



**General Wildlife Habitat
Assessment Report**

Bruce Freeman Rail Trail
Sudbury, Massachusetts

Wildlife Habitat Assessment Relative to
the 25% Design Submittal dated
November 2016

April 8, 2020

Prepared for:

Massachusetts Department of
Transportation

Prepared by:

Stantec Consulting Services Inc.

April 8, 2020

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1.0 INTRODUCTION

On behalf of the Massachusetts Department of Transportation (MassDOT), Stantec Consulting Services Inc. (Stantec) performed a general wildlife habitat assessment for the proposed Bruce Freeman Rail Trail (BFRT; Project) located in Sudbury, Massachusetts, between the driveway to Chiswick Park off Union Avenue north to the Concord town line. The approximately 4.6-mile-long trail is proposed along the former Lowell Secondary Track of the Old Colony Rail Road that operated between Lowell and Framingham, Massachusetts (Figure 1). The right of way (ROW) is presently owned by MassDOT. In light of recent efforts in neighboring towns to rehabilitate the former railroad ROW as a rail trail, the Town of Sudbury (Town) is considering rehabilitation of the ROW in Sudbury to interconnect with trails in adjacent towns (Fay, Spofford, and Thorndike 2006).

The wildlife habitat assessment described herein considered the proposed impacts per 25% Design Submittal dated November 16, 2017, to wetland resource areas subject to the Massachusetts Wetlands Protection Act regulations (310 CMR; WPA) and relative to the guidance of the 2006 *Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands* (Guidance)¹ developed by the Massachusetts Department of Environmental Protection (MassDEP). Stantec Certified Wildlife Biologists (CWB), Daniel Nein and Rodney Kelshaw, performed the wildlife habitat assessment following review and approval of professional qualifications by the Sudbury Conservation Commission.

The assessment included a desktop review of publicly available natural resource data, including Massachusetts Geographic Information Systems (MassGIS), prior to the field survey and a wildlife habitat field assessment conducted October 1–2, 2018. MassDOT Environmental Services staff participated in the field assessment on October 1, 2018.

2.0 METHODOLOGY

Methodology is described below for the data review and field survey associated with the general wildlife habitat assessment at the Project.

2.1 EXISTING DATA REVIEW

Stantec reviewed publicly available natural resource data from MassGIS to evaluate the potential presence or absence of resources and to identify specific areas of potential unique ecological value to target during the field assessment. The MassGIS data review included federal and state wetlands and waterways, open space, aerial photography, Areas of Critical Environmental Concern, Federal Emergency Management Agency (FEMA) flood zones, Coldwater Fisheries Resources, Massachusetts Natural Heritage and Endangered Species data, University of Massachusetts (UMass), and surface and wellhead drinking water supplies. The UMass Conservation Assessment and Prioritization System (CAPS) data for the Town was also reviewed. This wildlife habitat assessment also considered the results

¹ MassDEP. 2006 *Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands* is available at: <http://umasscaps.org/pdf/wldhab.pdf>.



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of the previous wildlife habitat assessment performed by Call of the Wild Consulting in 2009 (Call of the Wild 2009) and vernal pool surveys performed by Stantec and other consultants between 2015 and 2018 (Stantec 2018), the results of which are summarized herein.

2.1.1 25% Design Submittal and Preliminary Resource Area Impacts

The existing data review also considered the 25% Design Submittal prepared by Vanasse Hangen Brustlin, Inc. (VHB) dated November 17, 2016 (Appendix A), and the associated wetland resource area impact tables for floodplain, Bordering Vegetated Wetland (BVW), and Bank dated September 25, 2017 (Appendix B).

2.2 FIELD ASSESSMENT

Following the completion of the existing data review, Stantec CWBs performed the field assessment along the full length of the proposed BFRT in Sudbury to evaluate general wildlife habitat and potential for Project adverse effect relative to the Guidance. The Guidance was referenced to determine each wetland resource area to assess, followed by a determination of the impact being above or below the “significance” threshold to identify the appropriate field data form (i.e., Guidance’s Appendix A or B). The results of field form for each wetland resource area were used to assess whether or not the Project will adversely affect wildlife habitat.

Based on the preliminary wetland resource area impact calculations prepared by VHB (Appendix B) and our interpretation of the Guidance, Appendix A of the Guidance was used as the field data form when evaluating wetland resource areas where impact was proposed based on the 25% Design Submittal. Appendix A provides a simplified evaluation of small-scale alterations to ensure protection for certain “important habitat features” and identify projects that warrant detailed wildlife habitat evaluations (i.e., Appendix B of the Guidance). Appendix A also was deemed applicable based on the localized nature of proposed impacts based on the 25% Design Submittal. The following is a summary of the proposed wetland resource area impacts that triggered Appendix A of the Guidance.

- The Project proposes 4,681 square feet (sf; 3,670 sf temporary/1,011 sf permanent) of impact to BVW. Appendix A applies when impacts are below 5,000 sf to BVW.
- The Project proposes 1,752 linear ft (lf; 1705 lf temporary/47 lf permanent) of impact to Bank. Appendix A applies when impacts are above 50 lf to Bank.
- The Project proposes to fill approximately 3 cubic yards and cut approximately 73 cubic yards of floodplain/Bordering Land Subject to Flooding. The proposed impacts do not trigger Appendix A, but localized Bank habitat can be important to wildlife, so the wildlife habitat assessment evaluated where impact is proposed to this resource.
- Impacts to Previously Developed Riverfront Areas does not require a wildlife habitat assessment per the Guidance; however, Riverfront can be important to wildlife, so the wildlife habitat assessment considered these areas associated with Hop Brook, the unnamed tributary to Hop Brook, and Pantry Brook.



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Stantec assessed the ROW for the following important habitat features outlined in Appendix A of the Guidance:

- Habitat for state-listed species
- Sphagnum hummocks and pools suitable as nesting habitat for four-toed salamanders
- Trees with large cavities (>18" diameter at entrance)
- Existing beaver, mink, or otter dens
- Areas within 100 feet of existing beaver, mink or otter dens
- Existing nest trees for birds that traditionally reuse nests (bald eagle, osprey, great blue heron)
- Land containing freshwater mussel beds
- Wetland and waterbodies known to contain open water in winter that may serve as waterfowl winter habitat
- Turtle nesting areas
- Vertical sandy banks (bank swallows, rough-winged swallows or kingfishers)

In addition to the above habitat features, the Guidance identifies the following habitat characteristics to evaluate when not commonly encountered in the surrounding area:

- stream bed riffle zones,
- springs,
- gravel stream bottoms (trout and salmon nesting substrate,
- plunge pools (deep holes) in rivers or streams, and;
- medium to large, flat rock substrates in streams.

The activities identified in Appendix A of the Guidance, if proposed within resources areas, that would trigger a detailed wildlife habitat evaluation include:

- Activities located in mapped "Habitat of Potential Regional or Statewide Importance"
- Activities affecting certified or documented vernal pool habitat, including habitat within 100 feet of a certified or documented vernal pool when within another jurisdictional resource area
- Activities in Bank, Land Under Water, Bordering Land Subject to Flooding (presumed significant) where alterations are more than twice the size of thresholds
- Activities affecting vegetated wetlands >5000 sf occurring in source areas other than Bordering Vegetated Wetland
- Activities affecting the sole connector between habitats >50 acres in size



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- Installation of structures that prevent animal movement
- Activities for the purpose of bank stabilization using hard structure solutions that significantly affect ability of stream channel to shift and meander, or disrupt continuity in cover that would inhibit animal passage, and
- Dredging (>5,000 sf)

The evaluation not only considered Appendix A of the Guidance but additional evidence of wildlife use and potential wildlife habitat not identified on Appendix A and general design recommendations that would avoid, minimize, and mitigate impacts, where deemed applicable, to general wildlife habitat interests protected under the WPA.

3.0 RESULTS

The results of the existing data review and field assessment at the Project are presented below.

3.1 EXISTING DATA REVIEW

The BFRT is proposed along an existing ROW in a suburb of Greater Boston where adjacent primary land uses include residential, commercial / industrial, and open space available for conservation and recreation. Several of these larger open space parcels are owned by the Town and occur near the northern extent of the Project. Commercial / industrial uses primarily occur in the southern extent of the ROW, located south of Codjer Lane and near the Hudson Road (Route 27) and North Road (Route 117) road crossings. The ROW crosses several perennial or intermittent waterways, including Hop Brook and Pantry Brook. We understand the determination of whether a stream is perennial or not may be ongoing and is being performed by others. Wetland areas are present in lower lying areas along the ROW, some of which are associated with riparian areas.

Table 1 below summarizes the natural resource desktop data review and identifies resources within, or immediately adjacent to, the ROW. It is noteworthy that unique ecological communities and high value wildlife habitat requiring regulatory review are not present within or proximal to the Project; these include:

- Critical Habitat for federally listed species,
- Priority or Estimated Habitat for state-listed species or BioMap2 Critical Natural Landscape, or
- Area of Critical Environmental Concern.



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Table 1. Existing Natural Resource Data Review, Bruce Freeman Rail Trail, Sudbury, Massachusetts

Resource Type Within or Immediately Adjacent* to Project	Yes	No
NHESP BioMap2 Core Habitat Core Habitat 1920 (mapped for Species of Conservation Concern)	X	
NHESP Critical Natural Landscape		X
NHESP Priority/Estimated Habitat for state listed species		X
NHESP Potential Vernal Pool (8 PVPs) PVPs 24213, 24206, 24192, 24191, 24159, 24158, 24157, 24155	X	
NHESP Certified Vernal Pool CVP 1428 between Route 27 & Morse Road CVP 2504 between Route 27 & Old Lancaster Road	X	
NHESP Natural Community		X
Area of Critical Environmental Concern		X
Critical Habitat for federally listed species		X
UMass CAPS Habitat of Potential Regional or Statewide Significance	X	
MassWildlife Coldwater Fisheries Resource Hop Brook Unnamed Tributary to Hop Brook	X	
Protected Open Space	X	
MassDEP wetlands	X	
Bicycle Trails	X	
Surface Water Protection Area (Zone A, B, or C)		X
Zone II Wellhead Protection Area	X	
Interim Wellhead Protection Area		X
FEMA National Flood Hazard Area	X	

Notes:

Data is derived from MassGIS with the exception of CAPS data from UMass and Critical Habitat data from USFWS.

* For the purposes of the data review, immediately adjacent is considered as present within 500 feet of the Project ROW.

BioMap2 Core Habitat² (for Species of Conservation Concern) as mapped by the NHESP occurs between Hudson Road (Route 27) and Morse Road (Figure 2a). The Project is not mapped as BioMap2 Critical Natural Landscape, which can overlap with BioMap2 Core Habitat. BioMap2 is intended as a strategic conservation planning tool designed by the by the Massachusetts Department of Fish and Game and Massachusetts Nature Conservancy in 2010 to guide strategic biodiversity conservation to focus land protection and stewardship on areas most critical for ensuring long-term persistence of rare and native species and their habitats, exemplary natural communities, and a diversity of ecosystems and includes

² BioMap2 Core Habitat consists of 1,242,000 acres that are critical for the long-term persistence of rare species and other Species of Conservation Concern, as well as a wide diversity of natural communities and intact ecosystems across the Commonwealth. It includes habitats of rare, vulnerable or uncommon species; Priority Natural Communities; high quality wetland, vernal pool, aquatic, and coastal habitats; and intact forest ecosystems.



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the habitats and species of conservation concern identified in the State Wildlife Action Plan. When the NHESP updated Priority Habitat of Rare Species and Estimated Habitat of Rare Wildlife mapping in 2017 for the 14th Edition of the Natural Heritage Atlas, which are regulatory maps used for review under Massachusetts Endangered Species Act (MESA and WPA, respectively), the Project was not mapped within or proximal to either habitat. It is possible that the BioMap2 Core Habitat from 2010 overlapping the Project was due to the inclusion of NHESP Priority Habitat mapping that predated the 14th Edition of the Natural Heritage Atlas.

Two generally small areas, which are adjacent to but not within the Project, have been modeled by the UMass Conservation and Assessment Prioritization System (CAPS)³ and are mapped as Habitat of Potential Regional or Statewide Importance⁴. The first is the existing CVP noted above and surrounding forest immediately west of the ROW between Hudson Road and Morse Road, and second is small open water wetland/PVP and shoreline area immediately west of the ROW near the Sudbury-Concord town line (Figure 2a). When areas modeled by CAPS occur within jurisdiction of the WPA, they are subject to the Guidance.

Hop Brook and an unnamed tributary to Hop Brook are designated as Coldwater Fisheries Resources by Massachusetts Division of Fisheries and Wildlife (MassWildlife) (Figure 2b). Wellhead Protection Areas, Zone IIs, occur at the northern and southern extents of the ROW (Figure 2b). The nearest Surface Water Protection Areas associated with Cambridge Reservoir and surrounding waterbodies of the Charles River Watershed are located in the adjacent towns of Lincoln, Weston, and Waltham. FEMA Floodzones can be generally associated with low-lying areas at waterway crossings and wetlands.

There are two National Wildlife Refuges (NWR) (2,480 acres), one state Wildlife Management Area (WMA, 411 acres), two State Forests (~1,630 acres), one municipal state forest (289 acres) and multiple other open space parcels located within 5 miles of the Project. The boundaries of the Pantry Brook State Park WMA and Great Meadows NWR are located approximately 1,100 feet and 2,100 feet east of the ROW, respectively (Figure 2c). The boundary of the Marlborough-Sudbury State Forest, Callahan State Forest, Memorial Forest, and Assabet River NWR are located approximately 2 miles west or southwest of the ROW. Non-federal or state protected open space within a mile of the ROW includes Mineway Brook Corridor, Brues Woods, Gray Reservation, and Emmons Conservation Restriction (Figure 2c). Using data publicly available through MassGIS, greater than 30% and more than 25,000 acres of the land area within a 5-mile buffer of the ROW is currently protected open space.

Mapped vernal pool habitat (Potential or Certified Vernal Pools, PVP and CVP, respectively) are present in low density and scattered along and generally proximal to the ROW. At a landscape scale, vernal pools are more common in other parts of Sudbury and nearby towns. Several PVPs are generally present in the northern extent of the ROW and two CVPs have been identified in the southern extent of the ROW (Figure 2a). Under WPA, vernal pool habitat protection includes the vernal pool and the 100-foot zone around the vernal pool when located within a wetland resource area.

³ CAPS is an ecosystem-based (coarse-filter) approach for assessing the ecological integrity of lands and waters and subsequently identifying and prioritizing land for habitat and biodiversity conservation.

⁴ Areas representing the 40% of the landscape with the highest potential wildlife habitat value as measured by CAPS, and applicable to the MassDEP Guidance when within the jurisdiction of WPA.



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The ROW is mapped as a Bicycle Trail, which is a MassGIS data layer representing trails where bicycles are a permitted use and corridors with conversion potential. The mapping in Sudbury connects with the Bicycle Trail mapping in adjacent towns of Concord and Framingham. The Massachusetts Department of Conservation and Recreation created this data layer for the purpose of regional planning and mapping.

Call of the Wild Consulting performed a wildlife habitat assessment between 2007 and 2008 in response to the Town's request for a comprehensive four-season wildlife habitat assessment (Call of the Wild 2009). Wildlife habitat assessment results, evidence of species use, and recommendations were provided in 2009.

3.2 FIELD ASSESSMENT RESULTS

A two-day field survey was conducted on October 1–2, 2018 to evaluate general wildlife habitat conditions, wildlife use, and direct observations of wildlife species within and near delineated wetland resource areas within the ROW that may be adversely affected by the Project. MassDOT Environmental Services staff participated in the field assessment on October 1, 2018. Stantec's wildlife habitat assessment was subsequent to the wetland delineation conducted by VHB in 2015-2016 that supported development of the 25% Project Design Submittal. This evaluation is based on the 25% Project Design Submittal and proposed impacts at this early stage should continue to be evaluated as the Project design advances in an effort to further avoid and minimize the possibility of adverse effect to not only general wildlife habitat, but the other interests protected under the WPA.

As noted in Section 3.1, the ROW traverses a suburban setting with adjacent areas of protected open space, past/current agricultural use, and commercial/industrial businesses. Representative and dominant ecological communities which were observed adjacent to the ROW included variants of the Mixed Oak Forest/Woodland, White Pine-Oak Forest, and Red Maple Swamp as described in the *Classification of Natural Communities of Massachusetts* (Swain 2016). These communities are widespread and considered common and secure in Massachusetts. The encroachment of commercial and residential land uses within the ROW has occurred over time. The ROW is approximately 65 feet wide for most of its length and is predominantly a wooded corridor passing through multiple wetland areas, including vegetated wetlands, perennial/intermittent streams, and associated floodplain. Wetland areas are previously disturbed or presumed to be an artifact or, at a minimum, influenced hydrologically by the original ROW construction. The vegetated wetlands where temporary or permanent impacts are proposed generally occur at the toe of slope or near the edge of the rail bed. A further description of the wetland resource areas can be found in the VHB wetland report.

Within the ROW, the existing railbed (i.e., the earthen area containing the tracks and ties), is of variable width as a result of adjacent cut and fill slopes among other variables. The track, wooden ties, and ballast are visible along the ground surface over much of the ROW. A buildup of a shallow duff and/or soil layer over areas of ballast has occurred over time, allowing the colonization of some rooted native species; however, the dominant species are predominately invasive plant species within the ROW. It can be inferred that the initial construction of the rail bed involved the use of off-site and on-site fill material, which may have created depressions or lower lying areas and additionally caused soil compaction.



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Portions of the ROW less frequented by pedestrian foot traffic in the northern section are heavily overgrown with dense shrubbery and vines. Overall, invasive species are common throughout, including: glossy buckthorn (*Frangula alnus*), Oriental bittersweet (*Celastrus orbiculatus*), and honeysuckle (*Lonicera spp.*), with occasional occurrences of winged euonymus (*Euonymus alatus*) and Japanese barberry (*Berberis thunbergii*), and with common reed (*Phragmites australis*) frequent in wetland resource areas.

3.2.1 Wildlife Observations

The mosaic of the wooded corridor interfacing with seasonal and permanent wetlands and small waterways represents habitat for a variety of wildlife species and their uses (e.g., foraging, breeding, shelter, nesting), including representative and regionally common species expected for a suburban or urban area. However, less common or rare species are also documented from nearby state WMAs and NWFs and possibly other open space or protected areas noted in section 3.1. For example, Blanding's turtle (*Emydoidea blandingii*), state-listed and candidate for federal listing, and spotted turtle (*Clemmys guttata*), previously state-listed, are known inhabitants at Great Meadows NWF. The closest NHESP documented occurrence of a state-listed rare species to the Project is blue-spotted salamander (*Ambystoma laterale*) observed at the previously certified CVP 1428 located just beyond 100 feet west of station 336+00, which is further described below in the Vernal Pool Survey section as CVP #13. Direct observations of wildlife species presence within the ROW primarily included common or generalist species typical of a suburban and forested landscape such as the conditions present at the Project and those in areas of eastern Massachusetts and the region. No state-listed or federally listed species were observed within the ROW during the assessment.

