-2, at 5-25).

4. Substation Upgrades

According to the Company, work at the Sudbury and Hudson Substations would take place over a roughly one-year period (Tr. 8, at 1364-1365). At the Sudbury Substation, Eversource would begin by installing equipment foundations, and then proceed with the installation of new electrical equipment (Tr. 8, at 1364). Cable pulling and splicing work to complete installation of the New Line would also be required (Tr. 8, at 1364). Work at the Hudson Substation would consist of expanding the area of the Substation, followed by installation of foundations and new electrical equipment (Tr. 8, at 1364-1365; Tr. 14, at 2474-2475).

D. Environmental Impacts

1. Land Use and Historic Resources

a. Company Description

As discussed above, much of the MBTA Routes is proposed within an existing MBTA ROW running through the towns of Sudbury, Stow, and Hudson and the City of Marlborough (Exh. EV-2, at 5-3). Eversource stated that the MBTA ROW measures approximately 82.5 feet across and contains an intact, but unused, railroad track, approximately eight to nine feet wide, consisting of steel rails, treated ties, and rock ballast (Exhs. EV-16, at 7-3; EFSB-C-12(R1)(2) at 4). According to the Company, vegetation has re-established itself in many areas of the MBTA ROW since rail service ended in the early 1970s, with 50- or 60-year-old trees in some locations (Exh. EV-16, at 7-3; Tr. 9, at 1477). Eversource indicated that an informal, user-created path adjacent to the railroad track is used by the public for hiking, running, walking,

mountain biking, and horseback riding (Exh. EV-16, at 7-3). The Company would remove the rails and ties in order to construct the Project, and work in coordination with DCR to ultimately transform the Project's gravel access road into a segment of the MCRT, a regional rail trail (Exhs. EV-2 at 1-1, 5-11; EV-16, at 2-30; Tr. 8, at 1379-1380).

Two land use agreements relate to the MBTA ROW: (1) a 2017 Option Agreement Between the MBTA and NSTAR Electric Company d/b/a Eversource Energy for a Transmission Line Easement on Central Mass Branch Right of Way Located in Hudson, Stow, Marlborough and Sudbury, Massachusetts ("Option Agreement"); and (2) a 2010 Alternative Transportation Corridor Lease Agreement by and between the MBTA and the Commonwealth of Massachusetts by and through its Department of Conservation and Recreation ("DCR Lease") (Exh. EFSB-C-12(R1)(2)).

In the Option Agreement, the MBTA agrees to grant Eversource the right and option to acquire a permanent, non-exclusive, subsurface easement, approximately 8.63 miles long by 82.5 feet wide, along the MBTA ROW for the purposes of constructing, operating, and maintaining the proposed Project (Exh. EFSB-C-12(R1)(2) at 62). In the Option Agreement, the MBTA reserved the right, among other things, to "relocate all or any portion of [the Project] to another location within the [easement] any time after the expiration of twenty (20) years from the date hereof, if in MBTA's opinion, the [Project facilities] unreasonably interfere with then present or future use of MBTA's ROW for the operation of its transportation system (and for no other purpose)." (Exh. EFSB-C-12(R1)(2) at 64). Further, the Option Agreement specifically acknowledges the pre-existing DCR Lease, which grants DCR, for 99 years, access to a portion of the MBTA ROW to construct a multiuse path for bicycle, pedestrian, and other non-motorized public transportation and recreation uses (Exh. EFSB-C-12(R1)(2) at 3, 90-91). The Option Agreement states that Eversource must not materially interfere with or disturb the DCR's use of its leased premises; shall cooperate with DCR in connection with the future operation, use, and maintenance of the multiuse path; and shall negotiate a memorandum of understanding ("MOU") (or similar instrument) with DCR regarding Eversource's and DCR's obligations, liabilities, and commitments to each other regarding the DCR Lease, the Option Agreement, and the easement itself (Exh. EFSB-C-12(R1)(2) at 3).

Eversource indicated that the MBTA Underground Route would necessitate a 22-foot-wide clearing for the Project corridor within the MBTA ROW and a 40- to 50-foot-wide clearing at each proposed splice vault location (Exhs. EV-18, at 16, 93, 116-117; EV-2, at 5-40).[93] The Company stated that the MBTA Underground Route would require approximately 23.9 acres of tree clearing in total (Exh. EV-18, at 23). The Company stated that the MBTA Overhead Route would necessitate clearing the full width of the 82.5 foot ROW, constituting approximately 70 acres of tree clearing in total (Exh. EV-2, at 5-40, 5-44, 5-46). Eversource stated that no tree clearing would be required for the All-Street Route, except for possible selective trimming of branches in some locations (Exh. EV-2, at 4-21, 5-63). The Company affirmed that all vegetation removal would be conducted in accordance with its approved Vegetation Management Plan ("VMP"), DCR's Trail Guidelines and Best Practices Manual ("DCR Trail Manual"), and all applicable state and local laws, bylaws, and regulations (Exh. EV-2, at 4-21, 5-12).

Eversource stated that it would cut tree trunks as close to the ground as possible and would leave the stumps and roots in place to regrow, except in areas where grading would require their removal (Exh. EV-2, at 5-11 to 5-12; Tr. 9, at 1477). Large tree trunks, limbs, and brush would be chipped and removed from the MBTA ROW (Exh. EV-2, at 5-12). To avoid disturbing saturated soils and/or to provide habitat for wildlife after construction of the New Line, the Company may leave some felled trees to decompose in place (Exh. EV-2, at 5-12). Eversource stated that cutting of trees and vegetation along stream banks would be selective to minimize disturbance of bank soils and limit the potential for erosion (Exh. EV-2, at 5-12).

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93 In the FEIR, submitted July 2, 2018, the Company indicated that it has reduced the typical width of tree clearing for the MBTA Underground Route from 30 feet to 22 feet; 22 feet is the width of the construction platform (Exh. EV-18, at 16). The Siting Board notes that some of the receptor information in this section is based on the original 30-foot-wide clearing.

The Company stated that, following construction of the MBTA Underground Route, the MBTA corridor would be maintained to a width of 22 feet, including a 14-foot access road[94] and an approximately four-foot-wide strip of maintained herbaceous and low-growing shrubby vegetation on each side of the access road (Exh. EV-16, at 7-5).[95] For the MBTA Overhead Route, the corridor would be maintained to a width of 30 feet centered on the overhead transmission line and would be managed to allow low herbaceous or low growing woody vegetation not exceeding 15 feet in height; the remainder of the MBTA ROW would be allowed to revegetate to varying heights (Exh. EV-2, at 5-63; RR-EFSB-93; RR-EFSB-94).

The Company stated that it expects to finalize an MOU with DCR, currently in draft form, regarding vegetation management on the MBTA ROW, with DCR ultimately carrying out maintenance activities such as mowing and trimming within the maintained area of the MBTA ROW (Exh. EV-2, at 5-16). The Company anticipates that DCR would undertake vegetation management responsibilities once construction of the rail trail begins; the Company would assume responsibility for vegetation management prior to that (Tr. 9, at 1498, 1500).[96] Eversource has developed a Corridor Management Plan ("CMP") that lays out the responsibilities of DCR once the MCRT is constructed (Exh. EV-18, app. 6-1). Eversource stated that vegetation management carried out by DCR would conform with the DCR Trail Manual and electric utility best management practices (Exh. EV-2, at 5-16).

Land uses along the entire length of the three alternative routes include residential, commercial, and industrial, with recreation and open space areas and sensitive receptors such as schools, daycare facilities, hospitals, and elder care facilities (Exh. EV-2, at 5-51 to 5-53). Residential land uses consist of single- and multi-family housing units, such as apartments and

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94 Of the 14-foot wide gravel access road, ten feet would be paved by DCR for the rail trail with a two-foot-wide seeded and loamed shoulder on each side (Exh. EV-18, at 59, 206 fig. 2-4).

95 According to the draft MOU between Eversource and DCR, no trees or woody shrubs or plantings can be planted within the estimated 22-foot wide corridor (Exh. EV-18, app. 2-4, at 287 of 382).

96 The Company indicated that construction of the MCRT is anticipated to begin within one year of the completion of the Project (Exh. EV-18, at 20).

condominiums, with a total of 315 residential units with properties abutting the MBTA Routes and 549 residential units adjacent to the All-Street Route (Exh. EV-2, at 5-51).[97] The Company identified three sensitive receptors adjacent to the MBTA Routes and nine sensitive receptors adjacent to the All-Street Route – each within 50 feet of the limits of Project work areas (Exh. EV-2, at 5-53; RR-EFSB-90). The Company identified 90 commercial or industrial entities abutting the MBTA Routes and 61 commercial or industrial entities abutting the All-Street Route (Exh. EV-2, at 5-52). Eversource noted that, while there are more commercial/industrial entities adjacent to the MBTA Routes than the All-Street Route, the All-Street Route would result in a higher potential for construction-related disruption of vehicle access and parking for commercial and industrial properties because the All-Street Route would be installed entirely within roadways (Exh. EV-2, at 5-52).

Eversource indicated that there are three man-made recreational land uses (e.g., playgrounds, ball fields, and golf courses) along each of the proposed routes (Exh. EV-2, at 5-54). Additionally, there is undeveloped land conserved for the protection of natural resources such as wetlands, waterways, wildlife habitat, and open space (Exh. EV-2, at 5-55). The Company identified 14 conservation properties bordering the MBTA Routes, totaling 3.7 miles of abutting length (Exh. EV-2, at 5-55). For the All-Street Route, the Company identified nine bordering conservation properties, totaling approximately three miles of abutting length (Exh. EV-2, at 5-55). Eversource reported that neither the MBTA Routes nor the All-Street Route would involve the use of protected conservation land and would not require Article 97 approval (Exhs. EV-16, at 2-10; EFSB-LU-40).[98,99] Temporary trail closures would

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97 According to the Company, 16 residential units are located within 50 feet of the proposed work area along the MBTA Underground Route, compared to 108 and 61 for the MBTA Overhead Route and All-Street Route, respectively (Exh. EV-2, at 5-71 to 5-75).

98 Article 97 lands are protected conservation lands that require legislative action for use under Article 97 of the Constitution of the Commonwealth of Massachusetts.

99 Eversource noted that the MBTA ROW does abut several Article 97 properties: four Town of Sudbury parcels; three Sudbury Valley Trustees parcels; three City of Marlborough parcels; three Town of Hudson parcels; and one Commonwealth of Massachusetts parcel (which is listed as owned by "Commonwealth of Massachusetts Environmental Management" on the assessor maps) (Exh. EV-16, at 2-10; Tr. 9, at 1540;

be necessary along the MBTA Routes where existing recreational paths cross the Project ROW (Tr. 13, at 2337-2339). Eversource indicated that it would work with the towns to develop appropriate detours for these closures (Tr. 13, at 2339).

The Company used NHESP Priority and Estimated Habitat maps to identify areas of protected habitat for state-listed rare species along each alternative route (Exh. EV-2, at 5-47 to 5-50). The Company identified three areas mapped as protected habitat for state-listed rare species along the All-Street Route (Exh. EV-2, at 5-49). Eversource stated that it assumed no impacts to those protected habitat areas, as the transmission line would be installed entirely within the paved limits of the public roadways, and the proposed installation would be exempt from NHESP review (Exh. EV-2, at 5-49 to 5-50). Eversource stated that the MBTA Routes pass through one Priority/Estimated Habitat area for the eastern box turtle, the eastern whip-poor-will, Gerhard's underwing moth, and the coastal swamp metarranthis moth (Exh. EV-16, at 7-2).

The Company initiated field studies to identify box turtles within the Priority/Estimated Habitat area along the MBTA Routes (Exh. EV-16, at 7-2). The Company reported that construction of the New Line could result in potential adverse effects to turtle habitat from the removal of vegetation and leaf litter, and turtle mortality due to movement within the construction areas (Exh. EV-18, at 117). Due to its current informal trail uses, the Company stated that the MBTA corridor is not a potential nesting habitat for whip-poor-will, nor suitable foraging habitat (Exh. EV-16, at 7-4; Tr. 9, at 1437). The Company reported that potential adverse effects for the whip-poor-will involve removal of vegetative cover (Exh. EV-16, at 117). The Company indicated that NHESP's primary concerns are vegetative management practices, future use of the corridor, and protection of habitat (Exh. EV-16, at 7-4; Tr. 9, at 1436-1437).

With regard to the MBTA Underground Route, the Company stated that impacts to protected habitat would include tree clearing and permanent loss associated with construction of the access road (Exhs. EV-2, at 5-49; EV-16, at 7-5). Specifically, the Company estimated approximately two acres of permanent habitat loss due to the 14-foot access road, and

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RR-EFSB-65(1) at 1). A parallel assessment of Article 97 properties adjacent to the All-Street Route was not provided.

approximately four acres of habitat conversion from forested to shrub/herbaceous vegetation in other areas (Exh. EV-18, at 22).

For the MBTA Overhead Route, mapped habitat impacts would include 1.1 acres of temporary disturbance caused by the placement of work pads for access of construction equipment, 13.2 acres of habitat conversion due to tree clearing, and 2.5 acres of permanent habitat loss associated with construction of the access road and the transmission structures (Exh. EV-2, at 5-49). For both MBTA Routes, Eversource noted that the 14-foot-wide access road would not be regarded as suitable habitat for the state-listed rare species following construction of the Project (Exh. EV-16, at 7-5).[100]

The Company indicated that in areas where the Project would traverse rare species habitat, it would set up strategic exclusion fencing at the onset of construction to avoid turtle nesting areas and have a field biologist on site to do a search and relocation of the relevant turtle species prior to the start of construction each day (Tr. 9, at 1449-1450). Specifically, the Company has developed a Turtle Protection Plan ("TPP") in conjunction with NHESP and DCR that included protection methods for turtles and their nests both during and after construction (Exh. EV-18, at 118, app. 6-2). The TPP includes the following time-of-year restrictions and directives: (1) vegetation clearing and earth moving between November 1 and March 31 only; (2) no-work zones within 100-feet of known hibernation locations between November 1 and March 31; (3) construction monitoring between April 1 and October 31; and (4) post-construction vegetation management between April 1 and November 1 only (Exh. EV-18, at 118-119; Tr. 9, at 1451). In addition, to protect the whip-poor-will, no construction would occur during the breeding season from May 1 through August 1 (Exh. EV-18, at 119; Tr. 9, at 1451).

Eversource testified that, as part of the MESA checklist, it would map host plant communities to determine the potential for the two moth species to be located within the limits of the Project (Tr. 9, at 1433). The Company stated that it has been working with NHESP to develop avoidance, minimization and mitigation measures described above, and that following

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100 The Company stated that in its assessments the area surrounding the MBTA ROW, but not the MBTA ROW itself, was identified as potential suitable foraging, migration, mating, and nesting habitats (Exh. EV-16, at 7-4).

the submission of the Project Review Checklist, additional or revised measures may be required (Exh. EV-18, at 118).

On October 19, 2018, NHESP issued a determination concluding that, subject to conditions – including implementation of the Company's TPP and CMP – the Project along the MBTA Underground Route would not result in a "take" of state-listed species (Exh. EFSB-LU-7(S2)(1)). On November 8, 2018, Protect Sudbury challenged this determination (Exh. EFSB-LU-7(S3)). On April 12, 2019, the Director of the Massachusetts Division of Fisheries and Wildlife issued a Final Decision confirming the conditional no-take determination (Exh. EFSB-LU-7(S4)).

Eversource stated that it would use several practices to limit the spread of invasive species along the Project route (Exh. EFSB-LU-32). For example, seed-free erosion controls would be used; soil stabilization and restoration would be done with weed-free seed mix; and vehicles and equipment used for Project construction would be cleaned each day prior to entering the MBTA ROW in order to reduce the transport of off-site seed (Exh. EFSB-LU-32).

Eversource coordinated with the Commonwealth Heritage Group, Inc. ("CHG") to identify cultural, historic, and archaeological resources within a quarter-mile radius of each route (Exhs. EV-2, at 5-59; EV-16, at 12-1). Along the MBTA Routes, the Company identified 20 archaeological sites, 22 historically significant buildings, and eight additional areas of interest (Exh. EV-2, at 5-60). Along the All-Street Route, the Company identified 22 archaeological sites, 16 historically significant buildings, and three additional areas of interest (Exh. EV-2, at 5-60). The Company noted that the MBTA Routes would be subject to review under Section 106 of the National Historic Preservation Act and would require a permit from the US Army Corps of Engineers ("USACE"), and would also be subject to a review by the Massachusetts Historical Commission ("MHC") (Exh. EV-2, at 5-60).

Eversource does not anticipate impacts to known archaeological sites within the MBTA ROW due to the previously disturbed nature of the corridor (Exh. EV-16, at 12-2). Eversource stated that it would coordinate with the USACE, the MHC, and local historic commissions through the MEPA process to avoid or minimize adverse impacts to any applicable historic

resource or archaeological resource (Exhs. EV-2, at 5-60; EV-16, at 12-3).[101] Further, Eversource affirmed that where practical, in coordination with CHG, it would take measures to avoid historic or archaeological resources as the Project design advances and that any unanticipated discoveries during construction would be addressed as part of its construction management plan (Exhs. EV-2, at 5-61; EFSB-EIR-22).[102] Eversource stated that construction along the All-Street Route would not result in any impacts to abutting historic or archaeological resources (Exhs. EV-2, at 5-61; EV-16, at 12-2; Tr. 9, at 1471).

Eversource noted that a combination of laydown areas, temporary storage areas, and staging areas would be needed to support Project construction along any of the three routes (Exh. EV-2, at 5-10). The Company testified that its designated contractor would be responsible for selecting the laydown areas and therefore the locations have not yet been selected (Exh. EV-2, at 5-10; Tr. 13, at 2377). However, the Company indicated that a project of this size is anticipated to require four to five laydown areas of one to two acres each, ideally located as close as possible to the Project but they could be as far as five to six miles away (Exhs. EV-16, at 5-6; EV-18, at 83). Eversource emphasized that license or lease agreements for such sites would contain terms and conditions designed to minimize the impact of the use of the sites on surrounding properties (Exh. EV-2, at 5-10).

b. Positions of the Parties

i. Town of Sudbury

Sudbury argues that construction and operation of the Project would substantially affect the unique natural environment along the MBTA ROW in Sudbury (Sudbury Brief at 51).

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101 The Company explained that as part of its investigation, the USACE would consult with Native American Tribes that express an interest in the cultural resources that may be affected by the portions of the routes subject to USACE and MHC jurisdiction (Exhs. EV-2, at 5-60; EV-16, at 12-3; EFSB-LU-35).

102 Eversource noted if certain resources could not be avoided, specific minimization and mitigation measures such as research, photography, archaeological testing, and preparation of an interpretive panel would be established through consultation with USACE, MHC, and other parties (Exh. EFSB-EIR-22).

Sudbury argues that the Project would cross or abut an expanse of protected land and restricted land areas such as streams, marshes, swamps, forest, recreational open space, vernal pools, wellhead protection areas, NHESP priority and estimated habitat, Article 97 lands, local water districts, historic properties, and local historic districts (Sudbury Brief at 51-52, citing Exhs. EV-2 at Table 3-1, Table 4-3 and 4-20; EFSB-SUD-42(1)).[103] The town further notes that that MBTA ROW is currently used by the public for walking, hiking, and other passive recreational uses (Sudbury Brief at 51, citing Exhs. SUD-DMD-1, at 3; EV-2, at 1-5). Sudbury argues that it is committed to the preservation of open land for conservation purposes, and that over 3,000 acres of permanently protected lands are contained within properties directly abutting the MBTA ROW (Sudbury Brief at 52-53).

Sudbury challenges Eversource's claim that the MBTA ROW is an already-disturbed area, emphasizing that, despite its prior rail use, the corridor has been used solely for passive recreation for over 40 years (Sudbury Brief at 51, 70, citing Exhs. SUD-DMD-1, at 3, 5; EV-2 at 1-5; Tr. 12, at 2186). Thus, the town argues that existing wildlife habitats would be disrupted and destroyed if the Project were constructed along the ROW (Sudbury Brief at 70, citing Exh. SUD-DMD-1, at 5; Tr. 12, at 2186). Sudbury notes that there are small species, such as snakes and turtles, and larger ones, such as coyote, fox, and bobcat that use the corridor; it contends that the impact on each species would vary (Sudbury Brief at 71, citing Tr. 12, at 2196). Sudbury states that some species use the MBTA ROW in a linear fashion and others cross the corridor to access habitat on either side (Sudbury Brief at 71, citing Tr. 12, at 2196). Sudbury concludes that Eversource has not accounted for the fact that the Project would have a harmful effect on wildlife habitat currently located along the MBTA corridor (Sudbury Brief at 71).

Sudbury argues that the Company's project plans do not allow for a full evaluation of the Project and its effects on existing environmental conditions along the MBTA ROW, and that the plan set issued on December 22, 2017 was submitted after the close of the evidentiary hearings on environmental topics (Sudbury Brief at 56-57). The town lists numerous deficiencies with the

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[103] Sudbury's concerns related to vernal pools, wellhead protection areas, and local water districts are discussed further in Section VI.D.2, below.

latest Project plans and contends that it was not afforded due process with respect to review of these Project plans or the revised environmental impact summary based on the plans (Sudbury Brief at 57). Sudbury contends that proper mitigation measures or quantitative information regarding proposed mitigation have not been identified by Eversource (Sudbury Brief at 61).

Sudbury notes that although Eversource has stated it has a system-wide VMP, the Company would not apply that plan to the MBTA ROW because DCR is expected to undertake vegetation management (Sudbury Brief at 64, citing Exhs. EV-2, Appendix 5-4; SUD-VM-5). Sudbury questions Eversource's contention that all vegetation management would be the responsibility of DCR, including a responsibility to work with NHESP regarding vegetation management practices related to priority habitat in the area (Sudbury Brief at 64). Sudbury asserts that since currently there is no final executed MOU between Eversource and DCR on the record – and DCR does not yet have the funds to proceed with work on the MBTA ROW – there is an open question as to which party is responsible for specific mitigation measures related to vegetation management and protection of priority species (Sudbury Brief at 64-65, citing Exh. SUD-G-20(S3); Tr. 9, at 1441-1444).

Further, Sudbury asserts that proper mitigation would require that surface contours and vegetation be substantially restored wherever construction activities related to splice vault and duct bank installation take place (Sudbury Brief at 65, citing Exh. SUD-MJN/RMG-1(R) at 40). Sudbury reports that Eversource plans to seed unstable soils outside the 14-foot gravel access road with a seed mixture and/or mulch (Sudbury Brief at 65, citing Exh. SUD-DEIR-4). The town insists that this is not proper mitigation, as the surface vegetation and contours of the temporary construction area would not be substantially restored in accordance with the Massachusetts WPA regulations, and that simple seeding or mulching would not restore the vegetation that provides food, shelter, and breeding areas for existing native wildlife, or shade for the coldwater fisheries (Sudbury Brief at 65; Exh. SUD-MJN/RMG-1(R) at 40-41).

Sudbury further argues that the Siting Board cannot determine that the Project would have no adverse effect on rare species habitat because Eversource has not presented a mitigation plan, nor has it completed the required wildlife habitat evaluations under the Massachusetts WPA, or the site-specific assessments of habitat quality as required by NHESP (Sudbury Brief at 65, citing Exh. SUD-MJN/RMG-1(R) at 27). Sudbury asserts that without a completed

evaluation, the Company has not overcome the presumption inherent under 310 CMR 10.61(1) that the Project would have an adverse effect on wildlife habitat (Exh. SUD-MJN/RMG-1, at 27; Sudbury Brief at 65).

Sudbury argues that the construction of the All-Street Route within existing roadways would have no impact on wetland resource areas, groundwater, public water supplies, coldwater fisheries, wildlife habitat, rare species, conservation land use, and abutting historic or archaeological resources (Sudbury Brief at 71). Further, Sudbury claims that the mitigation required for a route along the MBTA ROW would be significantly greater than mitigation required for the All-Street Route (Sudbury Brief at 71-72). The town asserts that the Company has failed to demonstrate that the MBTA Underground Route is superior to the All-Street Route on the basis of balancing environmental impacts and should be denied by the Siting Board (Sudbury Brief at 72).

Sudbury challenges the MBTA's authority to grant Eversource rights to construct, operate, and maintain a transmission line along the MBTA ROW (Sudbury Brief at 84-85). The Town filed a lawsuit with the Land Court alleging that, without statutory authorization, the MBTA does not have the right to modify the use of the MBTA ROW to one that is not consistent with the prior public railroad use by the MBTA (Sudbury Brief at 85, citing Complaint, Exhibit A to Motion for Stay). The Town emphasizes that if the MBTA is restricted from leasing the ROW to Eversource, the Company would not be able to continue to seek approval for the Project on the basis of its Petition with the Siting Board (Sudbury Brief at 85).

ii. Protect Sudbury

Protect Sudbury contends that the Project, using the MBTA ROW, would be sited "as close to a wilderness area as [one] can find in Boston Metrowest" on "one of the largest and most pristine natural resource areas…with over 3,000 acres of permanently preserved land" (PS Brief at 8). Protect Sudbury argues that the Project would have short- and long-term environmental impacts that would be more significant than those of the All-Street Route (or the NEP Alternative; see Section IV.D) (PS Brief at 7).

Protect Sudbury contends that the Project would permanently disturb rare species, protected conservation land or open space, scenic roads, coldwater fisheries, and vernal pools

(PS Brief at 8). Protect Sudbury voices alarm that the Project would result in the permanent loss of mature forest land and vegetation, increase the risk associated with flooding and pollution, and would be in close proximity to abutting homes and businesses (PS Brief at 8). Protect Sudbury asserts that the All-Street Route has none of the environmental impacts associated with the Project, such as impacts to rare species, cultural or historic resources, conservation lands, trees and vegetation, wildlife habitat, wetlands, groundwater or public water supplies, nor does it pose the risk of contamination from hazardous materials (PS Brief at 9, citing Exh. SUD-MJN/RMG-1, at 10-11, 52-53). In contrast, Protect Sudbury notes that most of the impacts of the All-Street Route would be caused primarily by traffic disruption and temporary inconveniences (PS Brief at 9, citing Exh. SUD-MJN/RMG-1, at 10-11, 52-53). Protect Sudbury argues that Eversource failed to acknowledge that the traffic disruptions from construction of the All-Street Route are temporary while the impact of the Project on the natural environment would be "significant" or "permanent" (PS Brief at 9, citing Exh. SUD-MJN/RMG-1, at 10-11, 52-53).

Protect Sudbury argues that the probable impacts to property values from the Project should have been included as an additional consideration in the Environmental Analysis (PS Brief at 48, citing Tr. 12, at 2018-2083). Protect Sudbury claims the record confirms that transmission lines generally negatively impact property values, the Project would likely have such impacts, and some definitive determination should be made with respect to the possible impacts on property values from the Project as compared to the Noticed Alternative and NEP Alternative Routes (PS Brief at 48, citing Exhs. Protect-C, D, E; Tr. 12, at 2109-2114).[104]

iii. Town of Hudson

Hudson argues that the MBTA Underground Route has significantly greater environmental impacts than outlined in the Company's Petition (Exh. Hudson-PH-1, at 3).

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[104] On September 15, 2017, the Presiding Officer issued a Scoping Order regarding Property Values, which stated that "evidence concerning potential property value impacts associated with the Company's proposed transmission facility in this case may be presented by the parties for the limited purpose of the Siting Board's review of the general public interest relating to the Company's Section 72 and G.L. c. 40A, § 3 petitions" (September 15, 2017 Ruling at 4). Accordingly, the property value issue raised by Protect Sudbury, although related to land-use, is addressed in Section X below.

Hudson states that construction of the MBTA Underground Route would result in permanent damage to the natural environment, including loss of habitat, trees, and conservation land (Exh. Hudson-PH-1, at 4, 6). Specifically, the town notes that the MBTA Underground Route bisects one of the largest and most pristine natural resource areas remaining in Hudson and surrounding communities, which includes the Assabet River National Wildlife Refuge, the Desert Conservation Area, Marlborough-Sudbury State Forest, and conservation lands in Sudbury (Exh. Hudson-PH-1, at 6-7). Further, Hudson states that the MBTA Underground Route passes close to at least 15 vernal pools and upland areas around vernal pools, which are critical to the survival of numerous species, and provide habitat for several rare and endangered species (Exh. Hudson-PH-1, at 7, 10, 11). Hudson argues that the Project would result in the clearing of over one million square feet of mature forestland in Hudson, which would have an impact on wildlife, soils, and microclimate, and would increase the potential for invasive plant species to take root (Exh. Hudson-PH-1, at 8).

iv. Company Response

The Company argues that it has provided substantial evidence that it has minimized environmental impacts of the Project consistent with the Siting Board's statutory mandate (Company Reply Brief at 57). Eversource argues that following construction of the Project, the MBTA ROW would continue to offer suitable habitat for species, as tree clearing and vegetation maintenance along the MBTA ROW would be considered habitat conversion rather than habitat loss (Company Brief at 110, citing Exhs. EV-2, at 5-50; EFSB-LU-21). Moreover, the Company contends that once the old railroad track is removed, there would no longer be a physical barrier to movement for reptiles like eastern box turtles (Company Brief at 110, citing Exh. EV-16, at 7-5). Eversource confirmed that based on discussions with NHESP, it has initiated field studies to identify eastern box turtles within the priority/estimated habitat area (Company Brief at 109, citing Exhs. EFSB-EIR-15; EV-16, at 7-2).

The Company argues that it plans to provide the best suitable habitat for wildlife along the MBTA corridor after construction by minimizing the width of the maintained corridor, promoting the growth of native plant species, removing the railroad track, and consulting with

managers of protected land, and local, state, and federal agencies (Company Brief at 110, citing Exhs. EV-16, at 7-6; EFSB-LU-21).

Lastly, the Company states that the Project would be designed and constructed to incorporate best management practices, to comply with federal, state, and local laws and regulations, and that Eversource would provide mitigation for any impacts that may not be avoided (Company Brief at 91, citing Exh. EV-2, at 5-83). For these reasons, Eversource argues that it has properly minimized impacts to rare species (Company Brief at 111).

The Company challenges the arguments presented by the intervenors regarding the status of Project plans and the description of the environmental impacts and mitigation (Company Reply Brief at 58). Eversource argues that the level of detail and design it has presented for the Project, the extent of the evidentiary record, and the information on mitigation provide a "substantially accurate and complete" description of environmental impacts (Company Reply Brief at 58-59). Further, the Company argues that the considerable amount of information presented in this case is typical for a Siting Board proceeding, and that there is no requirement for the Company to present a fully designed Project (Company Reply Brief at 58-59). Lastly, Eversource contends that throughout the proceeding it has refined and improved its mitigation plans (Company Reply Brief at 60). The Company asserts that it will finalize reasonable mitigation measures with local Conservation Commissions as Project design is finalized (Company Reply Brief at 62). Eversource concludes by arguing that construction impacts associated with the Project would be minimized and mitigated (Company Reply Brief at 63).

In response to Sudbury's claim that the MBTA could reestablish the corridor for transportation purposes, the Company argues that it could relocate its facilities elsewhere within the ROW, without causing a reliability impact, and that the town's argument is therefore baseless (Company Reply Brief at 22 and 57, citing Exh. EFSB-C-12(R1)(2) at 5; Protect-2-14; Tr. 7, at 1002). Likewise, the Company argues that the lawsuit by the town challenging the MBTA's authority to convey an easement on the MBTA ROW is speculative and that, if any presumption is to be made, it should be that the MBTA has a clear understanding of its rights and obligations with respect to the prior public use doctrine and its own enabling legislation (Company Reply Brief at 56). Further, the Company argues that site control is not a prerequisite in project permitting before the Siting Board, and that a project proponent is not required to secure any

necessary interests in land prior to filing its petitions with the Siting Board or the Department (Company Reply Brief at 56).

c. Analysis and Findings on Land Use and Historic Resources

The parties to this proceeding have described the MBTA ROW in a variety of ways – a former transportation corridor that has been historically disturbed, a valuable transportation corridor that can be used for a future rail trail, and an area that has been restored to its natural condition, connecting important conservation lands. The Siting Board views the corridor as a combination of the above and recognizes its multiple attributes and values as a regional transportation and recreational resource, a regional energy transmission corridor, and a linear location with ecological and natural resource value.

Within the category of Land Use and Historic Resources, the Siting Board considers a diverse range of impacts to the built and natural environments, leaving other specific impacts, such as water and wetlands, noise, traffic, and visual, for separate review. With respect to the built environment, the record in this case shows that in comparison with the All-Street Route, abutters to the MBTA Routes include 234 fewer residential units and six fewer sensitive receptors, although there are 29 more commercial/industrial entities. Each of the three route options is located adjacent to three man-made recreational uses. The record further shows that for those most affected by Project construction – residences and sensitive receptors within 50 feet of Project work areas – the MBTA Underground Route has the fewest abutters (16 residences and three sensitive receptors), the All-Street Route has three to four times as many (61 residences and nine sensitive receptors), and the MBTA Overhead Route has the most (108 residences and three sensitive receptors). Finally, the record shows that a total of 50 historically significant sites are located along the MBTA Routes, whereas 41 such sites would be located along the All-Street Route. No direct impacts to historic resources or archeological sites are anticipated from Project construction along any of the three routes considered.

In view of the number and proximity of abutters to the various route locations, the Siting Board concludes that the MBTA Underground Route has the lowest potential impact to the built environment from a land use perspective, followed by the All-Street Route, and last, by the MBTA Overhead Route.

With regard to natural environment land use impacts, the Siting Board notes that, although the MBTA ROW is situated adjacent to significant expanses of ecologically sensitive, protected natural resource areas, the MBTA ROW itself is not classified as protected open space. It has, however, been over 40 years since there was active rail service on the MBTA ROW, and the corridor has significantly filled in with trees and other vegetation that provide important habitat and ecological value. Over the course of this proceeding the Company has reduced the width of the corridor along the MBTA Underground Route that would be cleared of trees and vegetation during construction. These changes help to preserve the natural resources in the MBTA ROW that have flourished since rail service ended. The Siting Board expects that recreational use of the ROW is likely to continue following Project construction, regardless of whether the rail trail is ultimately constructed.[105]

The MBTA Overhead Route would require the most vegetation removal for construction, and therefore it has the highest potential impact to wildlife and rare species habitat and adjacent conservation lands. The reduced amount of tree clearing and the lack of above-ground structures associated with the MBTA Underground Route make this option much less impactful to the natural environment than the MBTA Overhead Route. Further, NHESP has determined that, subject to conditions (described below), construction of the Project along the MBTA Underground Route would not result in a "take" of protected species. The All-Street Route has the lowest potential land use impacts to the natural environment given the fact that it is an existing roadway and would not require any habitat loss or conversion.

In view of the above, the Siting Board finds that, on balance, the MBTA Underground Route and the All-Street Route have impacts that are different in nature, but are comparable with respect to land use and historic resource impacts. As noted above, the All-Street Route is preferred with regard to natural environment impacts, while the MBTA Underground Route is

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105 This recreational use may, in fact, be improved with construction of the Project. For example, in the expanded Environmental Notification Form Certificate issued by the Secretary for the MCRT, the Secretary noted that the existing informal trail lacks user access consistent with the requirements of the Americans with Disability Act and does not discourage encroachment on the MBTA ROW. See Exh. EFSB-LU-36(2) at 4. Removal of the existing rail and ties and construction of the Company's gravel access road would result in a more accessible and clearly defined trail.

advantageous with regard to impacts to the built environment. Both the MBTA Underground Route and the All-Street Route are preferable to the MBTA Overhead Route from a land use perspective.

With respect to mitigating environmental impacts, Eversource emphasized that it would design the Project to minimize the overall disturbance from construction and to minimize habitat loss along the length of the MBTA Underground Route. To further mitigate Project impacts to rare species, the Company committed to implementing mitigation measures including time-of-year restrictions, temporary barriers, avoiding nesting areas, and conducting surveys in advance of construction. The Company has received a final "no-take" determination from NHESP for the Project, conditional on compliance with these commitments. Eversource would limit the spread of invasive species along the MBTA ROW by, among other things, using weed-free seed mixes and cleaning vehicles and equipment used for Project construction each day prior to entering the ROW.

The Company committed to coordinate with USACE and the MHC to avoid and/or minimize adverse effects to any eligible historic and archaeological resources. To avoid impacts to historic districts or specific historic uses, Eversource would consult with MHC and the local historic commissions to ensure that it identifies any necessary avoidance and/or timing of mitigation-related measures that would need to be implemented during the construction phase.

The Siting Board does not agree with the Town of Sudbury that Eversource's latest Project plans are deficient with respect to existing environmental conditions and mitigation, nor with the town's complaint that these plans were filed after the close of evidentiary hearings on environmental topics. The Siting Board notes that the permitting process for a transmission line is iterative and that as a project design advances more information becomes available. The Siting Board encourages proponents to actively engage with all permitting and regulatory agencies early in its design process so that adequate and up-to-date information is available for the Siting Board's review. However, the Siting Board does not require a proponent to have produced final design plans before a decision can be issued, nor is it the Siting Board's view that the record is incomplete without the final design plans. See e.g., Needham-West Roxbury, Ruling on Motion to Reopen Evidentiary Hearings (April 13, 2018) (town not entitled to any specific degree of design-plan completeness … either during or after hearings). Further, as

discussed in Section I.C, above, Intervenors in this case were afforded a full and fair hearing, consistent with the MAPA. The Siting Board notes that the Company actively consulted with agencies, such as NHESP, local conservation commissions, and MEPA, and that each requires mitigation as part of its regulatory process.[106] In sum, the Company has produced adequate information for the parties in this proceeding, and the Siting Board, to evaluate the Project's potential environmental impacts and the Company's proposed mitigation and minimization plans for purposes of the approvals sought in this docket.

With respect to the Company's MOU with DCR regarding vegetation management, the Company stated throughout the proceeding that an MOU would be developed and that it would file a copy of the MOU with the Siting Board. Therefore, the Siting Board directs the Company to file, prior to construction, the executed MOU between DCR that outlines vegetation management along the MBTA ROW.

The Siting Board recognizes and appreciates the concerns of the towns and Protect Sudbury relating to the proximity of the Project to conservation and open land (e.g., Assabet River National Wildlife Refuge, Marlborough-Sudbury State Forest, Desert Conservation Area).[107] Impacts to wildlife habitat and conservation lands, including habitat disturbance and temporary closures to recreational trails, are anticipated as a result of Project construction. The Company's efforts to reduce the size of Project work areas along the MBTA ROW, as well as its commitments to (i) leave stumps and roots in place where possible along the ROW to encourage vegetation recovery; (ii) to perform only selective vegetation removal along stream banks; and (iii) to potentially provide new habitat for wildlife by leaving felled trees to decompose in place, will limit the extent of these impacts. The Company has also committed to providing signage to

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106 For example, during the local wetlands permitting process (specifically, the Abbreviated Notice of Resource Area Delineation ("ANRAD") application), the Company will provide current design plans and Sudbury will have further opportunity to review the environmental mapping for the Project with a focus on mitigating potential wetland impacts.

107 The Town of Sudbury's concerns with respect to construction activities in wetland areas (e.g., the Project's compliance with Massachusetts Wetlands Protection Act ("WPA") regulations) is addressed in Section VI.D.2, below.

notify the public of trail closures and to work with the towns to arrange detours to minimize construction-related impacts to recreational users.

In furtherance of this goal, the Siting Board directs the Company, in consultation with the owners/managers of bordering conservation land – Sudbury, Hudson, Marlborough, Sudbury Valley Trustees, DCR, and the U.S. Department of the Interior – to develop an access plan that details: (1) the time of year that access would be limited along the MBTA ROW; (2) alternative access points to specific conservation areas if applicable; (3) guidelines for communicating with all owners/managers of such conservation lands; and (4) a complaint and resolution process regarding any issues arising from construction that impact the bordering conservation land.

The Town of Sudbury questions the validity of the Option Agreement between the MBTA and the Company, arguing in the Massachusetts Land Court that the MBTA cannot allow its ROW to be used by Eversource for the Project absent statutory authorization. The Siting Board notes that since the submission of briefs in this proceeding the legal processes relating to the town's lawsuit have advanced. On December 22, 2017, the MBTA filed a Motion to Dismiss with the Land Court; on February 26, 2018 Eversource joined the Motion to Dismiss. On September 28, 2018, the Land Court ruled allowing the defendants' motion to dismiss. Subsequently, the Town of Sudbury appealed this decision, and on May 16, 2019, the Supreme Judicial Court ("SJC") took jurisdiction of the appeal sua sponte. Briefing is complete and oral arguments in the SJC proceeding were heard on October 1, 2019.

As the Company noted, site control is not a prerequisite in project permitting, particularly before the Siting Board. Nothing in either G.L. c. 164, § 69J or § 72 requires that a project proponent secure any necessary interests in land prior to filing its petitions with the Siting Board or the Department. G.L. c. 164, §§ 69J, 72. Rather, the SJC has explicitly found that a project proponent has standing to pursue its petitions before the Siting Board even if the proponent lacks necessary property rights. Town of Andover v. Energy Facilities Siting Bd., 435 Mass. 377, 395 (2001). See Company Reply Brief, at 56. Nevertheless, the Company's legal rights to install the Project within the MBTA ROW will ultimately be determined by the SJC. Should the SJC rule in favor of the town, specific legislation would be required to permit construction of the Project along the MBTA ROW. To limit the potential for impacts while the status of the Company's Option Agreement is in dispute, the Siting Board directs that the Company cannot commence

construction of the Project along the MBTA Underground Route until the question of whether the MBTA can enter into the Option Agreement is resolved and the Company's rights to install the New Line along the MBTA ROW are thereby confirmed. Given the implementation measures proposed by the Company and the above conditions, the Siting Board finds that land use impacts from the Project along the MBTA Underground Route would be minimized.

2. Water and Wetlands

a. MBTA Underground Route and MBTA Overhead Route

i. Wetlands and Waterbodies

The Company reported that construction along the MBTA ROW would result in permanent and temporary impacts to wetland resources areas including bordering vegetated wetlands ("BVW"), bordering land subject to flooding ("BLSF"),[108] riverfront areas, vernal pools, and buffer zones (Exh. EV-2, at 5-29 to 5-30). Eversource estimated that no impacts to wetland resource areas would occur along the in-street portion of the MBTA Routes, and therefore only presented impacts along the MBTA ROW (Exh. EFSB-W-10). Eversource identified the following construction activities that would result in wetland resource impacts: development of the construction platform and access road; tree clearing; grading; construction and installation of the underground transmission line and splice vaults; installation of new bridge abutments at Hop Brook; and excavation for overhead structure foundations (Exhs. EV-2, at 5-32; EV-18, at 95; SUD-W-28; RR-SUD-10). Table 5, below, provides the Company's total estimated impacts to wetland resource areas.[109,110] In addition, the Project would result in

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108 The Company stated that the Massachusetts WPA develops BLSF limits based on the Federal Emergency Management Agency ("FEMA") Zone A floodplain; and therefore, the terms BLSF and floodplain can be used interchangeably (Tr. 10, at 1743).

109 As noted above, the Company reported the impacts to several types of wetland resources. The Company indicated that the Massachusetts WPA regulations include performance standards for permanent fill of BVW and BLSF, which are the impacts that are presented in Table 5 (Exh. EV-2, at 5-33).

110 Eversource reported that its estimates of wetland resource impacts have been reduced as engineering has advanced because it has been able to include mitigation such as retaining

1,500 square feet of permanent wetland fill at the Hudson Substation regardless of which of the routes is chosen (Exhs. EFSB-PA-36(R-3)(1); EFSB-HLD-1). HLPD indicated that this wetland is a drainage swale that was created during construction at the Hudson Substation (Tr. 14, at 2478). HLPD further indicated that it would hire and consult with a wetlands expert to analyze the resource, and if necessary, determine with the Hudson Conservation Commission any necessary mitigation (Tr. 14, at 2460, 2476-2480). The work at the Hudson Substation is the same for all three routes and is not reflected in Table 5 (Exhs. EFSB-PA-36(R-3)(1); EFSB-HLD-1).

Table 5. Estimated Impacts to Wetland Resource Areas (in square feet)

Route	Permanent Fill within BVW	Temporary Fill within BVW	Tree Clearing within BVW	BLSF Impacts[111]
MBTA Underground Route	284	2,234	0	Total: 34,314
MBTA Overhead Route	1,059	17,519	195,755	Permanent: 29,333 Temporary: 24,002 Tree clearing: 278,784
All-Street Route	0	0	0	0

Sources: Exhs. EV-18, at 30-31; EFSB-PA-36(R-3)(1); RR-SUD-10.

The Company stated that these wetlands impacts would be jurisdictional to regulations and bylaws enforced by USACE, MassDEP, and the conservation commissions of Hudson, Sudbury, and Stow (Exhs. EV-2, at 5-33; EFSB-W-1; Tr. 10, at 1711-1714). For permanent, unavoidable impacts to BVW, depending on the location and jurisdiction of the wetland

walls and rip-rap in its design and to locate its work areas outside wetlands (Exhs. EFSB-EIR-29; EFSB-EIR-30).

111 The BLSF impacts for the MBTA Underground and Overhead Route are not directly comparable since for the MBTA Overhead Route tree clearing activities that would occur outside the limits of grading were not calculated (Exhs. EFSB-W-7; EV-16, at 2-7; EV-18, at 30-31).

resource, compensation would be required at a minimum of 1:1 ratio or up to 20:1 (Exh. EV-2, at 5-33; Tr. 10, at 1742, 1776).[112] The Company stated that any fill within BLSF would require compensatory flood storage at the same incremental elevation as the proposed fill (Exh. EV-2, at 5-33; Tr. 10, at 1741-1742). Eversource filed its ANRAD applications with the Hudson and Sudbury Conservation Commissions in November 2017, beginning the local wetland permitting process (Exhs. EFSB-EIR-28(S1); EFSB-EIR-28). Further, Eversource stated that it would file a Notice of Intent for geotechnical borings and construction activities after the Project's final design is completed (Exh. EV-16, at 2-10). Eversource stated it would minimize impacts to wetlands to the extent practicable in consultation with the appropriate jurisdiction (Exh. EFSB-W-9).

Eversource stated that it continues to work with all regulatory entities to establish mitigation, but it has not reported the location, or types of wetland replication or compensatory flood storage it would implement (Exh. EFSB-EIR-8; Tr. 10, at 1741-1742, 1746). The Company proposed to provide replication for unavoidable permanent impacts to BVW and isolated vegetative wetlands at a 2:1 ratio (Exh. EV-18, at 51, 96). The Company reported it would develop mitigation plans that would include wetland replication and compensatory flood storage due to permanent fill of BVW and BLSF resources when the final design is complete (Exhs. EV-2, at 5-33 to 5-34; EFSB-W-9). The Company noted that it confirmed one location requiring compensatory flood storage along the MBTA Underground Route, which it has designed to provide the appropriate storage, and reported an additional location that may require compensatory flood storage, which would depend on further engineering and topographic information (Exhs. SUD-DEIR-30; SUD-DEIR-31; Tr. 10, at 1745, 1747).

The Company stated that it would minimize impacts to wetland resource areas by designing the access road and construction platform to be located outside of wetland resource areas wherever possible, and by reducing the size of the construction platform to 18 feet across

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112 Among the host communities, only Sudbury has a local wetlands protection bylaw, which could require wetland replication up to a 3:1 ratio (Exh. EV-2, at 5-33; Tr. 10, at 1776; Tr. 12, at 2143-2144). The USACE recommends a compensation ratio of at least 2:1 and up to 20:1, depending on the type of resource area impacted and the proposed mitigation (Exh. EV-2, at 5-33).

(compared to 22 feet for the rest of the ROW) in locations near vernal pools (Exh. EV-2, at 5-33; Tr. 8, at 1354).[113] Eversource stated it would further minimize impacts to wetland resource areas through the use of erosion and sedimentation controls, and by excluding vehicle refueling from wetland protection and buffer zones (Exh. EV-2, at 5-35 to 5-37; Tr. 10, at 1685).

Eversource indicated that the New Line would cross several perennial and intermittent streams, including Hop Brook, Dudley Brook, Fort Meadow Brook, and several existing unnamed culverts (Exh. EFSB-W-2). With respect to the MBTA Underground Route, the Company stated that the duct bank would be attached to bridge structures and installed over existing culverts (Exhs. EV-2, at 5-14; EFSB-W-2). The Company stated that it does not anticipate impacts to wetland resources or waterbodies due to bridge rehabilitation (Exh. SUD-W-6).

ii. Public Water Supplies

The Company reported that the Project would be located in the vicinity of wellhead protection areas regulated by MassDEP and water supply protection overlay districts regulated by local zoning authorities (together, "public water supplies") (Exhs. EV-2, at 5-35; EFSB-W-11).[114] Eversource stated that the MBTA Overhead and Underground Routes would cross 6.5 linear miles of public water supplies, including three Zone II wellhead protection areas (two in Hudson and one in Sudbury) and three local water supply protection overlay districts (Exh. EV-2, at 5-35 to 5-36). The Company provided the distance between the Project along all three routes and each municipal well in Sudbury and Hudson (Exhs. EFSB-W-13; EFSB-W-15). See Table 6, below.

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113 With respect to vernal pools, Eversource committed to avoiding construction within 450 feet of vernal pools during the migratory breeding period from March 1 to May 14 (Exh. EV-18, at 137). Further, the Company conducted an analysis of existing and proposed flows to vernal pools, confirming that the Project would not affect the annual recharge of these resources (Exh. EV-18, at 137).

114 The Company stated that there are no known private drinking wells within 100 feet of the MBTA ROW (Exh. EV-16, at 8-2).

Table 6. Distance Between Closest Municipal Well and Project Features for All Route Alternatives

Well Name	Distance to MBTA Underground Route Duct Bank	Distance to MBTA Overhead Route Structure	Distance to All-Street Route Duct Bank
GP Well 2A (Sudbury)	1,820 feet	1,840 feet	5,312 feet
Cranberry Bog Well (Hudson)	713 feet	700 feet	3,209 feet
GP Well 4 (Sudbury)	3,458 feet	3,443 feet	5,131 feet
Kane Well (Hudson)	1,031 feet	1,017 feet	646 feet

Sources: Exhs. EFSB-W-13; EFSB-W-15.

The Company stated that it engaged a professional hydrogeologist to complete a groundwater hydrology assessment for public water supplies in Sudbury and Hudson (Exhs. EV-2, at 5-35 to 5-36, app. 5-6, app. 5-7; EV-16, app. 8-1, app. 8-2; Tr. 10, at 1655). The assessments evaluated the potential for the Project features (e.g. duct bank, concrete foundations) to affect the flow and quality of water within the public water supplies and identified locations along the MBTA ROW where the duct bank, manholes, or overhead structure foundations would extend into the groundwater table, which is presented in Table 7, below (Exhs. EV-2, at 5-35 to 5-36; EV-16, app. 8-1, app. 8-2; RR-EFSB-73).[115]

[115] The Company asserted that it considered relocating manholes that would extend into the groundwater table, however, it subsequently determined that relocation would be infeasible based on: (1) the distance required between manholes, which is limited by the length of cable segments (between 1,500 and 1,900 feet), and (2) natural features within the ROW, such as wetland resource areas (Tr. 10, at 1661-1671; RR-EFSB-71).

Table 7. Project Features Within Groundwater Table

Town	Project Features	Total Locations	Maximum Depth of Project Below Groundwater Level (feet)
Sudbury	Duct Bank	7	15
	Manhole	3	14
	Structure Foundation	18	30
Hudson	Duct Bank	4	10
	Manhole	2	6
	Structure Foundation	19	25

Sources: Exhs. EV-16, app. 8-1, at 7, and app. 8-2, at 6; RR-EFSB-72; RR-EFSB-73.
Note: The Company assumed that the duct bank would be buried approximately five feet below grade, manholes would be buried at a maximum of 14 feet below grade, and structure foundations would require excavation to a depth of 30 feet (RR-EFSB-72; RR-EFSB-73).

Eversource noted that: (1) the underlying aquifers are composed of highly permeable sand and gravel; and (2) the Project features would extend into a shallow portion of the 100-foot-deep aquifer, allowing groundwater to flow under and around each feature (Exh. EV-16, app. 8-1, app. 8-2; Tr. 10, at 1658-1661, 1683). Eversource concluded that the placement of duct banks, manholes, or structure foundations within the aquifer would not impact flow rate, flow direction, or quantity of groundwater flow (Exh. EV-16, app. 8-1, at 7-8, app. 8-2, at 6-7; Tr. 10, at 1659-1660, 1683). The Company stated that any potential Project impacts to public water supplies would be limited to contamination from spilled fuels, lubricants, or other potentially hazardous materials (Exh. EFSB-W-19). Eversource noted that, with respect to the potential for Project construction to encounter subsurface contamination, it may encounter currently unidentified contamination from the MBTA ROW's previous use as an active railroad corridor (Exh. EV-2, at 5-58). See Section VI.D.6. The Company stated that in a meeting with MassDEP about the MCRT, MassDEP did not express any specific concerns regarding groundwater and contamination from construction along the railroad corridor, given that the railroad has inactive for roughly 50 years and any leaching would have already occurred (Tr. 10, at 1693).

The Company asserted that it would minimize impacts to public water supplies by developing a Stormwater Pollution Prevention Plan ("SWPPP") and implementing spill

protection controls and countermeasures, including prohibiting equipment refueling within 100 feet of wetland or waterbodies, locating contractor staging and storage areas within existing developed and impervious areas, and requiring contractors to have spill containment and prevention equipment available (Exh. EV-2, at 5-35 to 5-37; Tr. 10, at 1685).[116]

As noted above in Section VI.D.1, DCR would be responsible for ROW maintenance and vegetation management once construction of the MCRT starts, and the Company stated that it expects that DCR's practices would comply with applicable best management practices and regulatory standards to ensure no impacts to public water supplies (Exh. EV-2, at 5-37; Tr. 10, at 1689). For the MBTA Overhead Route, DCR would be responsible for vegetation maintenance within its easement, and the Company would be responsible for maintenance outside of the DCR easement required for safe operation of the overhead transmission line (Tr. 9, at 1511; Tr. 10, at 1689). For any vegetation maintenance areas under Eversource's responsibility, the Company stated that it would adhere to its established VMP and Yearly Operating Plan to avoid adversely affecting groundwater (Exhs. EV-2, app. 5-4, app. 5-5; EFSB-W-12; EFSB-W-20; SUD-W-22; Tr. 10, at 1685-1686). Eversource stated that it does not use herbicides during construction and maintains a no-spray zone within 400 feet of public drinking water wells and 50 feet from private drinking wells after construction (Exh. EFSB-W-12).

iii. Coldwater Fisheries

The MBTA ROW crosses Hop Brook, a MassDEP and Massachusetts Division of Fisheries and Wildlife ("MassDFW") designated coldwater fishery, at two locations (Exh. EV-2, at 5-39).[117] Eversource indicated that tree removal and bridge rehabilitation could impact Hop

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116 The Company stated its SWPPP would be drafted during its detailed engineering phase, completed when the Company selects its construction contractor, and filed with the U. S. Environmental Protection Agency ("USEPA") prior to construction (Exh. EFSB-W-4).

117 The Massachusetts WPA defines waters as coldwater fisheries if: (1) the mean of the maximum daily temperature over a seven-day period generally does not exceed 68ºF; and (2) ecological factors are capable of supporting a year round population of coldwater aquatic life (Exh. EV-2, at 5-39). MassDFW designates waters as coldwater fishery resources when there is evidence that a coldwater fish population and suitable habitat (e.g., streamside vegetation) exists (Exh. EV-2, at 5-39). Hop Brook is one of several

Brook by causing erosion and sedimentation and removing vegetative cover (e.g., shade trees, tall grasses, shrubs, aquatic plants) from banks (Exhs. EV-2, at 5-40 to 5-41; EFSB-W-21).

The Company reported that it would minimize impacts to coldwater fisheries by retaining tree canopy along and on top of the banks, minimizing shrub removal and soil disturbance, and avoiding removal of logs, stumps, and woody debris (Exhs. EFSB-W-21; EFSB-EIR-4; Tr. 10, at 1727-1728). The Company determined that the main source of shading along Hop Brook, which could be impacted by construction, is dense shrubby vegetation beneath trees and along the banks (Exh. EFSB-W-21; Tr. 10, at 1728-1729). However, Eversource noted that this vegetation provides limited shading, as the branches do not hang directly over the brook, and that any shading realized occurs in the morning and afternoon hours rather than at the hottest time of the day (Exh. EFSB-W-21). The Company stated that new bridge decking would provide shading (Tr. 10, at 1728-1729).

Eversource reported that the Project would require a total of 287 linear feet of tree removal along banks, including along Hop Brook (Exh. EV-18, at 10, 85). Eversource stated it would restore vegetation along banks where tree removal would be required to the extent practicable (Exhs. EFSB-W-21; EFSB-EIR-4). The Company also noted that measures in its SWPPP would minimize the risk of erosion and would contain standard best management practices ("BMPs") to protect water quality and coldwater fisheries (Exhs. EV-2, at 5-41; EV-16, at 6-4). Eversource stated that the duct bank for the MBTA Underground Line would be attached to the bridges; however, temporary impacts to wetland resources would result from the installation of sheeting to support the new bridge abutments, and timber mats to support the cranes for the bridge work (Exhs. EV-18, at 85; EFSB-EIR-4). The Company stated that no active in-stream work would be performed in both Hop Brook locations from October 1 through June 30 to avoid potential impacts to the coldwater fishery resource (Exh. EV-18, at 137).

Eversource stated that it consulted with MassDFW staff regarding impacts to coldwater fisheries and measures to avoid, minimize and mitigate such impacts (Exh. EV-18, at 90). MassDFW indicated that the proposed work is not anticipated to result in impacts to coldwater

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nearby brooks, including Cranberry Brook and Trout Brook that are classified as coldwater fisheries (Exh. EFSB-W-21).

fisheries resources, given that a large portion of Hop Brook is already flowing through wet open meadows and the Company would be replanting appropriate and compatible vegetation (Exh. EV-18, at 90).[118] The Company reported that Sudbury's Wetlands Administration Bylaw and Regulations establishes performance standards for vegetated riverfront areas, which would include the banks of Hop Brook (Exhs. EV-16, at 2-27; EFSB-EIR-4; Tr. 10, at 1729). Under this bylaw, if the Company removes trees within 80 feet of coldwater fisheries, Eversource would be required to complete a wildlife habitat evaluation to identify key habitat features and develop an avoidance and restoration plan (Exh. EV-16, at 2-27; Tr. 10, at 1728-1730). The Company stated that it would work with all applicable regulatory agencies and landowners to adhere to coldwater fishery regulatory standards to the maximum extent practicable, and that it would minimize impacts to coldwater fisheries (Exh. EFSB-W-21).

iv. Stormwater

The Company stated that it would design and construct the stormwater management system for the MCRT (Tr. 10, at 1720). Eversource stated that it is designing the access road to comply with MassDEP stormwater standards applicable to its future use as a multi-use path and impervious surface (Exh. SUD-DEIR-3; Tr. 10, at 1722-1723).[119] The Company stated it would develop a SWPPP that details how stormwater discharges are controlled and would include adequate soil erosion, sediment, and turbidity control plans to prevent the migration of soil and sediment to adjacent wetlands and waterbodies (Exh. EV-18, at 31).

b. All-Street Route

The Company stated that the All-Street Route would not have permanent or temporary impacts to wetland resource areas, public water supplies, or coldwater fishes since the All-Street

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118 As discussed above, the Company received a final conditional "no-take" determination from NHESP of the MassDFW on October 19, 2019.

119 Eversource noted that it would design its stormwater system to be in full compliance with the stormwater standards for rail trails, which it indicated are more stringent that what the Project would be subject to as an electric transmission line (Tr. 10, at 1720-1723; Tr. 11, at 1888-1890).

Route would be located entirely within public roadways (Exh. EV-2, at 5-33, 5-36, 5-41).[120] Accordingly, the All-Street Route would not require any jurisdictional filings with USACE, MassDEP, or local municipalities, or mitigation due to wetland fill (Exh. EFSB-W-8).

c. Positions of the Parties

i. Town of Sudbury

The Town of Sudbury argues that Project construction will cause significant adverse impacts to wetlands resources and that the impacts to wetland resources and coldwater fisheries would be more serious and extensive than demonstrated by Eversource (Sudbury Brief at 56, 59, 66). Sudbury states that it has identified numerous errors, omissions, and inconsistencies in the Company's design plan sets throughout the proceeding, including in the Company's most recent filing on December 22, 2017 (Sudbury Brief at 57-58). According to Sudbury, these errors, omissions, and inconsistencies relate to wetland delineations, limits of work and construction disturbance, and topography (Sudbury Brief at 57-58).

Sudbury asserts that the Company's inadequate design plans make it impossible to quantify the temporary and permanent impacts to wetland resources, vegetation, and coldwater fisheries located along the MBTA ROW, specifically related to bridge repair and culvert replacement (Sudbury Brief at 56-57, 59-61, 63-64). Among other deficiencies, the town notes that BLSF impacts are only identified at 50-foot intervals on the cross-section sheets with no impacts identified between those intervals; wetland impacts for BVW and bank at culverts are not identified; and that there are three locations of BVW alteration shown on the plans which do not align with the impacts shown in a record request response (Sudbury Brief at 58, citing RR-SUD-10(3)). Moreover, Sudbury questions Eversource's delineation of bank in certain sensitive areas categorized as coldwater fisheries resources (Sudbury Brief at 58, citing Tr. 12, at 2172-2173). According to Sudbury, the total impact to bank in the final approved ANRAD

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120 Although Eversource asserted the All-Street Route would not impact wetland and water resources due to its location in a previously developed roadway, it reported that the All-Street Route would: (1) pass through BVW buffer zones, BLSF buffer zones, and riverfront areas; (2) traverse 6.63 miles of public water supplies; and (3) cross two coldwater fisheries (Exh. EV-2, at 5-33, 5-35 to 5-36, 5-41).

Plans may be significantly more than reported in RR-SUD-10; and thus, the wetlands boundaries on the December 22, 2017 plans and the reduced quantities of impact to wetlands resource areas reported in RR-SUD-10 are only approximations (Sudbury Brief at 58-59, citing Tr. 12, at 2152). Therefore, Sudbury concludes that there is no way to utilize the December 22, 2017 plans to confirm or replicate Eversource's most current summary of wetlands impacts (Sudbury Brief at 58).

Sudbury also asserts that the Company's mitigation measures are inadequate and that the Company has not provided any quantitative information on its proposed mitigation measures (Sudbury Brief at 61-62, 64). Sudbury specifies that Eversource has not identified a mitigation plan for sensitive environmental areas in the vicinity of the bridges, such as wetlands, and that a VMP would be essential for protecting the functions of wetlands and priority species (Sudbury Brief at 64). Sudbury states that proper mitigation is important to the protection of the values and function of wetlands and species (Sudbury Brief at 64). Sudbury contends that the Draft Environmental Impact Report ("DEIR") contains no mitigation measures or specific locations for mitigation measures (Sudbury Brief at 62, citing Exh. EV-16). Sudbury states that it does not allow the use herbicides or pesticides on any property that has been subject to a wetlands order of conditions (Tr. 11, at 2147).

Sudbury argues that the environmental impacts of the Project will be more significant than claimed by Eversource (Sudbury Brief at 66). Specifically, the town expresses concern regarding water resources such as wetlands and floodplains (Sudbury Brief at 66-69). With respect to wetlands, Sudbury states that tree clearing along banks of coldwater fisheries, construction activities within wetland resource areas, and bridge and culvert improvements would lead to significant adverse impacts (Sudbury Brief at 66). Sudbury argues that without adequate project design, construction specifications, and a wildlife habitat evaluation, the Company cannot accurately estimate the impact of the Project (Sudbury Brief at 66, 68).[121] Sudbury notes that its environmental experts, based on their experience on similar projects

[121] Specific project design features and construction specifications that the town claims are inadequate include slope stabilization measures, geotechnical investigations, and hydraulic analysis of floodplain fill (Sudbury Brief at 66-69).

within the town, expressed concerns about additional impacts which would be realized during construction (Sudbury Brief at 66, citing Exh. SUD-MJN/RMG-1(R) at 56).

Further, Sudbury argues that the Company has inadequately described the extent and the benefit of shading along banks to coldwater fisheries and failed to report woody and aquatic plant species that provide shading along adjacent banks (Sudbury Brief at 66-67). Sudbury asserts that removal of trees and shrubs along Hop Brook would eliminate shading to the underlying coldwater fisheries (Sudbury Brief at 66-67). With respect to vernal pools, the town argues that despite the Company's assertion that there would be no direct impact to vernal pools, there would be secondary effects of construction activities (Sudbury Brief at 67).

Sudbury argues that impacts to floodplains, including discharge of floodwater and obstruction of flow, would be realized through permanent fill and encroachment of construction activities and bridge features on BLSF (Sudbury Brief at 68-69, citing Exh. SUD-MJN/RMG-1(R) at 25-26; Tr. 11, at 2041-2046; Tr. 12 at, 2158-2061; RR-SUD-10). Sudbury argues that the Company failed to provide details of the stormwater best management practices that it would implement to comply with applicable stormwater standards (Sudbury Brief at 62). The town argues that the Company incorrectly stated it would be responsible for stormwater standards developed for foot paths, bike paths, and other pedestrian paths; rather, it claims that the Company would be responsible for stormwater standards for a vehicular access road (Sudbury Brief at 63).

ii. Protect Sudbury

Protect Sudbury asserts that the Project as proposed would impact environmentally sensitive and protected areas including bordering vegetative wetlands, bordering land subject to flooding, riverfront areas, and 100-foot buffer zones (PS Brief at 8, citing Exh. EFSB-W-7(1), SUD-MJN/RMG-1, at 10-11). Further, Protect Sudbury asserts that, in addition to the impacts to wetland resource areas listed above, the Project would permanently affect rare species, coldwater fisheries, vernal pools and public water supplies (PS Brief at 8, citing Exhs. SUD-DFN/WFO-1 at 7; Hudson-ER-1 at 3-7; SUD-MJN/RMG-1 at 18-48). Protect Sudbury concludes that Eversource cannot hide the long-lasting extensive damage to fragile wetlands, public water supplies, and coldwater fisheries resulting from the Project (PS Reply Brief at 11).

iii. Town of Hudson

Hudson stated its belief that use of the MBTA corridor for the proposed Project has significantly greater environmental impacts than identified by the Company in its Petition (Exh. Hudson-PH at 3). Specifically, Hudson asserted that the Company did not consider the cost of lost environmental services or the potential increased flooding and pollution due to the loss of stormwater absorption from tree clearing and wetland fill; Hudson also argued that the Company did not evaluate climate change implications of the Project (Exhs. Hudson-PH at 4, 6; EFSB-HUD-4). Hudson notes that the MBTA Routes traverse two Zone II protection areas and are in close proximity to, or within, one or more Zone I protection areas associated with Hudson's five town wells, which serve over 20,000 residents (Exhs. Hudson-PH at 4-5, 7, 10; Sudbury-ER at 3). Hudson asserts that construction along the MBTA corridor would negatively impact the town's water supply due to disturbance of soil likely contaminated by historic train operations (Exhs. Hudson-ER, at 4; Hudson-PH at 10).[122]

Hudson also points to the use of herbicides following construction as likely to contaminate surface water and groundwater, thereby affecting public drinking water wells (Exh. Hudson-ER-5). Hudson prefers the use of mechanical means of vegetation management versus herbicides in sensitive areas such as Zone I, Zone II, and other wetland resource areas (Tr. 11, at 2000-2002). Hudson states that in the Watershed Protection District, herbicide use is allowed by special permit only, and that as a general practice, special permits in this district prohibit such use (RR-EFSB-76). Hudson notes that based on the Company's groundwater hydrology assessments completed for the Project, soil in the area of the MBTA ROW is highly permeable, heightening the vulnerability of its public water supplies (RR-EFSB-76).

Hudson also notes that the clearing of vegetation could have serious adverse impacts on fish (and other wildlife) that depend on a limited range of water temperatures for living and

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[122] The Siting Board received two comment letters from the Town of Hudson reiterating its concerns relating to its public water supplies. In these letters, the town describes contamination of drinking water from a near-by industrial source. See March 28, 2019 letter from Thomas Moses, Executive Assistant of the Town of Hudson and March 29, 2019 letter from Pam Helinek, Town of Hudson Conservation Agent.

breeding, such as the native brook trout in the Hop Brook in Sudbury (Exh. Hudson-PH, at 8). With regard to wetlands, Hudson asserts that wetland replication is extremely difficult and fails more than it succeeds (Exh. Hudson-PH at 9). Finally, Hudson notes that routes using the MBTA corridor are near at least 15 certified vernal pools (Exh. Hudson-PH at 11).

iv. Company Response

The Company states that it has improved and updated its information regarding wetlands, coldwater fisheries, and stormwater runoff throughout this proceeding (Company Brief at 100 n.70; Company Reply Brief at 61-62). The Company acknowledges that information such as final bridge and culvert design would be addressed during the local permitting process (Company Reply Brief at 61-62). Eversource notes it will continue to work collaboratively with the conservation commissions in each town to identify reasonable mitigation measures while presenting advanced and refined Project designs at the local permitting level (Company Brief at 101; Company Reply Brief at 61-62).

The Company asserts that it has made significant commitments to mitigate wetland resource impacts through consultations with USACE, MassDEP, NHESP, and local conservation commissions (Company Brief at 100-101; Company Reply Brief at 65-66). The Company commits to continue to design the Project to avoid permanent floodplain fill (Company Brief at 100). Eversource asserts it would develop reasonable compensatory mitigation plans for wetland and floodplain impacts when final design is complete (Company Brief at 101; Company Reply Brief at 66).

The Company states that, in accordance with FEMA requirements, it would complete a hydrologic and hydraulic analysis, and that by providing necessary compensatory flood storage, the Project would not result in increased flood levels (Company Reply Brief at 80, citing Exh. SUD-DEIR-34; Tr. 8, at 1394-1397). The Company states that the installation of the Project would not have any appreciable impact on groundwater flow or public water supplies (Company Brief at 102-103). Eversource states that underground Project components would only impinge on a small fraction of the aquifer, which it claims is highly permeable, and that water would be able to flow under and around any underground Project components (i.e., duct banks, splice vaults, structure foundations) (Company Brief at 102-103). Further, the Company

contends that its spill protection controls and counter measures, as well its vegetation management practices, would ensure no impacts to water quality from Project construction (Company Brief at 103-104).

Eversource asserts it has adequately described the anticipated environmental impacts to Hop Brook from bridge construction and identified minimization measures applicable to that construction activity (e.g. minimizing tree clearing, completing wildlife habitat evaluations) (Company Reply Brief at 65). The Company contends that such action would minimize impacts to Hop Brook (Company Reply Brief at 65).

d. Analysis and Findings on Water and Wetlands

The Siting Board agrees with the Town of Sudbury that wetlands in the vicinity of the MBTA ROW are valuable and sensitive environmental resources that necessitate careful Project planning and mitigation measures. The Siting Board notes that as the Company's engineering and design plans for the Project have advanced, the Company has significantly reduced the Project's anticipated wetland resource impacts. The record shows that the Company continuously modified its design plans to minimize and avoid wetland resource impacts, including vernal pools; however, as final project design has not yet been completed, the Company has not presented its final plans for wetland replication and compensatory flood storage. Contrary to the Town of Sudbury's assertions, the Company's compliance with FEMA's National Flood Insurance Program, including required hydrologic and hydraulic analyses, will protect against any potential for increased flooding during a 100-year storm event following construction of the Project.

Comparing the routes, with respect to construction along the MBTA ROW, the MBTA Underground Route would have fewer impacts than the MBTA Overhead Route, primarily due to decreased tree clearing in wetland areas. Construction of the in-street portions of the MBTA Routes would minimize water and wetland resource impacts along both routes. The All-Street Route, given its exclusive use of public roadways, would not have any water and wetland resource impacts. Accordingly, with regard to wetland resources, the Siting Board finds that the All-Street Route is preferable to both the MBTA Underground and Overhead Routes, and that the MBTA Underground Route is preferable to the MBTA Overhead Route.

Eversource asserted it would meet all mitigation requirements, to the extent possible, identified by USACE, MassDEP, and local conservation commissions. Further, the record shows that the Company would complete wildlife habitat assessments and develop an avoidance and restoration plan for coldwater fishery resources. In addition, the Company has committed to avoid all in-stream work in both Hop Brook locations from October 1 to June 30 to further limit potential impacts to coldwater fisheries. The Siting Board directs the Company to file the following documents applicable to a particular community prior to the start of construction in that community: final mitigation plans for wetland replication and compensatory flood storage; completed wildlife habitat assessments; final avoidance and mitigation plans; and each Order of Conditions from the local conservation commissions. The Company shall not be precluded from commencing construction in a particular community if it is fully permitted to proceed in that community.

The record shows that the Project would cross public water supplies in Sudbury and Hudson, and that construction of the Project would not negatively affect these resources or groundwater flow. To minimize the potential for spills and other sources of groundwater contamination such as migration of contaminates from excavated soils into adjacent wetlands, Eversource would develop a SWPPP, and would not allow equipment fueling within 100 feet of wetlands and waterbodies. See Section VI.D.6.

The record shows that the MBTA ROW crosses a designated coldwater fishery at two locations. Construction activities could lead to erosion, sedimentation, and the removal of vegetative cover, but that the Company would minimize potential impacts to these resources through identified best management practices, adherence to its VMP, and consultation with MassDFW. The Siting Board directs the Company to report on any future consultations with MassDFW and provide any additional mitigation or best practices that will be implemented prior to construction of the Project.

The Siting Board notes that the towns have expressed concerns regarding vegetation management along the MBTA ROW and potential impacts to water supplies, and further that the Project would be located in a Hudson Watershed Protection District and a Sudbury Water Resource Overlay District (see Section VIII). The Siting Board directs Eversource to utilize mechanical vegetation management along the MBTA ROW. Further, if Eversource finalizes an

MOU with DCR for vegetation management along the MCRT, Eversource shall incorporate the same provision in the MOU. If DCR does not agree to the inclusion of this provision in the MOU, Eversource shall submit a report to the Siting Board describing DCR's objections for the Board's consideration.

Given the Company's ongoing consultations with the local conservation commissions, USACE, and MassDFW, and the wetland replication and compensatory flood storage that would be required for the MBTA Underground Route, and with the implementation of the above conditions, the Siting Board finds that wetlands and water resource impacts of the Project along the MBTA Underground Route would be minimized.

3. Noise

a. Company Description

The Company stated that noise from construction of the Project would result in localized, short-term increases in noise levels near work sites during construction (Exh. EV-2, at 5-69). Construction-related noise would occur as a result of the operation of heavy equipment, construction vehicles, backhoe excavations, dump truck loading, concrete truck operations, drilling rigs, and cranes, among other equipment (Exhs. EV-2, at 5-69; EV-18, at 115). According to the Company, typical Project construction equipment would produce sound levels along the MBTA Routes of 60 dBA to 98 dBA at a distance of 50 feet (Exhs. EV-2, at 5-72, 5-74; EV-16, at 13-5).[123] Project sound would be louder closer to construction, so along the MBTA ROW, where Eversource reported that the closest residence to the MBTA Underground Route is 34 feet from the proposed construction, sound levels would be from 63 dBA to 101 dBA (Exhs. EV-2, at 5-71 to 5-74; EV-16, at 13-5). For the MBTA Overhead Route, the closest residence is eleven feet from the proposed construction, where construction sound levels were estimated to be between 65 dBA to 111 dBA (Exhs. EV-2, at 5-71 to 5-74; EV-16, at 13-5). The Company estimated that construction sound levels at the closest residence along the roadway

[123] According to the Company, Project sound levels inside a building would typically be reduced by about 27 dBA in the winter months with windows closed, and by 17 dBA in the summer with windows open, relative to Project sound levels outside the building (Exh. EFSB-EIR-26).

portion of the MBTA Routes in Hudson, 28 feet from the limit of work, would be from 63 dBA to 93 dBA (Exhs. EV-2, at 5-72; Tr. 10, at 1711).

For the All-Street Route, sound levels from typical construction equipment would produce sound levels of 60 dBA to 90 dBA at a distance of 50 feet (Exhs. EV-2, at 5-75). Eversource reported that the closest residence to the All-Street Route is twelve feet from the proposed construction, where construction sound levels were estimated to be between 73 dBA to 103 dBA (Exh. EV-2, at 5-75).

The Company indicated that the noisiest activity of construction would be vegetation removal along the MBTA ROW (98 dBA at 50 feet), which would take two to three months for the MBTA Underground Route and three to four months for the MBTA Overhead Route, and would require bulldozers, grapple trucks, mowers, and chain saws, among other equipment (Exh. EV-2, at 5-72; 5-74; Tr. 13, at 2362-2363). Splice vault installation and trench excavation would be the noisiest activities associated with in-street construction (Exh. EV-2, at 5-74 to 5-75). Eversource stated that pavement saws, pneumatic hammers, and other heavy equipment would be used to complete this work (Exh. EV-2, at 5-74 to 5-75).

Table 8 below summarizes the range of construction noise levels at 50 feet and at the closest point to residences associated with all three routes, and the total number of residential units located along all three routes.

Table 8. Construction Noise Impacts

	Number of Residential Units at 50 Feet[124]	Sound Levels at 50 Feet	Sound Levels at Nearest Residence	Total Number of Residential Units Along Route
MBTA Underground Route	16	60 to 98 dBA	63 to 101 dBA (at 34 feet)	315
MBTA Overhead Route	108	60 to 98 dBA	65 to 111 dBA (at 11 feet)	315
All-Street Route	61	60 to 90 dBA	73 to 103 dBA (at 12 feet)	549

Source: Exh. EV-2, at 5-51, 5-72, 5-74, 5-75, 5-76.

The Company's proposed construction hours are Monday through Friday, 7:00 a.m. to 7:00 p.m., and Saturdays from 9:00 a.m. to 5:00 p.m. (Exh. EFSB-NO-2). Sudbury's Zoning Bylaw allows construction from Monday to Friday from 7:00 a.m. to 6:00 p.m. (Exhs. EFSB-NO-4(2); EFSB-Z-7). The Company is seeking an exemption from Section 3423 of the Sudbury Zoning Bylaw for allowed hours and days of construction (Exh. EV-3, at 15, 16) (See Section VIII).[125]

Eversource stated that extended work hours may be proposed beyond the normal construction hours due to schedule delays, inclement weather, business impact mitigation, or activities that must be performed continuously such as cable splicing (Exh. EFSB-NO-2). The Company explained that other activities that could occur outside of typical work hours may

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[124] Number of residences and sound levels are measured at 50 feet from the construction activity (Exh. EV-1, at 5-73).

[125] The Company is seeking an exemption from Section 3.8.13 of the Stow Zoning Bylaw from sound in excess of three decibels in sound increase beyond the property line (Exh. EFSB-NO-4(3)). There are no designated hours and days of construction (Exh. EFSB-NO-4(3)). Stow does not object to the exemption based on its application to construction activities only (Stow Brief at 4). Section 33 of the Hudson Town Bylaw limits loud noise between the hours of 11:00 p.m. and 7:00 a.m. (Exh. EFSB-NO-4(1) at 10).

include night work for installations of the cable within the roadway, which may be a preference of Hudson in order to minimize traffic impacts during the day (Exh. EFSB-NO-13).[126] Eversource proposed to perform work that requires continuous operation until completion on a limited time on evenings, Sundays, and holidays (Exh. EV-2, at 5-26, 5-76). Eversource stated that if it would need to extend construction hours, it would notify the municipality of the need for extended work hours one week prior to the needed date, and it would notify nearby property owners three to five days in advance (Exh. EV-18, at 114). For extended hours for unexpected work, it would notify the municipality at the time the need is identified and would notify abutters with door-to-door notifications (Exh. EV-18, at 114).

The Company stated that it would be willing to adjust its work hours to alleviate daytime impacts to businesses located along the ROW (Tr. 13, at 2382). Eversource explained that if any businesses along the ROW would benefit substantially from different construction hours, the Company would communicate with the businesses and the applicable town to identify construction work hours amenable to all parties (Tr. 13, at 2382).

Noise sources from underground cable splicing and pulling would include a generator, air conditioner, and splicing van (Exh. EV-2, at 5-72). The Company anticipates that cable splicing would require twelve hours of continuous work once started and may need to be performed outside typical work hours if the allowable workday has fewer than twelve hours (Exh. EFSB-NO-10; Tr. 13, at 2356). Eversource emphasized that during cable splicing the location of the generator would be strategically placed to minimize noise impacts to abutters (Tr. 13, at 2368). The Company affirmed that it would use low noise generators during cable pulling, splicing, and testing (RR-EFSB-91). Eversource maintained that low noise generators

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126 Eversource explained that Hudson would prefer nighttime construction at the intersection of Wilkins and Main Street due to heavy daytime traffic in that area (Tr. 13, at 2375). The Company stated that overnight construction hours could occur from 7:00 p.m. to 5:00 a.m., and Hudson confirmed that the Company can request approval for construction work beyond 11:00 p.m. (Tr. 11, at 1978; Tr. 13, at 2377).

are rated to produce sound levels of 60 dBA at a distance of 50 feet (Exh. EV-18, at 116; RR-EFSB-91).[127]

The Company explained that it would commence activities that require continuous work as early in the day as possible to minimize the number of hours needed beyond normal work hours (Exh. EFSB-NO-9; Tr. 13, at 2357, 2360). Outside of emergency situations, Eversource asserted that no construction has been identified that would require planned, around-the-clock work (Exh. EFSB-NO-5). Specifically, for the MBTA Overhead Route, the Company stated that foundation drilling associated with the overhead structures would have potential for requiring extended work hours in the event of a mechanical issue or if bedrock is encountered (Tr. 13, at 2360-2361).

Eversource proposed the following mitigation for noise impacts associated with construction of the Project: (1) the Company would minimize engine noise by ensuring that only necessary equipment would be running during construction; (2) the Company would require its contractors to use equipment that is in good working order and meets all regulatory requirements; (3) portable generator units would be placed as far away from sensitive receptors as possible and the exhaust would be pointed away from the receptors; (4) portable generators would be placed on solid, padded bases and on top of a vibration dampening pad; (5) a sound dampening enclosure or barrier would be placed around the generator units; (6) the Company would limit vehicle idling to no more than five minutes, per state law and MassDEP regulations, and job site supervisors would be responsible for full enforcement of this rule; (7) the Company would comply with all applicable local noise ordinances; and (8) the Company would request additional access points to the MBTA ROW from industrial or commercial abutting property owners in order to minimize its use of public road crossings, minimizing vehicle access noise to nearby residents (Exhs. EV-18, at 115, 116; EV-2, at 5-75 to 5-76; EV-16, at 13-5; EFSB-NO-4; EFSB-NO-6; EFSB-NO-11; EFSB-NO-16; Tr. 13, at 2368; RR-EFSB-91). In addition,

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[127] Eversource estimated that maximum noise impacts from cable splicing without the use of a low noise generator would be approximately 63 to 87 dBA at the closest residence to the Project (Exh. EV-2, at 5-72).

Eversource affirmed that it would consult with municipalities on a case-by-case basis during the permit application process for a suggested work schedule (Exh. EFSB-NO-16).

Eversource stated that it would have specific community outreach staff available during construction of the Project that would communicate with abutters and municipal officials by going door-to-door, distributing flyers, using email and phone, addressing noise-related concerns and providing advance notice of any modifications to construction (Exh. EV-2, at 5-76; Tr. 13, at 2385-2386). The Company reported that it would maintain a toll-free phone line for the public to contact project staff (Exh. EV-2, at 1-8). Eversource maintained that it would work directly with its construction contractors to address and mitigate specific concerns brought up by the public (Tr. 13, at 2386-2387). Further, the Project will maintain a field office in the area of the Project and Company staff would attend weekly meetings with the towns (Tr. 13, at 2384-2386).

With regard to operational noise, Eversource conducted a sound study to assess potential noise impact from the proposed installation of the shunt reactor and associated switching and protection equipment at the Sudbury Substation (Exh. EV-2, App. 5-1, at 1). The study indicated that the proposed shunt reactor and related equipment would not cause sound levels in excess of MassDEP or Town of Sudbury regulations (Exh. EV-2, at 5-6; App. 5-1, at 8). Specifically, the future sound levels would increase by 0.3 to 0.4 dBA at the three closest residential receptors from the Sudbury Substation, and no pure tone condition would be produced (Exhs. EV-2, at 5-6; EV-3, at App. 5-1, at 5, 8, 10; EFSB-NO-15). Eversource stated that as the MBTA Overhead Route would not require the installation of a third shunt reactor at the Sudbury Substation, there would be no additional operational sound (Exh. EFSB-NO-1). HLPD confirmed that no noise producing equipment would be installed at the Hudson Substation (Exh. EFSB-HLP-9).

Eversource stated that typical construction sound levels would be similar for all three proposed routes (Tr. 13, at 2389). The Company explained that the All-Street Route would have the highest potential for construction noise to disturb residents because more residential units are located along the All-Street Route (Tr. 13, at 2389-2390). However, Eversource noted that the MBTA Overhead Route would be the noisiest route for construction because it would involve extensive tree clearing (Tr. 13, at 2391).

b. Analysis and Findings on Noise

There would not be an increase in existing noise levels associated with operation of the proposed Project. Construction of the Project, however, would have considerable, though temporary, noise impacts along all three routes. The record shows that Project construction noise could be as high as 98 dBA along both of the MBTA Routes and 90 dBA along the All-Street Route at a distance of 50 feet from the construction activity, and higher at the closest residences. The impact of construction-related noise along all the routes depends on the construction equipment used for each phase of construction, the specific construction activity, and the proximity of residents, businesses, and sensitive receptors along each route.

The record shows that the MBTA Overhead Route has the greatest potential for construction-related noise impacts of the three routes proposed. The MBTA Overhead Route has the greatest number of residences within 50 feet of construction (108), involves the most vegetative clearing (the loudest construction activity proposed), and would result in the highest maximum noise level at an abutting residence (111 dBA). While the All-Street Route does not require vegetation clearing, the record shows that it has the greatest total number of nearby residential units of the three routes (549 versus 315 for the MBTA Routes) and that it has the second highest number of residences within 50 feet of construction (61 versus 91 for the MBTA Overhead Route and 16 for the MBTA Underground Route). Additionally, the All-Street Route has the second highest maximum noise level at the closest residential abutter (103 dBA for the All-Street Route versus 111 dBA for the MBTA Overhead Route and 101 dBA for the MBTA Underground Route). Overall, the Siting Board finds that with respect to noise impacts the MBTA Underground Route is preferable to the All-Street Route and that both are preferable to the MBTA Overhead Route.

Locations that would have the longest duration of construction noise impacts would likely be adjacent to manhole locations, where cable splicing activities would involve about twelve hours of continuous work. In order to minimize sound impacts from cable splicing operations, the Siting Board directs the Company to use the quietest low-noise generators reasonably available. In addition, Eversource proposed to place portable generator units as far from sensitive receptors as possible and to use solid, padded bases. The Siting Board directs

Eversource to place any additional stationary equipment that emits loud noise as far as practicable from residences and other sensitive receptors during construction.

Hudson indicated that it would prefer nighttime work to minimize traffic concerns. The Siting Board requests that the Company work collaboratively with Hudson to alleviate the town's concerns and to minimize noise impacts of nighttime construction through appropriate mitigation measures. The Company is directed to provide a filing with the Siting Board describing nighttime construction noise mitigation measures that will be implemented during Project construction.

The Siting Board notes that the Sudbury Zoning Bylaw allows construction from Monday to Friday from 7:00 a.m. to 6:00 p.m., with no construction on Saturday and Sundays. The Company has requested construction hours of 7:00 a.m. to 7:00 p.m., Monday through Saturday. The Siting Board recognizes that construction in close proximity to residential areas would have noise impacts and requires certain limitations. To alleviate noise disturbances to residents, the Siting Board will allow Saturday work at the Sudbury and Hudson Substations, but it shall be limited to large equipment deliveries and to quiet assembly and testing activities. Because Project construction is in close proximity to many residential areas along the proposed route, including some where homes are within 50 feet of the ROW, the Siting Board directs the Company to limit construction of the New Line in residential areas to Monday through Friday from 7:00 a.m. to 6:00 p.m., with the exception of in-street work as requested by the Town of Hudson. Work requiring longer continuous duration than normal construction hours allow, such as cable splicing, is exempted from this condition.

Should the Company need to extend construction work beyond the above-noted hours and days, with the exception of emergency circumstances on a given day necessitating extended hours, the Siting Board directs the Company to seek written permission from the relevant municipal authority before the commencement of such work, and to provide the Siting Board with a copy of such permission. If the Company and municipal officials are not able to agree on whether such extended construction hours should occur, the Company may request prior authorization from the Siting Board and shall provide the relevant municipality with a copy of any such request.

The Company shall inform the Siting Board and the relevant municipality within 72 hours of any work that continues beyond the hours allowed by the Siting Board. The Company shall also send a copy to the Siting Board, within 72 hours of receipt, of any municipal authorization for an extension of work hours. Furthermore, the Company shall keep records of the dates, times, locations, and duration of all instances in which work continues beyond the hours allowed by the Siting Board; if a municipality grants the Company extended work hours in writing, the Company shall keep records of work that continues past allowed hours, and must submit such records to the Siting Board within 90 days of Project completion.

With regard to community outreach, the Siting Board also directs the Company to provide a Project-specific phone number, staffed during all daytime construction hours, for the public to raise concerns with respect to Project construction impacts. Further, the Siting Board directs the Company to develop a Project-specific website, which should at a minimum contain contact information for Company public affairs personnel, the Project-specific phone number, all communications regarding local construction impacts, a Project map, traffic management plans ("TMPs"), and a construction timeline. The Company shall provide the Siting Board with the phone number and website address when created.

The Siting Board directs the Company, in consultation with the towns, to develop a separate, comprehensive outreach plan for the Project for each municipality. Each outreach plan should describe the procedures to be used to notify the public about: (1) the scheduled start, duration, and hours of construction in particular areas; (2) the methods of construction that will be used in particular areas (including any use of nighttime construction); and (3) anticipated street closures and detours. Each outreach plan should also include information on complaint and response procedures; Project contact information; the availability of web-based project information; and protocols for notifying the schools of upcoming construction.

With the implementation of the above noise conditions, the Siting Board finds that noise impacts of the Project along the MBTA Underground Route would be minimized.

4. Traffic

a. MBTA Underground Route and Overhead Route

The Company stated that 84 percent of the MBTA Underground and Overhead Routes would be along the MBTA ROW and, therefore, traffic impacts would be limited to the six locations where the MBTA ROW crosses public roadways and along the 1.3 miles of in-street construction in Hudson (Exhs. EV-2, at 5-65 to 5-68; EFSB-T-8). Eversource indicated that all traffic impacts would be temporary and construction-related (Exh. EV-2, at 5-68).

With respect to the MBTA Underground Route, the Company stated that trenching of roadways crossings along the MBTA ROW would require either: (1) temporary road closures and traffic detours for narrow road widths, or (2) alternating two-way traffic for wider road widths (Exh. EV-2, at 5-65). Roadway crossings required for the MBTA Overhead Route would require a temporary traffic stop during the conductor stringing process (Exh. EV-2, at 5-66). The Company stated that roadway crossings during construction along the MBTA ROW would not impact abutters, such as residences, businesses, public safety facilities, health care facilities, and schools as there are not any existing access points to these land uses along the MBTA corridor (Exh. EFSB-T-8). With respect to school bus stops within the proposed construction zone identified by Sudbury, Eversource committed to avoiding in-street construction during school bus hours identified by Sudbury (7:00 a.m. to 9:00 a.m. and 2:30 p.m. to 5:00 p.m.) (Exhs. SUD-DFN/WFO-1, at 8; EFSB-SUD-27; Tr. 14, at 2511-2513; RR-EFSB-80).[128]

The Company anticipated that road closures in the form of one-way alternating traffic would be required for construction along the in-street portion of the MBTA Underground and Overhead Routes (Exhs. EFSB-T-5; EV-16, at 11-1). At locations with high daytime traffic volumes and congestion, adjacent commercial or industrial land uses or, as requested by authorities, the Company would construct at night (Exh. EFSB-T-11). For instance, MassDOT may require night work along Route 20 and Hudson may also prefer night work at the

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[128] Sudbury presented pre-filed testimony and witnesses which identified concerns related to traffic impacts. See e.g. Exh. SUD-DFN/WFO-1. The town's witnesses stated that Sudbury would work with Eversource to address issues such as the construction schedule and road closures (Tr. 11, at 2028-2038).

intersection of Wilkins Street and Forest Street (Exh. EFSB-T-11; Tr. 13, at 2376-2377).[129] Eversource stated that it would consult with the towns and MassDOT to identify specific locations for night work (Tr. 13, at 2375-2377).