Mammals

Evidence of the wildlife species at the Project in part included mammals such as white-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), gray squirrel (*Sciurus carolinensis*), eastern chipmunk (*Tamias striatus*), and red squirrel (*Tamiasciurus hudsonicus*). Open portions of the ROW provide ease of travel for mammalian species, while overgrown areas provide cover or shelter in addition to functioning as a potential travel corridor.

Evidence of prior beaver (*Castor canadensis*) activity (>5 years) within the ROW was noted in three areas and included stumps of hardwood species with evidence of beaver chew near the existing Hop Brook crossing. Inactive heavily deteriorated bank dens in the embankment close to the toe of slope at stations 264+00 near Pantry Brook and 477+00 near the open wetland modeled by CAPS were likely historically used by beaver or possibly river otter (*Lontra canadensis*). Within the ROW, including areas of proposed wetland impact, there were no observations of evidence of recent or current use by beaver, American mink (*Neovison vison*), or river otter. Riparian and open water habitat that would be considered suitable to support these species is limited at the Project, with the most likely exception of Hop Brook and Pantry Brook.

The presence of small mammal populations and additional larger mammals such as grey fox (*Urocyon cinereoargenteus*), raccoon, and other species using the ROW and adjacent areas, as reported by the Call of the Wild 2009, is anticipated given available suitable habitat to support these species.



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A potential bat roost tree was identified near station 171+30 where an impact is proposed within a wetland resource area; however, potential roost trees were observed beyond the ROW and broader potential bat roost habitat, including mature trees, is expected to be common on the landscape. The spread of White Nose Syndrome has detrimentally impacted bat populations in the northeast United States.

Birds

Representative avian species such as red-tailed hawk (*Buteo jamaicensis*), American crow (*Corvus brachyrhynchos*), blue jay (*Cyanocitta cristata*), turkey (*Meleagris gallopavo*), black-capped chickadee (*Penthestes atricapillus*), gray catbird (*Dumetella carolinensis*), nuthatches (*Sitta* sp.), and several woodpeckers (*Picoides* sp.) were also observed at the Project. A pair of mallard ducks (*Anas platyrhynchos*) were observed in the open water wetland near the Sudbury/Concord town line. This area was modeled by CAPS and represents a small open water habitat for waterfowl and other bird species that is anticipated to freeze annually during winter months, unlike other larger open water habitats less likely to freeze in nearby WMAs and NWFs. Additional avian species anticipated to use the ROW and adjacent landscape include neotropical migrants and resident species typical of suburban forested and partially fragmented landscapes. The ROW provides an open corridor for avian travel and foraging, while overgrown areas provide increased cover, shelter, and nesting habitat, although these habitats are primarily located outside of jurisdictional areas. These types of habitats are not limited to the ROW and are expected to be abundant in the surrounding landscape.

Fisheries and Mussels

Hop Brook and an unnamed tributary to Hop Brook are designated as Coldwater Fisheries Resources by MassWildlife. Attributes of Coldwater Fisheries Resources include high water quality, natural flow regimes, cold water temperatures (less than 68°F), largely intact riparian area, and watershed connectivity. Hop Brook, the unnamed tributary to Hop Brook and additional potential perennial and intermittent streams were evaluated for the presence of fisheries and mussel habitat, including the habitat features and considerations identified in Appendix A.

The in-stream conditions at the existing Hop Brook crossing and nearby unnamed tributary to Hop Brook indicate a perennial condition with a sand and sparse gravel streambed with moderate shoreline and submerged aquatic vegetation. Habitat conditions are anticipated to support coldwater species where the ROW crosses these waterways. Species such as brook trout (*Salvelinus fontinalis*), dace (*Rhinichthys* spp.), and white suckers (*Catostomus commersonii*) may be present in small densities and are examples of species that would need to be documented to designate the waterway as a Coldwater Fisheries Resource by MassWildlife.

In-stream conditions at the Pantry Brook crossing include a higher percentage of muck/organic material in the substrate. Water quality is not expected to be as high in this area compared to Hop Brook and high water quality is needed to support coldwater species; however, habitat could support some warmwater species.



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Conditions at and near each perennial waterway crossing did not appear suitable (e.g., substrate, depth) for mussel beds, nor was there evidence of the predation of mussels, such as empty shells, which is also an indication of species presence.

There is the potential for mussel beds, and plunge pools and gravel dominated substrates suitable for fish spawning to be present further up or downstream of the areas assessed for the Project. The designation of Coldwater Fisheries Resources for waterways at the Project indicates suitable conditions are present for coldwater fish species, which might also be suitable for some mussel species.

Vernal Pool Species

A vernal pool survey at the Project was conducted by Stantec in April 2018 (Stantec 2018) and evaluated eligibility under the NHESP 2009 *Guidelines for the Certification of Vernal Pool Habitat* and the Sudbury Wetlands Administration Bylaw Regulations (Bylaw) revised September 25, 2017. The results of the 2018 survey identified three vernal pools eligible for NHESP certification (PVP 4, PVP 11, and PVP 12a). CVP 13⁵ continues to meet NHESP certification requirements, and PVP 9⁶, PVP 17, and PVP 20 may meet criteria as a vernal pool under the Town's Bylaw. Amphibian species observed during the spring survey included: wood frog (*Lithobates sylvaticus*), spotted salamander (*Ambystoma maculatum*), red-backed salamander (*Plethodon cinereus*), gray treefrog (*Hyla versicolor*), blue-spotted salamander (CVP 13; NHESP CVP# 1428), and spring peeper (*Pseudacris crucifer*).

There was no evidence of turtle nesting (i.e., shell fragments or nests excavated by mammals) or measurable areas of suitable turtle nesting habitat with the ROW or immediate vicinity observed during the 2018 vernal pool survey or wildlife habitat assessment.

4.0 EVALUATION OF ADVERSE EFFECT

The results of the data review and the results of the field survey were used to assess whether or not the Project will result in an adverse effect to wildlife habitat subject to the WPA. None of the important habitat features or other thresholds identified in Appendix A of the MassDEP guidance were observed within or proximal to wetland resource areas where temporary or permanent Project impacts are proposed. Additionally, no other high value habitats or species particularly sensitive to the construction of a rail trail were observed. The trail is not expected to be a barrier to wildlife usage patterns near the Project or at the landscape level, as most species would shift habitat usage patterns, as needed, to carry out their life cycles during construction and post-construction. Therefore, potential habitat impact within jurisdiction of the WPA is generally localized, temporary, occurring previously disturbed area, and would occur to habitat that is not considered critical; or limiting at the Project or the local landscape. As a result, no adverse effect to wildlife habitat within wetland resource areas is anticipated based on the 25% Design

⁵ Obligate vernal pools species observed in 2018 included fairy shrimp (*Eubbranchipus* spp.) and blue-spotted salamander (*Ambystoma laterale*) egg masses.

⁶ The NHESP confirmed Stantec's 2018 identification of two dead salamanders as the lead phase for eastern red-backed salamander.



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Submittal. As the Project design develops further, recommendations are provided below for consideration in consultation with the Sudbury Conservation Commission and other resource agencies, as appropriate.

5.0 ADDITIONAL DESIGN CONSIDERATIONS AND RECOMMENDATIONS

The following additional recommendations relative to the protection of wildlife habitat should be considered as Project planning and design continues.

1. Locate the Project limit of disturbance within existing ROW to the greatest extent practical, including staging areas, construction access, parking, and scenic vistas.
2. Avoid or minimize tree clearing where possible. For example, the forested habitat surrounding high value or productive vernal pools (e.g., certified or certifiable by NHESP), particularly the 100-foot zone surrounding the boundary of the pool breeding habitat.
3. Implement Best Management Practices (BMPs) to avoid/minimize potential impacts to wetland resources areas that support wildlife habitat. For example, avoidance and minimization of erosion and sedimentation into wetland resource areas, use of clean heavy machinery at Project to limit/avoid introduction of invasive non-native plant species, avoidance of machinery refueling in buffer zones, and general housekeeping (including final site cleanup).
4. Establish a robust erosion and sedimentation control program per MassDEP Erosion and Sedimentation Control Guidelines and guidance from the Sudbury Conservation Commission, including monitoring and timely maintenance throughout construction due to the proximity of limits of work near some wetland resource areas.
5. Use plantings and seed from native plant species during restoration of disturbed areas. The selection of species for plantings should consider enhancing or replacing wildlife habitat use (e.g., fruiting shrubs, pollinator habitat, evergreen species for cover, etc.).
6. Incorporate minimum Massachusetts Stream Crossing Standards at perennial waterway crossings to the maximum extent practical. Consider these standards in additional areas that may provide high value wildlife habitat (e.g., intermittent stream). In the case of Hop Brook, the reuse/rehabilitation of the existing bridge to span the brook is being considered for the design.
7. Consider maintaining or creating wildlife crossing passage at strategic locations underneath the trail (e.g., existing cattle crossing used by wildlife, new crossing where amphibians migrate from the forest to high value vernal pools close to the ROW).
8. If scenic vistas or additional parking are proposed, cite these in areas that avoid and minimize the potential impact to wildlife habitat and wildlife behavior.
9. Monitoring of Priority and Estimated Habitat mapping by the NHESP for the potential presence of state-listed species near or at the Project as environmental permitting continues.
10. Avoid or minimize installation of physical barriers that would create impassable conditions across the trail for some smaller wildlife species.



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11. Consider leash and waste clean-up rules for pets at the Project.
12. Strategically girdling trees (e.g., cottonwood) that are located a safe distance from the ROW (to avoid creating hazard tree to humans). This management practice would increase the number of standing dead trees that could offer natural cavities and crevices for wildlife (e.g., roosting bats, nesting birds and waterfowl, small mammal dens).
13. Beneficially reuse trees and brush cleared during on-site site preparation to create new or enhance existing brush piles near the ROW to serve as wildlife habitat (e.g., refugia for small mammals, amphibians, and reptiles; and nesting habitat for songbirds).
14. Avoid and minimize effects of temporary construction and permanent lighting to the maximum extent practical to minimize the potential for the disruption of wildlife behavior. If permanent lighting is proposed, use full cutoff lens to direct lighting downward toward the trail surface to avoid and minimize the secondary effect to adjacent wildlife habitat.
15. Consider strategically locating signage along the trail (e.g., trail heads or parking areas) to educate trail users about wildlife and wetland ecology.

6.0 REFERENCES

- Call of The Wild Consulting. 2009. Comprehensive Four-Season Wildlife Habitat Evaluation Phase II Bruce Freeman Rail Trail Project. Prepared for Sudbury Conservation Commission.
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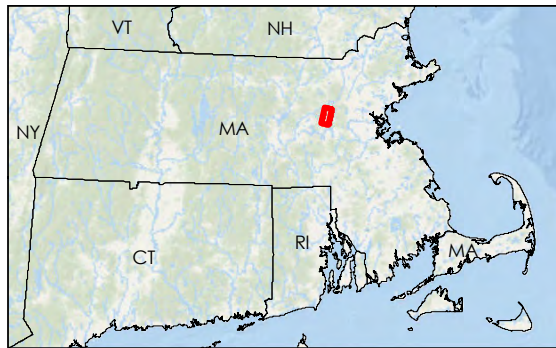




April 8, 2020

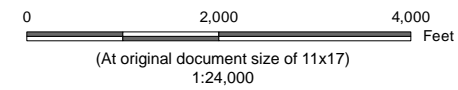
FIGURES



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Legend
 Bruce Freeman Rail Trail
 Town Boundary



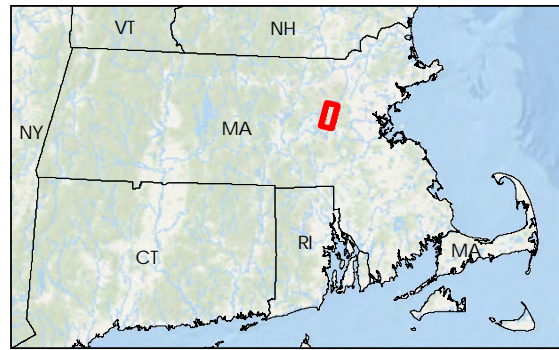
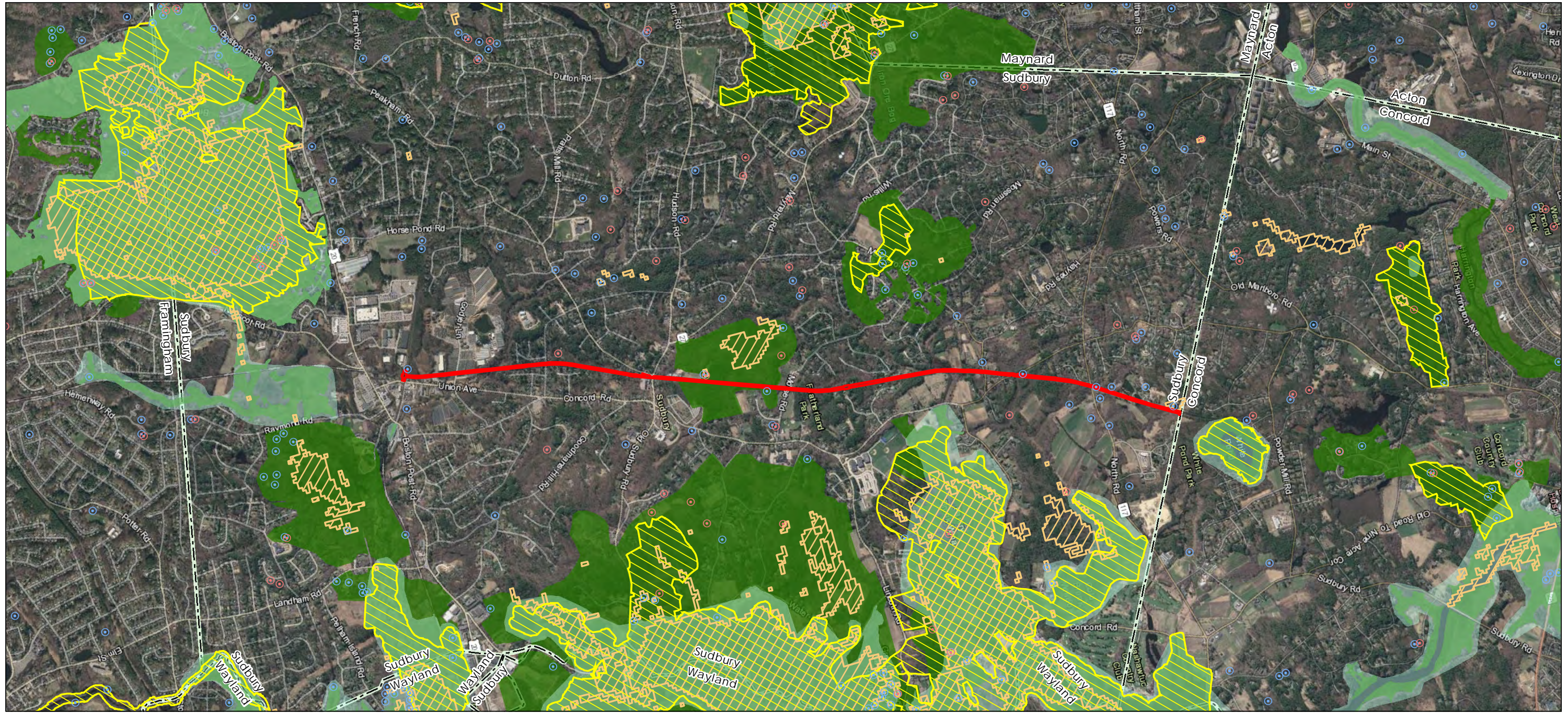
Project Location: Sudbury, Massachusetts
Prepared by REM on 2019-02-20
IR Review by DGN on 2019-02-21

Client/Project: MassDOT
Bruce Freeman Rail Trail
Sudbury, MA
179410498

Figure No.: 1
Title: Project Location Map

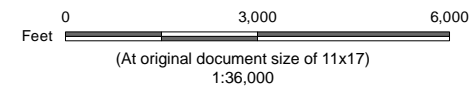
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2. Data Sources: Administrative boundaries provided by Bureau of Geographic Information (MassGIS). Bruce Freeman Rail Trail provided by MassGIS Sudbury parcel data layer.
3. Background: Orthoimagery: MassGIS 2013-2014 USGS Color Orthoimagery

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- Legend**
- ▭ Bruce Freeman Rail Trail
 - NHESP Potential Vernal Pools
 - NHESP Certified Vernal Pools
 - NHESP Priority Habitats of Rare Species (August 2017)
 - UMass CAPS Habitat of Potential Statewide or Regional Importance
 - BioMap2 Core Habitat
 - BioMap2 Critical Natural Landscape
 - Town Boundary

Notes
 1. Coordinate System: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001
 2. Data Sources: Administrative boundaries, NHESP data, and BioMap2 habitat and landscape data provided by Bureau of Geographic Information (MassGIS). CAPS habitat data provided by UMass. Bruce Freeman Rail Trail provided by MassGIS Sudbury parcel data layer.
 3. Background: Orthoimagery: MassGIS 2013-2014 USGS Color Orthoimagery