Eversource would seek to locate laydown areas and construction-worker parking areas within five miles of the MBTA ROW (Tr. 13, at 2377-2378). Eversource would work with its construction contractor to select these areas, and coordinate with the towns to identify locations outside of environmentally sensitive and residential areas (Exh. EV-2, at 5-10; Tr. 13, at 2377-2378). The Company stated that workers would park personal vehicles within designated parking areas and travel to the work site in Company work trucks (Tr. 13, at 2379-2380).

The Company outlined its public outreach process for notifying abutters of traffic-related issues such as nighttime and weekend construction (Tr. 13, at 2384-2386). In general, Eversource would notify abutters prior to the entire Project construction and follow up with notifications three to five days in advance of construction in the proximity of a specific location (Tr. 13, at 2384-2386). For more details on community outreach, see Section VI.D.3, above.

The Company stated that it would develop a construction TMP with each municipality prior to construction (Exh. EV-2, at 5-67). Eversource described the following components as items that may be included (but are not limited to) in its TMPs: (1) coordination with police and fire departments; (2) provisions for emergency vehicle access; (3) timing and delivery of equipment and materials; and (4) and work schedules and duration of lane closures (Exh. EV-2, at 5-68). Eversource stated that its TMPs would be developed as part of its final design process, and once complete, would be posted publicly (Exhs. EFSB-T-1; EFSB-T-6). In general, the Company asserted that a majority of its traffic management efforts are contingent upon final design, which include coordinating with MassDOT, municipalities, police and safety personnel; identifying plans and schedules for material delivery, locations of staging, storage, and laydown

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[129] Hudson presented pre-filed testimony and witnesses to support its concerns related to traffic impacts. See e.g. Exh. Hudson-ER-1. During cross-examination, the Hudson Director of Public Works stated that the DPW would collaborate with the Company to address concerns such as locations of staging areas and scheduling of nighttime construction (Tr. 11, at 1972-1981).

areas; and developing traffic control measures for road crossings, and therefore more specific information is not yet available (Exhs. EFSB-T-3; EFSB-T-5; EFSB-T-8; EFSB-T-9; Tr. 14, at 2514-2518). Finally, the Company indicated it would be providing curb-to-curb repaving along all of the roadways for all three routes (RR-EFSB-47; Tr. 7, at 1092).

b. All-Street Route

The Company stated that the entire ten-mile length of the All-Street Route would be constructed within public roads of varying degrees of traffic volumes, with significantly more residential abutters than the MBTA Routes (Exhs. EV-2, at 5-51, 5-66 to 5-67; EFSB-T-8). For the All-Street Route, 1.3 miles of the ten miles follows the same route in Hudson as both of the MBTA Routes (Exh. Ev-2, at 4-14). As noted above, the Company anticipated that most in-street construction would require one-way alternating traffic (Exh. EV-16, at 11-1).[130] Eversource noted that it would only draft a TMP for the All-Street Route if it reached a final design plan (i.e., if the All-Street Route was approved by the Siting Board as the preferred route) (Exh. EFSB-T-6). The Company claimed it has not identified specific locations of nighttime work along the All-Street Route, with the exception of work at the Wilkins Street and Forest Street intersection in Hudson, but anticipated nighttime work would be required (Exhs. EFSB-T-11; Tr. 13, at 2376-2377). Eversource concluded that the All-Street Route would have a higher potential for traffic impacts, compared to the MBTA Underground or Overhead Routes (Exh. EV-1, at 5-69).

c. Analysis and Findings on Traffic

Construction of either of the MBTA Routes along the MBTA ROW would result in temporary traffic impacts at locations where the ROW crosses public roads and along the 1.3 miles of in-street construction. At road crossings and for the in-street portions, coordination with municipal and state authorities to identify the need for road closures, or one-way alternating

130 During evidentiary hearings, Sudbury responded to the Company's characterization of the existing traffic volumes along the All-Street Route, and identified several stretches of roadway for which Sudbury would recommend road closures and detours based on the town's perception of existing traffic volumes (Tr. 11, at 2033-2037).

traffic, would mitigate the traffic impacts of construction. Eversource would consult with Hudson and MassDOT to identify locations where night construction would best mitigate traffic impacts. Additionally, the Company would work with each municipality to develop TMPs designed to minimize traffic impacts.

The All-Street Route would be constructed directly in roadways for approximately ten miles, resulting in direct, albeit temporary, impacts to abutting residential and commercial development. The Siting Board finds that the MBTA Underground Route and MBTA Overhead Route are comparable, and both routes are preferable to the All-Street Route with respect to construction-related traffic impacts, given the additional traffic impacts associated with in-street construction for the All-Street Route.

In addition to the TMPs, Eversource would develop an outreach plan to notify abutters of traffic-related impacts such as nighttime construction and road closures. In order to ensure adequate notice is received by the community, the Siting Board directs the Company to alert abutters a minimum of two weeks in advance of anticipated local construction activities, when possible. With the implementation of the conditions imposed above and in Section VI.D.3 (related to community outreach), the Siting Board finds that traffic impacts of the Project along the MBTA Underground Route would be minimized.

5. Visual

a. Company Description

i. MBTA Underground Route

Eversource stated that the primary visual impact associated with the Project would result from tree clearing along the MBTA ROW (Exhs. EV-2, at 5-61, app. 5-7; EV-16, at 2-12). The Company reported that for the MBTA Underground Route, a 22-foot-wide corridor cleared of trees and other vegetation would be required to facilitate the installation of the transmission line (Exhs. EV-2, at 5-11, 5-40, 5-43; EV-18, at 6). To accommodate the installation of splice vaults, including the use of cranes and other specialized equipment, Eversource would temporarily expand the clearing to a width of 40 to 50 feet for a length of approximately 50 feet at each proposed splice vault location (Exh. EV-2, at 5-11, 5-13, 5-40, 5-43). The Company estimated that post construction, the entire corridor would be maintained at a 22-foot width consisting of

the access road, duct bank, and a shoulder consisting of low-growing vegetation (Exhs. EV-2, at 5-16; EV-18, at 6).[131] Eversource stated that areas of the MBTA corridor outside of the defined work area would not be impacted by construction of the Project (Exh. EV-2, at 5-44). As noted above in Section VI.D.1, the Company estimated that approximately 23.9 acres of forested land within the MBTA corridor would be cleared for the Project (Exh. EV-18, at 13).

The Company stated that along the MBTA ROW, the average amount of existing tree buffer between the property line of the average residential abutter and the centerline of the existing railbed is 40 feet (Exh. EFSB-V-8; Tr. 13, at 2417). Following tree clearing, the average remaining tree buffer would be a minimum of 23.5 feet each side for the MBTA Underground Route (Exh. EFSB-V-8; Tr. 13, at 2417). Eversource noted that there are some residential areas along the MBTA ROW where the post-construction tree buffer within the ROW would be much less than 23.5 feet (RR-EFSB-93). The Company estimated, however, that in those areas, there is existing vegetation on the abutting residential property that would still provide some tree buffer (RR-EFSB-93). For all areas, depending on the season and the amount of vegetative buffer on the property after construction, the views from residential properties would consist of trees on the far side of the MBTA ROW or the access road itself (Tr. 13, at 2420-2421).[132] The cleared portion of the MBTA ROW would be visible at all road crossings (Exh. EV-2, at 5-62).

Eversource indicated its intention to allow the MBTA ROW to revegetate naturally post-construction, with the exception of the 14-foot-wide access road, which would remain permanently without vegetation and an approximately four-foot-wide strip on each side of the access road, which would consist of maintained herbaceous and low-growing shrubbery

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131 The Company stated that in absence of the Project, the proposed MCRT would require a 19-foot-width of clearing on the MBTA ROW, consisting of a 10-foot-wide paved trail, two feet of grassed shoulders on either side of the trail, and native plantings within the remaining five feet of the platform (RR-EFSB-98).

132 The Company stated that at many of the abutting commercial and industrial locations, there is already less than 23.5 feet of existing vegetative buffer between the property boundary and the existing rail, therefore post-construction conditions would not be much different (RR-EFSB-93).

(Exh. EV-16, at 7-5; RR-EFSB-93). The Company presented a visual impact assessment to examine the visual, aesthetic, and recreational resources within an area extending out to 0.5 miles from the Project centerline and the potential visual impact on these resources (Exh. EV-2, app. 5-8, at 3). The visual impact assessment included a viewshed analysis, photo simulations, and artist renderings to illustrate post-construction views from abutting landowners and sensitive receptor locations such as historic places, state forests and parks, and other designated scenic areas (Exh. EV-2, fig. 5-29; app. 5-6; 5-8). Based on the viewshed analysis, the Company concluded that the MBTA Underground Route would have minimal visual impact (Exh. EV-3, app. 5-8, at 20).

Eversource estimated that approximately twelve public shade trees would be removed for construction of the MBTA Underground Route (Exh. EV-2, at 5-28). The Company stated that all twelve trees are at locations where the MBTA ROW intersects public roadways (Exh. EV-2, at 5-28). The Company indicated that no public shade trees would be removed along the public roadway portion of the Project, as the transmission line would be entirely within the limits of the paved roads (Exh. EV-2, at 5-28). The Company stated it would work with tree wardens in each municipality and/or MassDOT to identify proper protection for remaining public shade trees, which may include temporary fences around individual trees (Exh. EV-2, at 5-29).

For visual mitigation measures, the Company proposed to work with any abutting landowners, on an individualized basis, that may experience a material change in their view due to tree clearing related to the Project to determine a reasonable and practical screening option that could be provided on their properties, as long as such mitigation would not interfere with the safe and reliable operation of the Project (Exhs. EV-2, at 5-63; EFSB-V-2; Tr. 13, at 2444-2445). Eversource stated that screening options would be in the form of vegetation and/or fencing (Exhs. EV-2, at 5-63; EFSB-V-2; EFSB-V-9; EFSB-LU-3). Further, Eversource asserted that it plans to work cooperatively with the municipalities, DCR, and the MBTA to advance the details of a landscaping plan on the MBTA ROW that would be compatible with the MCRT and the proposed transmission line (Exhs. EV-2, at 5-63 to 5-64; EFSB-V-2).

ii. MBTA Overhead Route

The Company indicated that the MBTA Overhead Route would have the greatest visual impact as it would require the greatest width of vegetation clearing on the MBTA ROW, in addition to the new aboveground transmission infrastructure (Exh. EV-2, at 5-82). Eversource indicated that for the MBTA Overhead Route, it would clear trees entirely from the 80-foot width of the ROW to maintain overhead transmission line safety clearances, but it would allow low-growing woody vegetation to remain outside of the active work area (Exh. EV-2, at 5-17, 5-40, 5-44; RR-EFSB-95). Eversource estimates that approximately 70 acres of forested land would be cleared from the MBTA ROW for construction of the MBTA Overhead Route, or 47 more acres of clearing than for the MBTA Underground Route (Exhs. EV-2, at 5-44; 5-46; EV-18, at 13).

The MBTA Overhead Route would require 90 steel monopole transmission structures ranging from 75 feet to 105 feet in height, with an average height of 87.5 feet (Exhs. EV-2, at 5-17; EFSB-V-6(1)). The viewshed analysis mapped by the Company shows the greatest amount of visibility would occur in residential areas, adjacent open fields, parking lots, and commercial areas (Exhs. EV-2, at 5-62, figs. 5-30 to 5-33; EV-3, app. 5-8). The Company indicated that the MBTA Overhead Route would result in permanent visual impacts to abutting land uses that would have a direct line of sight to the proposed vertical transmission line elements due to the anticipated tree clearing (Exh. EV-2, app. 5-8, at 20). Eversource stated that the overhead transmission line infrastructure and wires would also be directly visible to users of the MCRT (Exh. EV-2, app. 5-8, at 20).

Eversource indicated that it would maintain vegetation at varying heights for the MBTA Overhead Route (Exh. EV-2, at 5-19). In particular, an area approximately 30 feet wide centered on the overhead transmission line (directly under the wires and extending to 15 feet on each side), known as the wire zone, would be maintained to allow herbaceous and low woody vegetation to grow to a mature height of up to, but not exceeding, 15 feet (Exh. EV-2, at 5-19 to 5-20, 5-40, 5-44; RR-EFSB-94).[133] All other portions of the MBTA ROW, or the peripheral

[133] Within the wire zone, the access road and shoulders would be maintained the same as described above for the MBTA Underground Route (RR-EFSB-94).

zone, would be managed by the Company to allow for growth of native woody vegetation, tall shrubs, and low-growing trees that have a mature height of up to, but not exceeding, 25 feet (Exh. EV-2, at 5-20, 5-40, 5-44; RR-EFSB-94).

Eversource stated that for the MBTA Overhead Route, it would remove 47 public shade trees at points along the route where the MBTA ROW crosses public roadways (Exh. EV-2, at 5-28; Tr. 13, at 2443). The Company would not remove public shade trees along the in-street portion of the MBTA Overhead Route (Exh. EV-2, at 5-28). As noted above for the MBTA Underground Route, the Company stated that it would work with tree wardens or MassDOT to identify proper mitigation for remaining public shade trees (Exh. EV-2, at 5-29).

Eversource affirmed that mitigation measures for the MBTA Overhead Route would be similar to the MBTA Underground Route as discussed in Section VI.D.5.a.i, above (Exh. EV-2, at 5-63). Eversource does not anticipate that the installation of a transmission line in public roadways in Hudson would result in any permanent visual impacts (Exh. EV-2, app. 5-8, at 21).

The Company concluded that of all three proposed routes, the MBTA Overhead Route would result the greatest potential for visual impacts due to the proposed aboveground transmission structures and extensive vegetative clearing (Exh. EV-3, app. 5-8, at 21).

iii. All-Street Route

The Company indicated that there would be minimal visual impacts for the All-Street Route, as it would install the transmission line entirely underground within the existing limits of public roadways (Exh. EV-2, at 5-46, 5-63). The Company does not anticipate the need to cut any public shade trees along the All-Street Route; however, it may selectively trim tree branches to facilitate construction at specific locations such as splice vaults (Exh. EV-2, at 4-21, 5-63; Tr. 13, at 2443-2444). The Company would implement the same practice to protect public shade trees regardless of the route selected (Exh. EV-2, at 5-28). Upon completion of construction, the Company would restore roads to pre-existing conditions (Exh. EV-2, at 5-63). Eversource does not anticipate visual mitigation measures to be necessary with the All-Street Route because visual impacts would be minimal (Exh. EV-2, at 5-64; Tr. 13, at 2415). The Company concluded that even with visual mitigation along the MBTA Underground and Overhead Routes, the All-Street Route would result in lower visual impacts (Exh. EV-2, app. 5-8, at 21).

iv. Substations

Eversource stated that visual impacts at the Sudbury and Hudson Substations would result regardless of which alternative is constructed (Exh. EV-2, at 5-61). The Company noted that visual impacts at the Sudbury Substation would be minimal, as the new structures would be similar in height to existing structures at the Substation, shielded by the existing vegetative buffer, and integrated with similar existing structures within the Substation (Exhs. EFSB-V-4; EFSB-V-4(1)-(5)). The Company would also install a 100-foot shielding mast at the Sudbury Substation as part of the Project (Exh. EFSB-V-4). The Company noted that except for areas where the ROW emerges, the Sudbury Substation is surrounded by trees approximately 60 feet high, creating a visual buffer for the proposed and existing equipment (Exh. EFSB-V-4). Eversource noted that the Sudbury Substation is largely surrounded by vacant land and that the nearest building is an indoor sports dome with no windows approximately 325 feet to the northeast of the Substation (Exh. EV-2 app. 5-8, at 5).

Eversource reported that the existing lighting illuminates the equipment at ground level and the overhead switches, but is only kept on continuously during periods of night work at the Substation or at the request of law enforcement agencies (Exh. EFSB-V-3). For the MBTA Overhead Route, the MBTA Underground Route, and the All-Street Route, some additional lighting would be required for the breaker, line and terminal disconnect switches; the MBTA ROW routes would also require lighting for equipment associated with the proposed shunt reactor and relocated capacitor bank (Exh. EFSB-V-3).

The Company stated that it would be necessary to expand the limits of the existing fence line at the Hudson Substation in order to install the equipment necessary to support the new transmission line, but that there would be no additional removal of vegetation (Exh. EV-2, at 5-8). HLPD stated that any new equipment would not be taller than existing equipment (Exh. EFSB-HLP-6, at 2; HLPD Brief at 6). HLPD explained that the expansion would not result in any adverse visual impacts to the residents of condominiums to the south of the substation parcel, closest to the expansion area, largely because the portion of the condominium complex that is closest to the substation was designed and developed with the objective of avoiding views of the existing substation (Tr. 14, at 2484; HLPD Brief at 6-7).

b. Analysis and Findings on Visual

The MBTA Overhead Route would result in the highest potential for visual impacts as a result of the newly built overhead transmission line and associated structures. In addition, the MBTA Overhead Route would require the greatest amount of tree clearing, as the entire 80-foot wide limit of the MBTA ROW would be cleared.

For the MBTA Underground Route, the immediate visual impact would be the increased visibility of the MBTA ROW from abutting landowners and land uses due to the 22-foot wide vegetation clearance on the MBTA ROW. Following construction, a 14-foot width of the 22-foot clearance would remain cleared as the access road, and would be loam and seeded on the remaining eight feet. Thus, following revegetation, the long-term visual impacts would be the increased visibility of the permanently cleared 22-foot corridor.

The All-Street Route would have little to no visual impacts, as there would be no above-ground transmission structures built and no permanent vegetation removal is expected. The Company proposes selective cutting or trimming of branches and would allow such vegetation to regrow following construction. For all three routes, the visual impacts at the two Substations would be minimal, as both Substations would not require additional tree clearing. The only additional visual impacts of Sudbury Substation may be limited views of the 100-foot lightning mast; and the Hudson Substation expansion area would be screened by design measures already in place for the residential area closest to the expansion area. Thus, the Siting Board finds that with respect to visual impacts, the All-Street Route is preferable to both the MBTA Underground Route and the MBTA Overhead Route, and the MBTA Underground Route is preferable to the MBTA Overhead Route.

In several recent transmission line cases, the petitioners have been directed to implement off-site screening programs consisting of vegetative plantings and/or other screening. See e.g., Needham-West Roxbury at 62; Woburn-Wakefield at 120. The Company stated that it would work with abutting landowners that may experience a material change in their view of the MBTA ROW to determine a reasonable and practical screening option that could be provided on their properties on a case-by-case basis. Eversource acknowledged that for the MBTA Underground Route or the MBTA Overhead Route, abutters' view of the ROW could change

due to tree clearing and/or the new transmission line structures. Therefore, as Eversource has agreed, the Siting Board directs Eversource, upon request of any person or entity owning property located directly abutting the MBTA ROW whose view has materially changed due to construction of the Project, to provide appropriate and reasonable off-site screening. Such screening may include shrubs, trees, window awnings, and fences, provided that operating and maintenance requirements for the transmission line are met. Upon completion of construction, the Company shall notify all owners of property located on or abutting the MBTA ROW in writing of the option to request that the Company provide off-site mitigation. The Company shall honor all reasonable and feasible requests for mitigation that it receives from property owners within six months of receipt of the Company's written notification.

Based on the Company's proposed visual mitigation measures and with the conditions summarized above, the Siting Board finds that potential visual impacts of the Project along the MBTA Underground Route would be minimized.

6. Hazardous Waste

a. Description

Eversource stated that hazardous substances including hydraulic oil, greases, and construction equipment fuels, both gasoline and diesel, would be used during Project construction (Exh. EFSB-HW-1). The Company indicated that equipment refueling would occur outside of wetlands and buffer zones to the extent feasible (Exh. EFSB-HW-1). The Company and its contractors are required to have spill response materials available at all times (Exh. EFSB-HW-1). In the event of a spill along any of the routes, the Company stated it would activate its Oil and Hazardous Material Spill Release/Notification Contingency Plan Policy and Procedure ("Spill Response Protocol") (Exhs. EFSB-HW-1; EFSB-HW-3(1)). The Company stated that the risk of a hazardous material spill would also be reduced by compliance with the Company's USEPA National Pollutant Discharge Elimination System Construction General Permit and the SWPPP (Exh. EV-2, at 5-35 to 5-36). The Company stated that a contracted environmental inspector would conduct weekly inspections of the Project to enforce compliance with the Company's best management practices manual ("BMP Manual") and permit conditions (Exhs. EFSB-CM-5; EFSB-CM-6).

The Company stated that after the construction is complete, operation of the New Line would not produce any hazardous waste, noting that the New Line would not require circulating coolant or other hazardous materials that could leak or spill (Exhs. EFSB-HW-2; EV-2, at 5-35). The Sudbury Substation as it exists today contains mineral oil dielectric fluid ("MODF") in transformers and sulfuric acid in batteries (Exh. EFSB-HW-2).[134] A release of MODF would be contained by a secondary containment structure around each transformer (Exh. EFSB-HW-2). The batteries are located inside a building at the Sudbury Substation; any release of acid would be contained by an existing acid-resistant berm equipped with specialty pillows designed to neutralize acid (Exh. EFSB-HW-2). The Company stated its Spill Response Protocol would remain in effect after construction and would be activated in the event of a hazardous materials release at the Sudbury Substation (Exh. EFSB-HW-2).

The Company reported that, due to the commercial and industrial uses of nearby properties and the developed nature of the MBTA Underground Route, MBTA Overhead Route, and All-Street Route, there is a potential along all three routes to encounter subsurface contamination that would require special handling and management during construction (RR-EFSB-66(1) at 12). The Company reported that the MassDEP Best Management Practices for Controlling Exposure to Soil During the Development of Rail Trails guidance document ("MassDEP Rail Trail BMP") details the most commonly reported contaminants along rail lines to include metals, pesticides, petroleum compounds, coal ash, creosote, and polycyclic aromatic hydrocarbons ("PAHs") (Exh. EV-16, at 9-4). The Company explained that it does not anticipate these contaminants to be prevalent beyond the topmost layer of soil given that metals and PAHs are relatively immobile contaminants and more mobile contaminants would have leached out of soil during the intervening decades since active rail use on the corridor (Tr. 10, at 1623-1624). The potential for contamination along the ROW may vary by location, as further described further below. The Company also stated that non-point sources of contaminants along roadways such as the historic use of leaded gasoline and fill material used for road construction

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134 Gas insulated switching equipment containing sulfur hexafluoride gas ("SF_6") is also located at the Sudbury Substation. See Section VI.D.7.b.

could increase the likelihood of encountering previously undocumented hazardous material on the All-Street Route (Tr. 10, at 1630-1633).

The Company asserted that in its meeting with the MassDEP, the agency indicated that following MassDEP Rail Trail BMP would be appropriate because the proposed project would facilitate the conversation of the ROW to a rail trail (Tr. 10, at 1622). Furthermore, commenting on the DEIR, MassDEP stated that the Company should consult the MassDEP Rail Trail BMP "for measures to limit to exposure to workers and adjacent residents/trespassers" (Exh. EV-16, app. 15-2, at 841). Following the MassDEP Rail Trail BMP, the Company identified areas of the ROW that may, based on available information, have a higher potential for contamination due to railroad operations and/or adjacent land uses (RR-EFSB-66(1) at 33-34). The Company identified the locations of former railroad stations, known historic rail car collision locations, and industrial areas which may have contamination extending to the ROW unrelated to the former railroad use (RR-EFSB-66(1) at 33-34). The Company proposes to complete geotechnical soil borings and soil characterization at identified locations with a higher potential for contamination and throughout the industrial areas (Tr. 9, at 1593-1595; Tr. 10, at 1649-1650). The Company stated that its field investigation would be consistent with a Massachusetts Contingency Plan ("MCP") Phase I investigation and that results of the investigation would be incorporated into the soil and groundwater management plan (Tr. 9, at 1604-1606; Tr. 10, at 1648).

The Company stated that if contaminated soils or other regulated materials are discovered in excess of regulatory thresholds along any of the routes, they would be managed pursuant to the Utility-Related Abatement Measure ("URAM") provisions of the MCP (Exhs. EV-2, at 5-23; EV-16, at 5-12; EFSB-LU-5; RR-EFSB-66). Eversource explained that the URAM provisions are specific to subsurface utility installation work; the Company stated that it has been advised by MassDEP that URAM provisions would be applicable to the Project notwithstanding the addition of the rail trail component, whereas if the rail trail was constructed without the Project, a URAM might not be applicable (Tr. 9, at 1599). The Company has contracted with a Licensed Site Professional ("LSP") to be responsible for managing and overseeing activity pursuant to the MCP, including use of the URAM provisions (Exh. EV-2, at 5-23). The Company stated that the LSP has also been engaged to support construction planning and to ensure compliance with the

BMP Manual and other Company policies (Exhs. EFSB-HW-11; EV-2, at 5-58 to 5-59; SUD-CMM-10).

The Company expects that construction along either of the MBTA Routes would result in excess soil (Exh. EV-16, at 5-5). The Company stated it would develop a comprehensive soil and groundwater management plan describing how soils would be managed for reuse or disposal once the Project design is finalized, based on due diligence results and the MassDEP Rail Trail BMP (Exhs. EFSB-HW-8; EFSB-HW-10; Tr. 10, at 1647-1648). The Company stated that the maximum depth of excavation would be 15 feet below surface grade for the MBTA Underground Route and 22 to 28 feet for the MBTA Overhead Route (RR-EFSB-66(1) at 11). Eversource stated that, compared to the MBTA Overhead Route, the MBTA Underground Route would require a wider excavation corridor and a greater volume of excavated soil and, therefore, would have an increased potential for encountering undocumented subsurface contamination (Exh. EFSB-HW-5).

The Company stated that excess soil would remain on the ROW until soil testing and coordination of offsite transportation are completed (Exh. EV-16, at 5-5). Eversource stated it would manage soil stockpiles in accordance with its BMP Manual, which stipulates that stockpiles be located outside sensitive areas to the extent practical and managed to prevent erosion and sedimentation of adjacent areas (Exh. EV-16, at 5-5). The Company stated that its cut and fill analysis for the proposed access road on the MBTA ROW accounted for the amount of soil expected to require off-site disposal, the amount of soil expected to be reused in grading, and the amount of new soil to be required for capping (Exh. EV-DAS/DMB-1, at 10-11). Eversource stated that soil contaminated at levels above MCP thresholds would not be reused as fill along the ROW, and that new soil brought onsite for capping would be clean fill (Exhs. EV-16, at app. 2-3; EV-DAS/DMB-1, at 10; Tr. 10, at 1640, 1643). The Company explained that the 14-foot wide access road would be constructed of eight inches of clean gravel on top of a woven geotextile fabric (Tr. 10, at 1639-1640). The Company stated that, together, the geotextile and gravel would serve as a cap, thereby minimizing future exposures to contaminants in soil (Tr. 9, at 1601)

Eversource assessed the potential to encounter subsurface contamination from on-site or abutting sources along the MBTA Underground Route, the MBTA Overhead Route, and the

All-Street Route (RR-EFSB-66). The Company stated that its assessment would inform the development of its soil and groundwater management plan and in identifying appropriate BMPs to protect public health and the environment during and after construction (RR-EFSB-66(1) at 1). According to the Company, the assessment was a desktop review that followed the MassDEP Rail Trail BMP and the database review methods contained within the American Society for Testing and Materials ("ASTM") standard for due diligence (Tr. 9, at 1608; RR-EFSB-66(1) at 3, 23).

Specifically, the Company relied on methods from ASTM 1527-13: Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, which stipulates the use of an Environmental Risk Information Services ("ERIS") database search report, as well as the review of MassDEP records and other available historical information (RR-EFSB-66; RR-EFSB-66(1) at 23; Tr. 9, at 1608). In the assessment, the Company tallied state-listed disposal sites (i.e., MCP sites) within the limits of the three routes, identifying five MCP sites along the MBTA Routes and eight along the All-Street Route (RR-EFSB-66(1) at 11). For each route, the Company also enumerated the "sites of concern," which included active and closed MCP sites and other sites identified by the ERIS database report deemed to have elevated environmental risk inferring from historical uses and other information available to the Company (RR-EFSB-66(1) at 20-21).[135] Eversource stated that the two MBTA routes have 35 total sites of concern, and the All-Street Route has 25 sites of concern (RR-EFSB-66).[136]

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135 The ERIS database report includes "sites of concern" based on factors including, but not limited to, the presence of underground storage tanks, use for an environmentally sensitive industry (gas stations, drycleaners, automotive repair), and status as hazardous waste generator (RR-EFSB-66(1) at 20-21).

136 The Company's briefs did not specifically compare the routes with respect to impacts related to hazardous waste (see Company Brief at 93-99; Company Reply Brief at 57-66).

b. Position of the Parties[137]

i. Town of Sudbury

Citing the MassDEP Rail Trail BMP, Sudbury submits that the Company should expect to encounter residual levels of lead, arsenic, and petroleum when working in the MBTA ROW (Exh. SUD-MJN/RMG-1(R) at 50). Sudbury points out that the Company has identified that residual oil and or hazardous material associated with past use of the railroad ROW includes metals, pesticides, and PAHs (Exhs. SUD-MJN/RMG-1(R) at 50; EV-16, at 665). Sudbury cautions that, if improperly managed, potentially contaminated soil excavated during construction of the access road, duct bank, and splice vaults could lead to human and environmental exposures (Sudbury Brief at 69, citing Exh. SUD-MJN-RMG-1(R) at 51-52). Sudbury also suggests that dust from construction, stormwater runoff during the construction period, and effluent from excavation dewatering could cause the migration of contaminants to adjacent coldwater fishery resources, vernal pools, and wetland resources areas containing important wildlife habitat (Sudbury Brief at 70).

Sudbury argues that the Company's disposal costs or level of management of disposal activities cannot be confirmed as the Company has not characterized the soil that would be disposed of during construction (Sudbury Brief at 70). Specifically, Sudbury asserts that there would be a significant volume of soil displaced when the duct banks and splice vaults are installed (more than 50,000 tons), which Sudbury expects to be contaminated (Exh. SUD-MJN/RMG-1(R) at 49; Tr. 8, at 1404). Sudbury argues that the MassDEP Rail Trial BMP guidance applies to the limited disturbance from excavating at or near the surface for construction of rail trails alone, rather than excavation for electric transmission lines that are coupled with rail trails (Sudbury Reply Brief at 17; Exh. SUD-MJN/RMG-1(R) at 52). Sudbury argues that the MassDEP Rail Trail BMP recommends minimizing soil disturbance and that the soil disturbance associated with the Project far exceeds the volume typically estimated for rail trail construction (Sudbury Reply Brief at 17, citing Exh. EV-2, at app. 5-3).

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137 The Siting Board notes that the Town of Hudson's concerns relating to potential contamination of drinking water supplies are described in Section VI.D.2, above.

ii. Protect Sudbury

Protect Sudbury notes that the Company acknowledges the inherent contamination risks associated with historic railroad ROWs, such as metals, pesticides, petroleum constituents, lead, coal ash, and creosote (PS Brief at 32, citing Exh. EFSB-HW-6(S-1)(1) at 2). Protect Sudbury further notes that the Company has identified five state-listed contamination sites directly within the limits of the MBTA Routes and an additional nine state-listed sites in the vicinity of the MBTA Routes (PS Brief at 32, n. 23, citing Exh. EFSB-HW-6(S-1)(1) at 12).

Protect Sudbury argues that the Company should not have relied on the MassDEP Rail Trail BMP in evaluating the potential presence of hazardous soils along the MBTA Underground Route (Exh. Protect-RC/RH/ML/MO-1, at 10). Specifically, Protect Sudbury asserts that the Project involves an underground utility installation with far greater potential to expose contaminated soils and create new environmental impacts, compared to a typical rail trail project that is the subject of the guidance document (Exh. Protect-RC/RH/ML/MO-1, at 10). Thus, Protect Sudbury argues that relying on the MassDEP Rail Trail BMP for this Project may result in the Company significantly underestimating the potential impact of contaminated soils on Project cost (Exh. Protect-RC/RH/ML/MO-1, at 11-12). Protect Sudbury argues that Eversource should be required to conduct an MCP Phase 1 level of investigation (310 CMR 40.0483) to further evaluate subsurface contamination along the railroad ROW (Exh. Protect-RC/RH/ML/MO-1, at 11). Protect Sudbury asserts that, given the availability and advantages of the All-Street Route, the uncertainties, risks, and costs associated with contaminated soils along the MBTA Routes are needless (PS Brief at 32, citing Exh. Protect-RC/RH/ML/MO-1, at 12-13).

iii. Company Response

Eversource argues that environmental impacts, including hazardous waste impacts, would be similar for construction of the Project compared to the construction of only the MCRT (Company Reply Brief, at 61 citing RR-EFSB-98). Furthermore, the Company states that the Project would facilitate clean-up of any existing hazardous material that is encountered during construction, thereby improving the MBTA ROW in this regard (Company Reply Brief at 63 n. 32, citing RR-EFSB-66; RR-EFSB-66(1)). The Company asserts that its cost estimate

for the Project reflects the quantities of soil expected to be: (1) removed from the ROW; (2) reused on the ROW; and (3) brought onto the ROW for capping (Company Reply Brief at 71-72, citing Exh. EV-DAS/DMB-1, at 10).[138] The Company further asserts that this level of design detail affords a substantial reduction in soil management cost uncertainty (Company Reply Brief at 72, citing Exh. EV-DAS/DMB-1, at 10).

The Company states that it did not consider undocumented sources of hazardous materials in its comparison of the three routes because all of the routes have inherent potential to encounter previously undocumented hazardous materials and, therefore, the potential to encounter undocumented subsurface contamination would not provide any differentiator for each route in the analysis (Company Reply Brief at 51, citing Exh. EV-MB-2, at 18-19). While the Company acknowledges that based on the number of sites of concern, "one could infer that there is a greater potential for contamination" along the MBTA Routes than the All-Street Route, it notes that there is a risk of encountering additional contamination along any route until existing conditions are confirmed through soil and groundwater testing (RR-EFSB-66).

Eversource reiterates that, regardless of which route is selected, the Company expects to encounter contaminated soils and would perform pre-characterization to determine its regulatory obligations and avoid or eliminate the risk presented by those materials (Company Reply Brief at 51, citing Exh. EV-MB-2, at 18-19; Tr. 5, at 794). The Company points out that, in an attempt to refine its soil management plan, it sought approval from the Sudbury Conservation Commission to conduct subsurface work including soil characterization (Company Reply Brief at 62-63).[139]

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138 For the MBTA Underground Route, the Company estimates that approximately 66,000 tons of excess material would need to be removed during construction, including work at the Sudbury Substation, the MBTA ROW, and the portion of the project in Wilkins Street in Sudbury (Tr. 10, at 1635-1636).

139 The Siting Board notes that Eversource received permission to conduct subsurface work including soil characterization from the Sudbury Conservation Commission on August 20, 2018. See Sudbury Conservation Commission Meeting Minutes.

c. Analysis and Findings on Hazardous Waste

The record shows that, for all potential routes, construction will require the use of hazardous substances including hydraulic oil, greases, and construction equipment fuels. Risk related to the use of the use of hazardous substances during construction would be adequately mitigated by the following measures: (1) fueling equipment outside of wetlands and buffer zones to the extent feasible; (2) compliance with the Company's Spill Response Protocol; (3) the availability of on-site spill response materials; and (4) weekly inspections conducted by a contracted environmental inspector.

The record shows that operating the New Line after construction is complete would not generate any hazardous wastes. At the Sudbury Substation, the risk of a release of MODF stored in transformers and acid stored in batteries is mitigated by secondary containment structures and the Company's Spill Response Protocol.

The record shows that the MBTA Underground Route, MBTA Overhead Route, and the All-Street Route traverse commercial, industrial, and rural environments and, as such, the Project may encounter hazardous materials including contaminated soil and contaminated groundwater. While Sudbury and Protect Sudbury point out that the MBTA Routes are more likely to contain certain contaminants associated with the former use as a railroad ROW, the All-Street Route is not inherently lower risk since roadways also have a potential to contain hazardous materials specific to that type of land use. For example, while the MBTA Routes are more likely to contain contaminants such as metals, pesticides, petroleum compounds, coal ash, creosote, and PAHs, roadways may be contaminated from the historic use of leaded gasoline and urban fill materials.

MCP sites are documented sources of contamination, and the likelihood of encountering such subsurface contamination is likely related to the total number of MCP sites along a route. The Company identified a greater number of MCP sites along the All-Street Route than the MBTA Routes (eight versus five). Eversource enumerated what it described as "sites of concern," including active and closed MCP sites and other sites it considered to have elevated environmental risk along the proposed routes; both MBTA Routes have the same 35 total sites of concern, while the All-Street Route has 25 total sites of concern. It bears noting that the MCP sites document releases of hazardous materials in specific locations, whereas sites of concern

include properties that have elevated potential to contain hazardous materials, which have not been confirmed through observation or testing.

Although Sudbury argued that it was not appropriate for Eversource to utilize the MassDEP Rail Trail BMP and Protect Sudbury argued that the Company should be required to conduct a MCP Phase 1 level of investigation, the record shows that MassDEP concurs with the use of the MassDEP Rail Trail BMP and that the Company would conduct a field investigation consistent with the requirements of a MCP Phase 1 investigation. The field investigation would focus on higher risk areas identified by the environmental due diligence report, include environmental and geotechnical soil borings and soil characterization, and be completed prior to the start of construction. Results of the field investigation would be incorporated into the Company's soil and groundwater management plan, thereby reducing the overall risk and uncertainty associated with soil management in the MBTA ROW. Construction of the access road with a woven geotextile fabric and eight inches of gravel would serve as a barrier for potentially contaminated soil not removed from the ROW as part of project construction.[140]

The MBTA Underground Route has an increased potential for encountering subsurface contamination due to the wider excavation and greater volume of excavated soil compared to the MBTA Overhead Route. The MBTA Routes have fewer MCP sites within the limits of the route than the All-Street Route; however, the All-Street Route traverses fewer "sites of concern." The Siting Board ascribes greater significance to the count of MCP sites, given that each is a documented instance of contamination. Therefore, the Siting Board finds that the MBTA Underground Route and the All-Street Route are comparable with respect to hazardous waste impacts. The Siting Board also finds that due to the greater volume of excavation required for the MBTA Underground Route, the MBTA Overhead Route is preferable to both the MBTA Underground Route and the All-Street Route with respect to hazardous waste impacts.

The record shows that impacts from hazardous materials along the MBTA Underground Route would be minimized. Eversource will develop a comprehensive soil and groundwater management plan to address handling of contaminated media encountered during construction.

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[140] Should DCR complete the access road as a paved rail trail, a pavement covering, such as asphalt, would enhance the path's function as a cap.

Compliance with permit conditions and the Company's BMP Manual would be monitored by weekly inspections from a contracted environmental inspector. Eversource has provided assurance that its construction will comply with: (1) the Company's BMP Manual; (2) the forthcoming soil and groundwater management plan; (3) expected environmental permit conditions; and (4) all applicable environmental regulations. Specifically, any contaminated soil or other regulated materials encountered during Project construction would be managed in accordance with the URAM provisions of the MCP.

The combination of complying with the URAM provisions of the MCP in conjunction with the MassDEP Rail Trail BMP would address the potential for environmental impacts from encountering existing hazardous materials along the MBTA ROW portion of the Project. Compliance with the URAM provisions is enforced through the MCP. The Siting Board directs the Company to provide an interim report at the mid-point of construction and a final report at the completion of the Project describing how the Company followed the MassDEP Rail Trail BMP. The record shows that the Company has established procedures to guard against both spreading of existing contamination and new releases of hazardous materials. On this basis, the Siting Board finds that, with implementation of the above condition, hazardous waste and soil management impacts from the Project along the MBTA Underground Route would be minimized.

7. Safety and Air

a. Safety

Eversource maintained that, regardless of the route selected, construction safety would be addressed through adherence with all federal, state, and local regulations, as well as industry standards and guidelines established for protection of the public (Exhs. EV-2, at 6-1 to 6-2; EFSB-S-1). Eversource stated that it would establish traffic control plans for the Project, and that it would restrict public access to work areas (Exhs. EV-2, at 6-1 to 6-2; EFSB-S-1; EFSB-RR-87; Tr. 13, at 2336).

For work proposed along the MBTA ROW, Eversource would post signs at road crossings, nearby trail entrances, and regularly used ROW entrances detailing the ROW closure and ongoing construction (RR-EFSB-87). Temporary fencing would be used to secure the

construction site and deter unauthorized access (RR-EFSB-87). During working hours, open trenches would be monitored by construction personnel (Exh. EFSB-S-1). During non-working hours, trenches would either be fenced, covered with plates, or backfilled (Exh. EFSB-S-1; Tr. 13, at 2336; RR-EFSB-87). With regard to the proposed substation work, Eversource stated that construction activities at both the Sudbury and Hudson Substations would be performed within a fenced area that would be monitored by onsite construction staff while work is performed and locked during non-working hours (Exh. EFSB-S-1; Tr. 13, at 2340; Tr. 14, at 2474-2476).

b. Air

Regardless of route chosen, the Company indicated it would control dust at construction sites by placing water trucks with misters in or near work areas during construction activities (Exh. EV-2, at 5-9). The Company indicated that it would also comply with state laws concerning limited vehicle idling (Exh. EV-2, at 5-10; Exh. EFSB-A-1). To minimize air emissions from equipment operation, the Company would direct its contractors to retrofit any diesel-powered, non-road construction equipment rated 50 horsepower or above, whose engine is not certified to USEPA Tier 4 standards, and that will be used for 30 days or more over the course of the Project, with USEPA-verified (or equivalent) emission control devices (Exh. EV-2, at 5-10). The Company stated that its own diesel-powered construction equipment would use ultra-low-sulfur diesel ("ULSD") fuel and that it would require its contractors to use ULSD fuel in their diesel-powered construction equipment used for the Project (Exh. EV-2, at 5-10).

The Company indicated that at the Sudbury Substation it would add two SF_6 circuit breakers, each containing approximately 80 pounds of SF_6 (Exh. EFSB-HW-2). According to the Company, the new switchgear would be designed for an annual emission rate of 0.1 percent, which the Company stated would be in compliance with MassDEP's standard of not more than 1.0 percent per year, as set forth in 310 CMR 7.72 (Exhs. EFSB-A-3; EV-16, at 10-3). The Company has installed cameras at the Sudbury Substation to help detect any small leaks of SF_6 gas (Exh. EV-18, at 112). If a SF_6 leak is detected, the Company indicated it would switch the equipment out of service as soon as system and weather conditions allow (Exh. EV-G-16, at 10-3).

c. Analysis and Findings on Safety and Air

The Company committed to following all relevant safety laws and regulations during construction, regardless of the route selected. Accordingly, the Siting Board finds the three routes to be comparable on the basis of safety. Based on the Company's proposed safety mitigation measures, the Siting Board finds that potential safety impacts from Project construction along the MBTA Underground Route would be minimized.

Based on the above, the Siting Board finds that the air impacts are comparable regardless of the route selected. The Company commits to implementing dust control measures during Project construction, such as spraying water at worksites. The Company would comply with the standard Siting Board diesel retrofit provisions referencing the MassDEP Diesel Retrofit Program and follow the Massachusetts anti-idling law and regulations that limit vehicle idling to five minutes.

The Company would purchase new switchgear for the Sudbury Substation that contain SF_6, and the Company commits to complying with MassDEP regulations for SF_6. With the proposed measures to minimize dust and air emissions from construction equipment and the Company's selection of low-leakage SF_6 containing equipment, the Siting Board finds that potential air impacts from construction and operation of the Project along the MBTA Underground Route would be minimized.

8. Magnetic Fields

a. Background

A magnetic field is present whenever electrical current flows in a conductor (Exh. EV-2, at 5-77). Strengths of magnetic fields depend on the amount of current, the distance to conductors and, where there are multiple phases, the distance between conductors; field strength decreases rapidly as distance from the source increases (Exh. EV-2, at 5-77).

Over the years, some epidemiology studies have reported statistical associations between power-frequency magnetic fields and diseases such as childhood leukemia (Exh. EV-2, at 5-78, app. 5-9, at viii to ix). In 2007, the World Health Organization ("WHO") concluded that the evidence of a causal relationship is limited and that magnetic field exposure limits based upon epidemiological evidence are not recommended, but some precautionary measures are warranted

(Exh. EV-2, at 5-78; app. 5-9, at 1-2). When reviewing magnetic fields in past proceedings, the Siting Board, in recognition of public concern about magnetic fields and in keeping with WHO guidance, has encouraged use of low-cost measures that would minimize magnetic fields along transmission ROWs. Woburn-Wakefield at 121; New England Power Company d/b/a National Grid, 20 DOMSB 129; EFSB 13-2/D.P.U. 13-151/13-152 (2014) ("Salem Cables") at 88.

b. Company Description

The Company's consultant, Exponent, modeled above-ground 60-hertz magnetic field strengths from annual average and annual peak projected line loadings for the year 2023 (Exh. EV-2, at 5-78 to 5-79, app. 5-10, at 10-11). The Company modeled the expected magnetic fields above the centerline of an underground transmission line, above a manhole, and beneath an overhead conductor; the Company also modeled fields at various lateral distances from these centerlines (Exh. EV-2, app. 5-10, at 10-11). Further, the Company reported potential exposures to magnetic fields by future users of the MCRT (Exh. EFSB-MF-2; RR-EFSB-31). Table 9, below, provides the Company's modeled magnetic field values in milligauss ("mG"), based on average annual loadings projected for each route.[141]

[141] Exponent noted that average annual loads for all-underground options (MBTA Underground Route and All-Street Route) are higher than the predominately overhead MBTA Overhead Route (Exh. EV-2, app. 5-10, at 11-12). The average annual loads correspond to the lower impedance of underground cables, and translate to higher maximum electric currents and higher maximum magnetic field levels directly over the underground duct bank centerline (Exh. EV-2, app. 5-10, at 11-12).

Table 9. Average Annual Modeled Magnetic Field Values (in mG)

		Maximum on Street/ROW	Maximum at 25 feet from Centerline	Closest Edge of Rail Trail	Center of Rail Trail
MBTA Underground Route	Along cable route (MBTA ROW and in-street)	24	3.4	19 (5 feet from duct bank centerline)	11 (10 feet from duct bank centerline)
	At manholes	28	4.4		
MBTA Overhead Route	Along overhead portion	6.8	4.4	6.1 (18 feet from conductor)	5.5 (23 feet from conductor)
	In-street portion	13	1.8		
	At manholes along in-street portion	15	2.4		
All-Street Route	Along cable route	26	3.6	N/A	
	At manholes	29	4.7		

Source: Exhs. EV-2, app. 5-10, at 15; EFSB-MF-1; RR-EFSB-31; RR-EFSB-97.