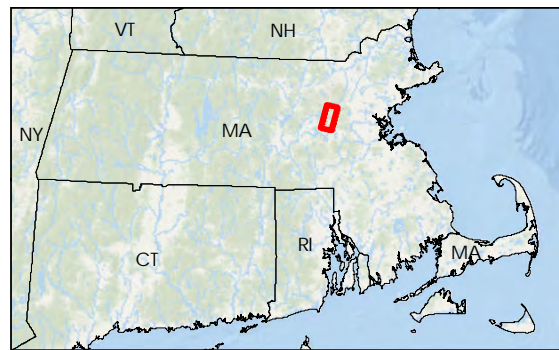
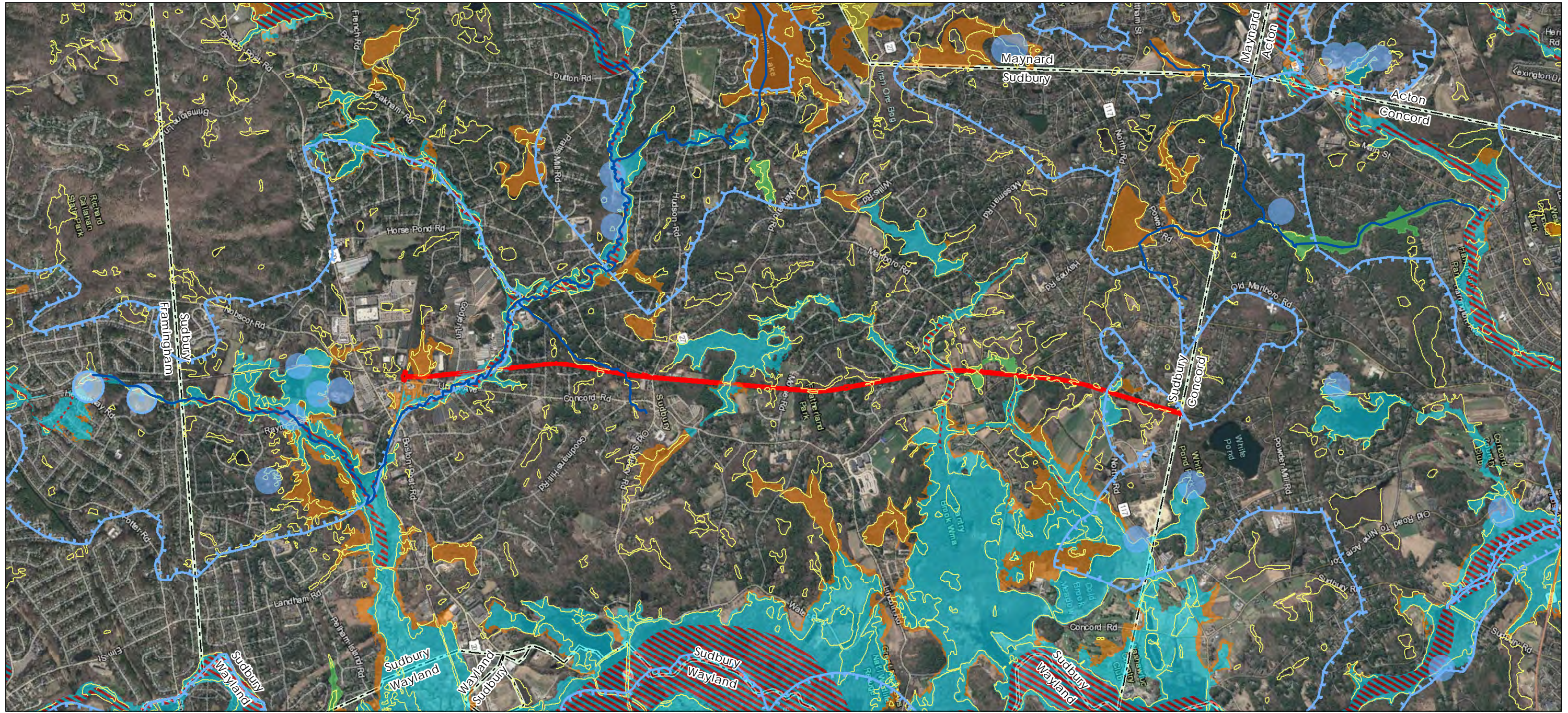
Project Location: Sudbury, Massachusetts
 Prepared by REM on 2019-02-20
 IR Review by DGN on 2019-02-21

Client/Project: MassDOT
 Bruce Freeman Rail Trail
 Sudbury, MA
 179410498

Figure No.: **2a**

Title: **Natural Resources Data Review
 National Heritage Resources**

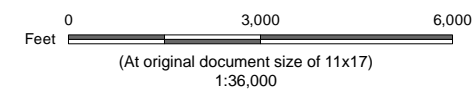
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 Revised: 2019-04-17 By: r.mack



Legend

- | | |
|--|--|
| Bruce Freeman Rail Trail | Surface Water Protection Areas
Zone A |
| Apparent Wetland Limit (DEP) | Zone B |
| DFW Coldwater Fisheries Resources | Zone C |
| FEMA National Flood Hazard Layer | Wellhead Protection Area |
| A: 1% Annual Chance of Flooding, no BFE | IWPA |
| AE: 1% Annual Chance of Flooding, with BFE | Zone Is |
| AE: Regulatory Floodway | Zone IIs |
| D: Possible But Undetermined Hazard | Town Boundary |
| X: 0.2% Annual Chance of Flooding | |

Notes
 1. Coordinate System: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001
 2. Data Sources: DFW coldwater fisheries resources, WPAs, DEP apparent wetland limit, SWPAs, FEMA National Flood Hazard layer, and administrative boundaries provided by Bureau of Geographic Information (MassGIS). Bruce Freeman Rail Trail provided by MassGIS Sudbury parcel data layer.
 3. Background: Orthoimagery, MassGIS 2013-2014 USGS Color Orthoimagery



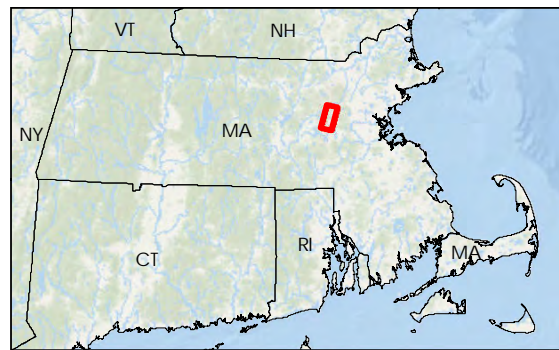
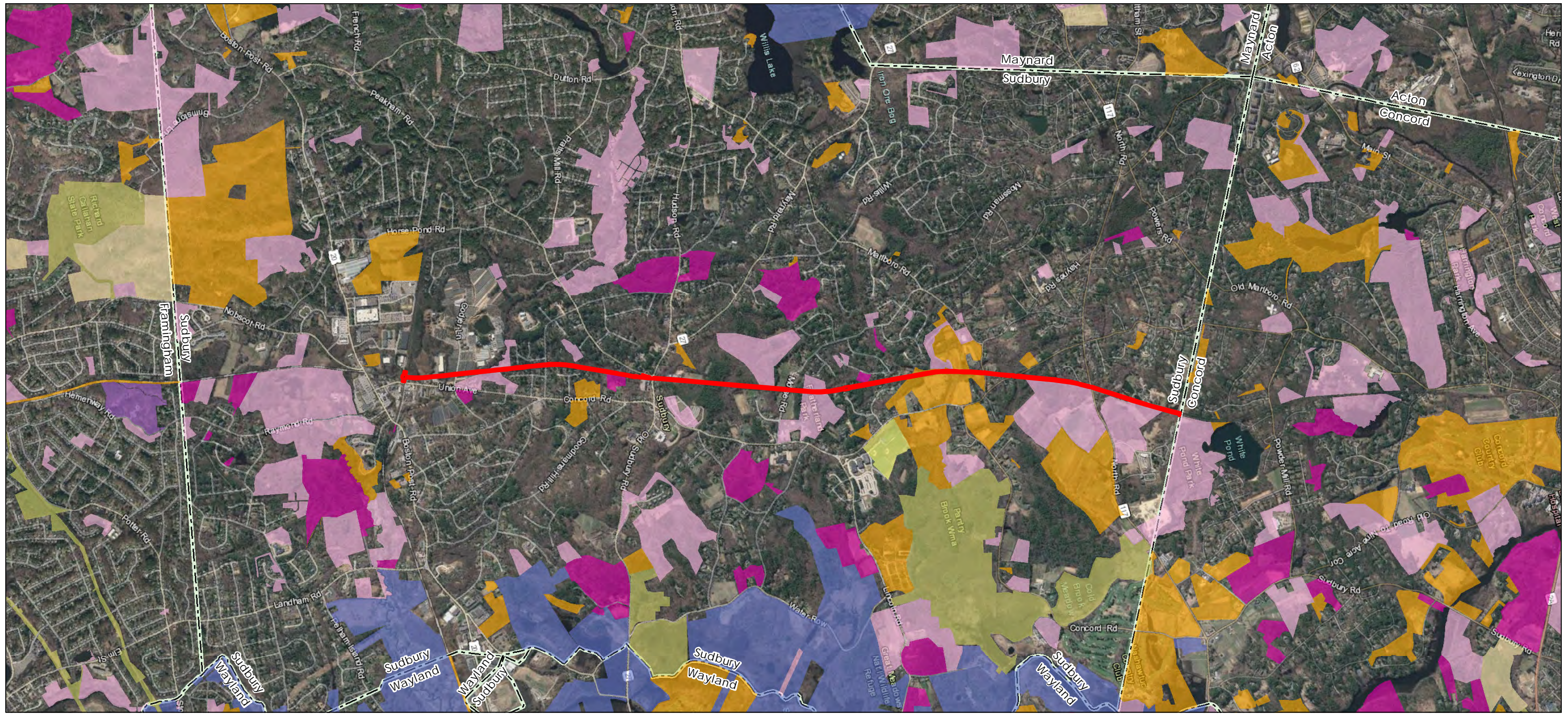
Project Location: Sudbury, Massachusetts
 Prepared by REM on 2019-02-20
 IR Review by DGN on 2019-02-21

Client/Project: MassDOT
 Bruce Freeman Rail Trail
 Sudbury, MA
 179410498

Figure No.: **2b**

Title: **Natural Resources Data Review
 MassDEP Resources and FEMA National
 Flood Hazard**

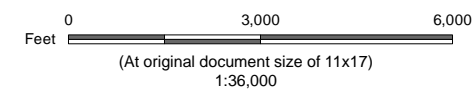
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- Legend**
- Bruce Freeman Rail Trail
 - Town Boundary
 - Protected and Recreational OpenSpace**
 - Conservation Organization
 - Federal
 - Land Trust
 - Municipal
 - Other
 - Private
 - Private Non-Profit
 - State

Notes

1. Coordinate System: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001
2. Data Sources: Protected and recreational open space and administrative boundaries provided by Bureau of Geographic Information (MassGIS). Bruce Freeman Rail Trail provided by MassGIS Sudbury parcel data layer.
3. Background: Orthoimagery: MassGIS 2013-2014 USGS Color Orthoimagery



Project Location
Sudbury, Massachusetts

Prepared by REM on 2019-02-20
IR Review by DGN on 2019-02-21

Client/Project
MassDOT
Bruce Freeman Rail Trail
Sudbury, MA

179410498

Figure No.

2c

Title

**Natural Resources Data Review
Open Space**

GENERAL WILDLIFE HABITAT ASSESSMENT REPORT

April 8, 2020

APPENDICES



GENERAL WILDLIFE HABITAT ASSESSMENT REPORT

Appendix A 25% Design Submittal
April 8, 2020

Appendix A 25% DESIGN SUBMITTAL



MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION

PLAN AND PROFILE OF BRUCE FREEMAN RAIL TRAIL

IN THE CITY/TOWN OF
SUDBURY
MIDDLESEX COUNTY

FEDERAL AID PROJECT NO.

25% SUBMITTAL

SUDBURY BRUCE FREEMAN RAIL TRAIL

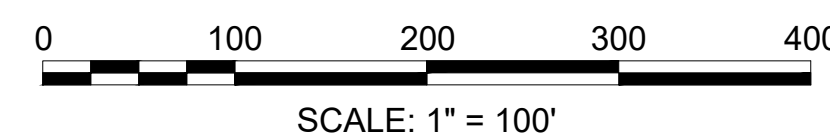
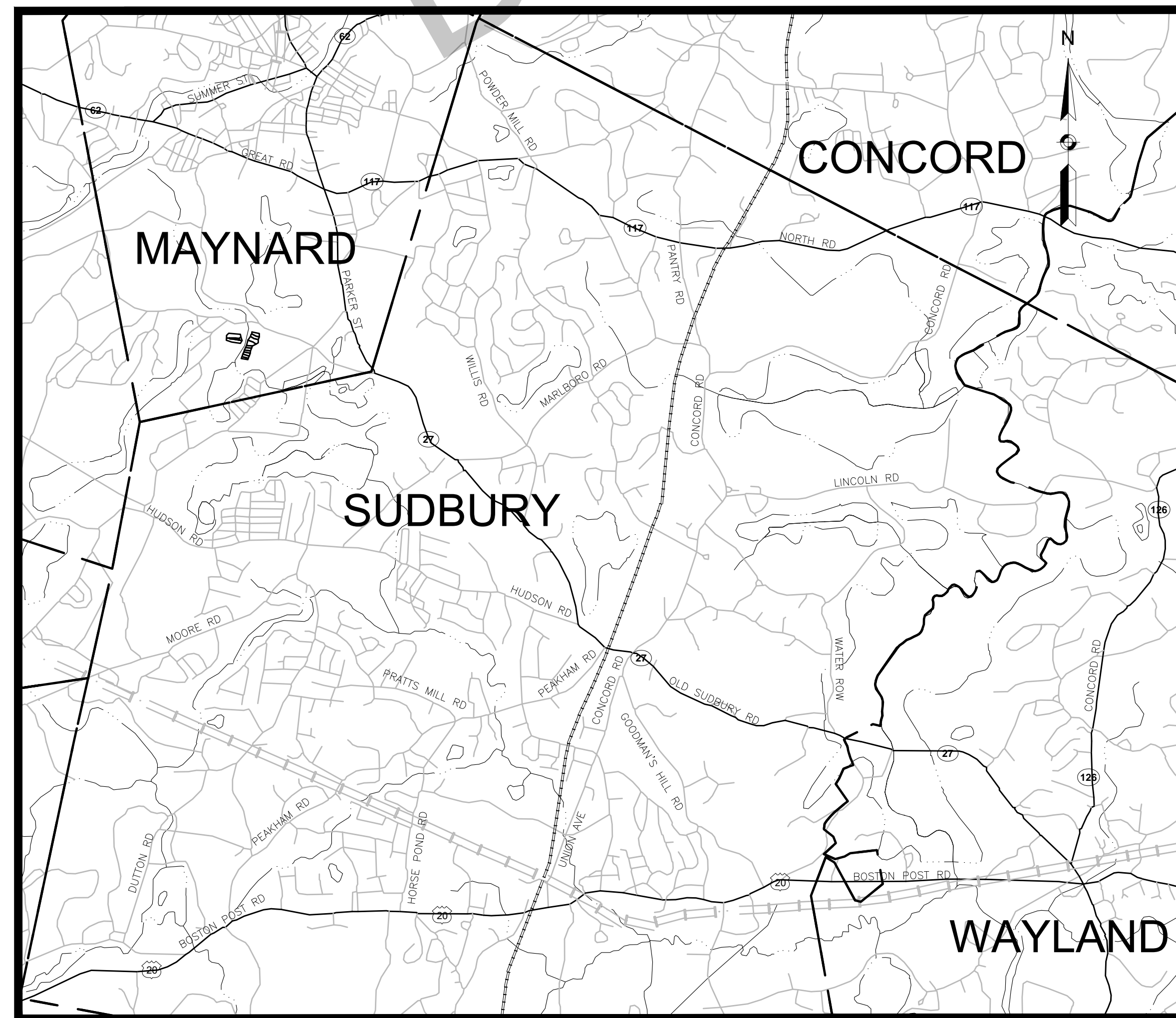
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MA	XXXX	01	XX
PROJECT FILE NO.		608164	

TITLE SHEET & INDEX

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED JULY 1, 2015, THE 2014 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS, 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, WILL GOVERN.

INDEX

SHEET NO.	DESCRIPTION
01	TITLE SHEET & INDEX
02	GENERAL NOTES
03	LEGEND & ABBREVIATIONS
X-X	KEY PLAN
X-X	TYPICAL SECTIONS
05-31	CONSTRUCTION PLANS
34-54	PROFILES
X-X	TRAFFIC SIGN & PAVEMENT MARKINGS
X	TRAFFIC SIGN SUMMARY SHEET
X-X	TEMPORARY TRAFFIC CONTROL PLANS
X-X	CONSTRUCTION DETAILS
X-X	CROSS SECTIONS



LENGTH OF PROJECT = XXX.XX FEET = X.XXX MILES

DESIGN DESIGNATION (STREET/RTE # OR NAME)

DESIGN SPEED	XX MPH
ADT (YYYY)	X,XXX
ADT (YYYY)	X,XXX
K	X%
D	XX%
T (PEAK HOUR)	X.X%
T (AVERAGE DAY)	X.X%
DHV	XXX
DDHV	XXX
FUNCTIONAL CLASSIFICATION	XXXXXXXXXX

Preliminary Design
DRAFT
November 17, 2016

DATE	DESCRIPTION	REV #



RECOMMENDED FOR APPROVAL

CHIEF ENGINEER DATE

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

APPROVED:

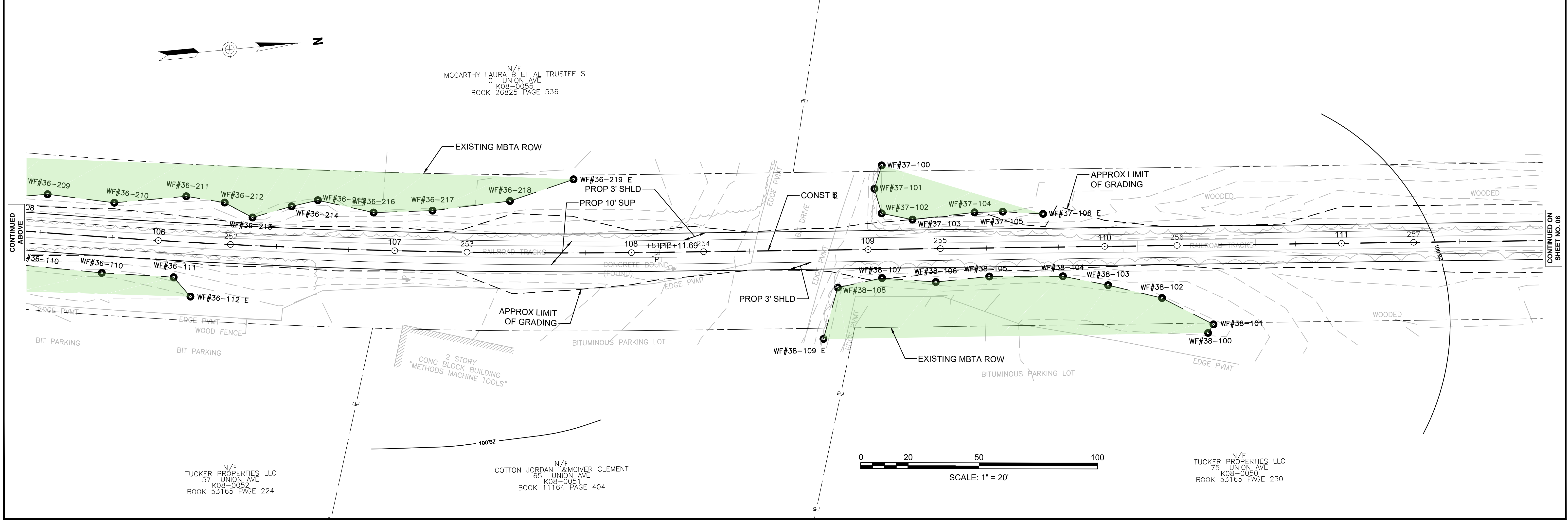
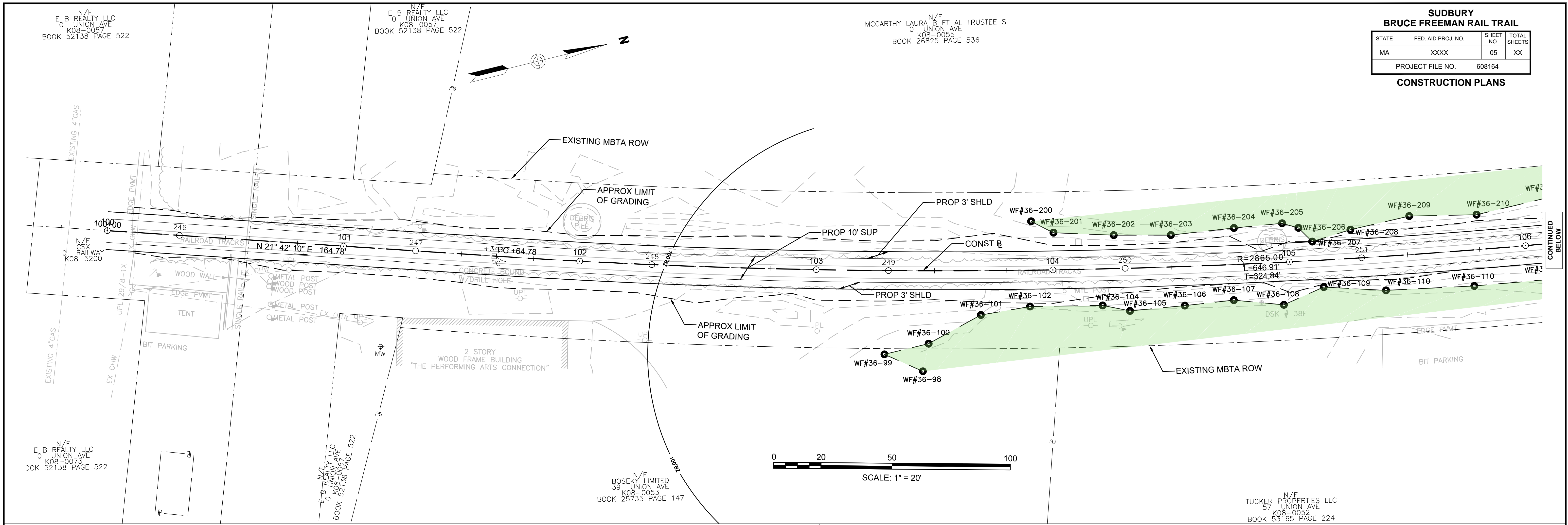
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HIGHWAY ADMINISTRATOR DATE

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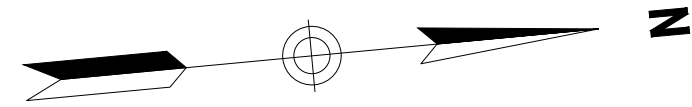
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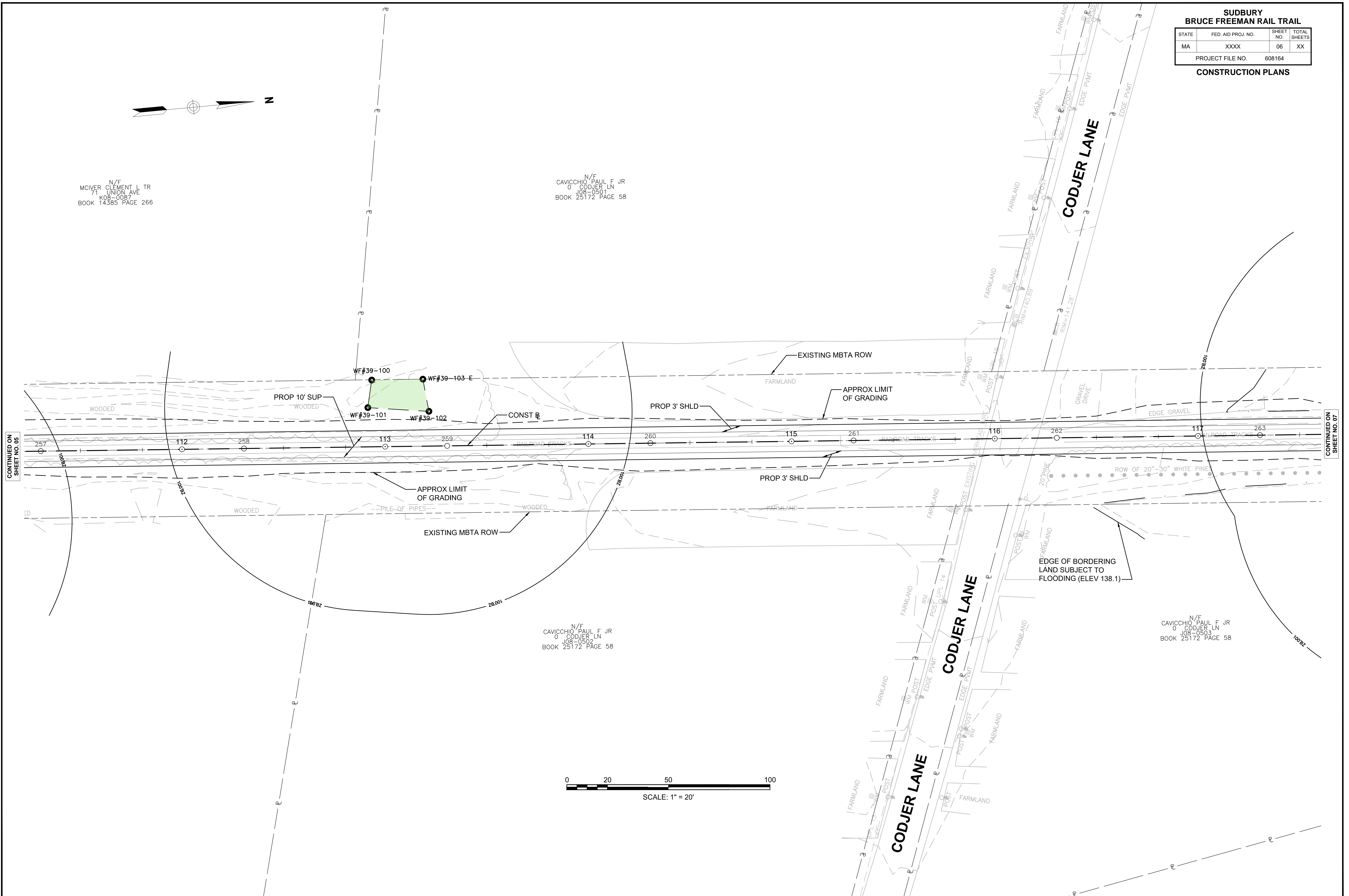
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 BOOK 25172 PAGE 58

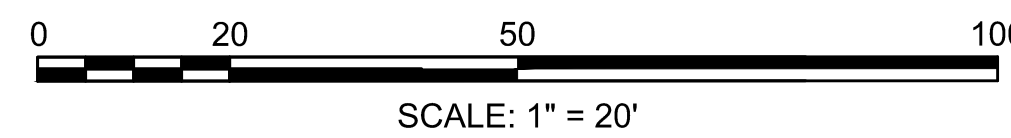


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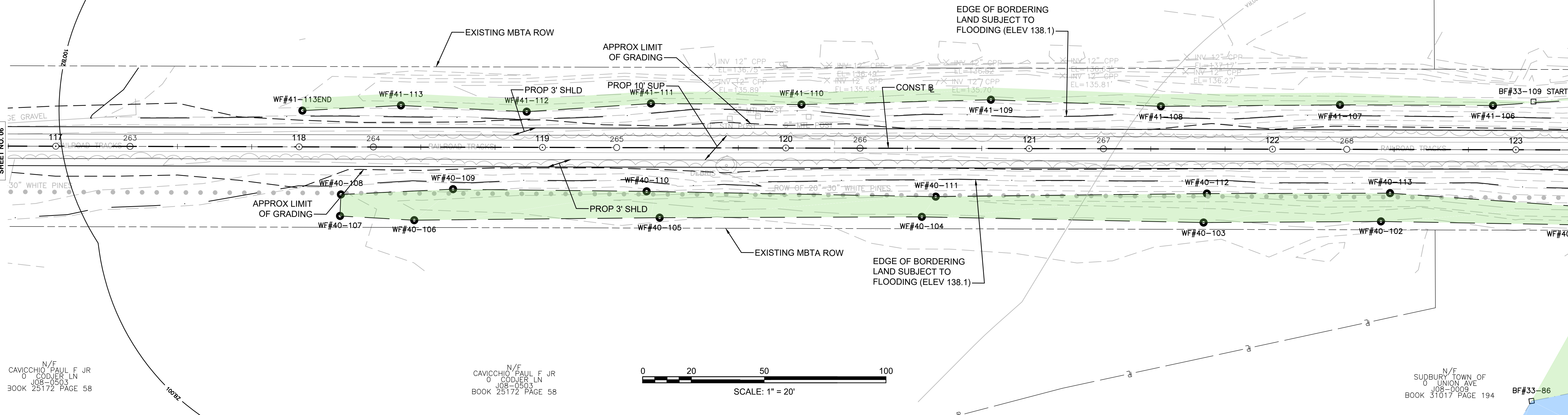
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 JOB-0503
 BOOK 25172 PAGE 58



N/F
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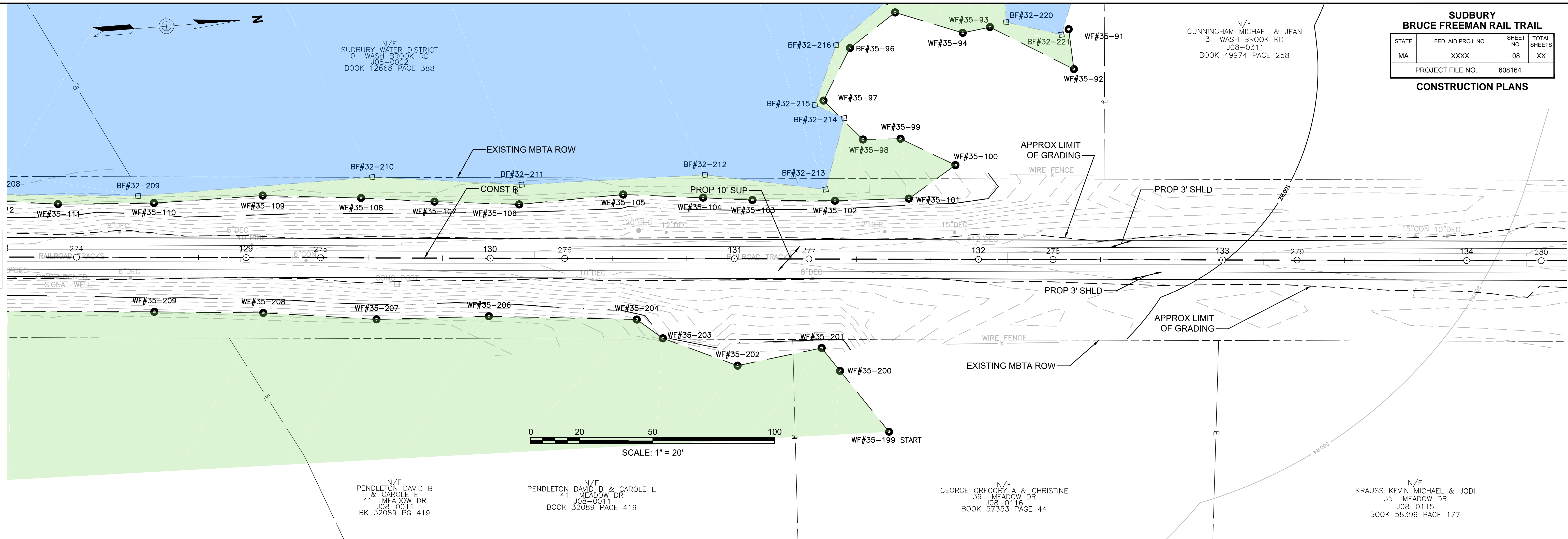
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BOOK 49974 PAGE 258

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BOOK 12668 PAGE 388



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BK 32089 PG 419

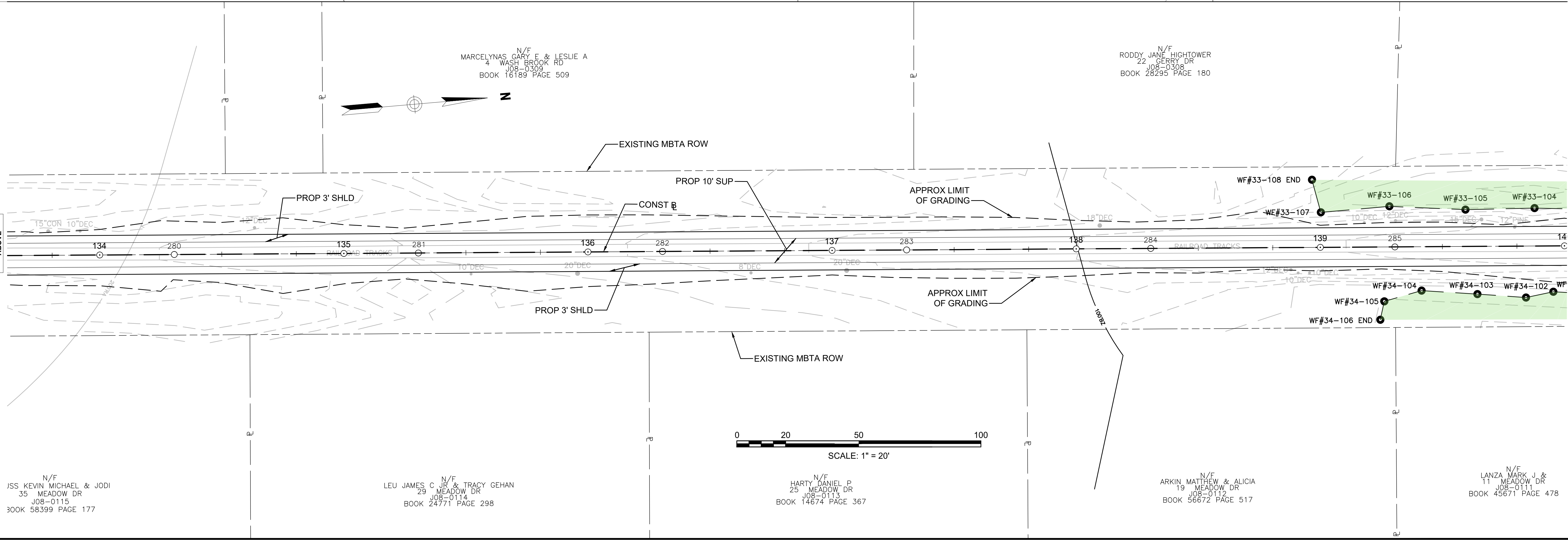
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BOOK 57353 PAGE 44

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BOOK 58399 PAGE 177

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BOOK 16189 PAGE 509

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22 GERRY DR
JOB-0308
BOOK 28295 PAGE 180



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JOB-0115
300K 58399 PAGE 177

N/F
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JOB-0114
BOOK 24771 PAGE 298

N/F
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25 MEADOW DR
JOB-0113
BOOK 14674 PAGE 367

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JOB-0112
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JOB-0111
BOOK 45671 PAGE 478