The Company stated that the proposed delta configuration of underground conductors, with limited spacing, minimizes potential magnetic field impacts (Tr. 4, at 684-688). The Company stated that it does not expect any health impacts from magnetic fields created by any part of the Project along any of the three potential routes (Tr. 4, at 682-683, 686).[142] The Company noted that the predicted magnetic field levels are well within guidelines of the WHO and further characterized the potential magnetic field levels for the MBTA Underground Route, MBTA Overhead Route, and the All-Street Route as similar to each other (Exh. EV-2, at 5-81 to 5-82).

[142] With respect to the potential for a future rail trail along the MBTA ROW, Eversource indicated that trail use, like appliance use or walking under a transmission line, would not constitute a long-term exposure and that the modeled values "are not outside the range that one could encounter in many places in our environment" (Tr. 4, at 682-683).

c. Analysis and Findings on Magnetic Fields

The record shows that, in the context of health-based guidelines, magnetic field strengths along the MBTA Underground Route, MBTA Overhead Route, and All-Street Route are not substantially different. Therefore, the Siting Board finds that the MBTA Underground Route, MBTA Overhead Route, and All-Street Route are comparable with respect to magnetic field impacts.

Consistent with WHO recommendations, the Siting Board continues to look for low-cost measures that would minimize exposures to magnetic fields from transmission lines. In prior Siting Board decisions, the Siting Board has recognized public concern about magnetic fields and has encouraged the use of practical and low-cost design to minimize magnetic fields along transmission ROWs. See, e.g., Salem Cables at 88. The Siting Board requires magnetic field mitigation which, in its judgment, is consistent with minimizing cost. The Company's average annual modeled magnetic field values, as indicated in above, show that the underground transmission line design and close positioning of the phases provides mitigation of magnetic fields.

The Siting Board finds that magnetic field impacts of the Project along the MBTA Underground Route would be minimized.

9. Massachusetts Central Rail Trail

a. Description

The Company stated that use of the MBTA ROW for construction of the MBTA Underground or MBTA Overhead Route would allow the Company to partner with the MBTA and DCR to develop a 7.63-mile portion of DCR's proposed MCRT, resulting in significant cost savings to DCR (Exh. EV-2, at 5-83; Company Reply Brief at 4).[143] The MCRT is a 104-mile-long proposed multi-use path between Boston and Northampton on the former Central

[143] DCR provided the Siting Board with a comment letter on April 18, 2017 in support of the MBTA Underground Route to facilitate DCR's planned development of the MCRT from downtown Sudbury to the Assabet River Rail Trail in Hudson, and the planned Bruce Freeman Rail Trail (Lowell to Sudbury). See Exh. EFSB-5.

Massachusetts Railroad corridor, including a 23-mile segment on inactive railroad ROW between Waltham and Berlin now owned by the MBTA, and leased to DCR (Exh. EFSB-LU-36(1) at 1; RR-EFSB-60). DCR serves as the project proponent for development of the MCRT on the 23-mile MBTA segment, including sections in the municipalities of Waltham, Weston, Wayland, Sudbury, Stow, Hudson, Bolton, and Berlin (Exh. EFSB-LU-36(1) at 2; RR-EFSB-60).[144] As noted in Section IV.D.1, the Company would maintain the access road, with respect to vegetation management and safety, to ensure it remains in appropriate condition until DCR's construction of the MCRT, whereupon DCR would manage the rail trail, including post-construction vegetation management (RREFSB-61).[145]

The Company argues that the majority of the construction impacts of the Project would be incurred if the MCRT were constructed absent the Project (RR-EFSB-98; Company Reply Brief at 60-61). As noted above in Section IV.B.2, the Company also argues that the impacts from the Project would be similar to those associated with the development of the MCRT, and further, if development of the rail trail is assumed, the incremental impact of construction of the Project is significantly reduced (Exh. EFSB-PA-36(R-3); Company Reply Brief at 60). In Section IV.D, the Siting Board noted that if construction of the rail trail is assumed, many of the environmental impacts associated with the Project would occur regardless of Project construction.

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144 Eversource, in consultation with DCR, reported on the status of the proposed MCRT (RR-EFSB-60). According to the Company, DCR has identified the Waltham to Berlin section of the MCRT as a priority project for the DCR (RR-EFSB-60). DCR's plans entail construction of the MCRT in partnership with communities and private and public entities (RR-EFSB-60). Some segments of the MCRT have already been constructed and some are presently under construction (RR-EFSB-60). DCR has developed funding and construction plans for the MCRT between Waltham and Hudson (17 miles); although the six-mile long section west of Wilkins Street in Hudson through Berlin is part of the MCRT scope, as reflected in the ENF filing with MEPA, DCR has not yet identified a source of funding or developed construction plans for that segment (Exh. EFSB-LU-36(1); RR-EFSB-60).

145 According to Eversource, following completion of the Project, DCR would add fine gravel, compact the existing access road, and finish with top surface or pavement (RR-EFSB-61).

The Company quantified the incremental environmental impacts between construction of the MCRT as a standalone project, and the Project coupled with the MCRT, as proposed by Eversource, and supported by DCR and the MBTA (Tr. 9, at 1512; RR-EFSB-98). The Company noted that since the MCRT has not been fully engineered, the only information available for this comparison are alignment sheets provided in DCR's 2013 ENF filing with MEPA (Exh. EFSB-LU-36(1); RR-EFSB-98; Tr. 9, at 1517). Eversource stated this conceptual information provides typical construction details, such as the width of the construction platform, but does not identify exact limits of clearing and grading (RR-EFSB-98).[146] Table 10, below, presents the Company's comparison of the environmental impacts based on the noted limitations of the data.

146 Specifically, the Company stated that DCR's conceptual design for the MCRT described a 19-foot-wide flat platform, consisting of a 10-foot-wide paved trail, two feet of grassed shoulders on either side of the trail, and native plantings within the remaining five feet of the platform (RR-EFSB-98). Eversource posited that the impacts would decrease as DCR advanced final design of the MCRT (RR-EFSB-98).

Table 10. Eversource Comparison of Environmental Impacts of the Project & the MCRT

	MBTA Underground Route and Rail Trail	MBTA Overhead Route and Rail Trail	Rail Trail
Tree Clearing (acres)	27.96	70.05	17.39
Permanent Wetlands (sq. ft.)	1,179	1,059	2,058
Visual	Permanent corridor: 22 ft.	Permanent corridor 80 ft.	Permanent corridor: 19 ft.
Hazardous Waste	Potential for impacts are similar – excavation of duct bank and overhead foundations would not result in additional disturbance of potential containments. Construction within MBTA ROW would require MassDEP guidance for rail trails construction.		
Rare Species, Wildlife, and Habitat	Potential for impacts are similar – removal of existing railroad infrastructure would eliminate a barrier to movement of existing species and tree clearing would remove existing habitat. The potential tree clearing is the greatest for the MBTA Overhead Route, which also would have the least amount of revegetation following construction.		
Historic Resources	Potential for impacts are similar – construction of the access road would have similar visual impacts from abutting historic properties. Tree clearing required for the transmission lines could lead to visual impacts on abutting properties; however at least 31 feet of visual buffer would remain. The increased depth of excavation required for the underground duct bank and overhead structure foundations could lead to the discovery of archeological resources. Any potential impacts would be handled with MHC.		
Traffic	MBTA Underground Route would require one-way traffic, detours, or road closures due to trenching of pavement for installation of underground transmission line at grade crossings.	MBTA Overhead Route would require brief road closures during conductor stringing.	Rail trail may require one-way traffic to install roadway edge and pavement markers at crossings, requiring the shortest amount of traffic disruption.
Noise	In addition to standard construction equipment required for the access road, duct bank, and rail trail, the MBTA Underground Route would require specialized equipment such as generators, air conditioners, and a splicing van.	In addition to standard construction equipment required for the access road, structure foundations, and rail trail, the MBTA Overhead Route would require specialized equipment for conductor stringing.	Rail trail construction would require standard construction equipment for vegetation removal, erosion and sedimentation control installation, and construction of access road.

Sources: Exhs. EFSB-PA-36(R-3); EFSB-LU-36(1); RR-EFSB-98.

Note: For consistency, impacts associated with the MBTA Overhead Route and Project have not been updated to reflect more recent refinements made by the Company – i.e., a reduction in anticipated tree-clearing and wetland impacts associated with the Project as identified in the Company's FEIR filing with MEPA.

Eversource maintains that the Project would involve similar construction activities and equipment, and would result in similar impacts to wetland resource areas, traffic, noise, hazardous waste, historic resources, rare species, and wildlife and habitat, as the MCRT construction (Company Reply Brief at 61). The Company states that the amount of tree clearing would differ between the Project and the rail trail alone, but concluded that the visual impacts would be similar (Company Reply Brief at 61, citing Exh. RR-EFSB-98).

Eversource estimated the cost savings to DCR to be in the range of $6 to $10 million due to Eversource's completion of the access road, which would serve as the base of the rail trail (Exh. EV-1, at 5-33; RR-EFSB-18; Company Reply Brief at 66). Eversource attributed those savings to the cost of removal and disposal of rail ties; clearing and grubbing; grading for the access road, rail trail, and shoulders; erosion and sedimentation controls; excavation and removal of contaminated soils; and laying of the gravel access road (RR-EFSB-18).[147] Further, the Company stated that it agreed to complete bridge rehabilitation work, regardless of which route along the MBTA ROW is selected (underground or overhead), to facilitate the Company's inspections of tower structures and the development of the access road to be used as the base for the rail trail (Tr. 8, at 1301-1303).

The towns of Sudbury and Hudson have contemplated construction of the MCRT, and in response to Siting Board record requests, provided information regarding various town votes concerning the MCRT, dating back to 1997 (Tr. 12, at 2210-2216; RR-EFSB-83; RR-EFSB-84). In April 1997, Sudbury Town Meeting approved Article 50, a non-binding resolution expressing support for development of a bicycle and pedestrian trail along the Massachusetts Central Railroad ROW, and requesting that the Massachusetts Department of Environmental Management (now DCR) and the Massachusetts Highway Department design and construct the trail (RR-EFSB-83(1) at 1-2). In September 2014, Sudbury Special Town Meeting "indicated strong support" for the MCRT, including Phase I (from Union Avenue to Dutton Road in Sudbury) and the "full trail" length in Sudbury (RR-EFSB-83(1) at 5). At Town Meeting in

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147 Conversely, the Company reported that it would benefit from annual cost savings of approximately $5,000 per year from DCR's vegetation management of the MBTA ROW following completion of the MCRT (RR-EFSB-63).

December 2014, Sudbury voters considered two MCRT-related articles: Article 3, which sought town approval to raise and appropriate funding for engineering design and construction bid documents for the 1.8-mile-long Phase I segment of the MCRT (indefinitely postponed as the Finance Committee had already voted to transfer Reserve Funds to prepare design specifications for the MCRT); and Article 4, a non-binding resolution advising the "Board of Selectmen to support a paved travel surface on the MCRT," which passed overwhelmingly (RR-EFSB-83(1) at 10-14). On May 11, 2015, Sudbury Town Meeting voters rejected Article 55, which called for $1,000,000 to be raised by taxation for the engineering and construction of "greenway style" multi-use recreation trail that would have a "rolled stone dust finish layer" (RR-EFSB-83(1) at 27).[148] With regard to the Town of Hudson, in May 1997, the Hudson Board of Selectmen unanimously approved a resolution in support of the MCRT (RR-EFSB-84).[149]

b. Positions of the Parties

The Company asserts that in addition to DCR's avoided costs described above, the rail trail would provide public benefits by extending public open space areas, promoting regional connectivity between towns, developing opportunities for outdoor recreation and pollution-free transportation, and providing environmental and historical educational opportunities (Exh. EV-2, at 1-7; Tr. 2, at 333-334). Eversource concluded that the Project would help implement DCR's vision for the MCRT and would effectively reduce the overall cumulative impact of the Project (Exh. EV-2, at 5-85; Company Brief at 93).

The Town of Sudbury and Protect Sudbury oppose the Company's assertion that construction of the Project (including the MCRT) would have comparable environmental

148 Concerns expressed at Sudbury Town meeting in opposition to Article 55 included the durability and accessibility of a stone dust trail surface, and competing demands at the time for capital projects by the town (RR-EFSB-83(1) at 29-31).

149 Hudson's witness, Ms. Helinek (Conservation Commission Agent/Planner), expressed her view that that the 1997 Select Board approval does not necessarily indicate "whether there is currently public support from Hudson residents for the Massachusetts Central Rail Trail" (RR-EFSB-84; RR-EFSB-84(1)).

impacts to the MCRT alone.[150] Sudbury argues that there would be no public benefit or consistency with the public interest by developing the Project and the MCRT in tandem (Sudbury Brief at 3; Sudbury Reply Brief at 14). Sudbury argues that construction of the MCRT absent the Project would have far less permanent environment impacts (Sudbury Reply Brief at 14). The town notes that the wider construction platform and tree clearing required for the Project would go beyond the "minor alterations" that would be required for just the rail trail (Sudbury Brief at 99, citing Exh. SUD-MJN/RMG-1(R) at 38). Specifically, Sudbury states that for the rail trail, DCR would not need to alter embankments along Hop Brook, and therefore would not impact BVW, vernal pools, waterbodies, or coldwater fisheries along banks (Sudbury Brief at 99, citing Exh. EFSB-LU-10(2)). The town further argues that the MCRT would have less impact to wildlife due to decreased tree clearing and would require less excavation and soil disturbance (Sudbury Brief at 99, citing Exh. EFSB-LU-10(2); Sudbury Reply Brief at 17).

Protect Sudbury argues that the Company has not demonstrated that the rail trail would provide any benefit to the Project, such as reliability or system need (PS Brief at 49-50). Protect Sudbury contends that the host communities should be allowed to decide independently about the development of the MCRT, without any consideration of the Project (PS Brief at 49-50). Further, Protect Sudbury claims that the advantages of a rail trail are fewer than the negative impacts of the Project (PS Brief at 50, citing Exh. SUD-MJN/RMG-1 at 41-43; PS Reply Brief at 7). Protect Sudbury claims that the MCRT, combined with the Project, would impact more of the natural environment than the rail trail alone (PS Reply Brief at 7-8). Protect Sudbury concludes that the Siting Board should not consider the MCRT as part of its evaluation of the Project (PS Brief at 50).

c. Analysis and Conclusions

Construction of the MCRT would further the Commonwealth's stated intention to provide greater access to natural resource areas and create corridors that are pedestrian and

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150 In a comment letter to MEPA on the Company's ENF and in a letter to the Siting Board, the Stow Conservation Commission indicated its support for the MBTA Underground Route and noted the opportunity to advance construction of the MCRT (Exh. EFSB-G-1(3) at 340; Tr. 9, at 1508-1509).

cyclist friendly. See Exh. EFSB-3. As DCR has stated, development of a multi-use rail trail along the MBTA ROW would provide the missing link in the regional MCRT, from downtown Sudbury to the Assabet River Rail Trail in Hudson, and the Bruce Freeman Rail Trail between Lowell and Sudbury. The rail tail is a unique opportunity to provide public open space, promote regional connectivity and local commerce, and to encourage outdoor recreation and the health benefits derived therefrom. Construction of the Project along the MBTA ROW would also provide significant cost savings to DCR and assist in DCR's goal of completing the MCRT.

If it is assumed that the MCRT would be constructed on the MBTA ROW, many of the environmental impacts associated with the MBTA ROW section of the Project would occur regardless of whether the Project itself is constructed. The record shows that the greatest difference in environmental impacts between the MCRT as a standalone project and the Project with the MCRT would be land use, coldwater fisheries, and visual impacts related to the increase in the width of the corridor required for the Project with either an underground or overhead transmission line. Otherwise, environmental impacts would be similar for construction of the Project along the MBTA Underground Route and the MCRT, as a standalone project.

Notwithstanding the stated opposition of Sudbury, Protect Sudbury, and Hudson to the Project in this proceeding, the record shows that on multiple occasions since 1997, elected officials and voters in both communities have shown support for the MCRT. As recently as December 2014, Sudbury Town Meeting voters approved Article 4, a non-binding resolution advising the Board of Selectmen to support a paved travel surface on the MCRT. These past expressions of support for the MCRT are consistent with the Company's view (shared by DCR) that the MCRT would provide important public benefits.

Nevertheless, in making a judgment on the merits of the Project, the Siting Board elects not to net out the prospective impacts from construction of the MCRT in its evaluation of the impacts for the Project. In this manner, the analysis used by the Siting Board places the full weight of environmental and cost impacts on the Project in comparison with alternatives. We do this despite the fact that the parts of the MCRT are already moving forward in the neighboring communities of Weston and Wayland, and that the Secretary issued a Certificate in 2014 on DCR's Expanded ENF for the MCRT on the MBTA ROW (including the section used by the

Project). This conservative approach severs consideration of the development of the MCRT as a "baseline condition" from the Siting Board's findings on Project impacts.

10. Summary of Environmental Impacts

The Siting Board finds that the information the Company provided regarding the Project's environmental impacts is substantially accurate and complete. A summary of the Siting Board's findings regarding the relative environmental impacts of the three routes is provided in Table 11, below.[151]

Table 11. Ranking of the Three Routes with Respect to Environmental Impacts (1 lowest impact, 3 highest impact)

Environmental Impacts	MBTA Underground Route	All-Street Route	MBTA Overhead Route
Land Use and Historic Resources	1	1	3
Water and Wetlands	2	1	3
Noise	1	2	3
Traffic	1	3	1
Visual	2	1	3
Hazardous Waste	2	2	1
Safety	1	1	1
Air	1	1	1
Magnetic Fields	1	1	1
Total Impact Ranking	**12**	**13**	**17**

On balance, the Siting Board finds that environmental impacts for the MBTA Underground Route are comparable with those of the All-Street Route; and that the MBTA Overhead Route has the highest environmental impact of the three routes proposed.

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151 The numbers in Table 11 reflect the comparisons presented in the individual environmental analyses above. For example, in the Land Use category, the Siting Board found that the MBTA Underground Route and the All-Street Route were both preferable to the MBTA Overhead Route, and as such the MBTA Underground Route and the All-Street Route are both ranked first and the MBTA Overhead Route is ranked third.

E. Cost

1. Company Description

In its initial petitions, Eversource provided conceptual-level cost estimates (i.e., -25%/+50%) for the MBTA Underground Route, the MBTA Overhead Route, and the All-Street Route (Exh. EV-2, at 5-84). The Company reported that these conceptual grade estimates were calculated using recent costs of similar materials and construction activities and include overhead items such as costs related to design and permitting, and allowance for funds used during construction (Exh. EV-2, at 5-84). Subsequently, Eversource provided a more refined planning grade cost estimate (-25%/+25%) for the MBTA Underground Route and made related updates to its conceptual grade estimates for the MBTA Overhead Route and the All-Street Route (Exh. EV-2, at 5-84; Tr. 7, at 1118-1119; RR-EFSB-50). Eversource stated that it uses the same cost estimate methodology across all projects and that this methodology is consistent with Attachment D of the ISO-NE's Planning Procedure No. 4 (pool-supported transmission facility cost review) ("PP-4") (Exh. SUD-C-1).[152]

The Company's planning grade cost estimate for the MBTA Underground Route is $95.8 million (RR-EFSB-50). By comparison, the Company's conceptual level cost estimates

[152] Eversource indicated that its cost estimate for the Project was developed using a bottom-up approach, aggregating the estimated costs of each component of the Project in accordance with widely accepted industry standards, such as the American Society of Professional Estimators Standard Estimating Practice (Exh. SUD-C-1; Company Reply Brief at 70; RR-EFSB-50). Eversource stated that, where applicable, standard base-level inputs are used, such as the depth of the duct bank and the number of test pits per mile, to ensure consistency and uniformity across estimates (Exh. SUD-C-1). The Company's cost estimate for the Project does not include annual lease payments associated with the MBTA ROW of approximately $425,000 per year for 20 years, which the Company considered operational costs rather than capital costs, for a total of $9,358,077 (Tr. 8, at 1285-1286; Exh. EFSB-C-12(R-1)).

for the Project are $67.5 million using the MBTA Overhead Route and $114.2 million for the All-Street Route, as detailed in Table 12, below (RR-EFSB-50).[153,154]

Table 12. Total Estimated Cost of the MBTA Underground Route, MBTA Overhead Route, and All-Street Route

Route	Sudbury Substation	Hudson Substation	Transmission Line	Total Estimated Cost
MBTA Underground Route	$3.8 million	$5 million	$87 million	$95.8 million (+/- 25%)
MBTA Overhead Route	$3.1 million	$5 million	$59.4 million	$67.5 million (-25%/+50%)
All-Street Route	$3.9 million	$5 million	$105.3 million	$114.3 million (-25%/+50%)

Source: RR-EFSB-50.

Based on the above, the Company estimated that the MBTA Overhead Route is the lowest cost route, followed by the MBTA Underground Route, with the All-Street Route being the most expensive (RR-EFSB-50).

2. Positions of the Parties

a. Town of Sudbury

Sudbury maintains that Eversource has not substantiated its contention that the MBTA Underground Route is superior to the All-Street Route in terms of cost (Sudbury Brief at 73).

153 The Company's initial conceptual level cost estimate for the MBTA Underground Route was $96 million (including $6.7 million for work at Sudbury Substation, and $5 million for work at the Hudson Substation) (Exh. EV-2, at 5-84). By comparison, the Company's initial conceptual level cost estimate for the MBTA Overhead Route was $49.2 million (including $4.2 million for work at the Sudbury Substation, and $5 million for work at the Hudson Substation), and $115.4 million for the cost of the All-Street Route (including $6.8 million for work at the Sudbury Substation and $5 million for work at the Hudson Substation) (Exh. EV-2, at 5-84).

154 With respect to cost allocation, Eversource indicates that, should the Siting Board approve the Project along the MBTA Underground Route, the Company would submit an application to ISO-NE seeking to regionalize the costs of the Project, including the incremental cost of underground construction, across New England (Company Reply Brief at 24-25, citing Tr. 4, at 718; Tr. 7, at 1000, 1257).

According to Sudbury, the Company failed to provide a coherent cost analysis necessary for the Siting Board's review, and the record is "completely devoid of substantial evidence to support the cost estimates" for the MBTA Underground Route and the noticed alternatives (Sudbury Brief at 73). Sudbury maintains that the Company's cost figures cannot be relied upon because evidence suggests that "the estimates are manipulated" by the Company (Sudbury Brief at 73). Even if not manipulated, Sudbury maintains that the costs of the MBTA Underground Route and the All-Street Route "are not meaningfully different at the level of precision used," and that the Company's cost estimates do not adequately consider "the high level of environmental mitigation" that would be required along the MBTA ROW (Sudbury Brief at 73-74).

Sudbury contends that the Company has not filed a reliable cost analysis "and has withheld the calculations and assumptions used for its estimates, in violation of the Town's due process rights" (Sudbury Brief at 73-74). Sudbury argues that, notwithstanding the Company's production of a basic table showing a breakdown of materials, labor, ROW costs, engineering/permitting, financing/AFUDC, and escalation for the proposed line along the MBTA Underground Route and at the Sudbury Substation, the Company refused to produce the workpapers, spreadsheets, and related cost documentation underlying this information (Sudbury Brief at 74, citing Exhs. EFSB-C-6; EFSB-C-13; SUD-C-17(S-1) at 1). Sudbury contends that it was "forced to proceed with an inadequate record, in clear violation of its due process right to review reasonable information supporting the Company's cost estimation process" (Sudbury Brief at 75). Sudbury notes that after the end of evidentiary hearings, the Company filed entirely new itemization tables professing to include a planning grade estimate for the MBTA Underground Route, but still including a conceptual grade estimate for the MBTA Overhead Route and All-Street Route (Sudbury Brief at 76, citing RR-EFSB-50(1)). Noting numerous cost changes made to all three routes in the updated estimates, the town argues that many of the changes were made without accompanying explanation and that parties have not had an opportunity to cross-examine the Company on the changes, in violation of their due process rights (Sudbury Brief at 76).

Sudbury argues that the Company's cost estimates are biased and unreliable (Sudbury Brief at 77). Sudbury asserts that the Company's original cost information contained data entry errors, included costs that were not properly applicable to the All-Street Route, and omitted the

$425,000 annual fee that must be paid to the MBTA for use of the ROW (Sudbury Brief at 77, citing Tr. 7, at 1017). The town argues that this annual fee is an incremental cost of the MBTA Underground Route and should have been included in a fair cost comparison between the alternatives (Sudbury Brief at 77). Sudbury maintains that, in the aggregate, the cited examples of errors give cause to seriously question the trustworthiness of the information provided by the Company (Sudbury Brief at 77-78).

Sudbury notes that estimates of Project costs associated with bridge repairs, tunnel installations, clearing and grubbing, and soil management all increased after the filing of the DEIR and cross-examination, arguing that these increases show that the Company's cost estimates are unreliable (Sudbury Brief at 78, citing Exh. SUD-C-17(S2)(1); RR-EFSB-50(1)). Sudbury notes that these changes initially narrowed the gap between the MBTA Underground Route costs and the All-Street Route cost estimate, but maintains that the Company "made up for these changes by systematically decreasing or removing" MBTA Underground Route costs while increasing All-Street Route costs in other categories, in most cases without explanation (Sudbury Brief at 78, citing RR-EFSB-50(1)(confidential)).

Sudbury maintains that the difference in costs between the All-Street Route and the MBTA Underground Route is "further distorted" by the Company's use of escalation and contingency multipliers, which Sudbury contends are not appropriate for use if a project is not yet fully designed and the cost estimates already involve "a high level of guesswork" (Sudbury Brief at 79).

Sudbury contends that even if the Company's cost estimates are taken at face value, the estimated cost differences between the All-Street Route and the MBTA Underground Route "are meaningless when considering the imprecision of the estimates" (Sudbury Brief at 82). According to Sudbury, the $20 million difference between the two routes is not a reliable statistic because the bandwidth of error associated with conceptual grade estimates is $87 million for the All-Street Route and $72 million for the MBTA Underground Route (Sudbury Brief at 82).[155]

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[155] According to Sudbury, narrowing the range for the MBTA Underground Route to -25%/+25% still results in a potential range of error equal to $50 million, which is greater than the difference between the Company's cost estimate for the MBTA Underground Route and the All-Street Route (Sudbury Brief at 82).

According to Sudbury, given the level of overlap between the cost estimates, "there is a likelihood that costs associated with the [MBTA Underground Route] would be equal to or more costly than" the All-Street Route, and that the Siting Board cannot reasonably demonstrate through sufficient evidence that the All-Street Route would be the more expensive route (Sudbury Brief at 82).

Sudbury also contends that the Company's cost estimates fail to recognize the sensitive nature of the MBTA ROW and assign appropriate mitigation costs to the Company's MBTA Underground Route (Sudbury Brief at 83, citing Exh. EV-16). Sudbury maintains that there are significant environmental sensitivities along the Company's proposed route (e.g., Project construction near jurisdictional wetland resource areas, excavation of contaminated soils, etc.) and that at the time of evidentiary hearings, the Company had undertaken only about half of the environmental survey work necessary for the MBTA Underground Route (Sudbury Brief at 83, citing Tr. 7, at 1165-1166). Sudbury describes what it believes to be the "absurd" result that the Company is currently estimating that the All-Street Route, which is located entirely in public roadways, would involve 44 percent higher environmental and mitigation costs compared to the MBTA Underground Route (Sudbury Brief at 83, citing RR-EFSB-50(1))(confidential).[156]

b. Protect Sudbury

Protect Sudbury argues that the Company's conceptual grade cost estimates are inherently inaccurate (PS Brief at 28-31). According to Protect Sudbury, conceptual estimates are a highly-variable, rough order of magnitude estimates, used principally to establish the feasibility of a project or to screen alternative project designs early in the planning process (PS Brief at 29, citing Exh. Protect-RC/RH/ML/MO-1, at 5). Protect Sudbury maintains that,

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156 The Siting Board notes that the mitigation costs presented by the Company for the All-Street Route consist solely of the additional cost of curb-to-curb repaving (RR-EFSB-47). The mitigation costs presented for both MBTA Routes consist of wetland replication, land preservation, and meeting environmental performance standards for tree restoration, wildlife habit, and coldwater fisheries, as well as curb-to-curb repaving for the in-street portion of these routes also (RR-EFSB-47). Soil management was included as a separate line item in the Company's cost estimates in addition to mitigation (RR-EFSB-50).

generally, these estimates are prepared using only basic criteria such as generic unit cost factors (PS Brief at 29, citing Exh. Protect-RC/RH/ML/MO-1, at 5, 14).

Protect Sudbury asserts that conceptual grade estimates do not include significant information such as material costs, labor costs, production rates, construction conditions, and overall competitiveness of the construction industry, nor soil characteristics, potential hazardous materials, and "specialty construction" areas, such as directional drilling, river and highway crossings (PS Brief at 29-30, citing Exh. Protect-RC/RH/ML/MO-1 at 5, 7-8). Protect Sudbury contends that if conceptual estimates are used, it would be more accurate to compare the cost ranges of the candidate routes, rather than the specific cost estimates, in any evaluation (PS Brief at 30, citing Exh. Protect-RC/RH/ML/MO-1, at 7).

Protect Sudbury specifically criticizes the Company's use of conceptual cost estimates on the grounds that such estimates would understate demonstrated risks relating to site conditions and contamination along the MBTA ROW (PS Brief at 31-32, citing Exh. EFSB-HW-6(S-1)(1) at 2).[157] Protect Sudbury asserts that despite the Company's acknowledgement of contamination risks associated with railroad ROWs (and the MBTA Underground Route, specifically), costs associated with these risks have not been included in the conceptual estimates (PS Brief at 32, citing Exh. EFSB-HW-6(S-1)(1)). Protect Sudbury maintains that the level of significant contamination along the MBTA Underground Route will likely increase costs beyond the upper range of the Company's conceptual cost estimate (PS Brief at 32, citing Exh. Protect-RC/RH/ML/MO-1, at 11-12). Protect Sudbury notes that elements of uncertainty may vary between projects and may increase the cost estimate of the MBTA Underground Route or decrease the cost estimate of another candidate route and argues that the absence of detailed information at this stage of the proceeding makes it difficult to determine whether there is enough relevant information to accurately rank the cost estimates (PS Brief at 31). Protect Sudbury argues that the Siting Board should "give more weight to the inherent inaccuracy of the estimates used in this case" because the proposed Project along the MBTA Underground Route was not vetted by ISO-NE as part of a Solutions Study or Proposed Plan Application ("PPA")

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157 The Siting Board notes that the final cost estimate submitted by the Company for the Project is a planning grade estimate, rather than a conceptual grade estimate.

process; rather, the lower-cost MBTA Overhead Route was evaluated by ISO-NE (PS Brief at 11-12, 27-28).

Beyond its concerns about the use of conceptual cost estimates, Protect Sudbury argues that the MBTA Underground Route is the more costly choice, as compared to the All-Street Route (PS Brief at 34). Protect Sudbury maintains that, in reaching a contrary conclusion, the Company erroneously compares the alternative routes based on the single conceptual cost estimate, rather than on the complete cost-range for any given candidate route (PS Brief at 34).

Finally, Protect Sudbury argues that, even if the Project along the MBTA Underground Route were the least cost alternative, the Siting Board should reject the Project and determine that another alternative is preferable (PS Brief at 36). Protect Sudbury submits that the Siting Board has previously determined that a more expensive route was, on balance, preferable to the alternatives because it had fewer environmental impacts and strong community support (PS Brief at 36, citing New England Power Company, EFSB 97-3, at 71-72 (1998)).

c. Company Response

The Company acknowledges that the MBTA Overhead Route is the least cost route (Company Reply Brief 67). Eversource contests criticisms of its cost estimates by the Town of Sudbury and Protect Sudbury (Company Reply Brief at 67-77). According to the Company, cost issues have been the subject of thorough cross-examination and exhaustive discovery, and the Company has established that the estimated cost of the MBTA Underground Route is lower than the cost of the All-Street Route (Company Reply Brief at 67). The Company argues that: (1) it has provided accurate and detailed cost estimates; (2) the Company's cost estimation process is consistent with industry practice and ISO-NE procedures; (3) the Company's updated cost estimates for the MBTA Underground Route and alternatives were appropriately developed (including inclusion of mitigation costs); (4) it was appropriate for the Company to include contingency allowances and escalation factors in its cost estimates; (5) current cost estimates appropriately reflect changes over time; and (6) the Company's cost estimates provide a sufficient basis for an informed review by the Siting Board (Company Reply Brief at 67-77). Finally, the Company emphasizes that the costs in the record for the MBTA Underground Route, the MBTA Overhead Route and the All-Street Route are the most current estimates available,

and that the MBTA Underground Route cost estimate has an accuracy of -25%/+ 25% (Company Reply Brief at 67, citing RR-EFSB-50).

The Company maintains that all the underlying estimates, assumptions, and subcomponents for its cost estimates have been provided and that its costs have not only been broken out by component (overhead transmission, underground transmission, and substation), but also by category (materials, invoices and labor) (Company Reply Brief at 68, 69 citing RR-EFSB-44; RR-EFSB-45; RR-EFSB-46; RR-EFSB-47, RR-EFSB-48; RR-EFSB-49; RR-EFSB-50). While costs of the route alternatives were not established at the same level of precision as costs of the MBTA Underground Route, the Company argues that: (1) its cost estimating methods were consistent across the three transmission route alternatives; and (2) the scope of cost-related information in this case "far exceeds" what is typical in Siting Board proceedings (Company Reply Brief at 68). In addition, the Company argues that its detailed set of cost submissions negates Sudbury's argument that the Company withheld workpapers and underlying calculations (Company Reply Brief at 69). Eversource argues further that the Company's approach accords with cost estimating methods used in recent Siting Board cases (Company Reply Brief at 68, citing Woburn-Wakefield at 46; East Eagle at 34).

Eversource contests Protect Sudbury's argument that conceptual level estimates are inherently inaccurate and should be rejected by arguing that the development of its Project cost estimates follows standard industry practice, both in terms of timing and level of accuracy (Company Reply Brief at 69, citing Exhs. EV-DAS/DMB-1, at 5; Protect-14). The Company cautions that the intervenors are seeking a level of precision in the Company's cost estimates that is not available at this stage of project design and engineering (Company Reply Brief at 72). The Company argues that it would be impractical to take every alternative to its complete engineering conclusion for the purpose of providing more certain comparative cost estimates because of the time and expenditures that would be required (Company Reply Brief at 69, citing Exh. EV-DAS/DMB-1, at 18). The Company suggests that Sudbury fails to recognize that the cost figures in the record reflect the current stage of Project design, that additional discovery would not bring forth final cost figures, and that the Company's cost estimates provide a range of precision typically accepted by the Siting Board (Company Reply Brief at 72).

Eversource disagrees with Sudbury's assertion that the Company has "withheld from the record critical information that will significantly increase the Project's environmental impacts and add to its cost" – for example, on costs relating to items such as bridge repair, culvert improvements, and soil disposal costs (Company Reply Brief at 71). The Company maintains that it has included costs for mitigation, taking into consideration unique elements and associated specific cost estimates for each alternative route (Company Reply Brief at 71). According to the Company, the record reflects consideration of the following elements: (1) specialized crossings, including bridge crossings; (2) the assumed extent of utility congestion and need for utility relocations; (3) the potential extent of contamination that may be present, the volume of soils that need to be transported off-site, and the amount of soil needed to be brought on-site for capping; and (4) the extent of necessary erosion control (Company Reply Brief at 71-72, citing Exh. EV-DAS/DMB-1, at 10). The Company argues that it has performed sufficient analysis of potential environmental mitigation to enable the Company to reduce uncertainties associated with its environmental mitigation costs (Company Reply Brief at 72).

The Company contests Sudbury's argument that contingency and escalation factors should not be used in the development of the Company's cost estimates, and maintains that it was appropriate to include both contingency and escalation in its cost estimates, and in accordance with Attachment D of ISO-NE's PP-4 (Company Reply Brief at 72-73, citing Exh. EFSB-1). The Company argues that it is appropriate to include higher contingency factors for the alternative routes because there has been less engineering work completed for these route options and therefore greater uncertainty (Company Brief at 73-74). The Company agrees with Sudbury that it had originally used different escalation factors for the MBTA Underground Route and All-Street Route and that it had corrected the discrepancy (Company Reply Brief at 74, citing RR-EFSB-50(1)(confidential).

The Company dismisses Sudbury's assertion that line-item cost changes made by the Company during the course of the proceeding are indicative of Company bias or manipulation or indicate the cost estimates are unreliable (Company Reply Brief at 74-75, citing East Eagle at 61; Exhs. EV-DAS/DMB-1, at 5; EFSB-1). Instead, the Company maintains that updates to its cost estimates reflect the Company's process of refining estimates as the Project design progresses, which, by definition, is an iterative process involving extensive internal review and refinement

prior to finalization (Company Reply Brief at 75). Eversource indicates that this is standard practice for transmission companies in the ISO-NE control area and is in accordance with PP-4 (Company Reply Brief at 70, citing Exhs. PROTECT-83; EFSB-1). The Company contends that Sudbury's argument concerning bias and manipulation are unsupported by the record (Company Reply Brief at 75).

The Company defends its use of a single-point cost estimate (versus using a comparison of the potential lowest and highest end of the range of a cost estimate) as both appropriate and in accordance with Siting Board precedent (Company Reply Brief at 69, citing Woburn-Wakefield at 18, East Eagle at 28, Walpole-Holbrook at 16, Mystic-Woburn at 18). The Company disputes arguments of Sudbury and Protect Sudbury that, given the overlap between cost estimates ranges, there is a likelihood that costs associated with the MBTA Underground Route would be equal to or more costly than the All-Street Route (Company Reply Brief at 75). The Company maintains that there is no rationale or factual basis to assume that similar cost items that exist across project alternatives will deviate in opposite directions for the MBTA Underground Route and its alternatives; while actual costs may change from estimates over time, the Company argues that the direction of cost changes will be consistent over time for all alternatives for the clear majority of cost items (e.g., labor, materials, overheads, etc.) (Company Reply Brief at 76, citing Exh. EV-DA/DMB-1, at 7). Further, although all three project alternative estimates are bounded at the bottom by -25 percent, the Company argues that the MBTA Underground Route's planning grade estimate is the only one of the three alternative cost estimates that now has a more limited +25 percent upper confidence limit, compared to the +50 percent confidence limits for the MBTA Overhead Route and the All-Street Route and that, therefore, the cost advantage of the MBTA Underground Route, relative to the All-Street Route, is even stronger when comparing the upper bounds of the cost estimate ranges (Company Reply Brief at 75-76). The Company further argues that its single point cost estimate approach is consistent with the procedures required in ISO-NE's PP-4 (Company Reply Brief at 69-70).

3. Analysis and Findings on Cost

The Siting Board requires the petitioner to demonstrate that the proposed route for the transmission facility is superior to the alternative route(s) on the basis of balancing

environmental impact, cost, and reliability of supply. G.L. c. 164, § 69J. Further, because G.L c. 164, § 69J provides that "no state agency shall issue a construction permit for any such facility unless the petition to construct such facility has been approved by the [Siting Board]," the Siting Board's balancing of environmental impact, cost, and reliability of supply takes place at a relatively early stage in the engineering design of a particular project. As a result, project cost estimates are typically developed only to an intermediate level of precision. Furthermore, applicants typically do not develop engineering design of alternatives to the same level of detail, so cost estimates for alternatives are necessarily less precise. See East Eagle at 60-61.

Sudbury's overarching complaint is that the Company failed to meet its burden to provide a coherent cost analysis of the MBTA Underground Route and its alternatives, and that the record is "devoid of substantial evidence to support the cost estimates for the Project." Following a motion by Sudbury to compel responses to discovery seeking, inter alia, workpapers used to develop the Company's line-item cost estimates, at the Siting Board's direction, the Company filed additional information (Exh. SUD-C-17(S-2)). This supplemental response provided some additional back-up information to support the Company's cost information for each of the three alternative transmission routes, but Sudbury argues that the Company did not produce its "actual workpapers."

At the December 5, 2017, evidentiary hearing, Siting Board staff as well as counsel for Sudbury and Protect Sudbury asked extensive questions of the Company's cost witnesses, and Siting Board staff issued a number of detailed record requests to obtain additional back-up documentation and explanations of the Company's cost estimates (see RR-EFSB-34 through RR-EFSB-49). Responses to these record requests provide substantial information on the underlying basis and rationale for the Company's cost estimates. Accordingly, the Siting Board does not accept Sudbury's contention that the record is devoid of substantial evidence supporting the Company's cost estimates.[158] To the contrary, the Siting Board concludes that the record

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158 The Siting Board also rejects the Town of Sudbury's contention that the Company's updated planning grade estimate was devoid of explanation. In many cases, the information contained in the updated cost schedule (RR-EFSB-50(1)(confidential) was derived and explained in separate response to record requests, such as RR-EFSB-44 (the cost of trenchless crossings), RR-EFSB-45 (costs of underground transmission pavement restoration costs), RR-EFSB-46 (costs of underground transmission materials),

contains extensive cost information, that taken together, constitute substantial evidence on the issue of Project cost. The Siting Board is entitled to rely upon this substantial body of evidence to conclude that the cost of the All-Street Route is likely to be greater than either of the MBTA Routes.

The Siting Board notes that the Company's responses to record requests concerning the cost of the MBTA Underground Route and its two alternatives contain a number of corrections from earlier Company cost estimate elements, including consistent per-foot pavement restoration costs and duct bank material costs, and vegetation clearing and grubbing costs for access roads.[159] Contrary to Sudbury's assertions, the substantial detail and explanations provided by the Company provide a sufficient basis to conclude that the Company's cost estimates, including soil management and environmental mitigation, are reliable.

In PP-4, ISO-NE anticipates different grades of estimates to be developed as planning for a project proceeds (e.g., conceptual estimates, planning estimates, etc.) and that the level of detail in the estimate will increase as the project develops. ISO-NE's PP-4 also requires project proponents to include escalation and contingency in their cost estimates for transmission projects, regardless of the grade of the estimate (Exh. EFSB-1, Attachment D, at 8-13). The Siting Board considers this approach to be reasonable and reflective of the uncertainty associated with cost estimation practices. Accordingly, the Siting Board sees no reason to diverge from the cost estimating process adopted by

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RR-EFSB-47 (mitigation costs for the three alternatives), RR-EFSB-48 (the costs of clearing and grubbing/access road), and RR-EFSB-49 (further support and explanation for costs associated with traffic control, flagger & police, the costs of unspecified trenchless crossings, the cost of plating, and the development and backup for the cost associated with soils management). Although not every change that the Company made to its cost estimate that was submitted with its updated planning grade estimate was explained, sufficient basis and explanation was provided to support the new planning grade estimate for the MBTA Underground Route and for revisions to estimates for the MBTA Overhead Route and All-Street Route.

159 The Siting Board rejects Sudbury assertion that its due process rights were violated by the Siting Board's long-standing practice of allowing parties to submit information not available at hearings in the form of record request responses. See 980 CMR 1.06(6)(g). See also Section I.C.

ISO-NE and is not persuaded by Sudbury's argument that escalation and contingency factors are inappropriate for conceptual and planning grade estimates.

With respect to the argument by Sudbury that it was unreasonable to assign different contingency factors for different routes, the Siting Board accepts the Company's explanation that because it had conducted more extensive engineering of the MBTA Underground Route, and therefore had a more detailed understanding of the Project compared to the All-Street Route and the MBTA Overhead Route, it was reasonable for the Company to use a lower contingency for the Project compared to the alternative routes. This is consistent with past Siting Board precedent (see e.g., East Eagle at 60-61), as well as PP-4, Attachment D, at 10, which suggests that contingency levels are expected to be reduced as a given cost estimate advances from an early preliminary cost estimate to a more detailed cost estimate.[160]

The record shows that the Company did not include annual lease payments to the MBTA in its estimates for the MBTA Routes on the grounds that these are operational costs, not capital costs. The Siting Board agrees that this is consistent with past Company practice and that including a selective operational cost associated with the MBTA Routes (as proposed by Sudbury) would create an inconsistent comparison. See e.g., New England Power Company d/b/a National Grid EFSB 09-1/D.P.U. 09-52/D.P.U. 09-53, at 64 (2011).

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[160] The Town of Sudbury correctly notes that the amount of contingency has increased for the All-Street Route in both actual and percentage terms under the updated cost estimate in RR-EFSB-50. The contingency for the All-Street Route increased by 77 percent and the contingency for the MBTA Underground Route increased by five percent (RR-EFSB-50(1)(confidential)). Although the Siting Board does not find it unreasonable for the contingency factor applied to the estimated costs of the All-Street Route to be higher than the contingency factor applicable to the MBTA Underground Route (given the greater level of uncertainty associated with the All-Street Route, as discussed above), it is unclear why the contingency for the All-Street Route has increased by approximately 77 percent, compared to the contingency for the same cost element as originally identified by the Company. Nevertheless, this difference does not materially alter the conclusion that the MBTA Underground Route is substantially less expensive than the All-Street Route.

The record shows that the cost estimate ranges for the MBTA Underground Route and the two alternative routes overlap. That is, the low end of the estimated cost range for the MBTA Underground Route is lower than the high end of the range for the MBTA Overhead Route, and the high end of the cost range for the MBTA Underground Route is higher than the low end of the All-Street Route. The Siting Board notes that there is a greater confidence level associated with the Company's estimate of the cost of the MBTA Underground Route than that of the MBTA Overhead and All-Street Routes. The Siting Board accepts the Company's position that the direction of any cost changes from the estimates would tend to be consistent for the majority of cost items over time, including increases or decreases in the cost of labor, materials, and overhead. As such, it is unlikely that, in the event of construction, actual costs of the MBTA Overhead Route would exceed those of the MBTA Underground Route under the same external conditions – or that the All-Street Route would become less expensive than the MBTA Underground Route. This view is reflected in ISO-NE's practices, which compare the cost of projects on a point-estimate basis.