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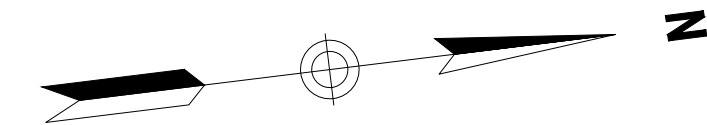
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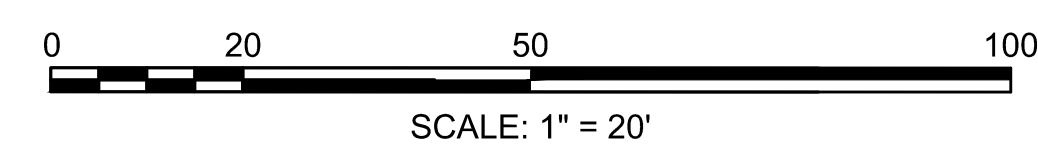
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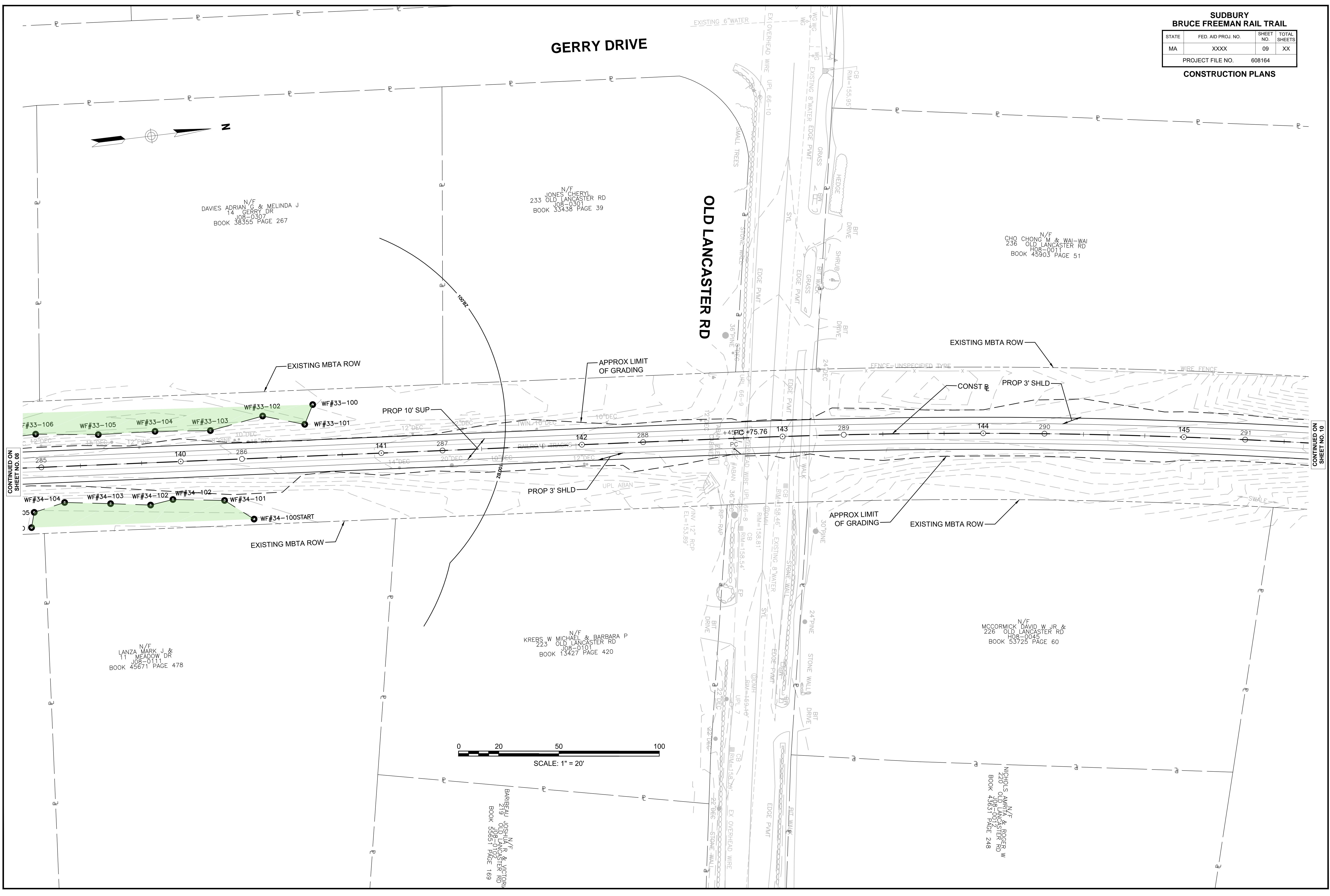
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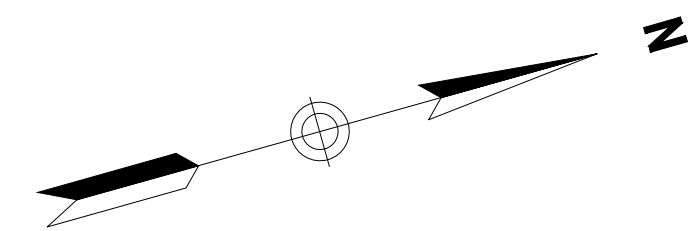
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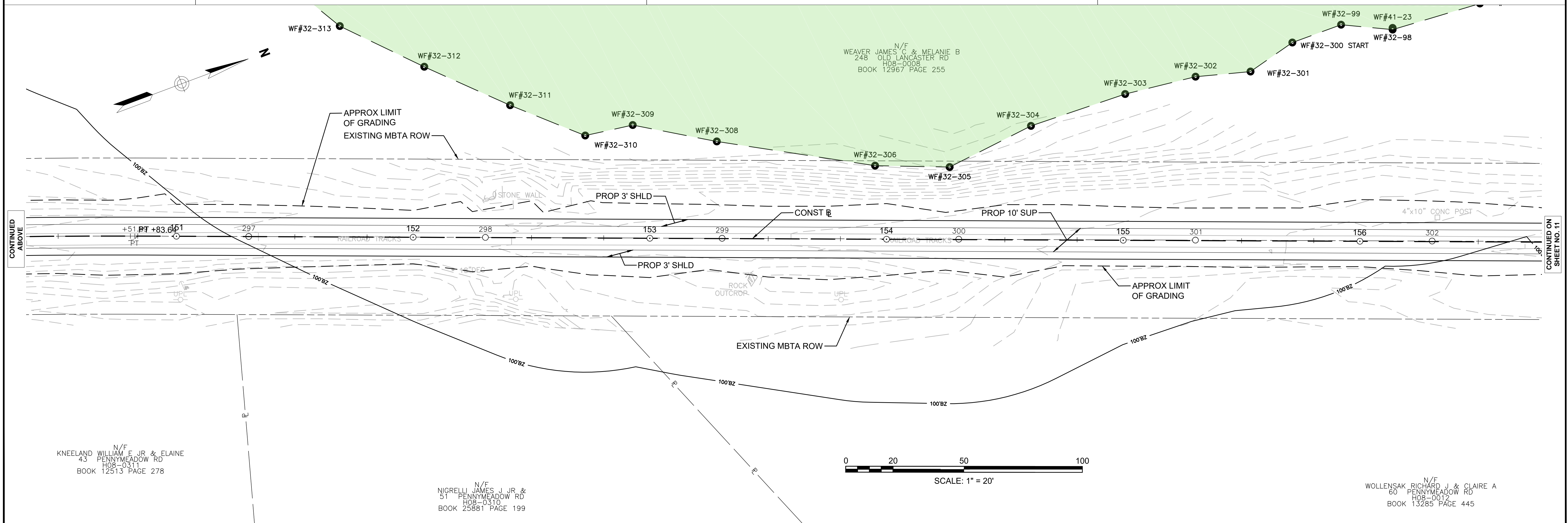
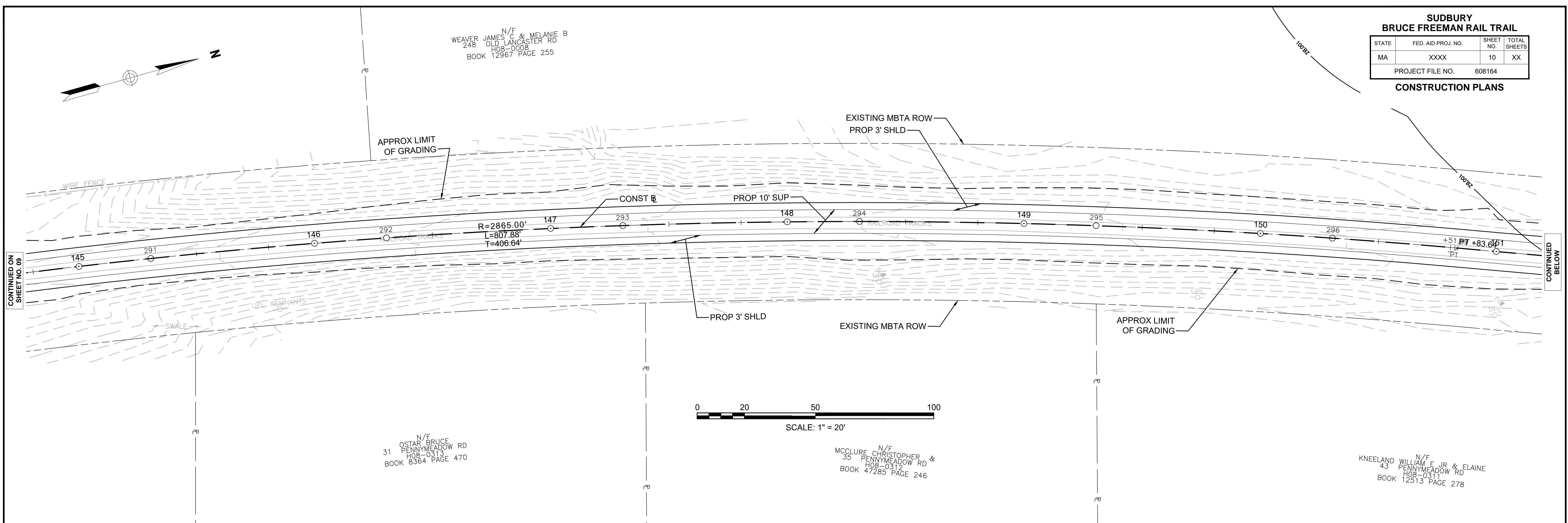
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BRUCE FREEMAN RAIL TRAIL**

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PROJECT FILE NO. 608164

CONSTRUCTION PLANS



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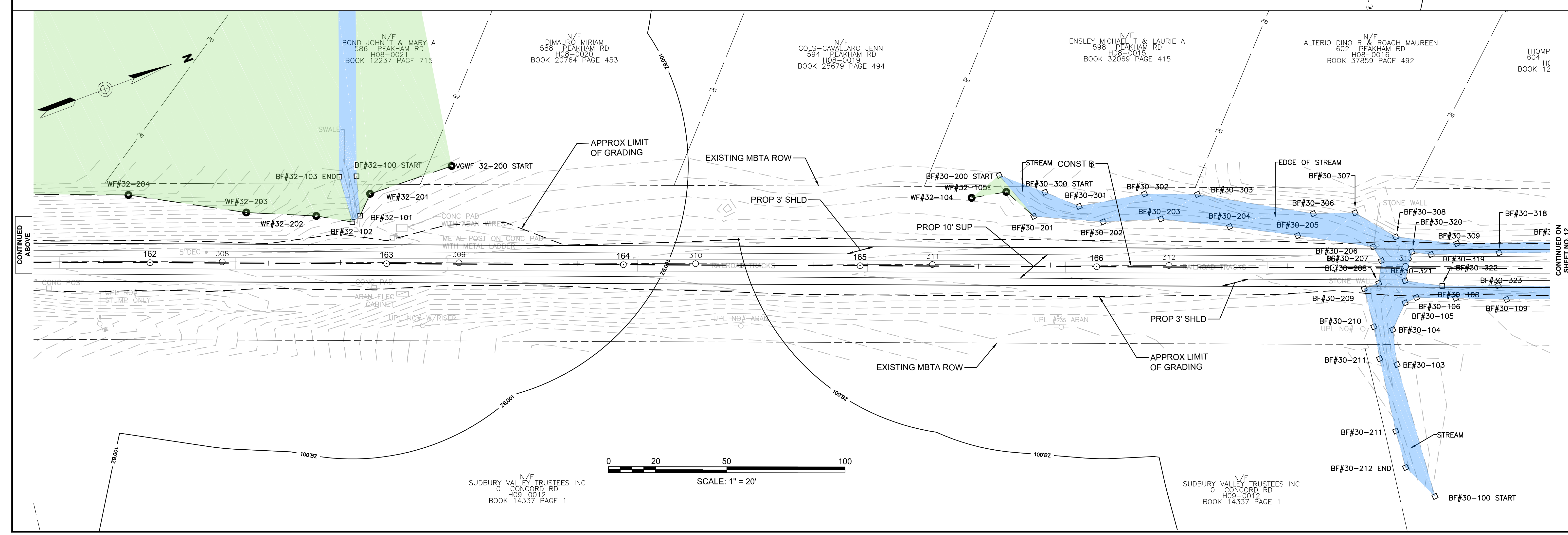
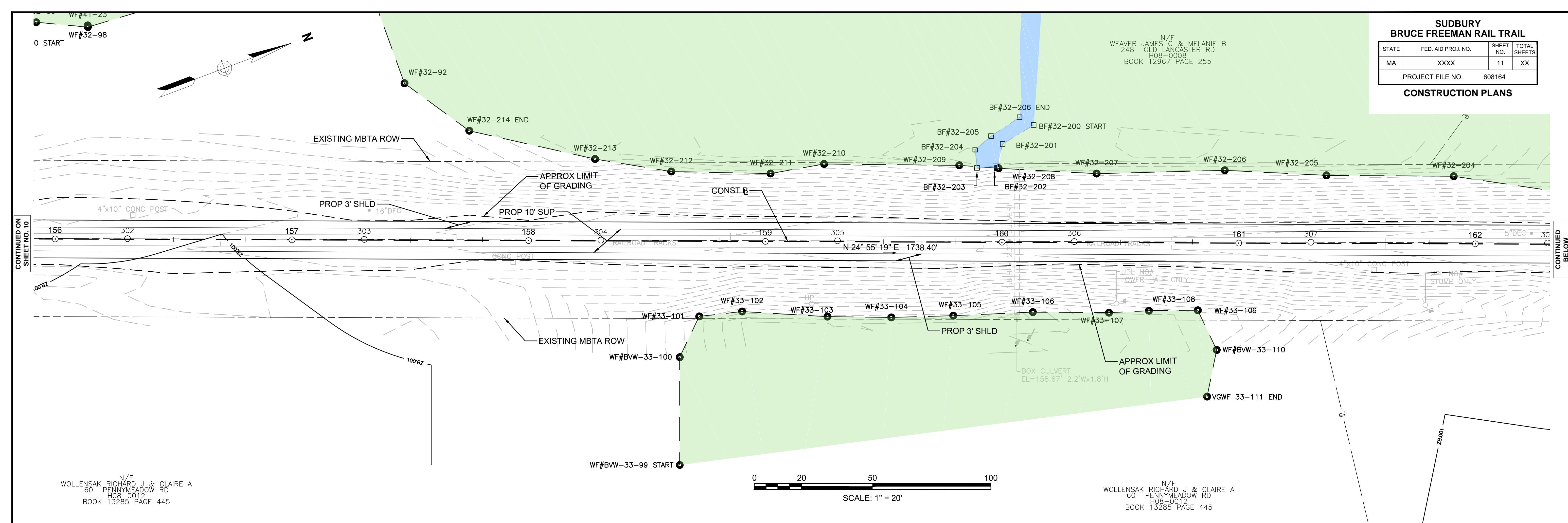
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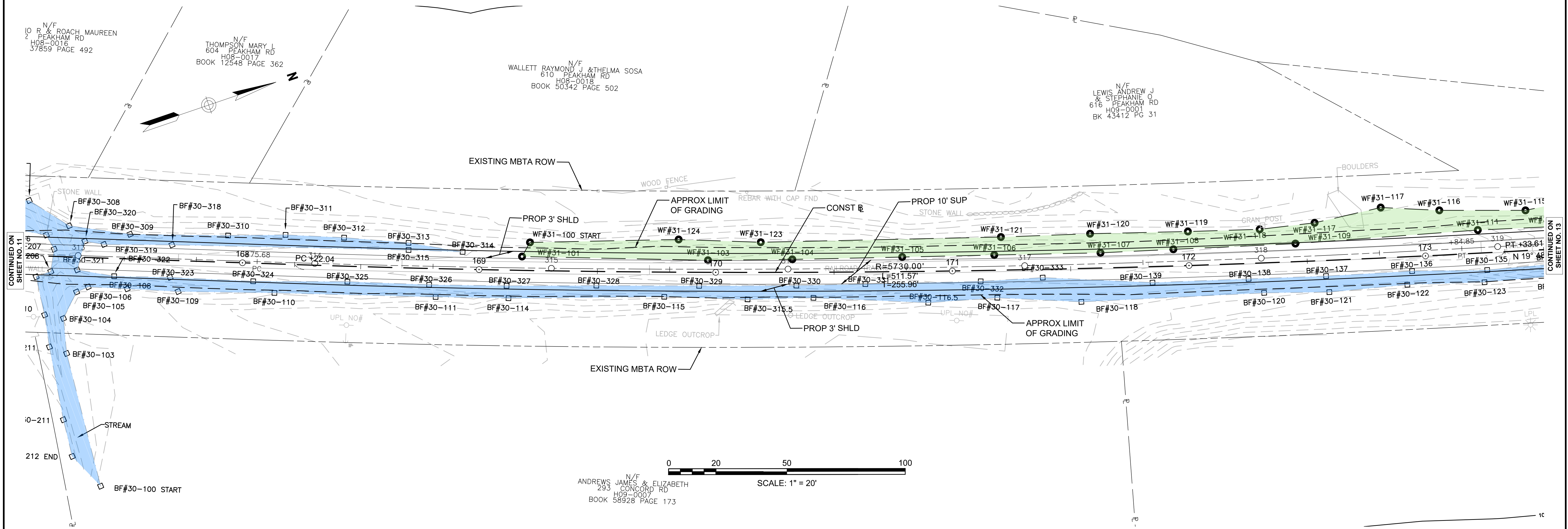
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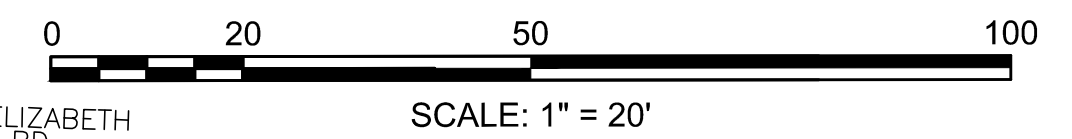
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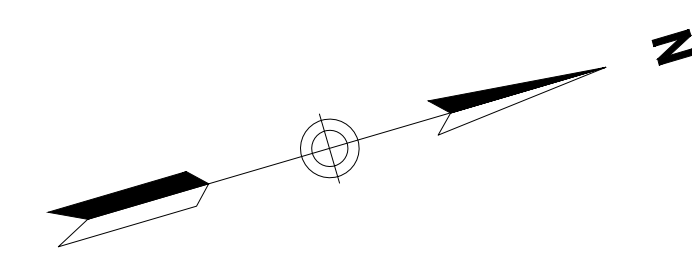
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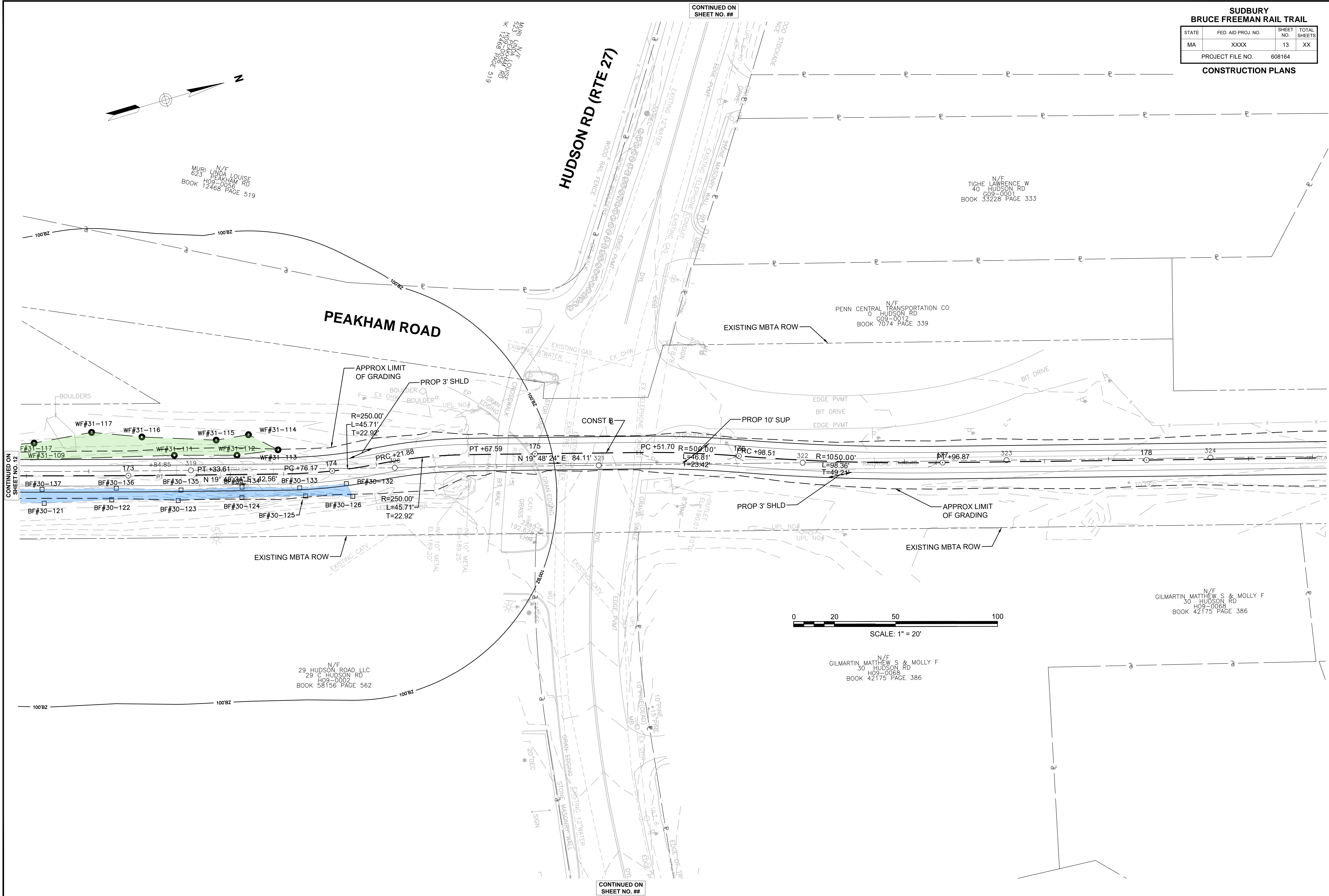
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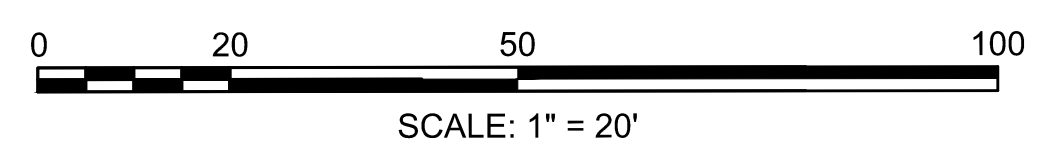
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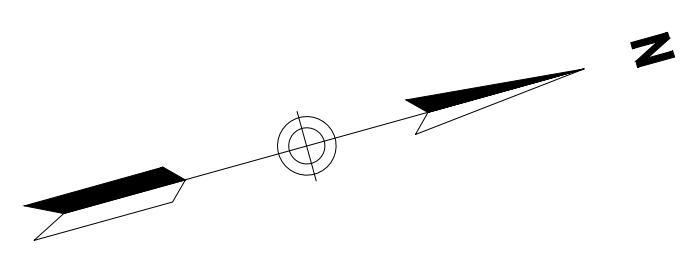
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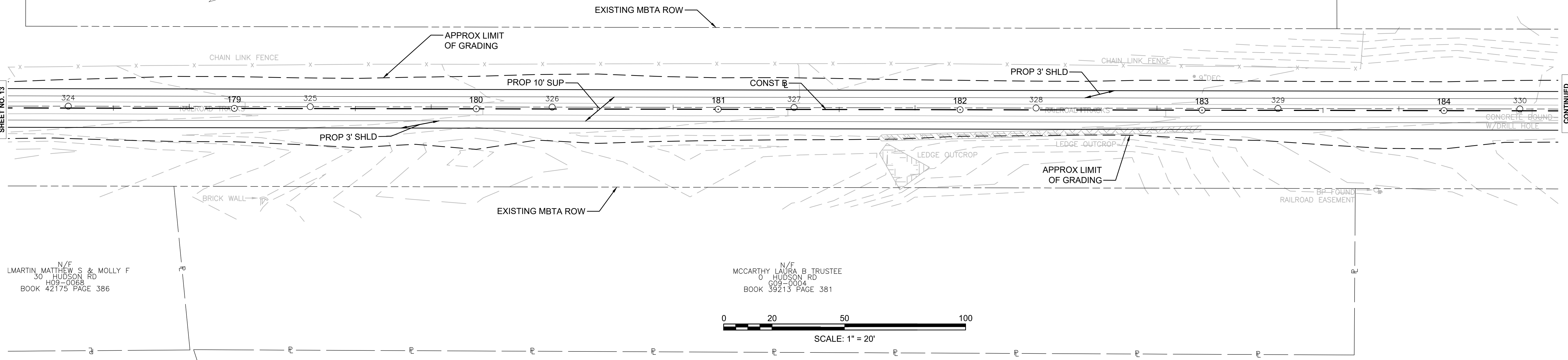
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CONSTRUCTION PLANS

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 36 HUDSON RD
 G09-0002
 BOOK 30663 PAGE 361



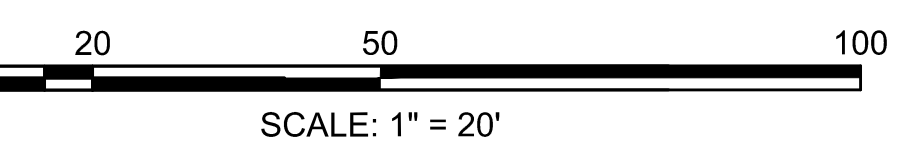
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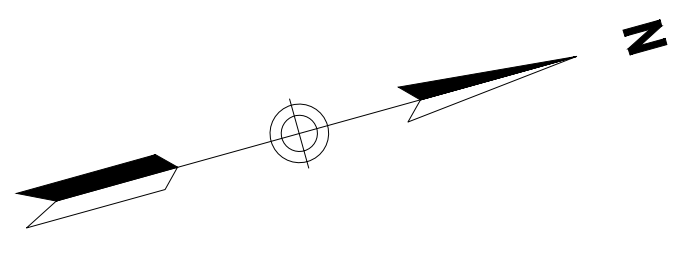


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 BOOK 42175 PAGE 386

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 BOOK 39213 PAGE 381

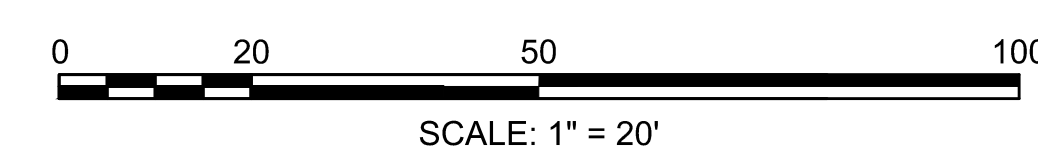
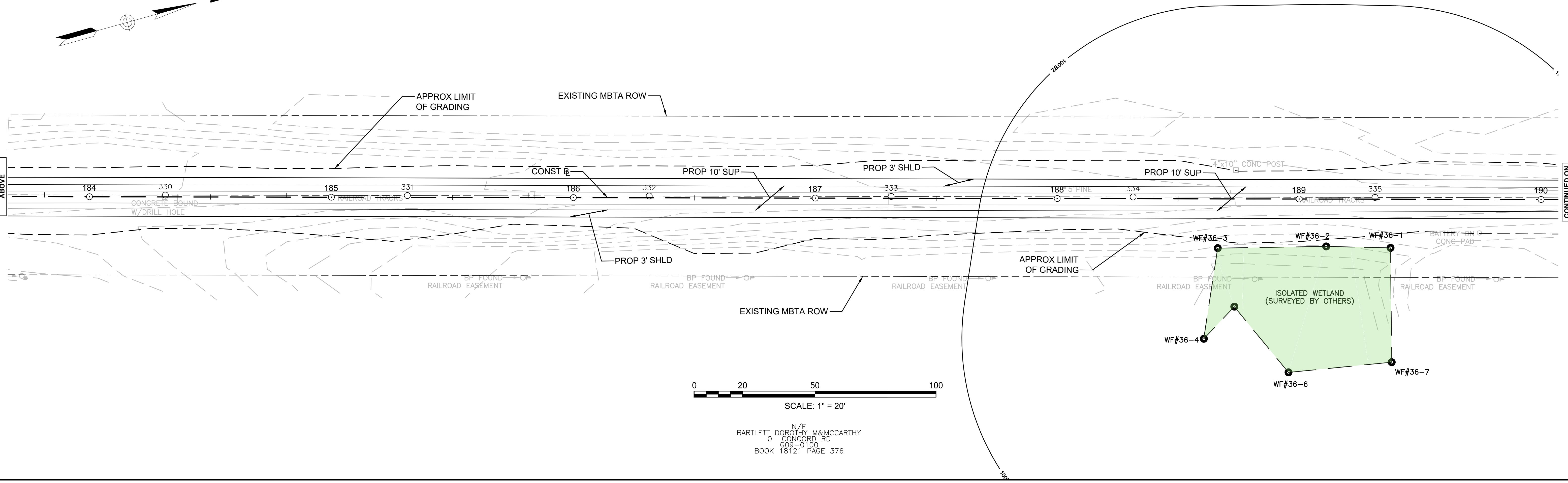


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 G09-0100
 BOOK 18121 PAGE 376

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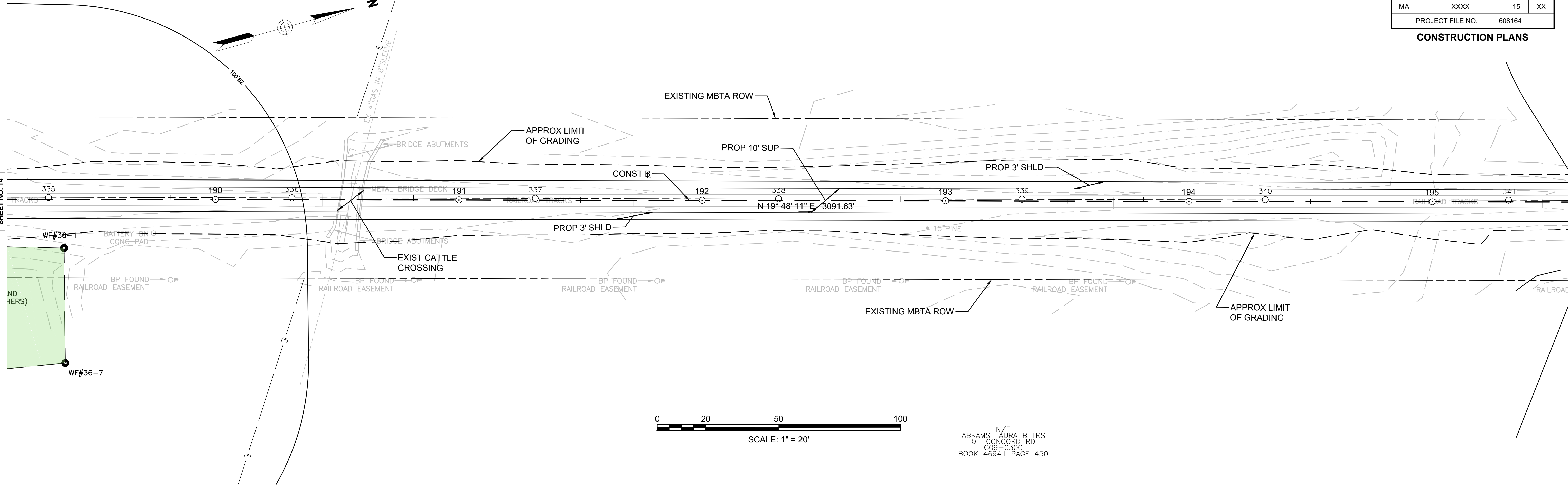
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PROJECT FILE NO. 608164
CONSTRUCTION PLANS

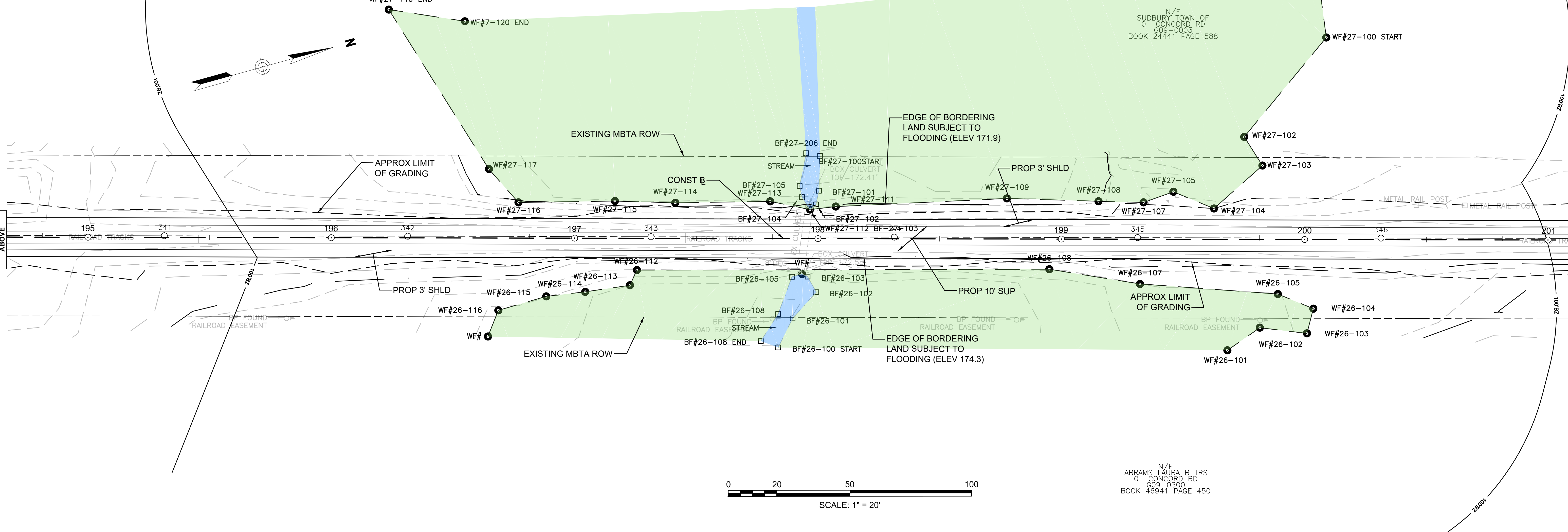
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SHEET NO. 16



7-100 START

N/F
SUDBURY TOWN OF
0 CONCORD RD
099-0003
BOOK 24441 PAGE 588

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXXX	16	XX
PROJECT FILE NO.		608164	
CONSTRUCTION PLANS			

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SHEET NO. 15

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BELOW

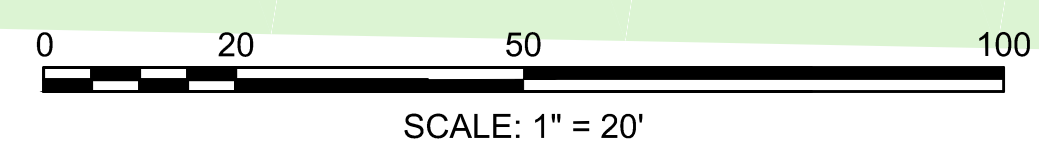
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RICHARDS JAMES C & SUSAN M
44 CODMAN DR
099-0807
BOOK 24467 PAGE 551

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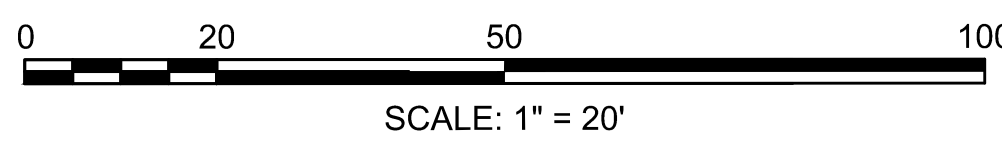
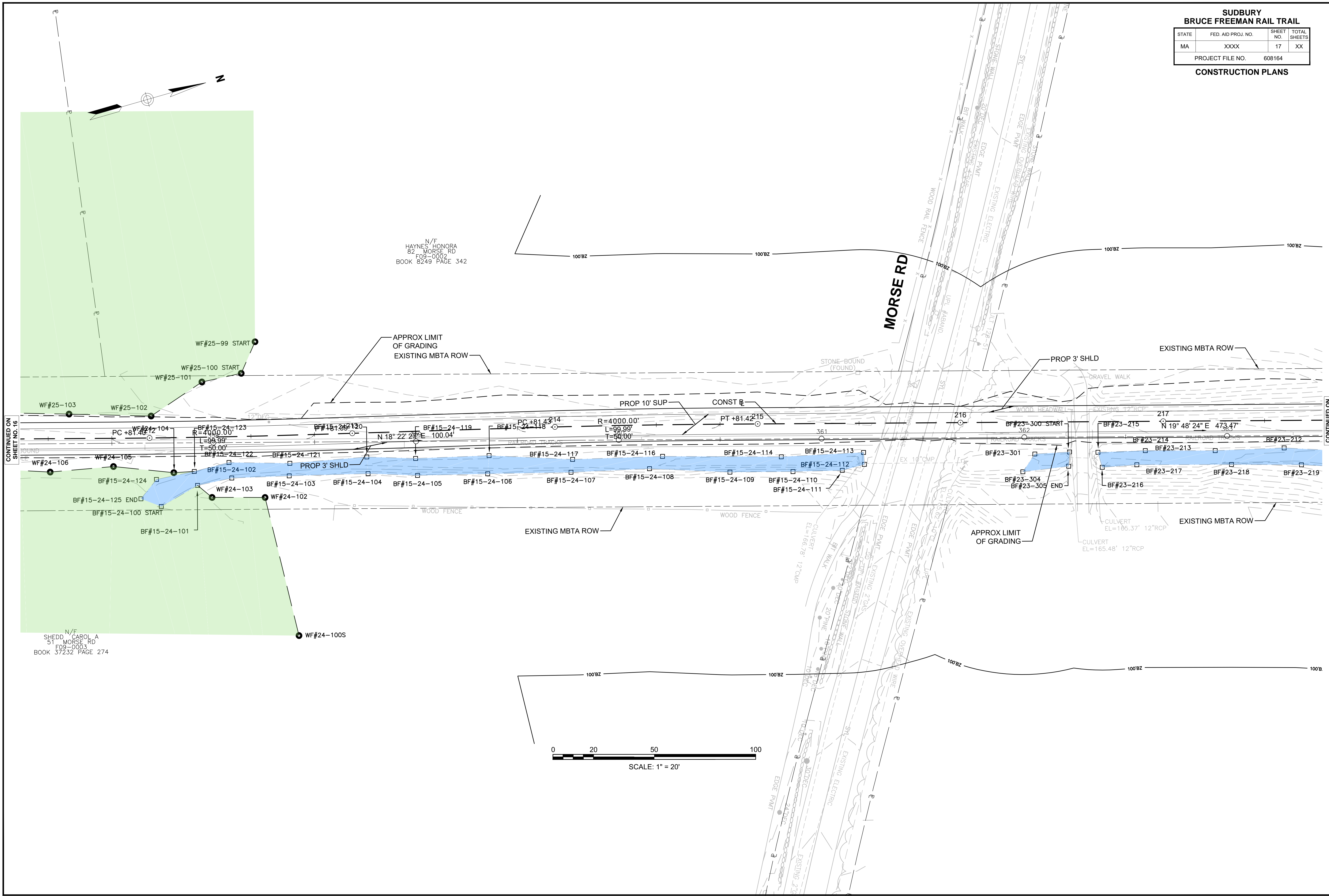