The record identifies the MBTA Overhead Route as the least cost alternative, with an estimated cost of approximately $67.5 million compared to the MBTA Underground Route estimated cost of approximately $95.8 million. The All-Street Route, with an estimated cost of approximately $114.3 million, is the highest cost of the three noticed route alternatives. Based on the Company's cost estimates, the Siting Board finds that the MBTA Overhead Route is preferable to the MBTA Underground Route with respect to cost and that both the MBTA Overhead Route and MBTA Underground Route are preferable to the All-Street Route with respect to cost.[161]

F. Reliability

The Company evaluates several factors when assessing the reliability of transmission projects, including the location of the transmission facilities, total exposure to faults (length), the

[161] The Siting Board notes that this relative ranking of costs remains unchanged even if costs associated with annual lease payments to the MBTA for the MBTA Routes are included.

type of transmission structures, and maintenance and repair accessibility (Tr. 2, at 283-284). According to the Company, while both overhead and underground transmission lines are reliable, historical performance on the Eversource system indicates that underground transmission lines experience fewer outages than overhead lines since they are protected from exposure to weather (Exh. EFSB-R-1). However, Eversource states that the duration of outages on overhead transmission lines is generally less than 24 hours, while the duration of outages on underground transmission lines is significantly longer, typically 30-60 days (Exh. EFSB-R-1). Considering both the frequency and duration of outages, the Company believes there is no meaningful difference between the reliability of the underground and overhead routing alternatives considered (Exh. EFSB-R-1). Furthermore, the Company does not consider the shorter length of the MBTA Underground Route (approximately nine miles) to provide a material advantage in reliability over the All-Street Route (approximately ten miles) (Exh. EV-2, at 1-1, 1-6; Tr. 2, at 284-285).

Sudbury argues that complications associated with the Company's decision to pursue underground construction of the Project, after initially proposing overhead construction in the ISO-NE planning process, creates a reliability concern that should be considered by the Siting Board (Sudbury Brief at 85-86). According to Sudbury, additional ISO-NE process would be required if the Board were to approve the Company's proposed MBTA Underground Route – specifically, a revised PPA to ensure that no material adverse impacts would result from construction of the Project (Sudbury Brief at 86). Sudbury also notes that the Option Agreement between Eversource and the MBTA contemplates underground construction only and does not allow overhead construction as proposed under the MBTA Overhead Route (Sudbury Brief at 86, citing Tr. 2 at 343). Finally, Sudbury argues that termination rights established in the Option Agreement allow the MBTA to terminate the Company's lease for railroad use or other transportation purposes, at which point Eversource would need to relocate its facilities along the MBTA ROW, creating additional reliability concerns (Sudbury Brief at 87, citing Exhs. SUD-G-19(1); Protect-2-14).

In response to Sudbury's arguments that a revised PPA is necessary, Eversource maintains that it has performed an analysis to verify that the proposed underground configuration of the Project will not adversely affect the existing transmission system (Company Reply Brief

at 20, citing Exh. EFSB-C-4). The Company will seek formal PPA approval from ISO-NE following a decision by the Siting Board (Company Reply Brief at 20-21, citing Exh. EFSB-C-4). Eversource dismisses Sudbury's concerns relating to its Option Agreement with the MBTA, stating that the Company is not precluded from constructing the transmission line overhead along the ROW,[162] and that in the unlikely event that the MBTA were to terminate its lease with Eversource, the Company's facilities would be relocated within the easement, and that such a relocation would be coordinated to ensure no reliability impact (Company Reply Brief at 22, 57, citing Exhs. EFSB-C-12(R1)(2) at 5; Protect-2-14; Tr. 7, at 1002).

The Siting Board is persuaded by the Company's testimony that the proposed underground construction of the Project would not adversely affect the existing transmission system and notes that the Project will be subject to formal ISO-NE review to confirm this fact following issuance of the Board's decision. Furthermore, Eversource has affirmed that, in the unlikely event that the MBTA restores rail service along the MBTA ROW or elects to use the ROW for other transportation purposes, the Company would be able to relocate its transmission facilities within the ROW without any detrimental impacts to system reliability.[163] Thus, the Siting Board concludes that the terms of the Option Agreement are not likely to have a significant impact on the reliability of the New Line. Accordingly, the Siting Board finds that the MBTA Underground and Overhead Routes, and the All-Street Route are comparable with respect to reliability.

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162 The Company stated that if overhead construction along the MBTA ROW were to go forward, an amendment to the Option Agreement would be pursued with the MBTA (Company Reply Brief at 22).

163 The Siting Board notes that if relocation of the New Line within the MBTA ROW were to become necessary, under the Option Agreement the MBTA is required to give Eversource no less than five years notice in order to allow Eversource sufficient time to complete construction of the relocated facilities prior to removal of the existing facilities and without disruption to the Project's operation (Exh. EFSB-C-12(R1) at 64).

G. Conclusion on Analysis of the MBTA Underground and Overhead Routes and All-Street Route

The Siting Board is charged with ensuring jurisdictional facilities approved for construction in the Commonwealth achieve an appropriate balance between environmental impacts, reliability, and cost. As discussed above, the Siting Board finds that the MBTA Underground Route, the MBTA Overhead Route, and the All-Street Route are comparable with respect to reliability. The Siting Board further finds that the MBTA Underground Route is comparable to the All-Street Route with respect to environmental impacts and preferable with respect to cost, and that the MBTA Overhead Route is preferable to the MBTA Underground Route and the All-Street Route with respect to cost.

While the MBTA Overhead Route is the lowest cost route alternative, the record shows that this route has the greatest potential for environmental impact. Construction of the MBTA Overhead Route would, among other things, require substantial tree clearing, the loss of valuable wetland resources, the highest level of construction-related noise impacts, and permanent visual impacts that would result in meaningful change to the natural environment and residential areas along the MBTA ROW. The record shows that these impacts can be avoided, or significantly, reduced through the use of underground construction techniques, as proposed in the MBTA Underground Route. On balance, therefore, the Siting Board concludes that the additional expenditure of $28.3 million associated with construction of the MBTA Underground Route rather than the MBTA Overhead Route is warranted in this instance.[164] While the specific environmental impacts associated with the MBTA Underground Route and the All-Street Route differ, on balance, the Siting Board has found them comparable. As such, the Siting Board concludes that the additional expenditure of $18.5 million to construct the All-Street Route rather than the MBTA Underground Route (or a total increase of $46.8 million over the least-cost route alternative) is not warranted in this instance.

The Siting Board therefore finds that the MBTA Underground Route is superior to the MBTA Overhead Route and the All-Street Route with respect to providing a reliable energy

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[164] The Siting Board notes that DCR "fully supports" the MBTA Underground Route, as this route would "best facilitate DCR's plans to develop a multi-use rail trail along that portion of the MBTA property" (Exh. EFSB-5 at 1).

supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

Based on review of the record, the Siting Board finds that the Company provided sufficient information to allow the Siting Board to determine whether the Project has achieved a proper balance among cost, reliability, and environmental impacts. The Siting Board finds that with the implementation of the specified conditions and mitigation presented above, and compliance with all applicable local, state, and federal requirements, the environmental impacts of the Project along the MBTA Underground Route would be minimized. The Siting Board finds that the Project along the MBTA Underground Route would achieve an appropriate balance among conflicting environmental concerns as well as among environmental impacts, reliability, and cost.

VII. CONSISTENCY WITH POLICIES OF THE COMMONWEALTH

A. Standard of Review

G.L. c. 164, § 69J requires the Siting Board to determine whether plans for construction of the applicant's new facilities are consistent with current health, environmental protection, and resource use and development policies as adopted by the Commonwealth. Vineyard Wind at 127; Needham-West Roxbury at 74; Woburn-Wakefield at 136.

B. Positions of the Parties

1. Town of Sudbury

Sudbury asserts that the Siting Board cannot conclude that Eversource's plan for construction of the Project is consistent with the Commonwealth's health, environmental protection and resource use and development policies, and therefore the Siting Board should deny the Petition (Sudbury Brief at 96-97).

Sudbury argues that the Project would have adverse impacts to jurisdictional wetland resource areas, adversely affecting interests that are protected by the Massachusetts WPA, such as the private or public water supply, ground water, flood control, wildlife habitat, and fisheries (Sudbury Brief at 88-89, citing G.L. c. 131, § 40). The town also maintains that the Company's Project is inconsistent with the Commonwealth's policy to avoid adverse impacts on coldwater

fisheries (Sudbury Brief at 88-89). Sudbury notes that the Company has not yet been able to demonstrate that the Project does not impact rare species habitat, as the Company has not yet completed its NHEPSP rare species evaluation (Sudbury Brief at 89-90).[165]

Sudbury alleges that the Company's Project is an affront to the State's longstanding commitment to preserve and enhance open spaces under the jurisdiction of Article 97, noting that there are 14 parcels of Article 97 land abutting the Project route (Sudbury Brief at 90, citing Exh. SUD-MJN/RMG-1(R) at 34; RR-EFSB-65(1)). Further, Sudbury argues that, in accordance with state law, the town has adopted a master plan that includes a "[n]atural and cultural resources element which provides an inventory of the significant natural, cultural and historic resource areas of the municipality, and policies and strategies for the protection and management of such areas" (Sudbury Brief at 90, citing G.L. c. 41, §81D). The town asserts that Eversource's preferred route along the MBTA ROW is in conflict with Sudbury's master plan, which preserves the Hop Brook landscape in Sudbury (Sudbury Brief at 90-91, citing G.L. c. 41, §81D).

Sudbury refers to Governor Baker's Executive Order 569, which recognizes that the generation and consumption of energy continues to be a significant contributor to greenhouse gas ("GHG") emissions in the Commonwealth, and the need to assess vulnerabilities and adopt strategies to increase the resiliency of the state's infrastructure (Sudbury Brief at 91). According to Sudbury, the Company's current design to compensate for flood storage, which will lower the elevation of the railroad platform surface at the Bridge #130 (Fort Meadow Brook) to below the 100-year flood plain elevation, would promote additional flooding and decrease resiliency (Sudbury Brief at 91-92; citing RR-SUD-10; RR-SUD-10(1)). Further, Sudbury argues that adding an additional transmission line to the Marlborough Subarea does not further the state's goal under the Global Warming Solutions Act ("GWSA") and Executive Order 569 to diversify the Commonwealth's energy portfolio (Sudbury Brief at 92).

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165 The Siting Board notes that, as discussed in Section VI.D.1, above, since the filing of briefs the Company has received a conditional "no-take" determination from NHESP, including a Final Decision signed by the Director of the Division of Fisheries and Wildlife denying an appeal petition filed by Protect Sudbury (see Exh. EFSB-LU-7(S2)(1); EFSB-LU-7(S4)(1)).

Sudbury argues that the Project is in contravention to the Commonwealth's Smart Growth/Smart Energy policy's Sustainable Development Principles #4, #5, and #9: Protect Land and Ecosystems; Use Natural Resources Wisely; and Promote Clean Energy, respectively (Sudbury Brief at 92-93). According to Sudbury, the Company's plan to construct the Project along the "ecologically sensitive" MBTA ROW, "and its failure to reasonably consider NTAs such as energy efficiency and renewable energy," are inconsistent with the Commonwealth's sustainable development goals (Sudbury Brief at 93).

Finally, the Sudbury takes issue with the Company's decision to address the identified need with a transmission project, which the town maintains is inconsistent with the Company's statutory mandate under the Green Communities Act ("GCA") and subsequent Department decisions, thereby avoiding any meaningful effort to consider NTAs that would satisfy the claimed need for the Project (Sudbury Brief at 93-96).

2. Protect Sudbury

Protect Sudbury argues that the Project is inconsistent with and violates the Commonwealth's Smart Growth/Smart Energy policy's Sustainable Development Principles and Siting Board past directives to evaluate whether a proposed project, among other things, has the support of local officials who have assisted in the development of the route as well as in a construction mitigation plan (PS Brief at 50-51, citing New England Power EFSB 09-1/D.P.U. 09-52/09-53 ("Worcester") at 63 (2011)).[166] According to Protect Sudbury, the Project: (1) has not been designed and conditioned to avoid or minimize impacts to natural and cultural resources by being placed underground in city streets and within existing underground rights of way; (2) would significantly affect undisturbed property; (3) does not have the support of local

[166] The Siting Board notes that the citation referenced by Protect Sudbury does not provide the cited information. In Worcester at 67, the Siting Board did not state that local officials supported the project, but noted "local officials and community groups played a significant role in developing the route for the [p]roject as well as construction mitigation plans."

officials; and (4) is located in a "mapped habitat" and is "likely to impact water or historic resources" (PS Brief at 51, citing East Eagle at 146; Worcester at 63).[167]

3. Company

Eversource argues that, in addition to satisfying the requirements of the Siting Board's statue under G.L. c. 164, § 69J, the Project is consistent with other state energy policies as articulated in the Electric Utility Restructuring Act of 1997, the GCA (Chapter 169 of the Acts of 2008), the Energy Diversity Act (Chapter 188 of the Acts of 2016), and the GWSA (Chapter 298 of the Acts of 2008) (Company Brief at 126, citing Exh. EV-2, at 6-1).

According to the Company, the Project will be consistent with applicable health policies because it will improve the reliability of the regional transmission system, ensuring a reliable supply of electricity to customers in the Marlborough Subarea – a matter, which Eversource submits, greatly affects public health and safety (Company Brief at 126, citing Exh. EV-2, at 6-1).[168] Further, the Company maintains that the more robust transmission system will enable the connection of various future energy resources that may be developed in response to the Energy Diversity Act, and a more efficient and flexible operation of the electric grid, consistent with the GCA (Company Brief at 131, citing Exh. EV-2, at 6-4 to 6-5).

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[167] Protect Sudbury filed a Notice of Claim with the Division of Fisheries and Wildlife ("Division") contending that Eversource improperly segmented the construction of the Project, which resulted in a "gross underestimation" of the impacts on state-listed species and the total acreage of disturbance within Priority Habitats" (Exh. EFSB-LU-7(S3)(1) at i-2). Both the Division and Eversource filed separate Motions to Dismiss the Petitioner's appeal for lack of standing (Exh. EFSB-LU-7(S4)(3) at 1-2). Subsequent to the filing of these motions to dismiss, a Ten Citizen Group filed a Motion to Intervene in the Petitioner's appeal pursuant to M.G.L. c. 30A, § l0A (Exh. EFSB-LU-7(S4)(3) at 1-2). In a Final Decision, the Director of the Division granted the respective Motions to Dismiss by the Division and Eversource based on a determination that the Petitioner Protect Sudbury, Inc. does not have standing to appeal the Division's Conditional No-Take Determination, and that the Ten Citizen Group's Motion to Intervene is therefore moot (Exh. EFSB-LU-7(S4)(1)).

[168] The Company further states that it will design, build, and maintain the Project so that the health and safety of the public are protected (Company Brief at 126, citing Exh. EV-2, at 6-1).

Eversource submits that it has compared a range of alternative projects and proposed specific plans to carefully mitigate environmental impacts associated with the construction, operation and maintenance of the Project, consistent with cost minimization, and that, as such, the Project is consistent with the environmental policies of the Commonwealth (Company Brief at 128-129, 1 citing Exh. EV-2, at 6-2 to 6-3). Further, Eversource states that the Project will be constructed and operated in accordance with all relevant federal, state and municipal regulations and environmental policies, and that it will have no adverse climate change impacts or negative effects on sea levels (Company Brief at 129, 132, citing Exhs. EV-2, at 6-3, 6-5, 6-7, Table 6-1; EV-16, at Table 2-3, Table 2-4 and Table 2-5). Thus, the Project is consistent with the GWSA and will contribute to a reliable, low cost, diverse energy supply for the Commonwealth while avoiding, minimizing, and mitigating environmental impacts to the maximum extent practicable (Company Brief at 129, citing Exh. EV-2, at 6-3).

Finally, Eversource argues that the Project is consistent with, and furthers, the Commonwealth's policies regarding resource use and development because no previously undisturbed property will be affected by construction of the Project (Company Brief at 132-133, citing Exh. EV-2, at 6-5 to 6-6).

In response to Sudbury's assertions that the Project is not consistent with policies of the Commonwealth because it will impact certain resource areas, Eversource argues that Sudbury has failed to acknowledge that the Company is required to obtain all environmental approvals and permits required by federal, state, and local agencies, and that the Project would be constructed and operated to fully comply with those permits and approvals, as well as all relevant federal, state, and municipal regulations and environmental polices (Company Reply Brief at 77, citing Exhs. EV-2, at 6-3, 6-7, Table 6-1; EV-16, at Table 2-3, Table 2-4 and Table 2-5.). According to the Company, the essence of a project that meets the Commonwealth's policies is reflected by meeting such approvals and permits, including the Certificate from the Secretary of Energy and Environmental Affairs under MEPA relating to the Company's FEIR (Company Reply Brief at 77-78, citing Exhs. EV-2, at 6-3, EV-16, at 2-8 to 2-30, RR-EFSB-104).

With respect to Article 97 land protection, the Company responds that the Project does not trigger the need for Article 97 approval, and that the Project would be constructed on an existing railroad transportation corridor and that previously undisturbed Article 97 land would be

largely unaffected by the siting, construction or operation of the Project (Company Reply Brief at 78, citing Exhs. EV-2, at 6, EFSB-LU-40, Tr. 9, at 1540-1541).

The Company rejects Sudbury's argument that the design of the Project at Bridge #130 is inconsistent with strategic approaches to climate change, or that the resiliency of the Company's infrastructure would be at risk because of increased flooding (Company Reply Brief at 80). According to the Company, potential increased flooding resulting from climate change would not impact the resiliency of the Company's Project because the New Line is designed such that, even if fully submerged, water would be unable to penetrate the conduits, protecting the cables from damage (Company Reply Brief at 80, citing Exh. SUB-DEIR-34; Tr. 8, at 1394-1397).[169] Further, the Company maintains that the Project would not cause additional significant environmental impact to the surrounding area, as maintained by the town, because the Project would comply with the FEMA National Flood Insurance Program regulations and the Massachusetts WPA regulations (Company Reply Brief at 80, citing Exh. SUB-DEIR-34; Tr. 8, at 1394-1397).[170]

The Company disagrees with Sudbury's contention that the Project reflects a bias by the Company not to undertake any meaningful effort to consider NTAs that would satisfy the asserted need for the Project (Company Reply Brief at 80-81). To the contrary, the Company argues that it thoroughly evaluated the feasibility and cost of implementing NTAs in lieu of the Project, but determined that the practical challenges to development of conventional fossil-fuel or renewable generation in the Project area make technically feasible NTAs inferior to the Project (Company Reply Brief at 81, citing Exh. EV-2, at 3-8 to 3-12, Appendix 3-5; RR-EFSB-24(R1); RR-EFSB-24(R1)(1)).

In response to the argument made by Protect Sudbury that the Project is inconsistent with and violates the Commonwealth's Sustainable Development Principles, and does not meet Siting

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169 Eversource stated that sections of conduit would be fuse-welded together, which prevents water entry (Tr. 8, at 1396).

170 According to the Company, where the Project encroaches upon a regulatory floodway, the Company would demonstrate through a hydrologic and hydraulic analysis that the Project would not result in any increase in flood levels within the community during a 100-year flood (Company Reply Brief at 80, citing Exh. SUD-DEIR-34).

Board precedent, the Company argues that the Project has been designed and conditioned to avoid or minimize impacts to natural and cultural resources by being placed underground on an existing transportation corridor where it would promote the development of an extension of the Commonwealth's rails to trails program (Company Reply Brief at 79). The Company notes that the Project would be located entirely within the existing infrastructure of the MBTA ROW or roadways, and therefore, the siting, construction, and installation of the Project would not affect undisturbed property (Company Reply Brief at 79). Further, the Company maintains that because the Project supports the development of the MCRT, it also supports Sustainability Principle #4, by increasing "accessibility of open spaces and recreational opportunities" (Company Reply Brief at 79-80).

C. Analysis and Findings

1. Health Policies

In Section 1 of the Electric Utility Restructuring Act of 1997, the Legislature declared that "electricity service is essential to the health and well-being of all residents of the Commonwealth" and that "reliable electric service is of utmost importance to the safety, health, and welfare of the Commonwealth's citizens." See St. 1997, c. 164. In Section VI.G, above, the Siting Board found that the Project would improve the reliability of electric service in Massachusetts. Reliable electricity service is essential to the health and well-being of residents of the Commonwealth; therefore, an improvement in electric service reliability will also help contribute to the health and well-being of Commonwealth's residents.

The Project has received an FEIR Certificate from the Secretary affirming the Project's consistency with MEPA requirements that all Project-related impacts to the environment have been properly and adequately identified, minimized, and mitigated. In Section VI.D, the Siting Board finds that the Project's land use, wetland and water resource impacts, noise, traffic, visual impacts, hazardous waste, safety, air, and magnetic fields impacts have been minimized. In addition to the Siting Board's conditions, the Company is required to obtain all environmental approvals and permits required by federal, state, and local agencies and must be constructed and operated according to those permits and approvals. Accordingly, subject to the Company's specified mitigation and the Siting Board's conditions set forth in Section VII, below, the Siting

Board finds that the Company's plans for construction of the Project are consistent with current health policies of the Commonwealth.

2. Environmental Protection Policies

The Global Warming Solutions Act, enacted in August 2008, is a comprehensive statutory framework to address climate change in Massachusetts. St. 2008, c. 298. The GWSA mandates that the Commonwealth reduce its GHG emissions by 10 to 25 percent below 1990 levels by 2020, and by at least 80 percent below 1990 levels by 2050. G. L. c. 21N, §3(b). The GWSA obligates administrative agencies, such as the Siting Board, to consider reasonably foreseeable climate change impacts and related effects when reviewing permit requests. G.L. c. 30, § 61. Pursuant to the GWSA, the Secretary issued the Massachusetts Clean Energy and Climate Plan for 2020 on December 29, 2010 (the "2020 CECP") and an update dated December 31, 2015 (the "2020 CECP Update"). In a determination accompanying the 2020 CECP, the Secretary set the 2020 state-wide GHG emissions limit at 25 percent below 1990 levels. In 2016, Governor Charles D. Baker issued Executive Order 569, titled "Establishing an Integrated Climate Change Strategy for the Commonwealth," and in 2017, MassDEP issued final regulations in accordance with the GWSA. In 2016, Massachusetts Governor Charles D. Baker signed into law "An Act to Promote Energy Diversity". St. 2016, c. 188. The Energy Diversity Act requires utilities to procure additional renewable energy resources including offshore wind, hydroelectric generation, and new Class I RPS eligible resources. St. 2016, c. 188, § 12.

The Siting Board notes that the transmission line portion of the Project would have minimal GHG emissions as it is an underground transmission line and would not create direct emissions from a stationary source or indirect emissions from energy consumption. The new 115 kV circuit breakers at the Sudbury Substation will require the use of SF_6 gas, a potent GHG (Exh. EFSB-G-3(S1)(2) at 11). The Secretary's Certificate on the FEIR notes that the annual emissions rate for these circuit breakers of 0.1 percent is the lowest commercially available, and that the potential for SF_6 emissions at the substation is minimal (Exh. EFSB-G-3(S1)(2) at 11).

With regard to increasing use of renewable energy resources, by improving the reliability of the regional transmission system, the Project will help facilitate the integration of these renewable energy resources. The Sudbury Substation currently has the capability to interconnect

distributed renewable energy resources and there are no changes that could be implemented in conjunction with the Project to enhance this capability (Exh. EFSB-G-3(S1)(2) at 11-12). The record also shows that an NTA solution consisting of combined battery storage facilities and solar PV was fully considered by the Company, as described in Section IV, above, and the Siting Board found that the Project is preferable to such an alternative.

The Company has shown that construction of the Project would have no adverse climate change impacts or suffer negative effects relating to sea level rise. As discussed in Section VI.D.2., above, the Siting Board does not agree with Sudbury's assessment that the Company's current design to compensate for flood storage would promote flooding in the area or change the hydrology either upstream or downstream of Fort Meadow Brook. In addition, any potential increased flooding that occurs due to climate change has not been shown to jeopardize any components of the Project. The underground construction of the Project does not need to be installed above surface water elevations, as sections of the conduit are fuse-welded together, which prevents water from penetrating and damaging it. Accordingly, the Siting Board finds that the Project is consistent with the Commonwealth's climate change and resiliency policies.

In Section VI.D, above, the Siting Board reviewed how the Project would meet other state environmental protection requirements. The Siting Board also: (1) considered the Project's environmental impacts, including those related to land use, historic resources, wetlands and water resources, coldwater fisheries, rare species habitat, wildlife habitat, noise, traffic, visual, hazardous waste, safety, air, and magnetic fields impacts; and (2) concluded that, subject to the specified mitigation and conditions set forth below, the Project's environmental impacts have been minimized. Accordingly, we reject Sudbury's argument that the Project is inconsistent with the Commonwealth's efforts to protect coldwater fisheries and rare species habitat. We also reject Sudbury's argument that construction of the Project is at odds with the Commonwealth's policy to protect, preserve, and enhance all open space areas covered by Article 97, as the Project would not be constructed on any Article 97 lands, and no undisturbed property would be directly impacted by the siting, construction, and operation of the Project. Moreover, the Project would be constructed on a pre-existing and already disturbed railroad corridor. As discussed in Sections VI.D.1 and VI.D.2, impacts to the Hop Brook landscape or other open space that has

been designated by the 2001 Sudbury Master Plan to preserve critical natural resources and wildlife habitat would be minimized.

The Project does not trigger enhanced public participation or enhanced analysis of impacts and mitigation under either the Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs issued on January 31, 2017 ("2017 EJ Policy"), or the prior EJ Policy issued in 2002 and in effect at the time the Company filed the Petitions (see Company Brief at 130). Further, consistent with established Siting Board practice and language access considerations, the Siting Board staff examined the linguistic composition of the affected Project area, and determined that additional outreach, in languages other than English, was neither required, nor specifically requested by members of the public.

Subject to the specified mitigation and conditions set forth in this Decision, the Siting Board finds that the Company's plans for construction of the Project are consistent with the current environmental protection policies of the Commonwealth.

3. Resource Use and Development Policies

In 2007, pursuant to the Commonwealth's Smart Growth/Smart Energy policy, the Executive Office of Energy and Environmental Affairs established Sustainable Development Principles. Among the principles are: (1) supporting the revitalization of city centers and neighborhoods by promoting development that is compact, conserves land, protects historic resources and integrates uses; (2) encouraging reuse of existing sites, structures and infrastructure; (3) protecting environmentally sensitive lands, natural resources, critical habitats, wetlands and water resources and cultural and historic landscapes; and (4) increasing the quantity, quality, and accessibility of open spaces and recreational opportunities. In Section V, the Siting Board reviewed the process by which the Company selected the MBTA Underground Route for the Project. The Project has been designed and conditioned to avoid or minimize impacts to natural and cultural resources by being constructed underground, primarily in an existing ROW linking the existing Sudbury and Hudson Substations.

As discussed in Section IV.D, above, given the reliability needs currently present in the Marlborough Subarea, NTAs are inferior to the Project. Accordingly, the Siting Board does not agree with Sudbury's argument that siting the Project along the MBTA ROW contradicts the

Commonwealth's Sustainable Development Principles, including the principle to promote clean energy. Indeed, the Project would further a more robust transmission system that is better positioned to support the objectives of the Energy Diversity Act.

The Siting Board also does not agree with Sudbury and Protect Sudbury that the Project is inconsistent with or violates the Commonwealth's Smart Growth/Smart Energy policy or past Siting Board practice on the subject. As discussed in Section VI.D, above, the Project's environmental impacts have been minimized, with applicable imposed conditions; its construction would be in compliance with all applicable federal, state and local laws and regulations, and would not significantly impact natural or cultural resources. The Project would be located within the existing infrastructure of the MBTA ROW and existing streets, and therefore, the siting, construction, and installation of the Project would not affect undisturbed property. Further, the Project supports the development of the MCRT, and therefore supports Principle #4, which seeks to increase the quantity, quality, and accessibility of open spaces and recreational opportunities. Contrary to Protect Sudbury's arguments, there are no legal or policy requirements that there be no mapped habitat in the vicinity of a project or that a project has the support of local officials.

Subject to the specific mitigation and the conditions set forth in this Decision, the Siting Board finds that the Company's plans for construction of the Project are consistent with the current resource use and development policies of the Commonwealth.

VIII. ANALYSIS UNDER G.L. C. 40A, § 3 - ZONING EXEMPTIONS

Pursuant to G.L. c. 40A, § 3, the Company filed a petition ("Zoning Petition") seeking individual and comprehensive zoning exemptions from the zoning bylaws of the Towns of Sudbury, Hudson, and Stow for the Company's Project.

A. Standard of Review

G.L. c. 40A, § 3 provides, in relevant part, that:

> Land or structures used, or to be used by a public service corporation may be exempted in particular respects from the operation of a zoning ordinance or by-law if, upon petition of the corporation, the [Department] shall, after notice given pursuant to section eleven and public hearing in the town or city, determine

> the exemptions required and find that the present or proposed use of the land or structure is reasonably necessary for the convenience or welfare of the public . . .

Thus, a petitioner seeking exemption from a local zoning bylaw under G.L. c. 40A, § 3 must meet three criteria.[171] First, the petitioner must qualify as a public service corporation. Save the Bay, Inc. v. Department of Public Utilities, 366 Mass. 667, 677 (1975) ("Save the Bay"). Second, the petitioner must demonstrate that its present or proposed use of the land or structure is reasonably necessary for the public convenience or welfare. Vineyard Wind at 132; Woburn Wakefield at 140; NRG Canal 3 Development LLC, EFSB 15-06/D.P.U. 15-180, at 140-141 (2017) ("NRG"). Finally, the petitioner must establish that it requires exemption from the zoning ordinance or bylaw. Vineyard Wind at 132; NRG at 141; Tennessee Gas Pipeline Company, D.T.E. 01-57, at 3-4 (2002).

Additionally, the Siting Board favors the resolution of local issues on a local level whenever possible, to reduce concern regarding any intrusion on home rule. The Siting Board believes that the most effective approach for doing so is for a petitioner to consult with local officials regarding its project before seeking zoning exemptions pursuant to G.L. c. 40A, § 3. Vineyard Wind at 132; Woburn Wakefield at 140; Russell Biomass LLC, EFSB 07-4/D.P.U. 07-35/07-36, at 61-62 (2009) ("Russell"). Thus, the Siting Board encourages petitioners to consult with local officials, and in some circumstances, to apply for local zoning permits, before seeking zoning exemptions from the Department under G.L. c. 40A, § 3. Vineyard Wind at 132; NRG at 141; Russell at 68.

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[171] G.L. c. 40A, § 3 applies to the Department. The Department refers zoning exemption cases to the Siting Board for hearing and decision pursuant to G.L. c. 25, § 4. In accordance with G.L. c. 164, § 69H, when deciding cases under a Department statute, the Siting Board applies Department and Board standards "in a consistent manner." Thus, the Siting Board the Department implement G.L. c. 40A, § 3 using consistent standards of review, and this Decision cites to both Siting Board decisions and Department orders interpreting G.L. c. 40A, § 3.

On April 27, 2017, the Chair of the Department referred the Company's Zoning Petition to the Siting Board for review and decision pursuant to G.L. c. 25, § 4.

B. Public Service Corporation

1. Standard of Review

In determining whether a petitioner qualifies as a "public service corporation" ("PSC") for the purposes of G.L. c. 40A, § 3, the Massachusetts SJC has stated:

> among the pertinent considerations are whether the corporation is organized pursuant to an appropriate franchise from the State to provide for a necessity or convenience to the general public which could not be furnished through the ordinary channels of private business; whether the corporation is subject to the requisite degree of governmental control and regulation; and the nature of the public benefit to be derived from the service provided.

Save the Bay, 366 Mass. at 680; Woburn-Wakefield at 141; Berkshire Power Development, Inc., D.P.U. 96-104, at 26-36 (1997) ("Berkshire Power").[172]

2. Analysis and Conclusion

The Company is an electric company as defined by G.L. c. 164, § 1 and, as such, qualifies as a public service corporation. Woburn Wakefield at 141. Accordingly, the Siting Board finds that the Company is a public service corporation for the purposes of G.L. c. 40A, § 3.

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[172] The Department interprets this list not as a test, but rather, as guidance to ensure that the intent of G.L. c. 40A, § 3, will be realized: i.e., that a present or proposed use of land or structure that is determined by the Department to be "reasonably necessary for the convenience or welfare of the public" not be foreclosed due to local opposition. Berkshire Power at 30; Save the Bay, 366 Mass. at 685-686; Town of Truro v. Department of Public Utilities, 365 Mass. 407, 410 (1974) ("Town of Truro"); Exelon West Medway at 135 n.117; New England Power Company d/b/a National Grid, D.P.U. 15-44/15-45 at 5-6 (2016) ("MVRP"). The Department has interpreted the "pertinent considerations" as a "flexible set of criteria which allow the Department to respond to changes in the environment in which the industries it regulates operate and still provide for the public welfare." Berkshire Power at 30; MVRP at 6; see also Dispatch Communications of New England d/b/a Nextel Communications, Inc., D.P.U./D.T.E. 95-59B/95-80/95-112/96-113, at 6 (1998). The Department has determined that it is not necessary for a petitioner to demonstrate the existence of "an appropriate franchise" in order to establish PSC status. Berkshire Power at 31; MVRP at 6; NSTAR Electric Company, D.P.U. 15-02 (2015) at 4-5.

C. Public Convenience or Welfare

1. Standard of Review

In determining whether the present or proposed use is reasonably necessary for the public convenience or welfare, the Department must balance the interests of the general public against the local interest. Save the Bay, 366 Mass. at 685; Town of Truro, 365 Mass. at 407. Specifically, the Department is empowered and required to undertake "a broad and balanced consideration of all aspects of the general public interest and welfare and not merely [make an] examination of the local and individual interests which might be affected." New York Central Railroad v. Department of Public Utilities, 347 Mass. 586, 592 (1964) ("NY Central Railroad"). When reviewing a petition for a zoning exemption under G.L. c. 40A, § 3, the Department is empowered and required to consider the public effects of the requested exemption in the State as a whole and upon the territory served by the applicant. Save the Bay, 366 Mass. at 685; NY Central Railroad, 347 Mass. at 592.

Therefore, when making a determination as to whether a petitioner's present or proposed use is reasonably necessary for the public convenience or welfare, the Department examines: (1) the need for, or public benefits of, the present or proposed use; (2) the present or proposed use and any alternatives or alternative sites identified;[173] and (3) the environmental impacts or any other impacts of the present or proposed use. The Department then balances the interests of the general public against the local interest and determines whether the present or proposed use of the land or structures is reasonably necessary for the convenience or welfare of the public. Vineyard Wind at 136-137; Woburn-Wakefield at 142; Tennessee Gas Company, D.T.E. 98-33, at 4-5 (1998).

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[173] With respect to the particular site chosen by a petitioner, G.L. c. 40A, § 3 does not require the petitioner to demonstrate that its primary site is the best possible alternative, nor does the statute require the Department to consider and reject every possible alternative site presented. Rather, the availability of alternative sites, the efforts necessary to secure them, and the relative advantages and disadvantages of those sites are matters of fact bearing solely upon the main issue of whether the primary site is reasonably necessary for the convenience or welfare of the public. Martarano v. Department of Public Utilities, 401 Mass. 257, 265 (1987); NY Central Railroad, 347 Mass. at 591.

2. Analysis and Findings

With respect to the need for, or public benefits of, the Project, the Siting Board found in Section III that additional energy resources are needed for reliability in the Project area. In Section IV the Siting Board analyzed different project approaches including transmission and non-transmission alternatives, that the Company might use to meet the reliability need and concluded that the proposed approach is superior to other approaches. The Siting Board also reviewed the Company's route selection process in Section V, and has found that the Company demonstrated that it: (1) examined a reasonable range of practical siting alternatives and (2) identified locations which would minimize cost and environmental impacts while ensuring a reliable energy supply. The Siting Board also compared the impacts of the MBTA Underground Route, the MBTA Overhead Route and the All-Street Route. Based on that review, the Siting Board has concluded that the MBTA Underground Route is superior to the MBTA Overhead and All-Street Routes in providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

Finally, regarding Project impacts, in Section VI.D, the Siting Board evaluated the environmental impacts of the Project and found that, although the Project may result in some local adverse impacts, the environmental impacts of the proposed Project would be minimized with the implementation of mitigation measures directed by the Siting Board and described in this Decision. Based on the foregoing, the Siting Board finds that the need for the Project on balance outweighs identifiable adverse local impacts associated with the construction and operation of the Project. Accordingly, the Siting Board finds that the proposed Project is reasonably necessary for the convenience or welfare of the public.

D. Individual Exemptions Required

1. Standard of Review

In determining whether an exemption from a particular provision of a zoning bylaw is "required" for purposes of G.L. c. 40A, § 3, the Department determines whether the exemption is necessary to allow construction or operation of the petitioner's project. Vineyard Wind at 139; Woburn Wakefield at 143-144; Tennessee Gas Company, D.P.U. 92-261, at 20-21 (1993). The

Petitioner bears the burden to identify the individual zoning provisions applicable to the project and establish on the record that exemption from each of those provisions is required:

> The Company is both in a better position to identify its needs, and has the responsibility to fully plead its own case . . . The Department fully expects that, henceforth, all public service corporations seeking exemptions under [G.L.] c. 40A, § 3 will identify fully and in a timely manner all exemptions that are necessary for the corporation to proceed with its proposed activities, so that the Department is provided ample opportunity to investigate the need for the required exemptions.

Vineyard Wind at 139; Woburn Wakefield at 143-144; New York Cellular Geographic Service Area, Inc., D.P.U. 94-44, at 18 (1995).

2. Description

a. Exemptions

Tables 13, 14, and 15, below, summarize: (1) each of the specific provisions of the Sudbury, Hudson, and Stow Zoning Bylaws from which the Company seeks exemptions; (2) the relief available (if any) under the bylaws; and (3) the Company's argument as to why it cannot comply with the identified zoning provision and/or why the available zoning relief is inadequate.

Table 13. Requested Individual Exemptions from the Sudbury Zoning Bylaw – Summary of Company's Position

Section of the Sudbury Zoning Bylaw	**Available Relief**	**Why Exemption is Required: Company's Position**
Principal Use Regulations Section 2230	Special Permit	The provision requires a special permit for Essential Services (e.g., services provided by a public service corporation) in all zoning districts. The Company maintains that grant of a special permit is discretionary and, even if granted, would be susceptible to appeal.
Dimensional Requirements Section 2600	Variance	The provision limits height of structures to 35 feet, which would require a variance for the proposed 100-foot shielding mast at the Sudbury Substation. Eversource maintains that variances are a legally disfavored form of relief and, even if granted, are susceptible to appeal.
Performance Standards	Variance	The provision limits construction activity to weekdays from 7:00 a.m. to 6:00 p.m. A variance would be

Section of the Sudbury Zoning Bylaw	Available Relief	Why Exemption is Required: Company's Position
Noise Section 3423		required to allow the Company's proposed construction hours. Additionally, the Company asserts that the provision's prohibition of excessive noise may require a variance to the extent that construction activities would not meet the noise standard included in the provision. Eversource maintains that variances are a legally disfavored form of relief and, even if granted, are susceptible to appeal.
Performance Standards **Vibration, odor, glare, etc.** Section 3425	Variance	The Company argues that it cannot ensure that its construction activities would meet the requirements of this provision, which prohibit detectable vibration without instruments at any lot line, and that dust shall be confined to the premises. Eversource maintains that variances are a legally disfavored form of relief and, even if granted, are susceptible to appeal.

Section of the Sudbury Zoning Bylaw	Available Relief	Why Exemption is Required: Company's Position
Performance Standards **Site Development Criteria** Section 3427 subpart (a) (Natural Features Conservation); subpart (c) (Siting of Structures); subpart (f) (Outdoor Lighting); subpart (g) (Other Site Features)	Variance	*Section 3427(a)* provides that changes to the natural topography be kept "to an absolute practical minimum" and that where tree coverage has been removed, new plantings may be required. The Company maintains that compliance with the topography standard is "subjective" and that some trees will need to be permanently removed in connection with the Project. *Section 3427(c)* provides that the siting of all structures minimize disruption of the topography, facilitate natural surface drainage, and be properly designed for particular site conditions. The Company argues that construction of the access road and transmission line placement may change topography, and that the topography standard is "subjective." *Section 3427(f)* provides standards for outdoor lighting and requires that all glare and light spilling onto neighborhood properties be avoided. The Company states that it will need to employ temporary outdoor lighting in connection with its construction activities during extended work hours. Lighting will also be required for nighttime repairs during operation of the Sudbury Substation. The Company contends that a variance would be required to the extent that these provisions apply to the Project, and the lighting necessary for the Project is not in compliance. *Section 3427(g)* requires that all utility structures and facilities be located or visually screened so as not to create hazards or visual or other nuisances. The Company argues that the application of this provision to the Sudbury Substation, as modified, is "subjective." For each provision where the available relief is a variance, Eversource maintains that variances are a legally disfavored form of relief and, even if granted, are susceptible to

Section of the Sudbury Zoning Bylaw	**Available Relief**	**Why Exemption is Required: Company's Position**
Erosion Control Section 3430 Section 3431 (Final slopes >15 percent) Section 3432 (Topsoil and vegetative cover requirements) Section 3433 (Vegetation Clear-stripping or Filling) Section 3436 (Vegetative Cover Requirements)	Variances	Section 3430 requires various conditions be met for site design, materials, and construction processes to avoid erosion damage, sedimentation, or uncontrolled surface water runoff. According to the Company, the Project has not advanced sufficiently to ensure that it will meet Sections 3431 and 3432 with respect to the grading of slopes, nor to determine whether the vegetative cover requirements of Section 3436 will be met. The Company further argues that the term "hillside" in Section 3436 is undefined and therefore it is unclear whether the provision applies to the Project. The Company maintains that the Project will not be able to comply with section 3433, as work along the ROW will involve removal of vegetation to construct the access road and duct bank. For each bylaw provision where available relief is a variance, Eversource maintains that variances are a legally disfavored form of relief and, even if granted, are susceptible to appeal.
Excavation Abutting Roads Section 3440	Zoning Board of Appeals ("ZBA") Approval	Excavation within 50 feet of a road may not be below the grade of the road without ZBA approval. The Company maintains that the design of the Project is not sufficiently advanced to ensure its ability to meet the excavation requirements.
Flood Plain Overlay District Section 4100 et seq.	Special Permit or None Available	Section 4140 generally prohibits filling, excavation and construction in the Flood Plain Overlay District. The Company maintains that construction of the Project would require a use variance, which is not an available form of relief for the Project under the bylaw. Section 4166 provides the Board of Appeals the authority to grant a special permit under certain circumstances. The Company maintains that grant of a special permit is discretionary and, even if granted, would be susceptible to appeal.

Water Resource Protection Overlay District Section 4200	Use Variance or None Available	The provision allows uses in the Water Resource Protection Overlay District only if such uses are allowed in the underlying zoning district. According to the Company, to the extent that this provision applies to uses allowed by special permit (and not just to those allowed as-of-right), a use variance would be required for construction of the New Line along the MBTA ROW in the Water Resource Protection Overlay District. The Company maintains that use variances are allowed in limited circumstances, but that none of the limited circumstances apply in this case. Eversource argues that because there is no local relief available an exemption from the requirements of Article 4200 are per se required.
Section 4243(c) Section 4253(b) Section 4260 Section 4261(a) Section 4261(b) Section 4261(c) Section 4261(f)	Special Permits	Eversource indicates that the application of a starter fertilizer along with seed is common practice for the stabilization of disturbed soils following the construction of large linear projects. Sections 4243(c) and 4253(b) require a special permit for the application of fertilizers for non-domestic or non-agricultural uses in Zone II and III wellhead protection areas. Eversource maintains that the conditions required for the grant of a special permit are subjective and that a special permit, if granted, is susceptible to appeal. Section 4260 specifies the procedures and conditions for the grant of a special permit for excavation in the Water Resource Protection Overlay District. The Company maintains that because excavated material may be re-used at different locations along the duct bank, or removed from site as excess material, the Project may not comply with Section 4260. Further, the Company argues that the Project will not be able to meet the special conditions found in Section 4261 that are required for the grant of a special permit because (1) they are inconsistent with the Company's access road or transmission line design requirements, or (2) because this requirement does not conform with MassDEP's "Best Management Practices for Controlling Exposure to Soil During the Development of Rail Trails," which the Company maintains allows for the reuse of materials along the corridor. Additionally, Eversource maintains that Section

Section of the Sudbury Zoning Bylaw	Available Relief	Why Exemption is Required: Company's Position
		4261(f) of the bylaw states that "[f]ill material shall contain no solid waste, toxic or hazardous materials or hazardous waste" and the town relies on the plain English definition of these words to interpret this provision. Eversource seeks an exemption from Section 4261(f) in part because the provision does not reference or rely on the definitions and/or characteristics of the terms "soil waste" "toxic or hazardous materials" or "hazardous waste" as specified in applicable regulations. Further, Eversource argues that the conditions required for the grant of a special permit are subjective and that a special permit, if granted, is susceptible to appeal.

Sources: Exhs. EV-3, at 18-19; EFSB-Z-4; EFSB-Z-7; EFSB-Z-15; EFSB-Z-16; EFSB-Z-17; EFSB-Z-19; Tr. 10, at 1688; RR-EFSB-69.

Table 14. Requested Individual Exemptions from the Hudson Zoning Bylaw – Summary of Company's Position

Section of the Hudson Zoning Bylaw	Available Relief	Why Exemption is Required: Company's Position
Residential District Allowed Uses Section 5.2	None Available	The Company maintains that Section 5.2 does not authorize electric transmission lines in Residential Districts and that the Hudson Zoning Bylaw does not authorize the granting of a Use Variance.
Watershed Protection District Section 3.3.10[174]	None Available	The Company contends that because the proposed transmission line is not a permitted use within the Single Residence District, the use is also not permitted within the Watershed Protection District. According to the Company, the Hudson Zoning Bylaw does not authorize the granting of a Use Variance.

Sources: Exhs. EV-3, at 21; EFSB-Z-6.

[174] Hudson bylaw Section 3.3.10(V)(4) states that the application of pesticides for non-agricultural uses in combination with inter alia erosion and sedimentation control plans may be allowed by special permit (Exh. EV-3, exh. B at 18; RR-EFSB-76). The Town of Hudson notes that although herbicide use is permitted by special permit, the

Table 15. Requested Individual Exemptions from the Stow Zoning Bylaw – Summary of Company's Position

Section of the Stow Zoning Bylaw	Available Relief	Why Exemption is Required: Company's Position
Table of Principal Uses Section 3.10	None Available	Pursuant to Section 3.10, Public Service Corporation use is allowed in the Residential District "in accordance with the provisions of M.G.L. Ch. 40A, Section 3." To the extent that the intent of the provision is to allow public utility use only after the Department's grant of an exemption, a use variance would be required, unless an exemption by the Department is granted. According to the Company, the Stow Zoning Bylaw does not authorize the granting of use variances.
Noise Section 3.8.1.3	Variance	Section 3.8.1.3 prohibits sound levels greater than three decibels above the natural ambient sound level, with exceptions not relevant to the Project. To the extent that construction activities would not meet this standard, a variance would be required. Eversource maintains that variances are a legally disfavored form of relief and, even if granted, are susceptible to appeal.