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RICHARDS JAMES C & SUSAN M
44 CODMAN DR
099-0807
BOOK 24467 PAGE 551

N/F
WOLIN STEVEN M
& MAUREEN G
42 CODMAN DR
099-0808
BOOK 46761 PAGE 55

N/F
SHEDD CAROL A
51 MORSE RD
099-0003
BOOK 37232 PAGE 274

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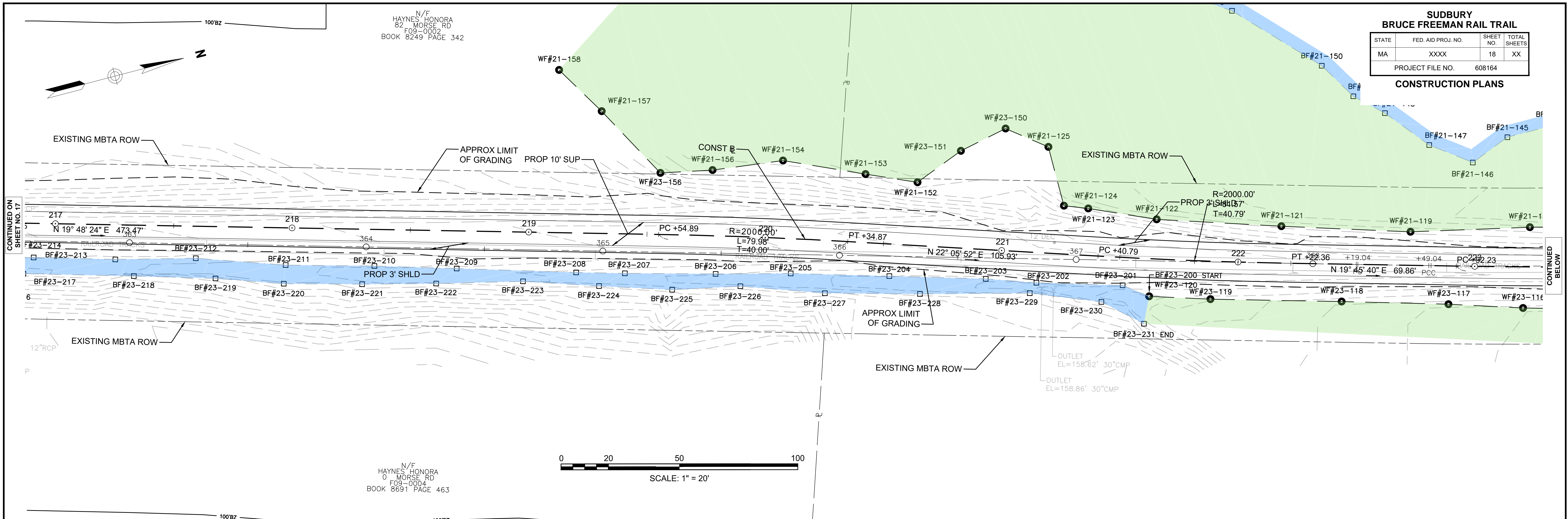
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**SUDBURY
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXXX	18	XX
PROJECT FILE NO.		608164	

CONSTRUCTION PLANS



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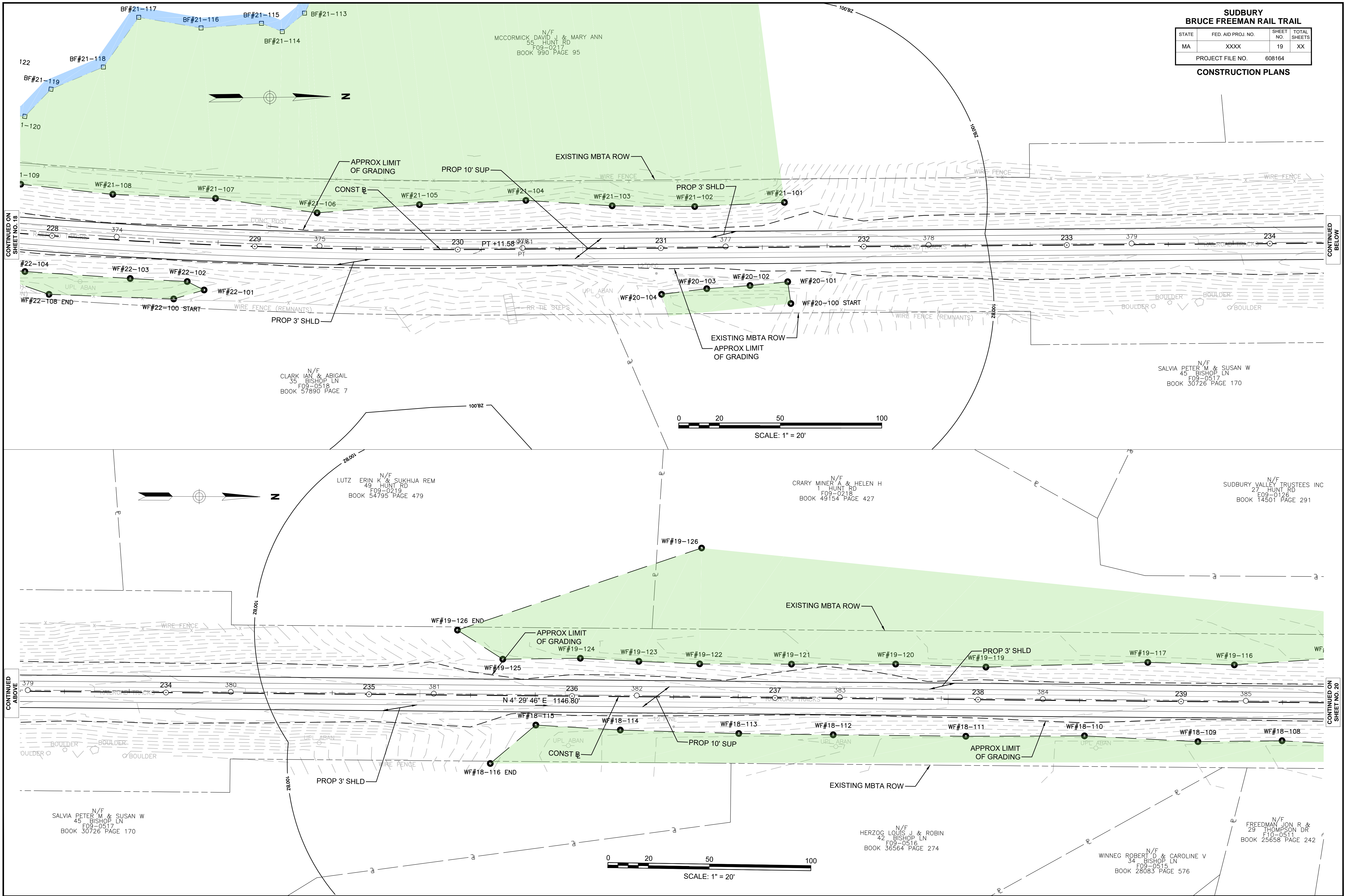
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SUDBURY
BRUCE FREEMAN RAIL TRAIL

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXXX	19	XX

PROJECT FILE NO. 608164
CONSTRUCTION PLANS



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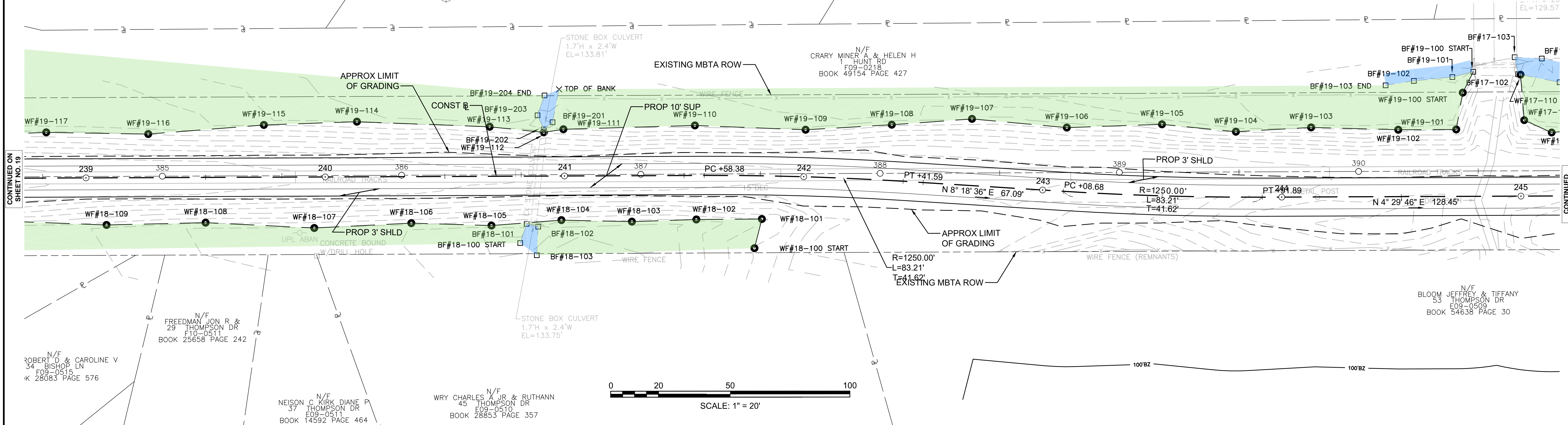
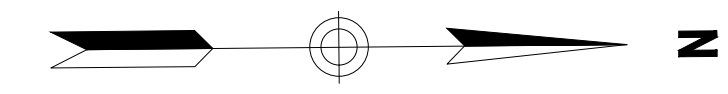
SUDBURY VALLEY TRUSTEES INC
27 HUNT RD
E09-0126
BOOK 14501 PAGE 291

N/F
STEINER KENNETH &
19 HUNT RD
E09-0127
BOOK 18899 PAGE 359

N/F
SCHOW JOAN M
11 HUNT RD
E09-0128
BOOK 12241 PAGE 378

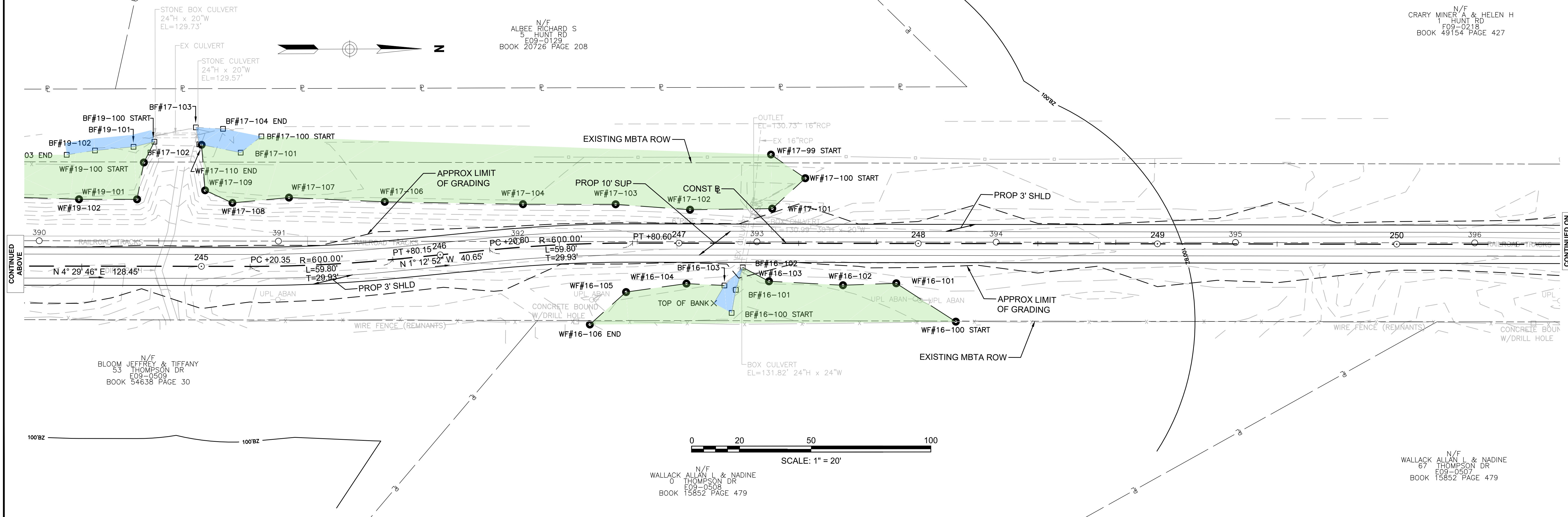
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STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXXX	20	XX
PROJECT FILE NO.		608164	

CONSTRUCTION PLANS



CONTINUED ON
SHEET NO. 19

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BELOW



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ABOVE

CONTINUED
ON
SHEET NO. 21

N/F
CRARY MINER A & HELEN H
1 HUNT RD
F09-0218
BOOK 49154 PAGE 427

N/F
CRARY MINER A & HELEN H
1 HUNT RD
F09-0218
BOOK 49154 PAGE 427

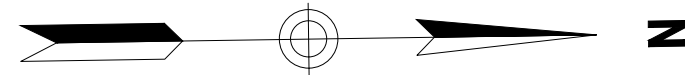
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WEST PANTRY BROOK FARM LIMITED
667 CONCORD RD
E10-0200
BOOK 49200 PAGE 410

**SUDBURY
BRUCE FREEMAN RAIL TRAIL**

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MA	XXXX	21	XX

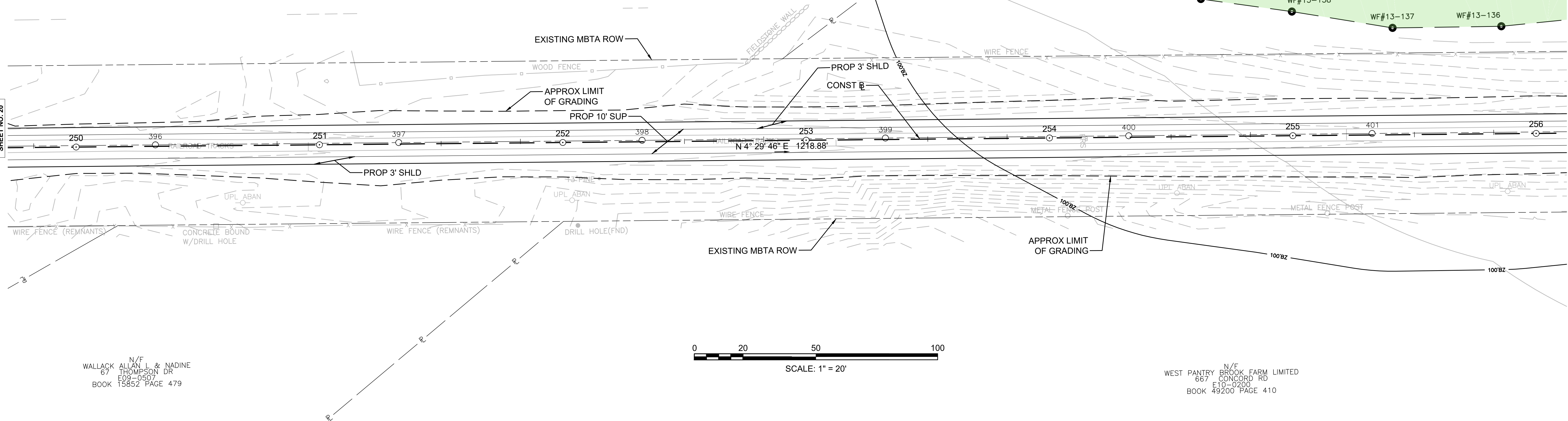
PROJECT FILE NO. 608164

CONSTRUCTION PLANS



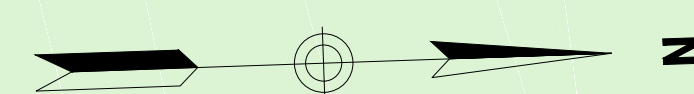
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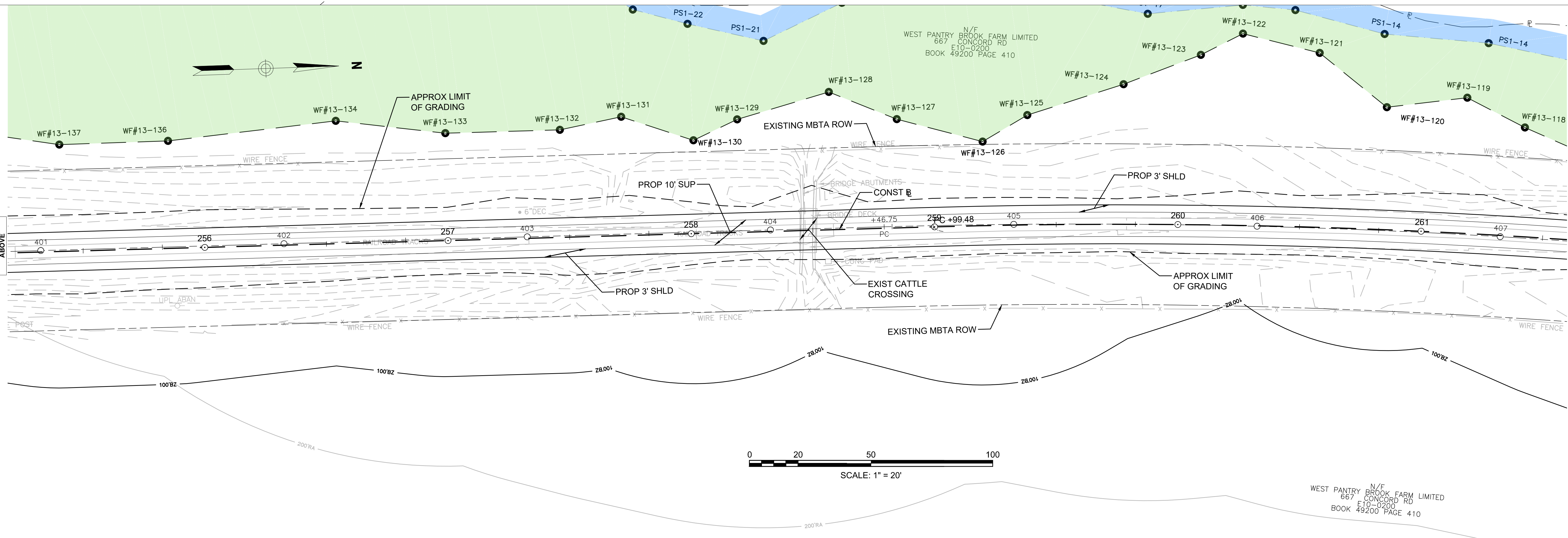
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WALLACK ALLAN L & NADINE
67 THOMPSON DR
E09-0507
BOOK 15852 PAGE 479