Sources: Exhs. EV-3, at 21-22; EFSB-Z-5.

b. Consultation with the Municipalities

Prior to filing its Zoning Petition, the Company conducted outreach to both local residents, special interest groups, regulatory agencies, and local officials in the affected municipalities (Exhs. EV-2, at 1-9 to 1-12, Table 1-1; EFSB-G-6). Eversource stated that it participated in numerous meetings with officials from Sudbury, Hudson, and Stow, and participated in Board of Selectmen meetings in Sudbury on October 26, 2016, Stow on November 9, 2016, and Hudson on November 14, 2016 (Exhs. EV-2, at 1-10 to 1-12;

ZBA generally conditions special permits to prohibit that use (RR-EFSB-76). Hudson also notes that utilities are granted an exemption under Section 3.3.10(IV)(12) of the Hudson Zoning Bylaws with respect to earth disturbance in the Watershed Protection District (RR-EFSB-76).

EFSB-G-6). Overall, the Company reports that it conducted more than 48 meetings with various stakeholders prior to filing its Petitions with the Siting Board (Company Reply Brief at 54, 81, citing Exhs. EV-2, at 1-9 to 1-12, 4-4 to 4-5; EFSB-G-6; EFSB-RS-1; Tr. 5, at 839; Protect-21; Protect-2-80; Protect-2-118).

In addition, the Company met with Hudson and Stow zoning officials to discuss the Company's approach to zoning on September 14 and September 15, 2017, respectively (roughly five months after filing its Zoning Petition) (Exh. EFSB-Z-2(S-2)). Eversource stated that it reviewed the zoning exemptions that were requested and the rationale for making the requested exemptions (Exh. EFSB-Z-2(S-2)). According to the Company, neither Hudson nor Stow zoning officials expressed concerns specific to the zoning requests at these meetings (Exh. EFSB-Z-2(S-2)). With respect to Sudbury, the Company reported that it did not meet with Sudbury zoning officials prior to filing its Zoning Petition, but did meet on February 14, 2018 to discuss pending permit applications and ongoing project-related issues (RR-EFSB-69; Company Brief at 146; Company Reply Brief at 81-82).

3. Position of the Parties

a. Town of Sudbury

Sudbury states that it "is not prepared to support" the individual and comprehensive zoning exemptions Eversource is seeking in this case (Sudbury Brief at 101). Sudbury objects to the lack of "detailed information" on Eversource's final design of the Project (e.g., location of equipment staging areas, parking areas, detailed erosion and sedimentation controls specific to sensitive areas along the Project route, best management practices for stormwater management, etc.) (Sudbury Brief at 101, citing RR-EFSB-81; Exh. SUD-MH-1, at 4). Sudbury opines that were the Project required to proceed through the ZBA, the town would have the opportunity to learn more about the details of the Project, engage in a public dialogue with the Company, and impose reasonable conditions on any zoning relief to address concerns such as buffering, landscaping, and water runoff (Exh. SUD-MH-1, at 3).

Sudbury expresses concerns relating to the Company's request for exemptions from Sections 3423 and 4200 of the Sudbury Zoning Bylaw (Exh. SUD-MH-1, at 5-7).[175] With respect to Section 3423, Sudbury argues that this provision "prohibits any use from causing a nuisance or hazard to persons by reason of excessive noise generated therefrom," and that construction of the Project along the MBTA Underground Route could result in a significant disturbance for the town's residents, especially where the route travels through a residential area (Exh. SUD-MH-1, at 5). With respect to Section 4200, the Water Resource Protection Overlay District, Sudbury argues that Eversource's Zoning petition does not address important issues that could impact this sensitive area, such as storage of fuel and hazardous materials, use of herbicides, and extent of increased water runoff (Exh. SUD-MH-1, at 7; RR-EFSB-81).[176]

Sudbury also argues that the Company's failure to consult with town zoning officials before filing its Petition is inconsistent with the Siting Board's directive in Russell that applicants not seek a zoning exemption "without first consulting with the municipality" (Sudbury Brief at 100). Sudbury states that the Zoning Petition was filed in April 2017, and the Company did not seek to consult with Sudbury zoning officials until September 2017 (Sudbury Brief at 101). Moreover, Sudbury maintains that the Company's requested zoning relief from the Town of Sudbury should be denied because the Project "does not serve the public convenience and is not consistent with the public interest" (Sudbury Brief at 101).

In its reply brief, Sudbury argues further that Eversource is now seeking certain relief from the Sudbury Zoning Bylaw that was not included in the Company's original Zoning Petition or in the Siting Board's Notice of Adjudication and Notice of Public Comment Hearing (Sudbury Reply Brief at 22-23). According to Sudbury, while the Company's original Zoning

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175 Sudbury initially expressed concerns with Eversource's request for an exemption from Section 2600 of the Sudbury Zoning Bylaw, which limits the height of structures to 35 feet in the Single Residence "A" zoning district (Exh. SUD-MH-1, at 6). However, during evidentiary hearings the town's building inspector and zoning enforcement agent, Mr. Herweck, indicated that the Company's proposed location for its 100-foot-tall shielding mast limited this concern (Tr. 11, at 2060-2062).

176 Sudbury's concerns with potential water-related impacts from construction and operation of the Project are described in Section VI.D.2, above.

Petition clearly requested an exemption from that portion of the Sudbury performance standards contained in Section 3423 (noise), the Zoning Petition made no reference to the Sudbury performance standards in Sections 3425 (detection of vibration, odor, glare, etc.); 3427 (site development criteria); 3430-3433 (erosion control); 3436 (vegetative cover of hillside areas); or 3440 (excavation of abutting roads), which Sudbury maintains the Company references in its initial brief (Sudbury Reply Brief at 22-23). According to Sudbury, although the Company cites to its response to Exhibit EFSB-Z-19 to support its request for these additional zoning exemptions, the town contends that the Company's response to an information request response during discovery "cannot remedy its failure to include reference to these exemptions" in the Company's initial Zoning Petition (Sudbury Reply Brief at 22-23). In addition, Sudbury notes that the Company's reference to Section 4100 (flood plain overlay district) and 4166 (conditions for filling and excavating in a flood plain overlay district) were identified by the Company for the first time in its initial brief, and cannot be found in either the Company's Initial Petition or in a Company response to discovery (Sudbury Reply Brief at 22-23).

Sudbury argues that the zoning exemption statute, G.L. c. 40A, § 3, expressly requires public notice, as does Section 11(1) of the MAPA (parties must have sufficient notice of the issues "to afford them reasonable opportunity to prepare and present evidence and argument,") and that such notice was not provided in the Siting Board's May 4, 2017 Public Hearing Notice (Sudbury Reply Brief at 23). According to Sudbury, the Siting Board cannot consider additional zoning relief "after the fact" because to do so violates the intervenors' due process rights (Sudbury Reply Brief at 23). Sudbury argues that the Siting Board should, therefore, "strike or otherwise give no consideration" to the Company's additional requests for relief from the Sudbury Zoning Bylaw (Sudbury Reply Brief at 23).

b. Town of Stow

The Town of Stow maintains that the Project "may properly be exempted" from application of the Stow Zoning Bylaw Sections 3.10 and 3.8.1.3, as requested by the Company (Stow Brief at 1). Stow does not object to the Siting Board granting an exemption from Section 3.8.1.3 based on Eversource's argument that "*construction activities* may exceed the Bylaw limit of 3 dBA above ambient" (emphasis added) (Stow Brief at 4). Stow "does not disagree" that the

Company has met the established legal framework for obtaining the identified individual zoning exemptions (Stow Brief at 3-4).

c. Town of Hudson

The Town of Hudson raised concerns regarding the granting of any exemptions related to water resources, including Section 3.3.10, Watershed Protection District, relating to the Company's potential use of pesticides and soil disturbances within an area with wells providing the supply of water to Hudson (Exh. Hudson-ER-1, at 6; Tr. 11 at 1954-1957; RR-EFSB-76). Hudson noted that although the Hudson ZBA could grant a Special Permit for the use of pesticides in the Watershed Protection District pursuant to Section 3.3.10(V)(4), the ZBA conditions special permits to prohibit such use as a general practice (RR-EFSB-76). Hudson also noted that the Company does not require an exemption for earth disturbance under the zoning bylaws since utilities are granted a specific exemption in the provisions of Section 3.3.10(IV)(12) (RR-EFSB-76). Hudson did not file a brief addressing these issues.[177]

d. Company Position

The Company answered Sudbury's objections concerning its requested individual zoning exemptions stating that the exemptions are needed to avoid delay in construction of a facility which is necessary to meet the regional need for additional energy resources (Company Reply Brief at 81-85). First, with respect to Sudbury's claim that Eversource did not timely consult with Sudbury zoning officials regarding the requested zoning exemptions, the Company maintains that it conducted more than 48 outreach meetings with municipal officials, special interest groups, regulatory agencies and other stakeholders in Sudbury, Marlborough, Stow and Hudson before it filed its Petition (Company Reply Brief at 54, 81, citing Exhs. EV-2, at 1-9 to 1-12, 4-4 to 4-5; EFSB-G-6; EFSB-RS-1; Protect-21; Protect-2-80; Protect-2-118; Tr. 5, at 839).

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177 Christine Nelson, a Hudson resident, opposed the Company's request for zoning exemptions and expressed support for the Town of Sudbury's opposition to the Company's request for zoning relief (Nelson Brief at 2-3). Brian O'Neill, another Hudson resident, also opposed the Company's request for exemptions related to the proximity of the Preferred Route to the Hudson town wells (O'Neill Brief at 2).

The Company further stated that it deferred zoning discussions with municipal officials in an attempt to address municipal concerns (Company Reply Brief at 82). According to the Company, once the petitions were filed, "it became eminently clear" that Sudbury was opposed to the Project, and the town would not support the Company's request for zoning exemptions (Company Reply Brief at 82). Nevertheless, the Company states that it did request a meeting with Sudbury zoning officials in September 2017 (Company Reply Brief at 82). The Company argues that the town's clearly stated opposition to the Project moots "any hypothetical omission by the Company to meet with Sudbury zoning officials" (Company Reply Brief at 82).

The Company objects to Sudbury's argument that certain Company-requested individual zoning exemptions are not properly before the Siting Board in this case, arguing that none of the Company's requested zoning exemptions were explicitly enumerated in the Public Hearing Notice, nor is it commonplace to do so (Company Reply Brief at 83). The Company maintains that the information it provided in Exhibit EFSB-Z-19, in which the Company identified and requested additional individual zoning exemptions, "constitutes a legally sufficient request for additional exemptions" (Company Reply Brief at 83). The Company argues that the Public Hearing Notice put the public "on notice" that the Company was seeking both individual and comprehensive zoning exemptions pursuant to the provisions of G.L. c. 40A, § 3 (Company Reply Brief at 83). Since a comprehensive zoning exemption would have the effect of exempting the Project from the operation of all applicable provisions of the Sudbury Zoning Bylaw, including the additional requested zoning exemptions identified in Exhibit EFSB-Z-19, the Company contends that the public was on notice of the breath of the Company's request and fully afforded "a reasonable opportunity to prepare and present evidence and argument" (Company Reply Brief at 83).

4. Analysis and Findings

a. Notice of the Company's Requested Exemptions

As a preliminary matter, we address the assertion by the Town of Sudbury that the Company has failed to provide adequate notice of certain of the zoning exemptions it is seeking from the Sudbury Zoning Bylaw.

The Company seeks exemption from a total of nine individual provisions of the Sudbury Zoning Bylaw, as well as a comprehensive exemption from the bylaw in its entirety. Eversource requested these exemptions at different points in the proceeding. In its Zoning Petition, filed on April 20, 2017, the Company requested four individual exemptions (Sections 2230, 2600, 3423, and 4200). Subsequently, on July 27, 2017 in answer to an Information Request issued by Siting Board staff prior to hearings, Eversource identified an additional four exemptions (Sections 3425, 3427, 3430, and 3440) necessary for the Project. Finally, in its initial brief, filed on March 2, 2018, the Company requested one additional zoning exemption (Section 4100).

The Town of Sudbury objects to the timing of the Company's various requests for zoning relief. Sudbury asserts that the Board should consider only the four exemptions identified in the Company's original Zoning Petition and disregard or strike the remaining requests (Sudbury Reply Brief at 22). Sudbury asserts that, because the original Zoning Petition did not include the five later zoning exemption requests, inadequate notice of these requests was provided to the parties, in violation of the notice requirements in G.L. c. 40A, § 3, and G.L. c. 30A, § 11(1) (Sudbury Reply Brief at 22-23).

The MAPA addresses the notice requirements applicable to state-agency adjudicatory proceedings in the Commonwealth. G.L. c. 30A. Section 11 of the MAPA addresses the question of adequate notice to parties regarding the issues to be determined in an adjudicatory proceeding. Importantly, Section 11 does not require that all issues be identified at the outset of the proceeding. In fact, Section 11 recognizes that this does not, or cannot, always occur, and it sets out the notice provisions that apply when issues are identified later in the proceeding, rather than at the outset. Section 11 provides that:

> parties shall have sufficient notice of the issues involved to afford them reasonable opportunity to prepare and present evidence and argument. If the issues cannot be fully stated in advance of the hearing, they shall be fully stated as soon as practicable. In all cases of delayed statement, or where subsequent amendment of the issues is necessary, sufficient time shall be allowed after full statement or amendment to afford all parties reasonable opportunity to prepare and present evidence and argument regarding the issues.

G.L. c. 30A, § 11(1).

There is no question the parties, including the towns of Sudbury, Hudson, and Stow, had sufficient notice of the Company's initial four zoning exemption requests, as they were set forth

in the Company's April 20, 2017 Zoning Petition, the filing of which commenced this proceeding. Parties received notice of the next four exemption requests on or about July 27, 2017, when the Company filed its response to Information Request EFSB-Z-19 of the Board's second set of Information Requests. Evidentiary hearings in the proceeding did not begin until October 31, 2017, and they ended on January 24, 2018; briefing was completed March 2018. The parties thus had approximately eight months to address the four additional requests, both during hearings and in briefing. The Siting Board finds that this eight-month period provided sufficient notice to afford the parties a reasonable opportunity to prepare and present evidence and argument regarding these exemptions, as required by G.L. c. 30A, § 11. See also Hopkinton LNG Corporation, D.P.U. 17-144, at 66-69 (2018).

The fifth additional zoning exemption, requested for the first time in the Company's initial brief, is in a different category than the four additional exemptions requested during pre-hearing discovery. The timing of the Company's request for this exemption precluded examination of the request, both by the Board and by the parties, either during discovery or during hearings. Intervenors had an opportunity to comment on the request only in reply briefs two weeks after the Company made the request. Therefore, the Siting Board must determine whether the Company's late exemption request provided "sufficient notice of the issues involved to afford [the parties] reasonable opportunity to prepare and present evidence and argument" consistent with the requirements of G.L. c. 30A, § 11.

The zoning relief requested in the Company's initial brief was for an exemption from a single section of the Sudbury Zoning Bylaw: Section 4100, pertaining to permissible uses and activities in the town's Flood Plain Overlay District. The record shows that a portion of the Project would be located in the Flood Plain District. Section 4100 provides that construction of the Project in the Flood Plain District would require: (1) a use variance, which is not an available form of relief under the Sudbury Zoning Bylaw; or (2) a Special Permit, for which the Project may or may not qualify. Thus, the argument to be made by the parties upon receiving notice of this exemption request was whether, under the Siting Board's standard of review, an exemption from Section 4100 is "required" to construct the Project. It is clear that an exemption from Section 4100 is necessary to construct the Project. As a result, the Company's request for an exemption from Section 4100 constitutes a relatively minor amendment to the Company's

original Zoning Petition. As such, we find that two weeks was not an unreasonable amount of time for the parties to review Section 4100 and to respond, if they wished to do so, to the Company's request for this final additional zoning exemption.[178]

Accordingly, the Siting Board finds that the notice provided for each of the Company's zoning exemption requests satisfied the requirements of G.L. c. 30A, § 11(1) and G.L. c. 40A, § 3, by providing actual notice with sufficient time for parties to respond.[179] The Board finds further that in this instance there is no prejudice to any party's rights by allowing the Company, in effect, to amend its initial Zoning Petition to include the five exemption requests not originally included in its Zoning Petition. Accordingly, the Siting Board finds that, consistent with G.L. c. 30A, § 11(1), the notice provided by the Company of its all nine of its individual zoning exemption requests was sufficient to afford the parties a reasonable and sufficient opportunity to address each of them.[180] The Siting Board considers the merits of the Company's individual zoning exemption requests below.[181]

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178 We note that the Town of Sudbury did in fact respond to the Company's request for an exemption from Section 4100. See Sudbury Reply Brief at 22-23.

179 The notice provided to the parties regarding the nine requested zoning exemptions also meets the notice requirement in G.L. c. 40A, § 3, as G.L. c. 40A, § 3 simply provides that the notice to be provided is the notice set forth in G.L. c. 40A, § 11.

180 The Board notes that the finding of adequate notice with respect to the Company's request for exemption from Section 4100 of the Sudbury Zoning Bylaw rests largely on the specific facts of this case, in particular the nature of the requested exemption and the unlikely success of an argument that the exemption is not required to allow construction of the Project within the meaning of G.L. c. 40A, § 3. Such a finding, however, may not necessarily result where a late-filed amendment to an initial petition is more substantial or more complex in nature than the Company's single zoning exemption request here. See New York Cellular Geographic Service Area, Inc., D.P.U. 94-44, at 18 (1995) (obligation to identify individual zoning exemptions applicable to a project).

181 One additional note. The Department is not required to identify each and every zoning provision that applies to a particular facility in its grant of a zoning exemption. The SJC has stated that "[t]here is no reason to require the [D]epartment to determine which specific by-laws apply… the [D]epartment can exempt specified uses of specified property from the by-laws and ordinances to the extent applicable. That the land, structure, or use are specified is sufficient." Planning Board of Braintree v. Department of Public Utilities, 420 Mass. 22, 29 (1995).

b. Individual Exemptions Required

The Company has identified in Tables 13 through 15, above, the individual provisions of the Sudbury, Hudson, and Stow Zoning Bylaws from which it seeks exemptions to minimize delay in the construction and ultimate operation of the Project. The record shows that, without these exemptions, the Company would need to seek numerous variances and special permits. The Siting Board concurs with the Company that the grounds for issuing a variance may be subjective and that variances are difficult to obtain, constitute a disfavored form of relief, and may be overturned on appeal. Consequently, the need to obtain variances may result in an adverse outcome, burdensome requirements, or the potential for significant delay. Similarly, the Siting Board agrees that the discretionary nature of special permits and ZBA approval, the potential for an adverse result or burdensome conditions, and the delay that would result from a potential appeal warrant exemption from the provisions of the towns' bylaws requiring special permits. Furthermore, the Company has demonstrated that exemptions from: (1) Sections 5.2 and 3.3.10 of the Hudson Zoning Bylaw, which would otherwise prohibit the construction and operation of the Project in the town's Residential District and Water Protection District; and (2) Section 3.10 of the Town of Stow Zoning Bylaw, which effectively allows a public service corporation use in the Residential District only upon the grant of an exemption by the Department, are necessary for construction of the Project. As such, the Siting Board concludes that grant of the individual exemptions requested by the Company is warranted subject to the following conditions and exceptions.

First, as noted in the environmental analysis section above, Project construction in close proximity to residential areas would have noise impacts and requires certain limitations. Accordingly, while the Siting Board grants the Company's request for exemption from Section 3423 of the Sudbury Zoning Bylaw (and the construction hours prescribed therein), weekday construction in residential areas within the town shall be limited to Monday through Friday between the hours of 7:00 a.m. to 6:00 p.m., and Saturday construction in the town shall be limited to large equipment deliveries and quiet assembly and testing activities at the Sudbury Substation. This limitation is subject to the parameters described in Conditions J and K, below.

Second, the Board has declined to grant exemptions from zoning restrictions related to the operation, as opposed to the construction, of a proposed facility. The Siting Board is concerned that granting such exemptions would preclude the municipality from exercising its authority to limit well-defined nuisances such as operational fumes, odors and smoke, which the Board views as an unwarranted incursion into municipal home rule authority. See; Woburn-Wakefield at 147-148; Walpole-Holbrook at 99; Woburn Substation at 36. The Siting Board grants the Company's request for an exemption from Section 3425 of the Sudbury Zoning Bylaw and Section 3.8.1.3 of the Stow Zoning Bylaw only as the request relates to the construction of the Project. Therefore, to the extent that Section 3425 of the Sudbury Zoning Bylaw (pertaining to vibration, odor, glare and other potential environmental impacts) and/or Section 3.8.1.3 of the Stow Zoning Bylaw (pertaining to noise) applies to operation, rather than construction, of the Project, the Siting Board denies the Company's request for exemption from that Section.

Third, Section 3.3.10 of the Hudson Zoning Bylaw requires a special permit for non-agricultural pesticide (including herbicide) use in the Watershed Protection District. As noted in Section VI.D.2, above, in this instance the Siting Board directed Eversource to utilize mechanical vegetation management along the MBTA ROW. Consistent with that determination, and the nature of the Company's access road, Siting Board declines to grant an exemption to the Company for the use of pesticides in the Hudson Watershed Protection District.

c. Municipal Consultation

The Siting Board encourages zoning exemption applicants to consult with local officials, and in some circumstances, to apply for local zoning permits, prior to seeking zoning exemptions from the Siting Board under G.L. c. 40A, § 3. In this case, the Company met with numerous stakeholders, including municipal officials of all three towns, regarding route selection and design options in multiple meetings. The Company notes that during the period of these outreach meetings the Company deferred zoning discussions with municipal officials of all three towns in favor of attempting to satisfy concerns about route selection and design options with other town officials and therefore delayed meetings otherwise planned with town zoning officials.

The record reflects the Company's efforts to meet with Sudbury's zoning officials, although such efforts were ultimately unsuccessful. It is not unreasonable for the Company to have concluded from the entirety of its earlier outreach meetings, as well as its inability to secure a specific zoning-related meeting, that Sudbury was clearly opposed to the Project and would not support the Company's request for zoning exemptions. See NSTAR Electric Company, EFSB 10-2/D.P.U. 10-131/10-132, at 107-108 (2012) (applying for local zoning permits in advance of filing a zoning exemption petition is not required where to do so would likely be futile, or where the Company has met the spirit and intent of Russell by engaging in outreach with the affected municipalities). Given these circumstances, the Siting Board is not persuaded by Sudbury's argument that the Company's requested zoning exemptions should be denied because the Company did not consult with Sudbury zoning officials regarding its request for zoning exemptions prior to the Company's filing of its Zoning Petition. See East Eagle at 160 (the Russell standard is met where an applicant demonstrates that it made a good faith effort to consult with municipal authorities regarding a proposed project). Based on the record in this proceeding, the Siting Board finds that the Company has engaged in good-faith consultations with Sudbury, Hudson, and Stow regarding the Project, consistent with Russell.

5. Conclusion on Request for Individual Zoning Exemptions

The Siting Board has found above that: (1) the Company is a public service corporation; (2) the proposed use is reasonably necessary for the public convenience or welfare; and (3) the specifically named zoning exemptions set forth in Tables 13 through 15 are required for construction of the Project, within the meaning of G.L. c. 40A, § 3, with the exception of Section 3425 of the Sudbury Zoning Bylaw and Section 3.8.1.3 of the Stow Zoning Bylaw (construction only), and the provisions of Section 3.3.10 of the Hudson Zoning Bylaw relating to pesticide use. Additionally, we find that the Company engaged in good faith consultation with Sudbury, Hudson, and Stow. Accordingly, the Siting Board grants the Company's request for the individual zoning exemptions listed above in Tables 13 through 15, subject to the exclusions and conditions set forth in this Decision.

IX. COMPREHENSIVE ZONING EXEMPTIONS

A. Standard of Review

The Company requests comprehensive zoning exemptions from the operation of the Sudbury, Hudson, and Stow Zoning Bylaws (Exh. EV-3, at 23; Company Brief at 151). The Siting Board grants such requests on a case-by-case basis where the applicant demonstrates that issuance of a comprehensive exemption could avoid substantial public harm by serving to prevent a delay in the construction and operation of the proposed use. Vineyard Wind at 153; Woburn-Wakefield at 150; East Eagle at 161-162.

In order to make a determination regarding substantial public harm, the Department and the Siting Board have articulated relevant factors, including, but not limited to, whether: (1) the proposed project contributes to a reliable energy supply for the Commonwealth; (2) the project is time sensitive; (3) the project involves multiple municipalities that could have conflicting zoning provisions that might hinder the uniform development of a large project spanning these communities; (4) the proponent of the project has actively engaged the communities and responsible officials to discuss the applicability of local zoning provisions to the project and any local concerns; and (5) the affected communities do not oppose the issuance of the comprehensive exemption. Vineyard Wind at 153; Woburn Wakefield at 150; East Eagle at 161-162.

B. Positions of the Parties

The Company argues that a comprehensive zoning exemption is necessary in this case because the Project is necessary for system reliability and because the Project is needed imminently (i.e., the reliability concerns identified arose prior to 2013) (Company Brief at 153, citing Exh. EV-3, at 25). According to the Company, a comprehensive zoning exemption is necessary for the Project because zoning bylaws and ordinances "are rarely written with unique energy infrastructure facilities in mind," leading to the absence of clearly defined and specific regulation of electric infrastructure (Company Brief at 153 n.97). Moreover, vague and subjective terms and provisions within zoning bylaws result in an imprecise application of the zoning provisions to electric utility infrastructure projects (Company Brief at 153 n.97). In

addition, the Company argues that a comprehensive zoning exemption would exempt the Project from future zoning enactments that might jeopardize the Project (Company Brief at 152). Therefore, although the Company asserts that it interprets the provisions of zoning bylaws conservatively, in the hope that it is requesting individual zoning exemptions "for all of the provisions that could conceivably be said to apply to a project," the Company maintains that the grant of a comprehensive zoning exemption would remove any reasonable doubt as to the ability of the Project to move forward without violating any terms of the relevant zoning bylaws (Company Brief at 153 n.97, citing Exh. EV-3, at 25).

Sudbury states that it "is not prepared to support" the Company's request for a comprehensive zoning exemption (Sudbury Brief at 101). Sudbury indicates that it lacks detailed information on the Company's final design and construction of the Project (Sudbury Brief at 101, citing RR-EFSB-81). In addition, Sudbury asserts that the Company has failed to demonstrate that the Project is consistent with the public interest (Sudbury Brief at 101).

Stow states that it does not believe that a comprehensive zoning exemption from the Stow Zoning Bylaw would be necessary for the Project (Stow Brief at 1-2). Stow rejects the Company's argument that such comprehensive exemption is needed to protect the Project from any *future* zoning enactment that "has the potential to jeopardize the Project" (Stow Brief at 2, 4), citing Company's Brief at 152). Stow asserts that if the Project along the MBTA Underground Route is approved by the Siting Board (which is the route Stow supports as the better option for the Project), it is highly unlikely that any future zoning enactment would have such potential, and accordingly that such comprehensive exemption is unnecessary (Stow Brief at 4).

C. Analysis and Findings on Comprehensive Zoning Exemption

General Laws c. 40A, § 3 provides the Department with the authority to ensure that local interests do not prevent construction of needed facilities that serve the public interest. "The zoning exemption available under G.L. c. 40A, § 3, is intended to assure utilities' ability to carry out their obligation to serve the public when this duty conflicts with local interests." Planning Bd. of Braintree v. Department of Public Utilities, 420 Mass. 22, 27 (1995) ("Braintree").

Compared to the grant of individual zoning exemptions, which is tailored to meet the

construction requirements of a particular project, the grant of a comprehensive exemption serves to nullify a municipality's zoning code in its entirety with respect to the project under review. Thus, compared to the grant of individual zoning exemptions, a comprehensive zoning exemption constitutes a broader incursion upon municipal home rule authority. In the absence of a showing that substantial public harm may be avoided by granting a comprehensive exemption, the granting of such extraordinary relief is not justified. NSTAR Electric Company, D.P.U. 13-126/13-127, at 38-39 (2014) ; NSTAR Electric Company, D.P.U. 11-80, at 45 (2012); NSTAR Electric Company Waltham, D.P.U. 08-1, at 36-37 (2009).

Department and Siting Board cases that have considered and granted comprehensive exemptions have typically involved projects that contribute to a reliable supply of energy, were time-sensitive, and often, but not necessarily, dealt with the zoning ordinances of multiple municipalities where conflicting provisions or interpretations could arise. See e.g., Woburn-Wakefield at 150-151; Walpole-Holbrook at 98-100.

As discussed in Section III above, the record in this proceeding shows that the Project is needed to maintain the reliability of the regional transmission grid and to address pre-existing violations of planning standards and criteria. Thus, construction of the Project both contributes to a reliable energy supply and is time-sensitive. The record also shows that the Project spans multiple municipalities, including the towns of Sudbury, Hudson, and Stow, and the City of Marlborough. In addition, the Siting Board found, in Section VIII, above, that the Company engaged in good faith consultations with numerous municipal officials concerning the Project, notwithstanding the fact that the towns of Sudbury and Stow have objected to the grant of a comprehensive zoning exemption. In Sections VI and XIII, the Siting Board has incorporated specific conditions with regard to the construction and operation of the Project, which seek to protect local interests with regard to environmental impacts. Under these circumstances, the Siting Board finds that delay in the completion of the Project would likely cause substantial public harm and that the grant of comprehensive exemptions from the zoning bylaws of the towns of Sudbury, Hudson, and Stow is warranted.

In granting this relief, however, the Siting Board notes that the Company must inform the Siting Board of any changes other than minor variations so that the Board may decide whether to inquire further into a particular issue. See Section XIII, below. This condition ensures that all

intervenors and interested persons receive notice of any potential modification proposed by the Company related to the construction and operation of the Project and have the opportunity to comment on the potential impact of such modifications on local interests. The imposition of this standard protects local interests and should assist in resolving any potential conflicts between local needs and the interest of the general public in the timely completion of construction and operation of an energy facility needed for reliability purposes.

Further, even when a comprehensive zoning exemption is granted, one class of zoning ordinances or bylaws is often excluded: zoning restrictions relating to well-defined environmental aspects of the ongoing operation of the proposed project (as compared to the construction phase of a project). Woburn-Wakefield at 147-148; Walpole-Holbrook at 99; Woburn Substation at 36. As discussed in Section VIII, above, the Siting Board recognizes that granting such exemptions could prevent a city or town from exercising reasonable control over the on-going operation of a project. See Woburn Substation at 36.

In this case, in addition to the individual performance standards exemptions identified above, Sudbury Zoning Bylaw Section 3421 (water quality), Section 3422 (air quality), Section 3424 (solid waste storage), and Section 3426 (inflammables and explosives) set forth the town's authority to limit activities associated with environmental irritants and hazards. Section 5.4.2 of the Hudson Zoning Bylaw (Uses Specifically Prohibited) sets forth Hudson's authority to specifically prohibit any use that may produce a nuisance or hazard from fire, toxic or noxious fumes, odors, etc. The Town of Hudson also specifically prohibits uses that contaminate ground water, pollution of any stream or otherwise pollute the atmosphere in Hudson. Similarly, Sections 3.8.1.2 and 3.8.1.3 of the Stow Zoning Bylaws regulate odor, dust, and smoke, and limit noise in Stow. Consequently, including the above-referenced zoning provisions in the grant of a comprehensive exemption would preclude the towns from exercising reasonable local control over the on-going operations of the Project with respect to these environmental impacts. Accordingly, a comprehensive exemption is granted from these provisions only as they relate to the construction, as distinguished from operation, of the Project.

Accordingly, we grant a comprehensive zoning exemption from the Sudbury, Hudson, and Stow Zoning Bylaws, with the exception of: (1) Sections 3421, 3422, 3424, 3425, and 3426 of the Sudbury Zoning Bylaw; (2) Section 5.4.2 of the Hudson Zoning Bylaw; and (3) Sections

3.3.1.2 and 3.3.1.3 of the Stow Zoning Bylaw (these zoning exemptions are limited to the construction, not ongoing operation, of the Project), and Section 3.3.10 of the Hudson Zoning Bylaw (relating to both construction and operation of the Project). The comprehensive zoning exemption shall apply to the Project specifically as it has been described, approved, and conditioned herein.

X. ANALYSIS UNDER G.L. C. 164, § 72

A. Standard of Review

General Laws, c. 164, § 72 requires, in relevant part, that an electric company seeking approval to construct a transmission line must file with the Department a petition for:

> authority to construct and use … a line for the transmission of electricity for distribution in some definite area or for supplying electricity to itself or to another electric Company or to a municipal lighting plant for distribution and sale … and shall represent that such line will or does serve the public convenience and is consistent with the public interest .... The [D]epartment, after notice and a public hearing in one or more of the towns affected, may determine that said line is necessary for the purpose alleged, and will serve the public convenience and is consistent with the public interest.[182]

The Department, in making a determination under G.L. c. 164, § 72, considers all aspects of the public interest. Boston Edison Company v. Town of Sudbury, 356 Mass. 406, 419 (1969). Among other things, Section 72 permits the Department to prescribe reasonable conditions for the protection of the public safety. Id. at 419-420.

In evaluating petitions filed under G.L. c. 164, § 72, the Department examines: (1) the need for, or public benefits of, the present or proposed use; (2) the environmental impacts or any other impacts of the present or proposed use; and (3) the present or proposed use and any alternatives identified. Needham-West Roxbury at 77-78: Woburn-Wakefield at 152; East Eagle at 164. The Department then balances the interests of the general public against the local

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[182] Pursuant to G.L. c. 164, § 72, the electric company must file with its petition a general description of the transmission line, a map or plan showing its general location, an estimate showing in reasonable detail the cost of the line, and such additional maps and information as the Department requires.

interests and determines whether the line is necessary for the purpose alleged and will serve the public convenience and is consistent with the public interest. Needham-West Roxbury at 77-78; Woburn-Wakefield at 152; East Eagle at 164.

B. Positions of the Parties

Protect Sudbury asserts that, under certain circumstances, "transmission lines generally do impact property values" and that "the Project would likely have such impacts" (PS Brief at 48, citing Exh. Protect-C, D, and E; Tr. 12, at 2109-2114). Protect Sudbury submitted three Massachusetts real estate listings (Multiple Listing Service, or "MLS" listings) for properties in the Town of Sudbury that referenced the potential for the Eversource Project (Exh. Protect-C, D, and E; Tr. 12, at 2109-2114). Protect Sudbury implied that these MLS listings demonstrated that properties in the vicinity of the Project had been removed from the market or had sold for less than the asking price (Exh. Protect-C, D, and E; Tr. 12, at 2109-2114).

Contrary to Protect Sudbury, Eversource argues that construction of the Project as proposed would not result in any detrimental effects to residential property values (Company Brief at 155, citing Exh. EV-JAC-1, at 4-5; Tr. 12, at 2127-2130). According to the Company, studies performed concerning other high-voltage transmission facilities have found no statistically significant effects on the market value of residential properties unless: (1) there was an easement on the property; (2) the residence was in very close proximity to the ROW (an average of 35 feet); and (3) there were unobstructed views of transmission structures (Exh. EV-JAC-1, at 3; Tr. 12, at 2085-2087). Eversource questioned the evidentiary value of the MLS listings provided by Protect Sudbury, indicating that listing prices vary with respect to sale prices for many reasons and that there is no basis for attributing differences for these three properties to the Project (Tr. 12, at 2130).

C. Analysis and Findings

In Sections III through VI, above, the Siting Board examined: (1) the need for, or public benefits of, the proposed Project; (2) the environmental impacts of the proposed Project; and (3) any identified alternatives. The Siting Board concluded that the Project along the MBTA

Underground Route would achieve an appropriate balance among conflicting environmental concerns as well as among environmental impacts, reliability, and cost.

As noted in Section VI.D.1, above, while impacts to property values are outside of the scope of the Siting Board's review under G.L. c. 164, § 69J, consideration of such impacts is appropriate in the Board's review of the general public interest under G.L. c. 164, § 72 and G.L. c. 40A, § 3. See Presiding Officer Scoping Order Concerning Issue of Property Values, September 15, 2017. Based on the record in this proceeding, the Siting Board concludes that construction of the Project along the MBTA Underground Route is unlikely to have a significant detrimental effect on residential property values. The Siting Board does not view the three MLS listings provided by Protect Sudbury as a sufficient basis for identifying a real or persistent trend in real estate values in the Town of Sudbury, nor for establishing a causal relationship between residential property values and the Project. Rather, the Siting Board accepts the testimony of Mr. Chalmers – supported by peer-reviewed research – that because the Project along the MBTA Underground Route does not involve residential properties with (1) easements on the property; (2) residences in very close proximity to the ROW; and (3) unobstructed views of transmission structures, negative impacts to property values are unlikely.

Accordingly, with implementation of the specified mitigation measures proposed by the Company and the conditions set forth by the Siting Board in Section XIII, below, the Siting Board finds pursuant to G.L. c. 164, § 72, that the Project is necessary for the purpose alleged, will serve the public convenience, and is consistent with the public interest. Thus, the Siting Board approves the Section 72 Petition.

XI. SECTION 61 FINDINGS

MEPA provides that "[a]ny determination made by an agency of the Commonwealth shall include a finding describing the environmental impact, if any, of the Project and a finding that all feasible measures have been taken to avoid or minimize said impact" ("Section 61 Findings"). G.L. c. 30, § 61. Pursuant to 301 CMR 11.01(3), Section 61 Findings are necessary when an EIR is submitted to the Secretary of Energy and Environmental Affairs and Section 61 Findings should be based on such EIR. Where an EIR is not required, Section 61 Findings are not necessary. 301 CMR 11.01(4).

The record shows that Eversource filed an ENF for the Project with MEPA on May 15, 2017, and a correcting and clarifying ENF, dated June 12, 2017 (Exh. EFSB-G-1). The Secretary issued a Certificate on the ENF on July 14, 2017, requiring the Company to file a DEIR and an FEIR (Exh. EFSB-G-1(3)).[183] Therefore a finding under G.L. c. 30, § 61 is necessary for the Company's Zoning and Section 72 Petitions.[184] The Company submitted its DEIR on October 27, 2017 (Exh. EV-16) and the Secretary issued a Certificate on the DEIR on December 15, 2017 (Exh. EFSB-G-2(S3)(2)). The Company submitted its FEIR on July 2, 2018 (Exh. EV-18).[185] The Secretary issued a Certificate on the FEIR on September 14, 2018, determining that the FEIR adequately and properly complied with MEPA and its implementing regulations (Exh. EFSB-G-3(S1)(2))).

The Siting Board recognizes the Commonwealth's policies relating to GHG emissions, including G.L. c. 30, § 61 and the MEPA Greenhouse Gas Emission Policy and Protocol. The Siting Board notes that the transmission line portion of the Project would have minimal GHG emissions as it is an underground transmission line and would not have direct emissions from a

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183 The July 14, 2017 Certificate states that the Secretary determined that the Project "is not subject to the requirement to file a Mandatory Environmental Impact Report (EIR)." However, the Certificate further states: "[t]he Proponent intends to proceed through the MEPA review process on a voluntary basis and has requested that I issue a Scope for a Draft EIR (DEIR)" (Exh. EFSB-G-1-1(S-2)). Thus, the Project did, in fact, undergo MEPA review and required both a DEIR and an FEIR (Exh. EFSB-G-1-1(S-2)). See also DEIR Certificate, which states: "MEPA jurisdiction for this project extends to all aspects of the project that are likely, directly or indirectly, to cause Damage to the Environment as defined in the MEPA regulations" (Exh. EFSB-G-2(S3)(2) at 5 of 77).

184 The Siting Board generally is not required to make a G.L. c. 30, § 61 finding in a G.L. c. 164, § 69J proceeding, as the Siting Board is exempt by statute from MEPA. G.L. c. 164, § 69I. However, the Board must comply with MEPA with respect to review of the Company's Section 40A, § 3, and § 72 Petitions, which are both Department statutes, and not exempt from MEPA. Accordingly, in approving the Company's Section 40A and 72 Petitions in this case, the Siting Board has conducted the review and made the findings required by MEPA.

185 The Company notified the Siting Board that in order to comply with the circulation requirements identified at 301 CMR 11.16(3)(b), on July 19, 2018, the Company withdrew its FEIR and subsequently resubmitted it for inclusion in the August 8, 2018 Environmental Monitor. See July 19, 2018 letter.

stationary source or indirect emissions from energy consumption. The new 115 kV circuit breakers at the Sudbury Substation will require the use of SF_6 gas, a potent GHG (Exh. EFSB-G-3(S1)(2) at 11). The Secretary's Certificate on the FEIR notes that the annual emissions rate for these circuit breakers of 0.1 percent is the lowest commercially available, and that the potential for SF_6 emissions at the substation is minimal (Exh. EFSB-G-3(S1)(2) at 11). Further, the Sudbury Substation currently has the capability to interconnect distributed renewable energy resources and there are no changes that could be implemented in conjunction with the Project to enhance this capability (Exh. EFSB-G-3(S1)(2) at 11-12).

In Section VI, above, the Siting Board conducted a comprehensive analysis of the environmental impacts of the proposed Project. Further, the record contains, and the Siting Board has reviewed, the MEPA documents submitted by the Company, including the ENF, DEIR, and FEIR for the Project, as well as public comments on the DEIR and FEIR (Exhs. EFSB-G-1; EFSB-G-1-1(S-2); EFSB-G-1(S-1); EFSB-G-2(S3); EFSB-G-3(S1); EV-16, and EV-18). In accordance with the requirements of MEPA, the Siting Board has: reviewed the FEIR for the Project; evaluated, and determined the impact of the Project on the natural environment; and specified in detail in this Decision measures to be taken by Eversource to avoid damage to the environment or, to the extent damage to the environment cannot be avoided, to minimize and mitigate damage to the environment to the maximum extent practicable. G.L. c. 30, § 61. The Siting Board notes that the Secretary has determined that the FEIR for the Project adequately and properly complies with MEPA (Exh. EFSB-G-3(S1)(2)). Accordingly, the Siting Board finds that all feasible measures have been taken to avoid or minimize the environmental impacts of the proposed Project. See G.L. c. 30, § 61; 301 CMR 11.2(5).

XII. RULING ON MOTION TO REPOEN RECORD AND HEARING

A. Procedural Background

On June 13, 2019, the Town of Sudbury filed a motion requesting that the Siting Board reopen the record and hearing in this proceeding to admit into evidence: (1) current load and EE forecast data from ISO-NE; (2) current MassDOER solar PV development data; and (3) new information relating to NTAs (Sudbury Motion at 1). Sudbury also filed a memorandum in support of its motion and an affidavit of Paul L. Chernick, and requested that the Siting Board

allow for limited additional discovery, cross-examination, or rebuttal with respect to such evidence (Sudbury Motion at 1).

On July 12, 2019 Protect Sudbury, HLPD, and the Company filed responses to Sudbury's Motion. The Company's response included two affidavits in support of its opposition to the Sudbury Motion: (1) a joint affidavit of Robert D. Andrew and Elizabeth Leonard; and (2) an affidavit of Julia Frayer. On July 26, 2019, Sudbury filed a reply to the Eversource Opposition, which included a second affidavit of Mr. Chernick.

B. Standard of Review

The Board's procedural regulations permit the re-opening of a completed adjudicatory hearing or record only for good cause, and only with respect to evidence that was unavailable at the time of hearing. Specifically, a party seeking to reopen a proceeding must: (1) explain the nature and relevance of the evidence it seeks to present; (2) explain why the evidence was unavailable while the hearing was still open; and (3) demonstrate clearly that good cause exists for re-opening. 980 CMR 1.09 (1). To demonstrate good cause clearly, a party must show that the new evidence, if allowed into the record, would be likely to have a significant impact on the Siting Board's decision in the proceeding. Cape Wind Associates, LLC and Commonwealth Electric Company d/b/a NSTAR Electric Company, EFSB 02-2/D.T.E. 02-53, Hearing Officer Ruling on Motion to Reopen (March 21, 2005) ("Cape Wind Ruling on Re-Opening"); in accord, Alliance to Protect Nantucket Sound v. Department of Public Utilities, 461 Mass. 190, 194-195 (2011) ("Alliance"); Box Pond. See also NSTAR Electric Company d/b/a Eversource Energy, EFSB 16-02/D.P.U. 16-77, Presiding Officer Ruling on Motion to Re-Open Evidentiary Hearings (April 13, 2018); NSTAR Electric Company d/b/a Eversource Energy, EFSB 14-04/D.P.U. 14-153/14-154, Presiding Officer Ruling on Four Post-Hearing Evidentiary Motions (November 8, 2017).

Whether to re-open a completed adjudicatory hearing is, in the first instance, a matter of administrative agency discretion. Alliance, 461 Mass. at 190, 193-194; Box Pond, 435 Mass. at 408, 420. For a number of reasons, including considerations of due process, efficiency, and finality, an agency's discretion to re-open a completed hearing is to be exercised sparingly, and for compelling reasons only. See Alliance, 461 Mass. at 190, 193-195. This is why, in addition

to demonstrating unavailability and relevance, a party seeking to re-open the record in a Siting Board proceeding for the purpose of admitting new evidence must also demonstrate good cause, by showing that the evidence, if admitted, would be likely to have a significant impact on the Siting Board's decision in the proceeding. See 980 CMR 1.09(1); Cape Wind Ruling on Re-Opening at 12-14; Alliance, 461 Mass. at 190, 194-195.

C. Sudbury Motion

In the Sudbury Motion and supporting documentation, Sudbury argues that this additional evidence is necessary for the Siting Board's review of the Project because:

- the load and EE forecast used in the proceeding is stale; more recent forecasts are available showing a significant decrease in electricity demand and should be considered by the Siting Board;
- a revised needs assessment is required given the downward trend in ISO-NE's load forecasts;
- MassDOER's Solar Carve-Out II Program ("SREC II") and Solar Massachusetts Renewable Target ("SMART") Program solar PV information is necessary for the Siting Board's review of the solar PV/storage alternative proposed by the town;
- Eversource should revise its NTA analysis to consider whether the minimum injection requirement has fallen further and whether solar PV development paired with energy storage is a feasible NTA; and
- additional information on other feasible NTA solutions, which was not available during evidentiary hearings, should be considered by the Siting Board.

(Sudbury Motion at 1-2; Sudbury Memorandum at 3-13).

Sudbury argues that good cause exists to reopen hearings based on the reasons above (Sudbury Motion at 1; Sudbury Memorandum at 1). Sudbury cites to the passage of time and the availability of current information, and notes that the information it seeks to admit was not available until after the close of hearings (Sudbury Memorandum at 3-4). According to Sudbury, the information is central to the Siting Board's findings on Project need and alternative approaches to satisfy that need (Sudbury Memorandum at 3). Sudbury contends that the information will show material changes to forecasts relied upon by the Company and therefore will have a significant impact on the Siting Board's determinations in this proceeding (Sudbury Memorandum at 8-9).

D. Position of the Parties

1. Protect Sudbury

Protect Sudbury supports the Sudbury Motion, arguing that the town had clearly demonstrated that critical assumptions relied upon by the Company have significantly and materially changed since the close of hearings (PS Support at 1-3). Specifically, Protect Sudbury identifies fundamental and important changes in forecast data, solar capacity, and NTAs (PS Support at 1-3). Protect Sudbury seconds the town's position that the Siting Board has the authority to reopen the case and asserts that "it is beyond question that Chernick's [June 13] Affidavit constitutes the material evidence required to demonstrate good cause" (PS Support at 3 n.1). Protect Sudbury argues that the Siting Board should: (1) consider the information presented in the Chernick June 13 Affidavit; (2) review Eversource's forecasts and assumptions; and (3) assess growth in distributed generation capacity, particularly solar PV and battery storage, and active demand technologies (PS Support at 2-3).

2. HLPD

HLPD opposes the Sudbury Motion, requesting that the Siting Board deny the motion and issue a Final Decision as soon as possible (HLPD Opposition at 1). HLPD notes that Eversource's Petition was filed on April 20, 2017, and that briefing in this proceeding was completed on March 30, 2018 (HLPD Opposition at 1). HLPD submits that there has been more than sufficient time for the Siting Board and parties to ask questions, submit evidence, and make arguments with respect to every issue in this case (HLPD Opposition at 1-2). HLPD argues that the Siting Board process is not a moving target where every new piece of information requires that the record and/or hearings be re-opened, and states that it is not uncommon for ISO-NE to issue new forecasts while the Siting Board is considering evidence and preparing a Tentative Decision (HLPD Opposition at 2).

3. The Company

Eversource objects to the Sudbury Motion, arguing that the town has failed to demonstrate that the new information provided by way of the motion, if allowed into the record,

is likely to significantly affect the Siting Board's Final Decision (Eversource Opposition at 2). Accordingly, the Company requests that the Sudbury Motion be denied (Eversource Opposition at 2, 10).

In response to the town's assertion that use of the 2018 and 2019 CELT forecasts may obviate the need for the Project, the Company reports that it updated its needs analysis for the year 2023 using the 2019 CELT forecast and that this analysis shows a clear and continuing need for the Project (Eversource Opposition at 4-5).[186] While the Company agrees with the town that load levels predicted for the year 2023 in the 2019 CELT forecast are lower than those predicted in the 2016 CELT, Eversource argues that the thermal overloads, low voltage violations, and voltage collapse issues identified in the Company's Petition and referenced during the evidentiary hearings remain (Eversource Opposition at 5; Andrew/Leonard Affidavit at 1-5). Specifically, the Company states that it identified post-contingency thermal overloads as severe as 164 percent of LTE (or 158 percent of STE), post-contingency voltages as low as 0.75 per unit, and the potential for a voltage collapse that would interrupt the supply of power to all electric customers in the Marlborough Subarea (Eversource Opposition at 5; Andrew/Leonard Affidavit at 3-5). As such, the Company argues that the information Sudbury seeks to admit as evidence does not affect the Company's demonstration of need based on existing record evidence, nor would it significantly affect the Siting Board's conclusions on need (Eversource Opposition at 6).

Eversource reports that, prompted by the Sudbury Motion, it also prepared an update to its original analysis of an NTA solution to the identified need, including updated injection amounts and locations (Eversource Opposition at 6). Using the 2019 CELT forecast, the Company projected that approximately 80 MW of effective capacity (50 MW connected at the

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[186] Eversource maintains that Sudbury bears the burden of proof to show it has met the Siting Board's good cause standard (Eversource Opposition at 2). Furthermore, Eversource states that the information provided in the Eversource Opposition and accompanying affidavits is not intended for admission into the evidentiary record, but rather is provided in response to the factual statements made in the Sudbury Motion and its attached documents, and is intended solely to demonstrate that the town has not met its burden to show good cause why the record and hearing should be reopened (Eversource Opposition at 2 n.1).

West Framingham Substation and 30 MW at the Hudson or Northborough Road Substations) would be required to address the revised need for local resources; this is a reduction of approximately 35 MW from the injection requirement identified in the evidentiary record (Eversource Opposition at 6-7; Andrew/Leonard Affidavit at 6).[187] Eversource argues that any NTA of this magnitude would still be infeasible and/or higher cost than the Project (Eversource Opposition at 7-10). For example, Eversource submits that to address the need for the Project with EE resources, net peak load in the Marlborough Subarea would need to be reduced by 22 percent (Eversource Opposition at 7). Eversource argues that this level of EE savings is significantly different in scope and scale from any existing Eversource program and continues to be far in excess of any peak load reductions achieved by the Company or other transmission operators (Eversource Opposition at 7; Andrew/Leonard Affidavit at 6-7).

Eversource reports that a combined solar PV and battery storage solution also remains infeasible and not cost-effective under its updated analysis (Eversource Opposition at 8-9). According to the Company, even under the revised injection requirement and using updated cost and market information, such a solution would face significant implementation obstacles and have a yearly cost of approximately four times the levelized cost of the Project (Eversource Opposition at 8-9). Eversource states that the MassDOER information on solar PV developments raised in the Sudbury Motion does not alter this conclusion (Eversource Opposition at 8-9). Overall, Eversource argues that its updated analysis confirms the abundant record evidence that the Project is the least-cost alternative to resolve the identified need (Eversource Opposition at 10).

4. Sudbury Reply

Sudbury takes exception to the factual representations made in the Eversource Opposition, arguing that the information raises disputes as to material issues of fact, and that, absent inclusion of the information in the record, there is no mechanism in the Siting Board's

[187] Eversource states that a total injection of 80 MW at the Hudson Substation would also resolve the identified need (Andrew/Leonard Affidavit at 6). The injection requirement would increase to 85 MW if all of the resources were to connect to the Northborough Road Substation (Andrew/Leonard Affidavit at 6).

procedures and prior decisions, nor in cognate law, for the Board to rely on the Company's factual assertions when determining whether there is good cause to reopen the record and hearing (Sudbury Reply at 2). Furthermore, Sudbury argues that the new analysis undertaken by the Company is untested, inconsistent with the underlying record, and not publicly available (Sudbury Reply at 2-3). Sudbury submits that Siting Board cannot rely on the factual assertions made by the Company without further process regarding such information (e.g., limited additional discovery, cross-examination and/or rebuttal) (Sudbury Reply at 3).

Without accepting the validity of the Eversource's updated analysis, Sudbury argues that the information presented shows a decrease of six violations in six years and that if this trend were to continue all violations could be resolved by 2025 (Sudbury Reply at 3). The town further argues that the lower NTA injection requirement cited by the Company provides clear support for Sudbury's request to update the record with current load and EE forecast data, and asserts that, because only 80 MW of effective capacity is now necessary, load rejection would be an acceptable alternative to the Project (Sudbury Reply at 4; Chernick July 26 Affidavit at 4).

Finally, using the Company's revised injection requirement, Sudbury describes a combination solar PV and storage project (250 MW solar PV and 308 MWh storage, intended to be used over a seven-hour period) as an alternative to the Project (Sudbury Reply at 5; Chernick July 26 Affidavit at 5). Sudbury argues that reopening the record would allow the Siting Board to properly evaluate a storage project as an NTA, in order to determine whether the falling cost of storage, the non-transmission benefits of storage, and the Commonwealth's goals for developing storage makes this NTA superior to the Project (Sudbury Reply at 5).

E. Analysis and Findings on Sudbury Motion

Administrative agencies have broad discretion over procedural matters before them. See Zachs v. Department of Public Utilities, 406 Mass. 217, 227 (1989). This is especially the case when the ruling concerns whether to reopen a proceeding or an administrative record. See Brockton Power Co., LLC v. Energy Facilities Siting Board, 469 Mass. 215, 219 (2014); Alliance II, 461 Mass. at 190; Box Pond, 435 Mass. at 420. In order for Sudbury to prevail on a motion to reopen the record, it must demonstrate clearly that good cause exists to reopen. 980 CMR 1.09(1). The burden is on Sudbury, and the Siting Board's regulations and standard of

review reflect this heavy burden. As discussed in Section III, above, the Siting Board found that there is a current need to address reliability criteria and planning standard violations in the Marlborough Subarea. These violations were found under both pre-existing and forecast summer peak load conditions and are so severe as to result in post-contingency thermal overloads well in excess of the LTE and STE ratings of existing transmission facilities, and the potential for an area-wide outage.

Parties agree that ISO-NE's most recent CELT forecast shows a lower level of electrical demand in year 2023 than previously predicted.[188,189] The significance of this decline to the need for the Project, however, is under dispute. The Town of Sudbury and Protect Sudbury argue that the decline in demand obviates the need for the Project, as evidenced by a reduction in the number of transmission elements experiencing post-contingency overloads. The Company maintains that demand in the area continues to exceed the existing transmission system's capability and that thermal overloads (both LTE and STE) and low-voltage violations remain to be addressed. In light of the severity of the planning standards and criteria violations identified in the Marlborough Subarea, above, and confirmed by the Company's updated analysis based on the ISO-NE 2019 CELT forecast showing criteria violations remain, the Siting Board concludes that inclusion of ISO-NE's recent demand forecast information in the record of this proceeding as requested by the town – and a revised needs assessment using this forecast – is not likely to

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188 The information that Sudbury requests to be added to the record was not available during hearings. However, the Siting Board notes that CELT forecasts were part of the adjudicated underlying proceeding. Sudbury seeks to update evidence on the record.

189 The Siting Board reviews the information provided in affidavits from Sudbury and the Company to determine whether good cause exists to reopen the record. The standard to establish good cause is different than the general standard to admit evidence in an adjudicatory proceeding. The proffered evidence must not be merely relevant, but also of a significant nature such that it is likely that the evidence would impact in a significant way the conclusions reached by the Siting Board.

have a significant impact the Siting Board's determination that the Project is needed for reliability purposes.[190,191]

As discussed in Section IV, above, the Siting Board found that an NTA solution is inferior to the Project, particularly in light of the urgency and severity of the reliability concerns in the Marlborough Subarea. While the scale of the NTA required to address the identified need has been reduced by approximately 35 MW to a firm injection requirement of 80 MW, for the reasons stated in Section IV, above, confirmed by the Company's updated NTA analysis, an NTA solution of this magnitude remains infeasible and significantly higher cost than the Project. The information provided by the Town of Sudbury with its motion regarding NTAs does not resolve the deficiencies associated with such an alternative identified in Section IV.D, above, including the viability of achieving unprecedented levels of EE reductions in the Marlborough Subarea in a cost-efficient and timely manner, and the costs, practicality, and timing of the programmatic support needed to incentivize and coordinate a distributed solar PV/energy storage solution. See n.61, above.

Finally, in Sudbury's Reply to the Eversource Opposition, the town raises the potential for a load interruption alternative not previously raised in this proceeding. Sudbury argues that because the firm injection requirement for the Marlborough Subarea has been reduced to 80 MW it now falls below ISO-NE's threshold for allowable load interruption following an N-1-1 contingency. The Siting Board notes that the 2010 ISO-NE Load Interruption Guidelines, presented by the town, includes guidance stressing the importance of providing reliable service to all customers as well as specific provisions stating that: (1) overloads above the STE rating of equipment must be corrected by means other than interrupting load; and (2) non-consequential

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190 The Siting Board concurs with HLPD that it is not uncommon for ISO-NE to issue updated load forecast information during the pendency of a Board decision.

191 The Siting Board is not persuaded by the Town of Sudbury's argument that a reduction in the number of violations observed in the Marlborough Subarea demonstrates the need for the Project has been reduced in a meaningful way. While the number of transmission elements subject to post-contingency overloads is of interest when characterizing the breadth of a reliability concern, it is not determinative because each and every component of the transmission system must comply with applicable reliability standards and criteria to ensure a reliable supply of electricity for the Commonwealth.

load interruption is not recommended as a mitigation for voltage violations.[192] See Load Interruption Guidelines at 8. Accordingly, the Siting Board is not persuaded that a load interruption alternative would be an appropriate means of addressing the thermal overloads and low voltage violations identified in the Marlborough Subarea.

Given the reliability needs currently present in the Marlborough Subarea, the Siting Board concludes that inclusion of the NTA information presented by the Town of Sudbury with its Motion to Reopen is not likely to have a significant impact on the Siting Board's determination that the Project is necessary and superior to other alternatives identified with respect to providing a reliable energy supply for the Commonwealth with minimum impact on the environment at the lowest possible cost.

F. Conclusion

The Siting Board finds that the Town of Sudbury has failed to demonstrate clearly good cause for reopening the record in this matter. Therefore, the Town of Sudbury Motion to Reopen Record and Hearing, dated June 13, 2019, is denied. The documents referenced above that Sudbury and the Company have filed pertaining to the Sudbury Motion will not be considered by the Siting Board in its deliberations and in the issuance of a tentative and final decision on this matter.

XIII. DECISION

The Siting Board's enabling statute directs the Siting Board to implement the energy policies contained in G.L. c. 164, §§ 69H to 69Q, to provide a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. G.L. c. 164, § 69H. Thus, an applicant must obtain Siting Board approval under G.L. c. 164, § 69J, prior to construction of a proposed energy facility.

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192 For example, the 2010 ISO-NE Load Interruption Guidelines includes a "guiding concept" stating that "[p]lanning of the regional transmission system should not consider load interruption as the primary means to mitigate transmission system reliability violations and thus recognizes the importance of providing reliable service to all customers." See Load Interruption Guidelines ("Load Interruption Guidelines") at 3.

In Section III, above, the Siting Board finds that additional energy resources are needed to maintain a reliable supply of electricity within the Marlborough Subarea.

In Section IV, above, the Siting Board finds that the Project is superior to the other alternatives identified with respect to providing a reliable energy supply for the Commonwealth with minimum impact on the environment at the lowest possible cost.

In Section V, above, the Siting Board finds that the Company has developed and applied a reasonable set of criteria for identifying and evaluating alternatives to the Project in a manner that ensures that the Company has not overlooked or eliminated any routes that are on balance clearly superior to the Project. The Siting Board also finds that the Company has identified a range of practical transmission line routes with some measure of geographic diversity. Consequently, the Siting Board finds that the Company has demonstrated that it examined a reasonable range of practical siting alternatives, and the proposed facilities are sited in locations that minimize cost and environmental impacts while ensuring a reliable energy supply.

In Section VI, above, the Siting Board finds that the proposed facilities along the MBTA Underground Route would be superior to the proposed facilities along both the All-Street Route and the MBTA Overhead Route with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

In Section VI, above, the Siting Board reviewed environmental impacts of the Project and finds that with the implementation of the specified mitigation and conditions, and compliance with all applicable local, state and federal requirements, the environmental impacts of the Project along the MBTA Underground Route would be minimized.

In Section VII, above, the Siting Board finds that with the implementation of specified mitigation and conditions, the Project is consistent with the health, environmental protection, and resource use and development policies of the Commonwealth.

In addition, the Siting Board finds, pursuant to G.L. c. 164, § 72, that the Project is necessary for the purpose alleged, and will serve the public convenience, and is consistent with the public interest, subject to the following Conditions A through S.

In addition, the Siting Board finds, pursuant to G.L. c. 40A, § 3, that construction and operation of the Company's proposed facilities are reasonably necessary for the public convenience or welfare. Accordingly, the Siting Board approves the Company's Petition for an

exemption from certain provisions of the zoning bylaws of the Towns of Sudbury, Hudson, and Stow, with limitations, as enumerated in Section VIII.D, above. In addition, the Siting Board finds that delay in the completion of the Project would likely cause substantial public harm and that the grant of comprehensive exemptions from the zoning bylaws of the towns of Sudbury, Hudson, and Stow is warranted. Accordingly, the Siting Board approves the Company's Petition for comprehensive exemptions from the provisions of the zoning bylaws of the Towns of Sudbury, Hudson, and Stow, with limitations, as enumerated in Section IX.C, above.

Accordingly, the Siting Board APPROVES pursuant to G.L. c. 164, § 69J, the Company's Petition to construct the Project using the MBTA Underground Route, as described herein, subject to the following Conditions A through S.

A. The Company shall file, prior to construction, the executed MOU between DCR that outlines vegetation management along the MBTA ROW.

B. The Company shall, in consultation with the owners/managers of bordering conservation land – Sudbury, Hudson, Marlborough, Sudbury Valley Trustees, DCR, and the U.S. Department of the Interior – develop an access plan that details: (1) the time of year that access would be limited along the MBTA ROW; (2) alternative access points to specific conservation areas if applicable; (3) guidelines for communicating with all owners/managers of such conservation lands; and (4) a complaint and resolution process regarding any issues arising from construction that impact the bordering conservation land.

C. The Company shall not commence construction of the Project along the MBTA Underground Route until the question of whether the MBTA can enter into the Option Agreement is resolved and the Company's rights to install the New Line along the MBTA ROW are thereby confirmed.

D. The Company shall file the following documents applicable to a particular community prior to the start of construction in that community: final mitigation plans for wetland replication and compensatory flood storage; completed wildlife habitat assessments; final avoidance and mitigation plans; and each Order of Conditions from the local conservation commissions. The Company shall not be precluded from commencing construction in a particular community if it is fully permitted to proceed in that community.

E. The Siting Board directs the Company to report on any future consultations with MassDFW and provide any additional mitigation or best practices that will be implemented prior to construction of the Project.

F. The Siting Board directs Eversource to utilize mechanical vegetation management along the MBTA ROW. Further, if Eversource finalizes an MOU with DCR for vegetation management along the MCRT, Eversource shall incorporate the same provision in the MOU. If DCR does not agree to the inclusion of this provision in the MOU, Eversource shall submit a report to the Siting Board describing DCR's objections for the Board's consideration.

G. The Company shall use the quietest low-noise generators reasonably available during cable splicing.

H. Eversource shall place any stationary equipment that emits loud noise in addition to portable generator units as far as practicable from residences and other sensitive receptors during construction.

I. Eversource shall provide a filing with the Siting Board describing nighttime construction noise mitigation measures that will be implemented during Project construction.

J. The Company shall limit construction of the New Line in residential areas to Monday through Friday from 7:00 a.m. to 6:00 p.m., with the exception of in-street work as requested by the Town of Hudson. Work requiring longer continuous duration than normal construction hours allow, such as cable splicing, is exempted from this condition. The Siting Board will allow Saturday work at the Sudbury and Hudson Substations, but it shall be limited to large equipment deliveries and to quiet assembly and testing activities.

Should the Company need to extend construction work beyond the above-noted hours and days, with the exception of emergency circumstances on a given day necessitating extended hours, the Company shall seek written permission from the relevant municipal authority before the commencement of such work, and to provide the Siting Board with a copy of such permission. If the Company and municipal officials are not able to agree on whether such extended construction hours should occur, the Company may request prior authorization from the Siting Board and shall provide the relevant municipality with a copy of any such request.

K. The Company shall inform the Siting Board and the relevant municipality within 72 hours of any work that continues beyond the hours allowed by the Siting Board. The Company shall also send a copy to the Siting Board, within 72 hours of receipt, of any municipal authorization for an extension of work hours. Furthermore, the Company shall keep records of the dates, times, locations, and duration of all instances in which work continues beyond the hours allowed by the Siting Board; if a municipality grants the Company extended work hours in writing, the Company shall keep records of work that continues past allowed hours, and must submit such records to the Siting Board within 90 days of Project completion.

L. The Company shall provide a Project-specific phone number, staffed during all daytime construction hours, for the public to raise concerns with respect to Project construction impacts. Further, the Company shall develop a Project-specific website, which should at a minimum contain contact information for Company public affairs personnel, the Project-specific phone number, all communications regarding local construction impacts, a Project map, traffic management plans, and a construction timeline. The Company shall provide the Siting Board with the phone number and website address when created.

M. The Company shall, in consultation with the towns, develop a separate, comprehensive outreach plan for the Project for each municipality. Each outreach plan should describe the procedures to be used to notify the public about: (1) the scheduled start, duration, and hours of construction in particular areas; (2) the methods of construction that will be used in particular areas (including any use of nighttime construction); and (3) anticipated street closures and detours. Each outreach plan should also include information on complaint and response procedures; Project contact information; the availability of web-based project information; and protocols for notifying the schools of upcoming construction.

N. The Company shall alert abutters a minimum of two weeks in advance of anticipated local construction activities, when possible.

O. The Company shall, upon request of any person or entity owning property located directly abutting the MBTA ROW whose view has materially changed due to construction of the Project, to provide appropriate and reasonable off site screening. Such screening may include shrubs, trees, window awnings, and fences, provided that operating and maintenance requirements for the transmission line are met. Upon completion of construction, the Company shall notify all owners of property located on or abutting the MBTA ROW in writing of the option to request that the Company provide off site mitigation. The Company shall honor all reasonable and feasible requests for mitigation that it receives from property owners within six months of receipt of the Company's written notification.

P. The Company shall provide an interim report at the mid-point of construction and a final report at the completion of the Project describing how the Company followed the MassDEP Rail Trail BMP.

Q. The Siting Board directs the Company to comply with all applicable federal, state, and local laws, regulations, and ordinances from which the Company has not received an exemption. The Company shall be responsible for ensuring such compliance by its contractors, subcontractors, or other agents.

R. The Siting Board directs the Company to submit to the Board an updated and certified cost estimate for the Project prior to the commencement of construction.

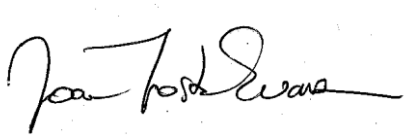
Additionally, the Siting Board directs the Company to file semi-annual compliance reports with the Siting Board starting within 180 days of the commencement of construction, that include projected and actual construction costs and explanations for any discrepancies between projected and actual costs and completion dates, and an explanation of the Company's internal capital authorization approval process.

S. The Siting Board directs the Company, within 90 days of Project completion, to submit a report to the Siting Board documenting compliance with all conditions contained in this Decision, noting any outstanding conditions yet to be satisfied and the expected date and status of compliance.

Because issues addressed in this Decision relative to this facility are subject to change over time, construction of the proposed Project must be commenced within three years of the date of the Decision.

In addition, the Siting Board notes that the findings in this Decision are based upon the record in this case. A project proponent has an absolute obligation to construct and operate its facility in conformance with all aspects of its proposal as presented to the Siting Board. Therefore, the Siting Board requires the Company, and its successors in interest, to notify the Siting Board of any changes other than minor variations to the proposal so that the Siting Board may decide whether to inquire further into a particular issue. The Company or its successors in interest are obligated to provide the Siting Board with sufficient information on changes to the proposed Project to enable the Siting Board to make these determinations.

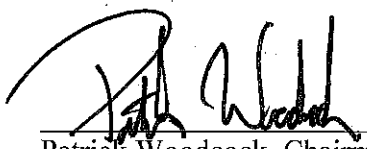
The Secretary of the Department shall transmit a copy of this Decision and the Section 61 findings herein to the Executive Office of Energy and Environmental Affairs and the Company shall serve a copy of this Decision on the Town of Sudbury Board of Selectmen, the Town of Hudson Board of Selectmen, the Town of Stow Board of Selectman, and the City Council of the City of Marlborough and the planning boards and zoning boards of appeals in these municipalities. The Company shall certify to the Secretary of the Department within ten business days of issuance that such service has been made.



Joan Foster Evans, Esq.
Presiding Officer

Dated this 18th day of December 2019

APPROVED by a vote of the Energy Facilities Siting Board at its meeting on December 17, 2019, by the members present and voting. Voting for the Tentative Decision as amended: Patrick Woodcock, Undersecretary of the Executive Office of Energy and Environmental Affairs and Siting Board Chairman; Matthew Nelson, Chair of the Department of Public Utilities; Cecile M. Fraser, Commissioner of the Department of Public Utilities;; Gary Moran, Deputy Commissioner and designee for the Commissioner of Massachusetts Department of Environmental Protection; Joseph Bonfiglio, Public Member; and Brian Casey, Public Member.



Patrick Woodcock, Chairman
Energy Facilities Siting Board

Dated this 18 day of December 2019

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Appeal as to matters of law from any final decision, order or ruling of the Siting Board may be taken to the Supreme Judicial Court by an aggrieved party in interest by the filing of a written petition praying that the order of the Siting Board be modified or set aside in whole or in part. Such petition for appeal shall be filed with the Siting Board within twenty days after the date of service of the decision, order or ruling of the Siting Board, or within such further time as the Siting Board may allow upon request filed prior to the expiration of the twenty days after the date of service of said decision, order or ruling. Within ten days after such petition has been filed, the appealing party shall enter the appeal in the Supreme Judicial Court sitting in Suffolk County by filing a copy thereof with the clerk of said court. Massachusetts General Laws, Chapter 25, Sec. 5; Chapter 164, Sec. 69P.

Attachment I

PERMIT COMPLIANCE MATRIX

Eversource Sudbury-Hudson Transmission Reliability Project - Permit Summary Overview

Agency	Permit	Recv'd or Cmplt	Status
Hudson Conservation Commission	Order of Conditions (#190-0647)	8/24/2020	Received
Stow Conservation Commission	Order of Conditions (#299-677)	7/10/2020	Received
Sudbury Conservation Commission	Order of Conditions (#301-1287)	2/4/2021	Received
Sudbury Planning Board	Stormwater Management Permit (SWMP #20-07)	1/27/2021	Received
Division of Fisheries & Wildlife	MESA No Take Determination (NHESP No. 15-34327)	10/19/2018	Received
United States Army Corps of Engineers	Section 404 Massachusetts General Permit		Under Review
Massachusetts Department of Environmental Protection - Waterways	Minor Modification		Received
United States Environmental Protection Agency	NPDES Construction General Permit Coverage	4/29/2022	Received

EVERSOURCE ENERGY
Project Name: Eversource Sudbury-Hudson Transmission Reliability Project
Town: Hudson, MA
List of Applicable Permits: OOC #190-0647; MESA No Take Determination (NHESP No. 15-34327)

Date: 5/4/2022

= Completed Action

Task #	Action Item	Permit Citation	Responsible Party	Status	Comments	Date Complete or Submitted	Date Approved (if applicable)
PRIOR TO CONSTRUCTION							
1	Within thirty (30) days of the issuance of this Order of Conditions, the applicant, property owner, project representative, or other applicable party must record the original copy of the Order with the Registry of Deeds. Proof of recording is required to `be submitted to the Commission or Conservation Agent prior to the pre-construction site visit and commencement of work.	OOC Special Condition 22	Eversource	Complete	Recorded on 11/4/2020	12/4/2020	Not Applicable
2	No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work .	OOC General Condition 9	Eversource	Complete	Recorded on 11/4/2020	12/4/2020	Not Applicable
3	A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words, " Massachusetts Department of Environmental Protection" [or 'MassDEP"] File Number :"190-0647"	OOC General Condition 10	Contractor	Not started	Epsilon to work with Contractor		
4	Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.	OOC General Condition 17	Epsilon Associates	Not started	Epsilon Team to schedule and complete once detailed construction schedule available		
5	Erosion controls shall consist of(a) silt fence or (b) silt fence with compost filter tubes, double-staked straw bales, or wattles, as shown on the plans. Only invasive seed free erosion controls shall be used. Syncopated fencing shall be used within 450 feet of vernal pools. A silt curtain shall be used in Fort Meadow Brook near the bridge if conditions warrant.	OOC Special Condition 23	Contractor	Not started	Epsilon to work with Contractor		
6a	Provide the Conservation Commission with the name and telephone number in writing, of the person who will be immediately responsible for supervision of all work on the project site and compliance with this Order of Conditions. The Con Com shall be notified in the event that the site supervisor or contractor is changed.	OOC Special Condition 24	Eversource/Contractor	Not started		submitted with draft SWPPP on 2/25/2022	Not Applicable
6b	Clearly mark the limits of work in the field and instruct all workers not to work beyond the limits.	OOC Special Condition 24	Contractor	In Progress			

6c	Notify the Commission of the date upon which work will commence and provide the most up-to-date projet time line and project workflow.	OOC Special Condition 24	Epsilon Associates	Not started	Epsilon will coordinate with Eversource and the Contractor	submitted with draft SWPPP on 2/25/2022	Not Applicable
6d	Properly install all siltation controls according to the plans approved and arrange with the Commission to have a site visit after installation, before work begins.	OOC Special Condition 24	Eversource/Contractor	Not started			
7	Environmental Monitoring: a. Resumes of Environmental Monitors being considered for the project shall be submitted to the Commission for review. b. If the chosen Environmental Monitor does not have a qualified Vernal Pool Biologist or equivalent, a separate Vernal Pool Specialist shall be hired by the applicant to approve and supervise work within 450 feet of Vernal Pools during the TOY restriction of March I to June I. A qualified Vernal Pool Specialist will have at least three years of experience conducting vernal pool assessments or surveys in the northeastern United States.	OOC Special Condition 25	Epsilon Associates	Complete		9/23/2021	Not applicable
8	A structural engineer shall inspect the culverts conveying Streams 1 and 3 beneath the MBTA ROW within the Project Site to determine whether they are structurally sound to (a) function hydrologically and (b) withstand the planned construction activities, and shall provide a report of the findings to the Commission. If either culvert does not meet these requirements or is damaged during construction, it shall be replaced with a culvert that meets current MA Stream Crossing Standards to the maximum extent practicable, as determined by the Commission or its Agent, during construction.	OOC Special Condition 26	EM/Eversource	Complete		9/23/2021	Approved 10/21 meeting
9	Detailed sequencing of the bridge removal work based on water levels and other conditions at the time of removal shall be provided to the Commission prior to commencement of work in this area. A silt curtain shall be used if conditions warrant. The Conservation Agent shall be notified when bridge removal is to begin and perform a site inspection before work commences.	OOC Special Condition 32	Contractor/Eversource	Not started			
10a	Provide the Final Stormwater O&M Plan and Final Stormwater Pollution Prevention Plan for review and comment to Conservation Commission	OOC Special Condition 27	Contractor/Eversource	Not started	SWPPP serves as the Stormwater O&M Plan for Eversource phase of work. DCR to submit another document	submitted draft SWPPP on 2/25/2022	received comments. Will send final SWPPP and ECM for their records
10b	Provide the Final MOU between ES and DCR on Corridor Maintenance and Management for review and comment to Conservation Commission	OOC Special Condition 27	Eversource	Complete		3/29/2022	Not Applicable
10c	Provide the Soil and Groundwater Management Plan for review and comment to Conservation Commission	OOC Special Condition 27	Weston & Sampson	Complete		10/20/2021	Assume approved with no comments received
10d	Provide the Structural Engineer report on culvert conditions for review and comment to Conservation Commission	OOC Special Condition 27	VHB	Complete		9/23/2021	Approved 10/21 meeting
11	Trash removal shall be performed along the ROW, even outside the limits of work, as practicable. Locations of trash removal shall be determined by a site walk of the applicant and Conservation Agent and/or Commissioner.	OOC Special Condition 33	Contractor/Eversource	Not started			
DURING CONSTRUCTION							
1	No excavated material shall be disposed of in violation of any local, state, or federal laws. All stumps must be removed from the site; no burying of stumps on site is permitted.	OOC Special Condition 20	Contractor				

2	All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.	OOC General Condition 18	Contractor				
3	All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollutant Discharge Elimination System Construction General Permit as required by Stormwater Standard 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.	OOC General Condition 19	Contractor				
4	Plantings must be native plants or substitutions only as identified on the approved plans. No invasive vegetation shall be planted.	OOC Special Condition 21	Contractor				
5	All Time-Of-Year (TOY) construction restrictions and sweeps required by the Natural Heritage and Endangered Species Program shall be followed. Time-of-Year restrictions for work within 450 feet of vernal pools shall be March I through June I. Between March I and June I, the Environmental Monitor shall conduct sweeps prior to vehicles traveling down the Project Site within vernal pool buffers. Between April I and Oct 31, the Environmental Monitor shall conduct turtle sweeps prior to initiating work in, or prior to vehicles traveling through, the Box Turtle Protection Area.	OOC Special Condition 28	Contractor				
6	There shall be a qualified Environmental Monitor on site at all times that work is being performed in jurisdictional wetland areas. The Environmental Monitor shall send weekly reports and reports following any storm events of½ inch or greater electronically to the Conservation Agent.	OOC Special Condition 29	EM				
7	Detailed construction sequencing and schedules shall be submitted to the Commission electronically, as they are completed or whenever they are revised.	OOC Special Condition 30	EM/Eversource				
8	The applicant shall endeavor to locate a supplier of pesticide-free seed mixes. All restoration seed mixes shall be pesticide-free if practicable. Documentation of seed sources shall be provided to the Commission, prior to purchase if practicable.	OOC Special Condition 31	Contractor				
9	Detailed sequencing of the bridge removal work based on water levels and other conditions at the time of removal shall be provided to the Commission prior to commencement of work in this area. A silt curtain shall be used if conditions warrant. The Conservation Agent shall be notified when bridge removal is to begin and perform a site inspection before work commences. The Conservation Agent shall be kept informed on a daily basis of bridge work to be performed and when the work is complete, and shall perform site inspections before any phase of work as the Commission or Agent deems appropriate.	OOC Special Condition 32	Contractor/Eversource				

10	If dewatering is necessary, water will not be discharged directly into any waterbodies, BVW, or inner 100' ofRFA. The Conservation Commission shall be notified in advance if dewatering is required within jurisdictional areas and shall inspect the work site before dewatering commences if such inspection can occur within 24 hours of notification.	OOC Special Condition 34	Contractor/Eversource				
11	If on-site excavation or other work reveals any soil contamination in reportable concentrations or quantities, the Conservation Commission shall be notified and shall be copied on all related correspondence.	OOC Special Condition 35	EM/Eversource				
12	The Conservation Commission shall be notified of any remedial activities or changes to the work plans required due to the potential presence of PF AS in the Zone II wellhead area or other jurisdictional areas.	OOC Special Condition 36	EM/Eversource				
13	The catch basin at stations 119 shall be a leaching catch basin.	OOC Special Condition 37	Contractor				
14	All equipment and timber mats shall be cleaned prior to use on the site to prevent the introduction of invasive species. If it is necessary to clean construction equipment while on site, it must be cleaned outside of the I 00-foot Buffer Zone, Riverfront Area, or any other Resource Area.	OOC Special Condition 38	Contractor				
15	If there is a gap between Phase I and Phase 2, erosion controls shall be maintained by Eversource. Erosion control in Priority and Estimated Habitat of Rare Species and within 450 feet of Vernal Pools may require removal. This shall be determined by a site walk with the applicant and Conservation Agent.	OOC Special Condition 39	Contractor/Eversource				
16	If there is a gap between Phase I and Phase 2, Eversource shall be responsible for the health of the restoration areas and the control of invasive species in these areas.	OOC Special Condition 40	Contractor/Eversource				
POST-CONSTRUCTION							
1	Prior to the issuance of a Certificate of Compliance the site shall be stabilized with vegetation or other measures approved by the Conservation Commission.	OOC Special Condition 41	Contractor/Eversource				
2	Prior to the issuance of a Certificate of Compliance and after the site has been stabilized, all erosion controls shall be removed from the site.	OOC Special Condition 42	Contractor				
3	Two (2) full growing seasons shall be required to determine that any plantings within buffer zones and/or resource areas or as part of any mitigation plan have successfully established or may require replanting in case of significant failure. a. During this 2-year period, the applicant/property owner shall submit a report from a qualified wetlands scientist or landscape specialist at the end of each growing season describing the condition of the plantings following installation. If greater than 25% of plantings are not in good health then replacement plantings are required. b. The consultant shall prepare a final report on the status of the plantings as part of the Request for a Certificate of Compliance. Successful establishment of the plantings will mean that at least 75% of the plantings have survived and are in good health and that the planting is free of invasive species. Successful establishment is a requirement for the issuance of a Certificate of Compliance.	OOC Special Condition 43	EM/Eversource				
4	Prior to the issuance of a Certificate of Compliance, the applicant shall submit to the Conservation Commission for review and approval an as-built plan and a letter of compliance stamped by a registered professional engineer. Said plan and letter shall show that all conditions of this Order have been complied with in substantial compliance with the Order and explain any differences from the approved plans.	OOC Special Condition 44	Eversource				

5	Within thirty (30) days of the completion of the transmission line project, or as otherwise approved by the Division, the Applicant shall submit a compliance report containing, including a summary of construction timelines and photographs, to the Division documenting the completion of the project.	MESA No Take Determination (NHESP No. 15-34327) Condition 4	EM/Eversource				
6	Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.	OOC General Condition 12	Eversource				

EVERSOURCE ENERGY
Project Name: Eversource Sudbury-Hudson Transmission Reliability Project
Town: Stow, MA
List of Applicable Permits: OOC #299-677; MESA No Take Determination (NHESP No. 15-34327)
Date: 5/4/2022

= Completed Action

Task #	Action Item	Permit Citation	Responsible Party	Status	Comments	Date Complete or Submitted	Date Approved (if applicable)
PRIOR TO CONSTRUCTION							
1	The form provided at the end of this Order shall be completed and stamped at the Middlesex Registry of Deeds. This form shall be returned to the Commission in accordance with General Condition #8, and prior to the commencement of Phase 1	OOC Special Condition 21	Eversource	Complete	Order recorded on 10/06/2020	8/17/2021	Not Applicable
2	At least one week prior to construction start, A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words, " Massachusetts Department of Environmental Protection" [or 'MassDEP"] File Number :"299-677"	OOC General Condition 10 & Special Condition 24	Contractor	Not Started	Epsilon to work with Contractor		
3	At least one week prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.	OOC General Condition 17 & Special Condition 24	Epsilon	Not Started	Epsilon will work with Contractor to schedule		
4	No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work ..	OOC General Condition 9	Eversource	Complete	Order recorded on 10/06/2020	8/17/2021	Not Applicable
5a	At least 45 days prior to the anticipated start of construction, provide for review and approval of the Stow Conservation Commission or their designee: a) Two copies of the final dated and stamped construction plans (all pages shall be stamped) for the Stow portion of the Eversource transmission line with the following revisions made to the plans: i) The location of any construction stockpiles shall be shown on the plans along with a detail for protecting stockpiles from erosion by water and wind at the end of each workday. All stockpiles shall be within the limit of work. ii) A note shall be added to the dewatering detail indicating that the Conservation Commission shall be notified in advance of any planned dewatering and must approve this work in the field prior to commencing dewatering. iii) Erosion control barriers shall either be shown as continuous, with straw wattle used to demarcate the limit of work in all areas where the plans do not show erosion controls, or plastic construction fencing shall be used to mark the limit of work in these areas. The plans shall show a continuous physical barrier along the right of way which shall serve as a limit of work. iv) A note shall be added indicating that the Conservation Commission shall be notified in the event that dust controls beyond water spraying is required on the project site.	OOC Special Condition 23	Eversource	Complete	No stockpiles in Stow	9/22/2021 (original) 9/30/2021 (revised)	Approved - 10/05/2021 Commission meeting
5b	At least 45 days prior to the anticipated start construction, provide copy of the final Stormwater O&M Plan for review and approval of the Stow Conservation Commission or their designee. The review of these plans and documents shall be limited to a determination of consistency with prior submittals and the conditions of this decision.	OOC Special Condition 23	Contractor	Complete	The final SWPPP will be submitted as Eversource's Stormwater O&M Plan as DCR responsible for final as part of their phase of Project	submitted draft SWPPP for review on 3/4/2022	Approved - email response from K. Sferra on 3/21/2022
5c	At least 45 days prior to the anticipated start of construction provide a copy of the MOU between Eversource and DCR on Corridor Maintenance and Management for review and approval of the Stow Con Com or their designee. The review of these plans and documents shall be limited to a determination of consistency with prior submittals and the conditions of this decision.	OOC Special Condition 23	Eversource	Complete	Submitted on 3/29/2022	3/29/2022	assume approved with no comments received
5d	At least 45 days prior to the anticipated start of construction a copy of the Soil and Groundwater Management Plan to the Commission for review and approval.	OOC Special Condition 23	Weston and Sampson	Complete		10/20/2021	assume approved with no comments received
6a		OOC Special Condition 24	Epsilon/Contractor	Not started	Contractor and schedule pre-con site meeting with Con Com		

6b	At least one week prior to the anticipated start of construction provide the Commission with the name(s) and contact numbers(s) of the person(s) responsible on site for compliance with this Order, including the on-site Environmental Monitor.	OOC Special Condition 24	Epsilon	Not Started	Epsilon will work with ES and Contractor	in draft SWPPP submitted 3/4/2022	send final copy of SWPP and ECM
6c	At least one week prior to the anticipated start of construction provide the Commission with the signed Certificate of Understanding, signed by both Eversource and on-site supervisor responsible for the project.	OOC Special Condition 24	Eversource/Contractor	In Progress	Epsilon will work with ES and Contractor		
DURING CONSTRUCTION							
1	The Stow Conservation Commission shall be notified of the time and location of regular project meetings relative to construction within the Town of Stow and provided with copies of meeting notes as applicable.	OOC Special Condition 26	Eversource				
2	All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.	OOC General Condition 18	Contractor				
3	All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollutant Discharge Elimination System Construction General Permit as required by Stormwater Standard 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.	OOC General Condition 19	Contractor				
4	Sediment and erosion control devices shall be installed in accordance with the final plan by Eversource prior to the beginning of Phase 1 construction, and shall be maintained for the duration of construction on the site. If there is a gap between Phase 1 and Phase 2, Eversource shall be responsible for monitoring and maintaining erosion controls and site stabilization until Phase 2 commences or until a Partial Certificate of Compliance is issued for Phase 1 in accordance with the condition below. A second erosion control barrier inspection shall be required prior to the commencement of Phase 2, and the Commission may require that erosion controls be replaced or repaired by the Department of Conservation and Recreation at this time in order to maintain their full functionality	OOC Special Condition 27	Contractor				
5	The erosion controls shall serve as a limit of work and no activity, including stockpiling or storage of material, is permitted beyond the sediment controls. The sediment and erosion control specifications in this Order and on the final plans will be the minimum standards for this project; the Commission may require additional measures. These will be maintained in good repair until the disturbed area is re-vegetated and stabilized to the satisfaction of the Stow Conservation Commission at which time they must be removed. The Stow Conservation Commission shall be contacted and approval obtained prior to removal of sediment and erosion controls.	OOC Special Condition 28	Contractor				
6	The areas of construction shall remain in a stable condition at the close of each construction day. All trenches shall be backfilled or secured at the completion of each work day. Sediment and erosion controls shall be inspected daily and repaired or reinforced or replaced as necessary, with any accumulated sediments removed as needed. A stockpile of additional sediment and erosion controls shall be maintained on the site for this purpose.	OOC Special Condition 29	Contractor				
7	The Commission shall be notified if dewatering is deemed necessary during construction activities and given an opportunity to review the proposed location and method of dewatering prior to the commencement of dewatering activities. No direct discharge to a waterbody is permitted. No overland discharge of water is allowed within 100 feet of vegetated wetlands.	OOC Special Condition 30	Contractor/Eversource				
8	Concrete wash-out water shall not be discarded within the 100' buffer or within 100' of any drainage system that may discharge to wetlands or outside of the limit of work. All washout materials will be managed with an appropriate BMP. If concrete is spilled during construction, spilled materials shall be removed from the buffer zone and disposed of properly	OOC Special Condition 31	Contractor				
9	SWPPP Inspection reports shall be provided to the Commission electronically within 48 hours of completion. The Commission shall be kept apprised of any corrective actions needed and taken.	OOC Special Condition 32	EM				
10	If on-site excavation or other site work during Phase 1 or Phase 2 reveals any soil contamination in reportable concentrations or quantities, the Stow Conservation Commission shall received notification concurrent with Mass DEP and shall be copied on all correspondence relating to site investigation and remedial actions. Remedial activities may require filing of an additional Notice of Intent in accordance with the Wetlands Protection Act and Stow Wetlands Bylaw.	OOC Special Condition 33	EM/Eversource				
11	If disturbed areas are not permanently stabilized by the end of the growing season, the owner must monitor the area and install or repair sediment and erosion controls to protect the resource area until the site is stabilized.	OOC Special Condition 34	Contractor/Eversource				
12	There shall be no outside storage of chemicals, oil, fuel, fertilizer, or other potentially hazardous materials within the limit of work. No refueling shall occur within the 100' buffer. A spill containment kit shall be kept on site at all times.	OOC Special Condition 35	Contractor				

13	All waste and excavated material including railroad ties and tracks shall be disposed of in accordance with applicable laws. Any fill or borrow material brought onto the project site in Stow from outside of Stow shall be 1) re-located from qualified immediately adjacent residential areas per DEP's Best Management Practices for Controlling Exposure to soil during the Development of Rail Trails; 2) certified as clean fill by the supplier; or 3) subject to analytical testing.	OOC Special Condition 36	Contractor				
14	All imported soils shall be clean and reasonably free of invasive species. No soil contaminated with Japanese knotweed and/or knotweed rhizomes may be reused in Stow. The Environmental Monitor shall identify and document any areas contaminated with Japanese knotweed within 500' of the eastern and western Town of Stow line prior to commencing construction.	OOC Special Condition 37	Contractor/EM				
POST-CONSTRUCTION							
1	Eversource shall notify the Commission upon the completion of the work in Phase 1. Eversource shall be required to maintain erosion controls and site stabilization until a Phase 1 Partial Certificate of Compliance is received by Eversource or the Conservation Commission receives formal notification via OCR that they are commencing Phase 2 and a Certificate of Understanding is received from OCR per Condition #25.	OOC Special Condition 38	EM/Eversource				
2	Certificates of Compliance: Phase 1: If Eversource desires a Partial Certificate of Compliance, it may submit the following to the Stow Conservation Commission: a. A letter from the applicant requesting a Partial Certificate of Compliance. b. A written statement from a registered professional engineer of the Commonwealth and as-built plan signed and stamped by a registered professional engineer or land surveyor certifying that the project has been constructed as shown on the plan(s) and documents referenced above, and as conditioned by the Commission. c. A letter from the Department of Conservation and Recreation assuming responsibility for the management of the site beginning on the date of issuance of the Partial Certificate of Compliance. if Phase 2 is abandoned, and the site is fully stabilized, Eversource may submit a request for a Final Certificate of Compliance at the conclusion of Phase 1 with the following: a. A letter from the Department of Conservation and Recreation indicating that Phase 2 has been abandoned b. A plan for the long-term maintenance and vegetation management of the project site consistent with the Perpetual Conditions in this Order of Conditions and any other restrictions applicable.	OOC Special Condition 39	Eversource				
3	No dumping of leaves, woody debris, dog waste, excessive snow and any other materials is permitted in or within 100' of wetland resource areas, including the Riverfront Area	OOC Special Condition 40	Contractor				
4	Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.	OOC General Condition 12	Eversource				
5	Within thirty (30) days of the completion of the transmission line project, or as otherwise approved by the Division, the Applicant shall submit a compliance report containing, including a summary of construction timelines and photographs, to the Division documenting the completion of the project.	MESA No Take Determination (NHESP No. 15-34327) Condition 4	EM/Eversource				

EVERSOURCE ENERGY
Project Name: Eversource Sudbury-Hudson Transmission Reliability Project
Town: Sudbury

List of Applicable Permits: OOC #301-1287; MESA No Take Determination (NHESP No. 15-34327); Stormwater Management Permit (SWMP #20-07)

Date: 5/5/2022

= Completed Action

Task #	Action Item	Permit Citation	Responsible Party	Status	Comments	Date Complete or Submitted	Date Approved (if applicable)
PRIOR TO CONSTRUCTION							
1	Prior to commencement of work, the Applicants shall provide the executed Memorandum of Understanding between Eversource and the Department of Conservation and Recreation and the agreements between the Massachusetts Bay Transportation Authority and the Applicants, to ensure the obligations of the project are fulfilled.	OOC Special Condition: Part I: General Conditions: For Phase I and Phase II - O	Eversource	Complete		DCR (3/29/2022) MBTA (5/5/2022)	Not Applicable
2	A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words, " Massachusetts Department of Environmental Protection" [or 'MassDEP"] File Number :"301-1287"	OOC General Condition 10	Contractor	Not Started	Epsilon will work with Contractor to complete		
3	Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.	OOC General Condition 17	Epsilon	Not Started	Epsilon will schedule and complete as necessary		
4	No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work ..	OOC General Condition 9 and Special Condition Part I: General Condition, Item G	Eversource	Complete	Recorded on 3/18/2021	3/22/2021	Not applicable
5	The baseflow and baseline water quality of all Cold Water Fisheries shall be established pre- construction. Baseline monitoring shall be accomplished to ensure there is no degradation of water quality over time from this project. The Applicants shall submit a detailed plan, subject to the Commission's approval, to specify water quality monitoring parameters, including times, methodology, analyses and reporting. Post construction, monitoring may be required and may continue in the Certificate of Compliance based on monitoring result up to that time.	OOC Special Condition: Part I: General Conditions: For Phase I and Phase II - Q	Epsilon	Complete	SWCA will complete testing and submit report with results at start of active construction then continue testing with monthly reports during construction	9/9/2021	9/13/2021
6	Prior to commencement of each Phase, the Conservation Commission or its Agent shall map the corridor for the presence of invasive species within and adjacent to the limit of work. The information generated from this mapping shall be used to identify any new invasive species populations or significant expansions of invasive species that are a direct result from the Project. Mapping shall be used by the Applicants to implement a program to control invasive species populations to ensure the functions of wetland resource areas in the limits of work that have been restored with native vegetation are not subject to degradation by expansion of invasive species. If the Commission or its agent determines that the Project resulted in new or significantly expanded invasive populations, the Applicants shall implement a program to control these populations to ensure the project does not result in additional degradation of wetland resource areas.	OOC Special Condition: Part I: General Conditions: For Phase I and Phase II - R	SWCA	Complete	Mapping reviewed and edited as per comments with Agent and then submitted to Con Com for review and approval on December 16, 2021. Approved by Commission at the 1/24/2022 meeting. Final version sent via link on 1/26/2022.	1/26/2022	Not applicable
7	Measures shall be implemented to protect Eastern Box Turtles during construction. Prior to the start of work, a final Eastern Box Turtle Protection Plan must be submitted to the Division and Commission for review and approval, and must be implemented as approved. Said Plan must include detailed turtle protection measures to be implemented by the Applicants. If changes to said Plan are proposed, a revised Plan must be submitted to the Division for review and prior written approval. The Commission shall be provided a copy of the final Eastern Box Turtle Protection Plan along with any modifications thereto.	OOC Conditions Related to Endangered Species Management For Phase I and Phase II - C	Eversource	Complete	Final Turtle Protection Plan for Phase 1 submitted to MNHESP by AECOM on 8/2/2021. Approved by MNHESP on 8/13/2021	9/23/2021	Not applicable
8	Prior to the start of work, the Applicants must submit to the Division and Commission, for review and approval, a native seed mix proposed for any planting or loam and seed activities.	OOC Conditions Related to Endangered Species Management For Phase I and Phase II - D	Eversource	Complete	Native seed mix was adjusted in August 2020 during Con Com hearings and approved by NHESP. Included on approved Plan Set (Sheet 161)	9/23/2021	Approved upon issuance of OOC on 2/4/2021
9	Work with Conservation Commission to get an independent Environmental Monitor, hired by the Conservation Commission and paid for by the Applicant prior to the start of construction.	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - A	Eversource	In Progress	Draft proposal sent to Eversource on 4/28. Eversource to provide comments and finalize agreement for approval by Con Com at 5/23 meeting		

10	At least four weeks prior to any land disturbance, an Invasive Species Management Plan shall be developed and submitted to the Conservation Commission for review and approval. Said Management Plan shall involve removal of invasive species and revegetation with native species for a period of five (5) years from a minimum of3.3 acres of land within the MBTA Right-of-Way, but outside the proposed limit of work, and shall focus efforts on improving wildlife habitat in areas identified through the Wildlife Habitat Evaluation and peer review thereof as being most impacted from proposed work. Following implementation, the Invasive Species Management Area shall be managed in accordance with Perpetual Condition b. contained within this Order	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - B	SWCA	Complete	Plan reviewed and edited as per comments with Agent and then submitted to Con Com for review and approval on December 16, 2021. Approved by Commission at the 1/24/2022 meeting. Final version sent via link on 1/26/2022.	12/16/2021	01/24/22
11	At least two weeks prior to any land disturbance, a Soil and Groundwater Management Plan (SGMP) prepared in conjunction with the selected contractor shall be submitted to the Conservation Commission for review and comment. The Applicant shall give due consideration to address comments received from the Commission that are needed to protect wetland resource areas functions and values. The SGMP will develop means and methods to manage soils and groundwater encountered during project construction activities including soil excavation, groundwater dewatering, and railroad tie and track removal. If conditions are encountered that suggest soil may require additional evaluation or special handling based on visual, olfactory, or field screening results, excavation activities in that area will immediately be stopped and Eversource, their Licensed Site Professional, and the Conservation Commission will be contacted immediately to evaluate the observations and recommend requirements for proper handling. The Commission shall be copied on all related correspondence.	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - C	Eversource	Complete	The Plan was originally submitted on October 20, 2021 and there are been several rounds of review and revision. The plan has been approved the the Commission and is now final and submitted on 1/31/2022.	10/20/2021	1/31/2022
11a	Provide the Conservation Agent with the specific "dust supression" methods to be implemented by the Contractor within wetland jurisdiction.	OOC Conditions Specific to Phase 1: Eversource Underground Transmission Line-D	Eversource/Epsilon	In Progress			
12	At least two weeks prior to any land disturbance, a structural engineer and wildlife biologist shall inspect the culverts and drainage structures within the Project Site to determine whether they are structurally sound to (a) function hydrologically, (b) withstand the planned construction activities, and (c) evaluate their wildlife migration functions, and shall provide a report of the finding to the Commission. If any culverts do not meet these requirements or is damaged during construction, it shall be repaired or replaced with a culvert that meets current MA Stream Crossing Standards to the maximum extent practicable, as determined by the Commission or its Agent. Any recommended improvements to these structures, not included in this Notice, shall be required to submit a separate Notice of Intent and/or an Amendment to this Order to the Commission for further evaluation. Following completion of Phase I and Phase II a similar structural evaluation shall be conducted to confirm work did not affect culverts and drainage structures.	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - D	Eversource	Complete		9/23/2021 and 10/20/2021 (with corrections)	Not Applicable
13	At least three weeks prior to any land disturbance, a Project Compliance Manual that includes the requirements from compliance from the various permits for the Project, including this Order and Conditions herein, shall be submitted to the Conservation Commission for review to confirm that the requirements of this Order are accurately stated.	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - E	Epsilon	In Progress	submitted draft to L. Capone on 4/14/2022. Will receive edits, update manual and send back to Commission for final approval on 5/23 meeting		
14	At least two weeks prior to the start of Phase I, the Applicant shall provide a construction schedule detailing construction activities and sequencing. This shall be amended as necessary throughout construction. Weekly reports shall be submitted to the Commission that details work completed each week and anticipated work for the coming week, including identifying when work is located in areas of potential elevated levels of soil and groundwater contamination. These reports shall include anticipated dewatering activities so that oversight can be provided by the Commission or its Agent, if found necessary, and include the location of active stockpiles with confirmation that appropriate erosion control measures are being implemented.	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - F	Contractor/Eversource	Complete	Epsilon will work with ES and Contractor to update prior to the start of construction as necessary	1/31/2022	Not Applicable
15	At least two weeks prior to the start of Phase I, the Applicant shall provide the final Stormwater Pollution Prevention Plan (SWPPP) to the Commission for review and approval. Any use of permanent infiltration BMPs for temporary construction-related stormwater management shall be specifically addressed in the SWPPP and protocol for removal of fine silt and sediment from these BMPs shall be conducted at the completion of Phase I. If a response is not received by the Conservation Commission within 10 days of receipt, the SWPPP shall be deemed approved. Any changes made to the SWPPP during the course of the project shall be submitted and approved by the Commission prior to implementation	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - G	Epsilon	In Progress	Draft sent to Commission on 2/25/2022, received comments from L. Capone on 3/7/2022. Sent final SWPPP document with ECM on 4/14/2022. Expect approval by Con Com at 5/23 meeting.		
16	The Limit of Work/erosion control location shall be survey located in the field and certified by a Mass Registered Professional Land Surveyor, installed under the oversight of the Applicant's Environmental Monitor, and reviewed by the Commission and/or its Agent prior to commencement of any site work	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - J	Contractor	In Progress	will send documentation when complete.		
17	Prior to any site disturbance, with the exception of the installation of the erosion control barrier, the Applicant shall schedule a pre-construction site visit with the Conservation Coordinator as least one week prior to commencement of work. At a minimum, those in attendance at this site visit should include the Applicant, construction supervisor, and environmental monitors involved in the project	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - K	Epsilon	Not Started	Epsilon will coordinate this site visit		

18	The Applicant's wildlife biologist or other qualified individual shall document the location of all important habitat features that will be removed (such as brush piles, snags, overhanging trees, logs within or near the water, large woody debris, etc.) to quantify the number of features removed and provide confirmation that work did not result in-the-loss of important wildlife habitat features. Brush, large woody debris, and logs shall be replaced within or near the water, generally in the location of where they were removed. Reports shall be provided to the Conservation Commission at least every six (6) months, for the life of the Order, documenting wildlife habitat removal and restoration efforts implemented, including monitoring of vernal pools	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - I	SWCA	Complete	Complete	12/8/2021	Not Applicable
19	The contractor shall provide detailed plans of the crane mat location and installation a minimum of one week prior to installation. All work and impacts associated with installation, removal, and stabilization of the crane areas shall be conducted in strict compliance with the Project Plans and Details and shall be reviewed and approved by the Commission and/or its Agent prior to installation and shall be installed under the supervision of the independent Environmental Monitor	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - P	Contractor	In Progress	Epsilon will work with the Contractor to complete.		
20a	The Applicant shall submit $10,000.00 for the purpose of the Town hiring a construction monitor to perform the inspections set forth in Section II. R. below for compliance with the stormwater management permit, design, and plans. If prior to completion of the Project, the Board finds that this initial deposit is not sufficient to cover actual costs incurred by the Town for these purposes, the Applicant shall be required to submit forthwith such additional amount as is deemed required by the Board to cover such costs. If the actual cost incurred by the Town for such purposes is less than the amount on deposit as specified above, the Board shall authorize that such excess amount be refunded to the Applicant concurrently upon issuance of a Certificate of Completion.	Stormwater Management Permit: II. Conditions and Requirements - C	Contractor/Eversource	Complete	Bartone sent check to PB - check cashed	Apr-22	Not applicable
20b	The Project will disturb more than one acre of land and is therefore required to obtain coverage under the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit. Draft Stormwater Pollution Prevention Plans (SWPPP) have been included in the application. The draft SWPPP includes recommended construction period pollution prevention and erosion and sedimentation controls. For each Project Phase, the final SWPPPs with all applicable attachments shall be submitted to the Board for review and approval prior to commencement of any work in connection with the Project. If a response is not received within 10 days of receipt, the Plan shall be deemed approved. All work on the Project Site shall be conducted in accordance with the requirements of those permits and plans. Any changes made to the SWPPP during the course of the project shall be submitted and approved by the Planning Board or its representative prior to implementation.	Stormwater Management Permit: II. Conditions and Requirements - C	Contractor/Eversource	Complete	Sent draft SWPPP to PB on 3/9/2022. This version included all of Sud CC's comments and Hudson CC's comments. No response from PB as of 5/5/2022.	3/9/2022	No response within 10-days of receipt. Assume approved as per condition
20c	A performance bond shall be submitted and held by the Planning Board until the paved rail trail, multi-use path is constructed, the Premises are fully stabilized with vegetation, and the stormwater structures have been cleaned and deemed functional by the Director of Public Works. The initial bond amount shall be established by the Town Engineer and may be adjusted at the discretion of the Town Engineer based on a detailed estimate provided by the Applicant. The bond amount may be reduced as progress is made during construction subject to review by the Town Engineer and approval of the Planning Board.	Stormwater Management Permit: II. Conditions and Requirements - C	Contractor/Eversource	In Progress	Eversource sent estimate to Engineering and PB on 5/1/2022. Breakdown of costs requested. Eversource organizing requested info.		
20d	The Applicant shall provide for review and approval by the Planning Board or a representative a construction schedule detailing construction activities and sequencing, that limits the area of the Site disturbed at any one time to the extent possible to mitigate environmental impacts and risk of erosion. If a response is not received within 10 days of receipt, the Schedule shall be deemed approved. The schedule shall be updated as necessary throughout construction and provided to the Planning Board.	Stormwater Management Permit: II. Conditions and Requirements - C	Contractor/Eversource	Complete	Schedule with sequencing sent with SWPPP on 3/9/2022	3/9/2022	No response within 10-days of receipt. Assume approved as per condition
20e	At least two weeks prior to any land disturbance, a structural engineer shall inspect the culverts and drainage structures within the Project Site to determine whether they are structurally sound to (a) function hydrologically and (b) withstand the planned construction activities and shall provide a report of the findings to the Planning Board. If any culvert does not meet these requirements or is damaged during construction, it shall be replaced with a culvert that meets current MA Stream Crossing Standards to the maximum extent practicable, as determined by the Sudbury Conservation Commission or its Agent. Any recommended improvements to these structures, not included in this Permit, shall be required to submit a separate permit application and/or permit amendments for further evaluation.	Stormwater Management Permit: II. Conditions and Requirements - C	VHB	Complete		9/23/2021	Not Applicable
20f	This Decision and the Operations and Maintenance Plan shall be recorded in the Middlesex South District Registry of Deeds, within the chain of title of the affected property. The recording information shall be submitted to the Planning Board.	Stormwater Management Permit: II. Conditions and Requirements - C	VHB	Complete		8/19/2021	Not Applicable
20g	An Illicit Discharge Compliance Statement, signed by the Applicant, shall be submitted to the Planning Board.	Stormwater Management Permit: II. Conditions and Requirements - C	DCR	Not Applicable to Phase 1	Not Applicable to Phase 1	Not Applicable to Phase 1	Not Applicable to Phase 1
20h	The Soil and Groundwater Management Plan (SGMP) prepared in conjunction with the selected contractor and meeting the requirements of the Sudbury Conservation Commission as conditioned in the Order of Conditions shall be submitted to the Planning Board.	Stormwater Management Permit: II. Conditions and Requirements - C	SWCA	Complete		1/31/2022	Not Applicable
20j	A Project Compliance Manual shall be submitted to the Planning Board for review and approval. The document shall include the requirements for compliance with the various permits for the Project, including this Decision and Conditions herein. If a response is not received from the Planning Board or its representative within 10 days of receipt, the Project Compliance Manual shall be deemed approved.	Stormwater Management Permit: II. Conditions and Requirements - C	Epsilon	In Progress	ECM sent to L. Capone for review and comment. Once updated with comments will be sent to PB for review		
20j	The Applicant shall provide to the Planning Board copies of both the executed Memorandum of Understanding between Eversource and Department of Conservation and Recreation and the lease agreement between Eversource and the MBTA to ensure the obligations of the project are fulfilled.	Stormwater Management Permit: II. Conditions and Requirements - C	Eversource	In Progress			

20k	The project engineer, contractors, and all subcontractors must be informed of the conditions in this Decision.	Stormwater Management Permit: II. Conditions and Requirements - C	Contractor/Eversource	In Progress	Epsilon will provide Env. Training prior to construction. PB and Con Com will be invited to training		
DURING CONSTRUCTION							
1	The Eastern Box Turtle Protection Plan (dated 5/31/2018) must be implemented as proposed.	MESA No Take Determination (NHESP No. 15-34327) Condition 1	Contractor				
2	The Corridor Management Plan for Massachusetts Central Rail Trail and Sudbury-Hudson Transmission Reliability Project (dated 5/31/2018) must be implemented as proposed	MESA No Take Determination (NHESP No. 15-34327) Condition 2	Contractor				
3	Timing restrictions for construction activities within Whip-poor-will habitats must be implemented, as proposed unless otherwise approved by the Division.	MESA No Take Determination (NHESP No. 15-34327) Condition 3	Contractor				
4	An independent Environmental Monitor, hired by the Conservation Commission and paid for by the Applicant, shall be provided to oversee the following activities: 1. Review the erosion control barrier following installation but prior to any land disturbance and each year prior to vernal pool species migration. Conduct spot inspections of vernal pools during construction and/or review reports provided by the Applicant's environmental monitor to ensure no negative impact to vernal pools during construction. 2. Be on site during initial tree removal and invasive species clearing activities, within the limit of work. 3. Review and ensure appropriate reporting of all activities associated with construction scheduling, erosion control monitoring, compliance with the project's SWPPP, and environmental monitoring activities including ensuring adherence to time of year restrictions. 4. Be on site during bridge platform installation and spot inspections during bridge construction. 5. Be notified of all dewatering activities and be on site during dewatering in sensitive locations, i.e. whenever excavation is proposed within 50 feet of a wetland, or when extensive dewatering will be needed. Specific oversight locations will be determined with the contractor, prior to commencement of work. 6. Review restoration/mitigation areas including being on site during the construction of the wetland replication area. 7. Be on site to oversee excavation/construction activities over culverts and drainage structures. 8. Be available to respond to emergency situations, should they arise.	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - A	Eversource				
5	All Time-of-Year restrictions and sweeps required by the Natural Heritage and Endangered Species Program shall be followed. Time-of-Year restrictions for work within 450 feet of all vernal pools shall be March 1 through June 1. Between March 1 and June l, the Applicants' Environmental Monitor shall conduct sweeps prior to vehicles traveling down the project site within vernal pool buffers (including certified, certifiable, and presumed vernal pools). Between April 1 and October 31, the Applicants' environmental monitor shall conduct turtle sweeps prior to initiation of work each day, or prior to vehicles travelling through the Box Turtle Protection Area.	OOC Special Condition: Part I: General Conditions: For Phase I and Phase II - P	Contractor/EM				
6	All equipment, including timber mats, shall be cleaned and certified invasive species free, prior to entering the site. Such certification shall be provided to the Commission prior to commencement of mobilization into the site and when remobilized within the project site	OOC Special Condition: Part I: General Conditions: For Phase I and Phase II - W	Contractor				
7	The site shall be accessed predominantly from public ways. If alternative access points are needed, the Applicants will first direct the contractor to use previously disturbed areas outside wetlands jurisdiction. If alternative access is found to be needed within wetlands jurisdiction, access may be permitted within previously disturbed areas that will not require additional vegetation removal or additional impacts to wetland resource areas, with approval from the Commission's representative. No equipment turnaround locations outside the limit of work are permitted.	OOC Special Condition: Part I: General Conditions: For Phase I and Phase II - S	Contractor/Eversource				
8	All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.	OOC General Condition 18	Contractor				
9	All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollutant Discharge Elimination System Construction General Permit as required by Stormwater Standard 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.	OOC General Condition 19	Contractor				
10	Laydown areas shall be located predominantly outside resource areas subject to the Commission's jurisdiction. If any construction laydown area is proposed outside of the currently proposed work limits and in an area subject to the Commission's jurisdiction, an erosion control plan shall be submitted in advance to the Commission's representative for review and approval.	OOC Special Condition: Part I: General Conditions: For Phase I and Phase II - T	Contractor/Eversource				
11	Any fill used in connection with this project shall be clean fill, containing no trash, refuse, rubbish or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles or parts of any of the foregoing.	OOC Special Condition: Part I: General Conditions: For Phase I and Phase II - U	Contractor				
12	No equipment cleaning or refueling may occur within a wetland or upland resource area, with the exception of the crane. For cranes positioned within wetland jurisdiction for more than one day, the Applicant shall provide secondary containment to contain any leaks that may emanate from equipment.	OOC Special Condition: Part I: General Conditions: For Phase I and Phase II - V	Contractor				
13	Heavy mechanical equipment (exerting a ground pressure of 3 psi or greater) will not be allowed in areas where final grading, aeration, and vegetation restoration/mitigation have been completed, including restored and replicated wetland resource areas. Following completion ofrestoration areas, erosion controls or other method of demarcation shall be implemented to prevent further alteration of restoration areas	OOC Special Condition: Part I: General Conditions: For Phase I and Phase II - X	Contractor				
14	All areas of disturbance shall be monitored for invasive species, which shall be manually removed if encountered, for the duration of the project and until such time as a minimum of90% native vegetative cover is established.	OOC Special Condition: Part I: General Conditions: For Phase I and Phase II - Y	Contractor/EM				
15	The wetland replication area and land adjacent thereto shall be monitored for invasive species, and manually removed when found, for the life of the Order. The wetland replication area shall be considered substantially restored when it contains a minimum of 90% cover with native species. Replications that do not properly restore the functions and values of altered resource areas will not be deemed acceptable no matter how closely they adhere to approved engineered plans	OOC Special Condition: Part I: General Conditions: For Phase I and Phase II - Z	EM				
16	There shall be no drafting of water from wetland resource areas for dust control, for watering plantings, or any other activity.	OOC Special Condition: Part I: General Conditions: For Phase I and Phase II - AA	Contractor				

17	Every effort shall be made to reduce soil compaction. Compacted soils shall be aerated prior to· being revegetated	OOC Special Condition: Part I: General Conditions: For Phase I and Phase II - BB	Contractor				
18	Unless otherwise approved by the Division, construction activities within Priority Habitat must not occur during the Eastern Whip-poor-will breeding season (May 1 -August 1), as proposed. The Applicants shall endeavor to refrain from construction activities within Priority Habitat from April 15 to August 1.	OOC Conditions Related to Endangered Species Management For Phase I and Phase II - F	Contractor				
19	Work within 450 feet of vernal pools is prohibited between March 1 and June 1. The Applicants shall have a qualified Environmental Monitor on site to monitor vehicular traffic during this Time of Year restriction, should a suitable alternative route not be available.	OOC Conditions Related to Endangered Species Management For Phase I and Phase II - H	Contractor/EM				
20	The Applicant shall ensure there is a qualified Environmental Monitor(s) on site at all times overseeing work that is subject to this Order. The Environmental Monitor(s) shall send weekly erosion control inspection reports and reports following any storm event of½ inch of rain or greater, to the Conservation Commission	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - I	EM				
21	During initial vegetation removal, trunks shall be retained but cut as close to the ground as possible. Following installation and approval of erosion controls, stumps and roots may be grubbed, if necessary. Stumping and grubbing activities shall not adversely affect woody vegetation or soils outside the erosion control barrier. Logs, stumps, and other large woody debris in and/or overhanging the resource areas shall be left undisturbed to maximize food source and habitat	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - M	Contractor				
22	Tree/limb clearing shall be minimized to only that which is required to access the project site with equipment and to conduct the approved work. Equipment shall be chosen which minimizes required clearing to the maximum extent practicable. The Applicant shall retain as many limbs overhanging the limit of work as possible. Prior to tree felling, the Applicant shall walk the corridor with the Commission or its Agent to determine the extent of canopy that can be retained	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - N	Contractor/Eversource				
23	Vegetation removed from the site shall be chipped directly into a truck and removed from the project site. Woody material for reuse on site for the creation of wildlife habitat features shall be identified and retained	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - O	Contractor				
24	Dewatering activities shall be located as far as possible from wetland resource areas and shall be prohibited from discharging to Bordering Vegetated Wetlands, Isolated Vegetated Wetlands, Land Under Water Bodies and Waterways, or within the inner Riverfront Area. Dewatering may only occur in other upland resource areas provided adequate control measures are implemented and locations are identified by the contractor and review and approved by the Commission and/or its agent prior to implementation	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - Q	Contractor/Eversource				
25	The Conservation Commission and their representative shall be notified at least three (3) business days in advance of the removal of the crane mats at Bridge 127	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - R	Eversource				
26	Other than the grading of minor amounts of soil within the immediate vicinity of the Hudson/Sudbury town boundary, no soil excavated from Hudson may be used in Sudbury. The Sudbury Conservation Commission shall be copied if the Hudson Conservation Commission is notified of any remedial activities or changes to the work plans required due to the potential presence of PFAS in jurisdictional areas in Hudson.	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - S	Contractor/Eversource				
27	The Applicant shall ensure that any reuse of on-site soils shall not result in the degradation of soil or groundwater in the area.	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - T	Contractor				
28	Stockpiling of materials within the ROW shall be limited in size and duration (one-week maximum) and shall be located as far from sensitive areas as possible. Soil stockpiles shall be covered with tarp or plastic sheet and surrounded by erosion controls. Excess soil not reused within the Project site shall be stockpiled outside the ROW and wetland jurisdiction. Weekly reports prepared by the Environmental Monitors throughout construction will identify-the locations of active stockpiles and will confirm that the appropriate erosion control measures are being implemented.	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - U	Contractor/EM				
29	Additional test pits/borings at the location of each proposed "area of increase infiltration" shall be conducted during construction to verify soil conditions, infiltration rates, and groundwater levels, and provided to the Conservation Commission for review. At a minimum, soil tests shall be conducted in the vicinity of Stations 502+00, 511+00, 570+00, and 579+00. A report of the findings, comparison with expectations, and a statement on the appropriateness of the design shall be provided to the Conservation Commission for review. If findings are not consistent with the assumptions made for the stormwater management design, revisions to the design and approval of modifications to the Plan may be required	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - V	Contractor/Eversource				
30	Infiltration basins shall not be used as sediment basins during construction. Additional erosion controls shall be installed to protect infiltration basins from sedimentation until contributing areas are stable.	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - W	Contractor				
31	The Conservation Commission and/or their agent shall inspect all permanent stormwater infiltration BMPs for acceptance prior to construction demobilization to a new location within the ROW.	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - X	Eversource				
32	Mitigation, and restoration efforts within the limit of work, shall be implemented during the first growing season following commencement of work. Written reports shall be submitted by December 1 of each year the Order is active that details mitigation efforts that have been implemented, success of implementation, and anticipated activities the following growing season. Mitigation and Restoration areas shall be deemed substantially in compliance when there is a minimum of 90% cover with native species and free of invasive species	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - Y	EM				
33	Areas adjacent to vernal pools shall be revegetated immediately following the completion of all necessary grading in these area, and the revegetation in these areas shall be monitored so erosion controls can be removed as soon as field conditions allow. Mitigation plantings around the vernal pool margins shall be monitored for successful establishment for a minimum of two growing seasons and annual reports documenting establishment shall be submitted to the Commission	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - Z	Contractor/EM				
34	Prior to planting, the Applicant's Environmental Monitor shall inspect, approve, and provide photo documentation of all plant stock. Any species substitutions must be provided to the Commission, in writing, including a justification for substation, for review and approval prior to implementation	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - AA	EM				
35	The wetland replication area shall be constructed during vegetation removal in the vicinity of the replication area and prior to the construction of structures in that vicinity	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - BB	Contractor				
36	All plantings must survive for at least two growing seasons or be replaced at the expense of the Applicant.	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - CC	Contractor/Eversource				
37	Loam borrow brought to the site to stabilize the work area after completing Phase 1 shall be sourced appropriately. Use of impacted soils (from contamination or invasive seed) shall be prohibited.	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - DD	Contractor				
38	No spoils of construction, construction material, or equipment shall be stored, placed or operated in the wetland resource areas or the wetland buffer zone except as may be permitted by this Order for work in the riverfront and upland resource area. These activities may not occur within the bordering vegetated wetland or within bordering land subject to flooding.	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - EE	Contractor				
39	In any part of the Project work limits within 200 feet of a road crossing where the MBTA ROW crosses a Zone II for the Sudbury Water District supply wells, if a clay layer is encountered in the excavation for the transmission line and the excavation will extend below the bottom of the clay layer, the clay shall be stockpiled and reused to backfill and line the excavation before the transmission line duct bank is placed in that location	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - FF	Contractor				
40	There shall be no disturbance beyond the limits of activities permitted as part of this Order	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - GG	Contractor				
41	Every effort shall be made to restore disturbed area with a similar soil composition to that which is was removed	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - HH	Contractor				

42	No deicing products shall be used within the project site. Snow may be stockpiled within the limit of work only or shall be removed from the site to an appropriate facility outside wetlands resource areas.	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - II	Contractor				
43	Erosion control shall be installed per the approved plan and maintained as necessary to prevent erosion and sedimentation from entering the resource areas. It is the Applicants' responsibility to take appropriate measures to control sedimentation into the wetland resource areas	OOC Part III: Erosion, Sedimentation, Stabilization Conditions for Phase I and Phase II - A	Contractor				
44	Perimeter erosion controls shall be installed along the down gradient side of disturbed areas where topography is directed towards other portions of the existing/proposed trail work area	OOC Part III: Erosion, Sedimentation, Stabilization Conditions for Phase I and Phase II - B	Contractor				
45	Stabilization of slopes shall be accomplished as soon as possible. Biodegradable jute netting shall be properly anchored in place, secured with non-chemically treated biodegradable materials. Should non-biodegradable fasteners be needed, with prior approval by the Commission and/or its agent, the Applicants may use non-biodegradable fasteners with the condition that the Applicants shall provide confirmation that all fasteners have been removed once the area is deemed fully stabilized by the Co.mmission and/or its representative.	OOC Part III: Erosion, Sedimentation, Stabilization Conditions for Phase I and Phase II - C	Contractor				
46	Appropriate netting shall be installed under the bridge 128 during bridge work to prevent debris from- entering the stream. The Applicants shall contact the Conservation Office once installed for review prior to commencement of bridge work	OOC Part III: Erosion, Sedimentation, Stabilization Conditions for Phase I and Phase II - D	Contractor/Eversource				
47	Following Land Under Water Restoration, erosion controls shall be removed once fully stabilized and the Conservation Commission or its representative has confirmed stabilization, to protect the long- term water quality of the adjacent wetland waterways	OOC Part III: Erosion, Sedimentation, Stabilization Conditions for Phase I and Phase II - E	Contractor				
48	During Phase I, Eversource shall be responsible for installing and maintaining erosion controls within the project site. Following completion of Phase I, Eversource shall continue to maintain erosion controls until DCR commences Phase II, provided that Eversource shall remove erosion controls from areas stabilized at the completion of Phase I, as confirmed by the Commission or its agent. Every effort shall be made during Phase I to stabilize areas within vernal pool habitat immediately following final grade	OOC Part III: Erosion, Sedimentation, Stabilization Conditions for Phase I and Phase II - F	Contractor/Eversource				
49	Any changes during construction due to soil types found or other conditions discovered during construction shall require immediate notification of the Conservation Commission for a determination if the changes require revisions to this Order or the filing of a new Notice of Intent. Any modifications or revisions to the plans referenced, or any new plans, must be submitted to the Commission for review and a determination as to whether a new Notice oflntent is required. If this procedure is not followed, this Order may not be amended. No additional work not specifically allowed by this Order shall be accomplished on the site without the approval of the Sudbury Conservation Commission and the appropriate new filings or amendment requests are approved. Amendment procedures as described in the Wetlands Protection Act, the regulations, and the Department of Environmental Protection's Wetlands Program Policies shall be followed	OOC Part IV: Plan Modifications - A	Eversource				
50	No additional new construction or disturbance of a wetland resource area, as defined in the Wetlands Protection Act and its regulations, or within the l00' wetland resource area buffer zone, not covered by this Order of Conditions, shall be permitted on this site until a determination has been made by the Commission as to whether a new Notice of Intent is required, and the new work or disturbance is incorporated into a new or amended Order of Conditions. An adequate stockpile of unused erosion controls shall be available at or near the site	OOC Part IV: Plan Modifications - B	Contractor				
51	Should the Sudbury Conservation Commission become aware of work on site being accomplished that was not approved as part of the Order of Conditions or subsequent amendments, the Commission reserves the right to require a new Notice of Intent. The plan filed with the new Notice of Intent must be based on an interim as-built plan prepared by a registered engineer. The new Notice must provide a detailed description of the discrepancies between the approved plan and the site conditions to date. The Commission reserves the right to require as part of the interim as-built plan, but not be limited to requiring, new topography survey, new drainage calculations, and details or all disturbance within the wetland resource and the l 00' wetland buffer zone.	OOC Part IV: Plan Modifications - C	Eversource				
52	Fertilizers shall not be used within jurisdictional areas	OOC Part VI: Conditions In Perpetuity - C	Contractor				
53	No pesticides or herbicides are allowed within a wetland resource area, including the 200-foot riverfront area, or within 100-foot of a wetland resource area (the adjacent upland resource area under the local bylaw), except for spot treatment of Japanese knotweed, without additional review by the Conservation Commission	OOC Part VI: Conditions In Perpetuity - D	Contractor				
54	Underground storage of petroleum products is prohibited within a wetland resource area and within the 100' buffer zone of a wetland resource area	OOC Part VI: Conditions In Perpetuity - E	Contractor				
55	No coal tar-based sealants may be applied to any area draining into the upland or wetland resource areas of the property	OOC Part VI: Conditions In Perpetuity - F	Contractor				
56	There shall be no snow removal activities or de-icing products used on site, except as required for emergency situations	OOC Part VI: Conditions In Perpetuity - H	Contractor				
57	Access During Construction: The Applicant shall ensure safe and convenient vehicular access to the Project Site during the entire duration of the construction period. The Board and its representatives shall be permitted access to the Project Site to observe and inspect the site and construction progress until such time as the Project has been completed. When possible prior to Project Site access, reasonable advance notice will be made. Compliance with health and safety protocols for the Project Site will be followed.	Stormwater Management Permit: II. Conditions and Requirements - B	Contractor				
58	A Stormwater Construction Site Inspection Report (Stormwater Pollution and Prevention Plan Inspection Report) shall be generated by the Applicant or its representative for this Project, at a minimum, every two weeks during construction, and after every major storm event.	Stormwater Management Permit: II. Conditions and Requirements - D	EM/Eversource				
59	Access to the drainage structures for inspection and maintenance shall be kept clear of obstruction.	Stormwater Management Permit: II. Conditions and Requirements - E	Contractor				
60	Additional soil testing shall be conducted during construction in the vicinity of "areas of increased infiltration" to verify soil conditions, infiltration rates, and groundwater levels. At a minimum, soil tests shall be conducted in the vicinity of Station 502+00, Station 511+00, Station 570+00, and Station 579+00. A report of the findings, comparison with expectations, and a statement on the appropriateness of the design shall be provided to the Planning Board by the design engineer for review. If findings are not consistent with the assumptions made for the stormwater management design, revisions to the design and approval of modifications to the Plan may be required.	Stormwater Management Permit: II. Conditions and Requirements - F	Contractor/Eversource				
61	Construction reports with a summary of past week activities and look ahead at anticipated activities with advanced notification of anticipated phasing transitions shall be provided to Planning and Community Development on a weekly basis. On-site meetings shall be provided throughout construction, as needed and indicated by the Planning and Community Development Environmental Planner. Site stabilization measures should be reviewed for adequacy and adjustments to the sediment and erosion control plan may be considered to optimize site stabilization. Reports shall include the location of active stockpiles with confirmation that appropriate erosion control measures are being implemented.	Stormwater Management Permit: II. Conditions and Requirements - G	Contractor/Eversource				
62	Soil stockpiles shall be covered with tarp or plastic sheet and surrounded by erosion controls.	Stormwater Management Permit: II. Conditions and Requirements - H	Contractor				

63	Responsibility of sediment and erosion control will depend on project phasing. 1) During Phase I, Eversource shall be responsible for installing and maintaining erosion controls within the project site. Eversource may remove erosion controls from areas restored and revegetated as part of Phase I work if the Planning Board representative has inspected those areas and confirmed they are stabilized sufficiently. In the period between Phase I and Phase II, any erosion controls removed in areas that have been properly stabilized shall be reinstalled prior to commencement of Phase II. 2) During Phase II, DCR shall be responsible for installing and maintaining erosion controls on the Project Site during the performance of all Phase II construction activities, which may include utilizing erosion controls that were installed and maintained by Eversource if those erosion controls remain in proper condition and demarcate the limit of Phase II work. Otherwise, DCR shall install new erosion controls as required for Phase II, including in any restored and revegetated areas where Eversource was authorized to remove erosion controls. 3) Following completion of Phase II and inspection by a Planning Board representative, OCR shall be responsible for removal of all erosion control barriers.	Stormwater Management Permit: II. Conditions and Requirements - I	Contractor				
64	Proposed infiltration basins shall not be used as sediment basins during construction. Additional erosion controls shall be installed to protect infiltration basins from sedimentation until contributing areas are stable.	Stormwater Management Permit: II. Conditions and Requirements - J	Contractor				
65	Evaluation of appropriate screening for adjacent properties has not been completed. Alterations to the Landscape Plan shall be submitted to Planning and Community Development for review and approval. If a response is not received within 10 days of receipt, the Plan shall be deemed approved.	Stormwater Management Permit: II. Conditions and Requirements - K	Eversource				
66	Native plants should be used for plantings throughout the site.	Stormwater Management Permit: II. Conditions and Requirements - L	Contractor				
67	The following source control and pollution prevention measures shall be employed on the site to prevent contamination of stormwater runoff: 1) Debris shall be removed from the paved path regularly, ideally swept with a vacuum or regenerative air sweeper. 2) Measures shall be taken to control litter on the site. 3) No chemicals or hazardous wastes shall be stored on the property. 4) Slow release nitrogen and low phosphorus fertilizers shall be applied sparingly to prevent wash off. 5) No fertilization, herbicide, or pesticide application shall occur within any vernal pool, vegetated wetland or waterway. Eversource, as part of their operations, shall not conduct fertilization, herbicide, or pesticide application. DCR shall not use herbicides within any vernal pool, vegetated wetland or waterway. Invasive species removal by DCR will be by mechanical means when possible and spot treatments of herbicide by a licensed applicator when other approaches are not effective. This Condition is ongoing and does not expire with the expiration of the Order of Conditions or the issuance of a Certificate of Compliance. 6) Hazardous wastes shall be used and disposed of properly. 7) No vehicle washing shall be allowed on the property. 8) Vehicles shall be maintained and clean up fluid spills/drips shall occur with absorbent materials immediately. 9) Personnel shall be educated on implementation of spill abatement and containment procedures. 10) No de-icing products shall be used on the site. 11) No coal tar-based pavement sealants are to be used on site.	Stormwater Management Permit: II. Conditions and Requirements - O	Contractor				
68	Inspections: In accordance with Section 9.B of the Regulations, the Board, or its designee, may inspect the Project Site at the following stages, at a minimum. The Applicant shall inform the Board of these stages in construction at least two days prior to commencement or completion, whichever is applicable, for scheduling of an inspection: 1) Pre-Construction Site Inspection - prior to commencement of construction for each Project phase, during which the construction schedule and acceptance of erosion control barriers can be finalized. 2) Erosion and Sediment Control Inspection - to ensure erosion control practices during and after construction are in accordance with the approved Plan. 3) Construction Inspection - multiple inspections will be made of the stormwater management system facilities, including but not limited to infiltration systems, BMPs, and connections to existing pipes, prior to backfilling of underground drainage or stormwater conveyance structures. It is recommended the Planning Boards designee inspect all permanent stormwater infiltration BMPs for acceptance prior to construction demobilization to a new location within the ROW. The Applicant and Planning Board designee will develop and agree to an inspection plan at the Pre-Construction Site Inspection. 4) Phase I Completion Inspection - after Phase I has been constructed, once the as built plan is prepared, and before partial Certification of Completion is issued. 5) Final Inspection - after the Phase II has been constructed, once the final as built plan is prepared, and before the final Certificate of Completion has been issued.	Stormwater Management Permit: II. Conditions and Requirements - R	Eversource				
POST-CONSTRUCTION							
1	Upon completion of the work associated within each phase, the Applicants shall forthwith request in writing that a Certificate of Compliance be issued stating that the work has been satisfactorily completed and clearly documenting any deviations or deficiencies from the approved plans.	OOC Special Condition: Part I: General Conditions: For Phase I and Phase II - CC	Eversource				
2	Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.	OOC General Condition 12	Eversource				
3	Within thirty (30) days of the completion of work, or as otherwise approved by the Division, the Applicants shall submit a compliance report to the Division and Commission documenting the completion of the project and compliance with all conditions herein, including a summary of construction timelines and photographs	OOC Conditions Related to Endangered Species Management For Phase I and Phase II - G	Eversource				
4	Should Phase II not commence within three years of completion of Phase I, the Applicant shall file an Amendment to bring the stormwater management into full compliance with the Town of Sudbury Stormwater Regulations.	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - JJ	Eversource				
5	All wildlife habitat replication and restoration shall be completed during the first growing season of Phase I to avoid a significant adverse project/site-specific impact or an adverse cumulative impact on wildlife for more than two growing seasons. Should Phase II not commence within two years of completion of Phase I, erosion controls or other methods of demarcation shall be implemented to prevent further alteration of restored areas. No important wildlife habitat features restored during Phase I shall be removed during Phase II.	OOC Conditions Specific to Phase I: Eversource Underground Transmission Line - KK	Contractor/Eversource				
6	Should the time between Phase I and Phase II exceed one year, the site shall be assessed every six months, in the presence of the Commission or its Agent, to determine if erosion controls containing areas that are stable which will not be destabilized during Phase II, can be removed.	OOC Part III: Erosion, Sedimentation, Stabilization Conditions for Phase I and Phase II - H	Eversource				
7	Following completion of Phase I, Eversource shall request a Partial Certificate of Compliance. This Request shall be accompanied by as-built plans, stamped by a professional land surveyor or other qualified professional, detailing all elements of Phase I including all restoration plantings, wetlands replication, all stormwater management elements, post construction structural report, provide a cut/fill analysis for the project by stream reach and elevations to confirm adequate compensatory storage is provided and affidavit from all site professionals that all aspects of this Order were adhered to, along with reports associated with mitigation activities. Any deviations from the approved plans shall be specifically called out on the as-built plan. A report on the restoration/mitigation plantings and invasive species management program shall be provided that includes an assessment of the plant community composition in the context of the wildlife habitat restoration. Vegetation outside the limit of work shall also be evaluated to confirm no negative impacts occurred outside the limit of work.	OOC Part V: Certification of Compliance Requirements - A	Eversource				
8	To ensure the environmental integrity of the site is maintained to offset the permitted activity, after the initial management period of five (5) years, the 3.3-acre invasive species management areas shall be monitored annually for the presence of invasive species and annual reports shall be submitted to the Conservation Office. Any areas found to contain concentrations of invasive species and/or should the plant community within the management area exceed l 0% invasive species, the management area shall be managed by DCR in accordance with a program developed in consultation with the Commission's representative	OOC Part VI: Conditions In Perpetuity - B	EM/Eversource				
9	Within thirty (30) days of the completion of the transmission line project, or as otherwise approved by the Division, the Applicant shall submit a compliance report containing, including a summary of construction timelines and photographs, to the Division documenting the completion of the project.	MESA No Take Determination (NHESP No. 15-34327) Condition 4	Eversource				

10	As-built Plan: The Applicant shall submit an as-built plan, containing all elements listed in Section 11.A.2 of the Regulations, to the Board upon completion of this Project and prior to the issuance of the Certificate of Occupancy. The plan shall be signed by a land surveyor or other qualified professional. A registered engineer shall certify that the work has been completed in accordance with the approved Plan and the Stormwater Management Permit. 1) Since the project is phased, the submission of current status, as-built plans shall be presented at the phasing transition 2) Following completion of Phase I, Eversource shall request a Partial Certificate of Completion. This Request shall be accompanied by as-built plans, stamped by a professional land surveyor or other qualified professional, detailing all elements of Phase I including all stormwater management elements, post construction structural report, and affidavit from all site professionals that all aspects of this Decision were adhered to. Any deviations from the approved plans shall be specifically called out on the as-built plan. Vegetation outside the limit of work shall also be evaluated to confirm no negative impacts occurred outside the limit of work.	Stormwater Management Permit: II. Conditions and Requirements - S	Contractor/Eversource				
11	No use or occupancy (except in connection with the construction activity authorized by this Permit) shall be conducted on the Project Site until a Certificate of Completion is issued by the Board in accordance with Section 11.0 of the Regulations. A Partial Certificate of Completion will be issued upon the satisfactory completion of Phase I. To the extent that the requirements of this Permit have been met with respect to such completed phase of the Project on the Project Site, the Board may permit the use and occupancy of the completed phase in accordance with Section 11.0 of the Regulations.	Stormwater Management Permit: II. Conditions and Requirements - T	Eversource				
12	The Planning Board shall be notified, in writing, within forty-eight hours of any transfers of title on this property. In the event the Property ownership or trail, multi-use path management transfers to a non-public entity, a covenant requiring maintenance of the stormwater management system in accordance with Best Management Practices and the Operation and Maintenance Plan shall be recorded on the Project Site. This covenant shall allow for the placement of municipal liens on the Project Site if the Applicant fails to maintain the system and the Town needs to do so. The Town shall be granted an easement to access the site in case emergency maintenance is needed. The Applicant shall submit the covenant for review and approval of the Select Board prior to recording at the Middlesex South District Registry of Deeds. A template will be provided by the Town.	Stormwater Management Permit: II. Conditions and Requirements - V	Eversource				