N/F
WEST PANTRY BROOK FARM LIMITED
667 CONCORD RD
E10-0200
BOOK 49200 PAGE 410



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ABOVE

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ON
SHEET NO. 22

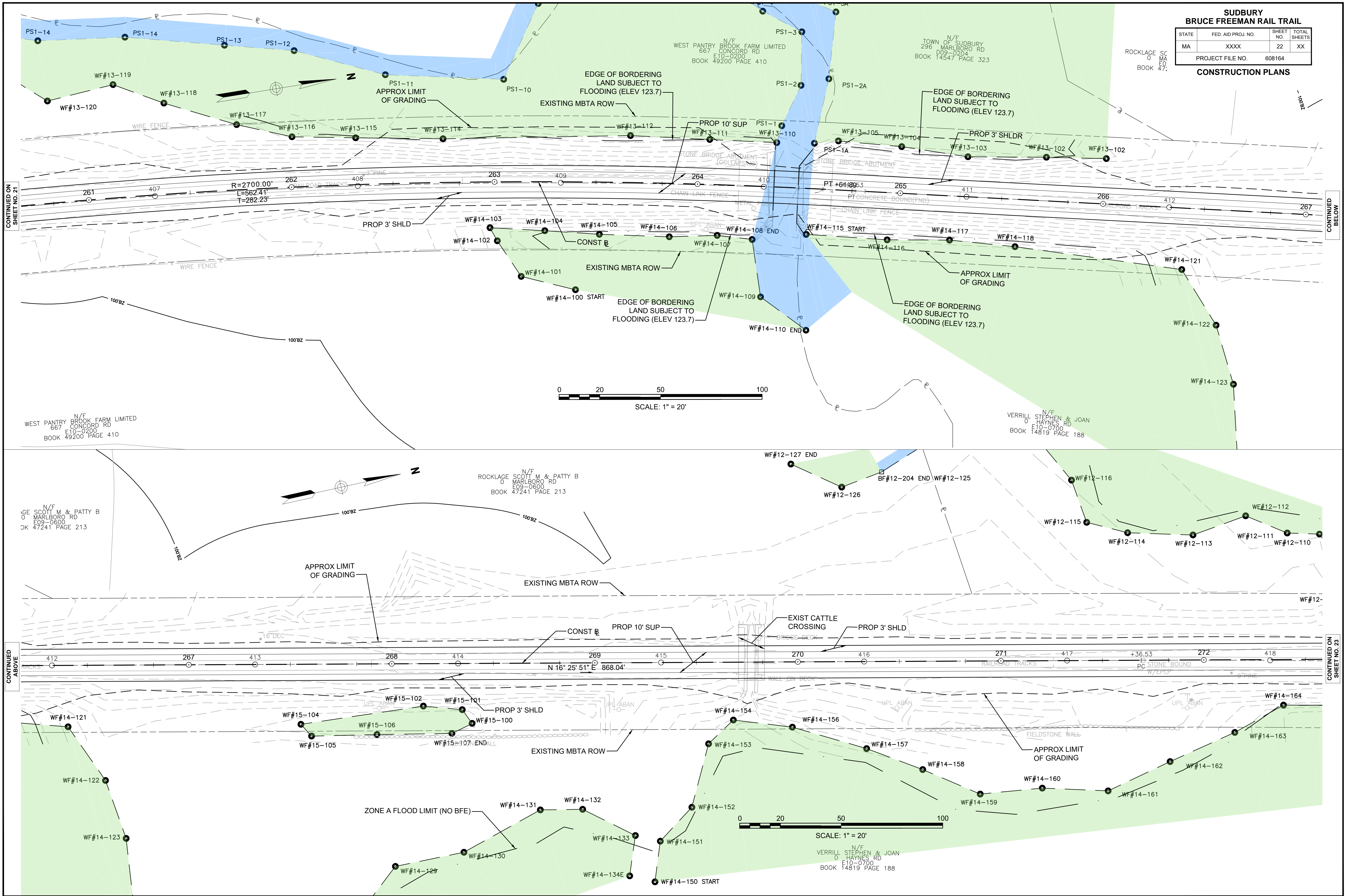


N/F
WEST PANTRY BROOK FARM LIMITED
667 CONCORD RD
E10-0200
BOOK 49200 PAGE 410

**SUDBURY
BRUCE FREEMAN RAIL TRAIL**

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXXX	22	XX
PROJECT FILE NO. 608164			

CONSTRUCTION PLANS

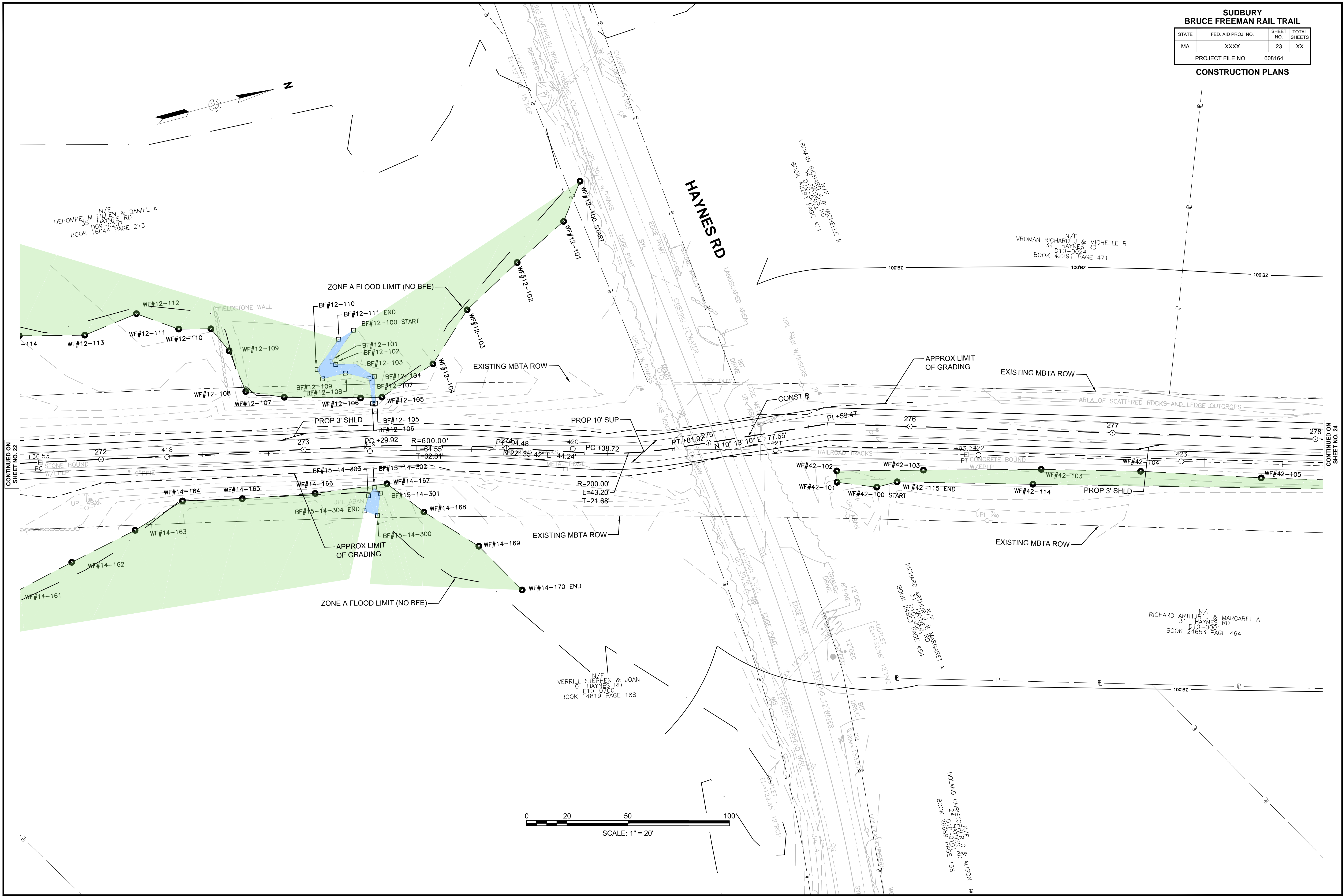


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CONTINUED
BELOW

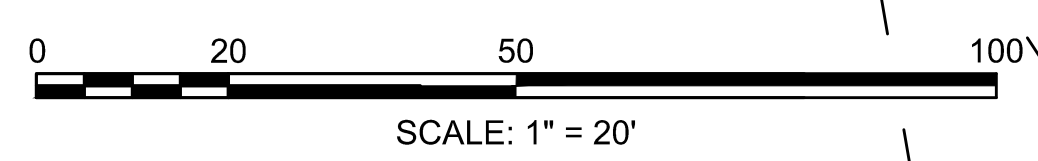
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SHEET NO. 23



CONTINUED ON
SHEET NO. 22

CONTINUED ON
SHEET NO. 24



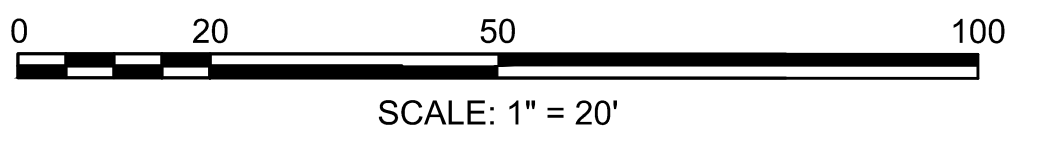
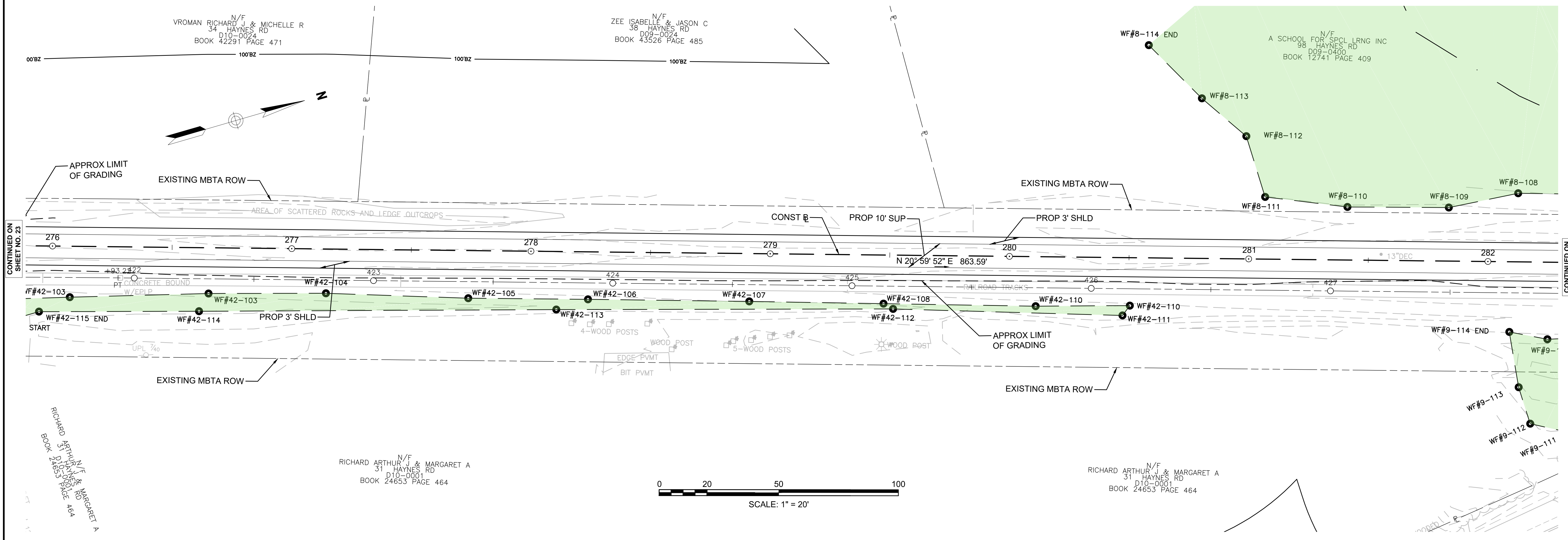
N/F
VERRILL STEPHEN & JOAN
0 HAYNES RD
E10-0700
BOOK 14819 PAGE 188

N/F
RICHARD S. ARTHUR & MARGARET A
31 HAYNES RD
D10-0001
BOOK 24653 PAGE 464

N/F
ROLAND CHRISTOPHER G & ALISON M
27 HAYNES RD
D10-0001
BOOK 26689 PAGE 158

N/F
DEPOMPEL M EILEEN & DANIEL A
35 HAYNES RD
D09-0207
BOOK 16644 PAGE 273

N/F
VROMAN RICHARD J & MICHELLE R
34 HAYNES RD
D10-0024
BOOK 42291 PAGE 471



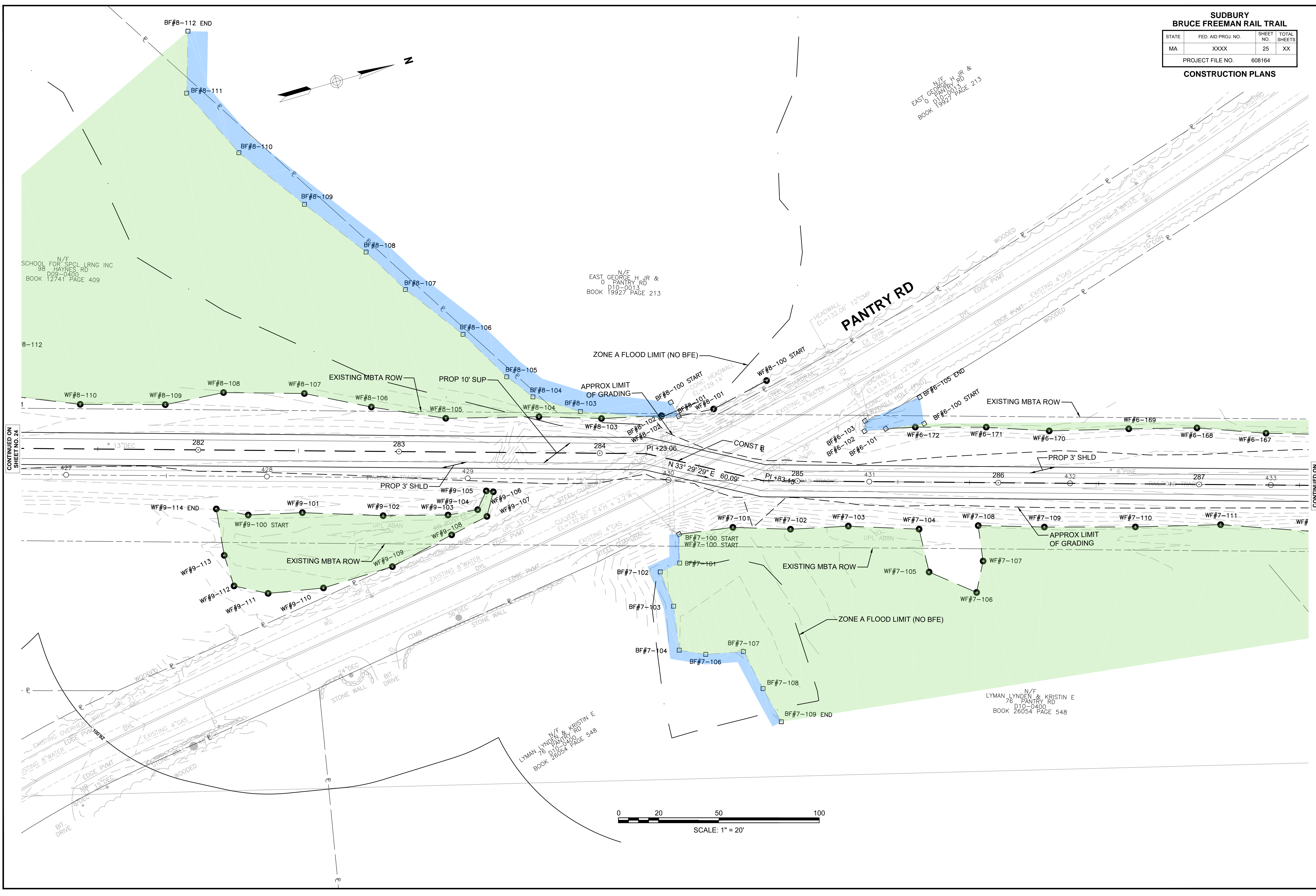
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SUDBURY
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXXX	25	XX

PROJECT FILE NO. 608164
CONSTRUCTION PLANS



N/E
EAST GEORGE H JR &
PANTRY RD
D10-0013
BOOK 19927 PAGE 213

N/E
EAST GEORGE H JR &
PANTRY RD
D10-0013
BOOK 19927 PAGE 213

N/E
SCHOOL FOR SPCL LRNG INC
98 HAYNES RD
D03-0400
BOOK 12741 PAGE 409

N/E
LYMAN LYNDEN & KRISTIN E
76 PANTRY RD
D10-0400
BOOK 26054 PAGE 548

N/E
LYMAN LYNDEN & KRISTIN E
76 PANTRY RD
D10-0400
BOOK 26054 PAGE 548

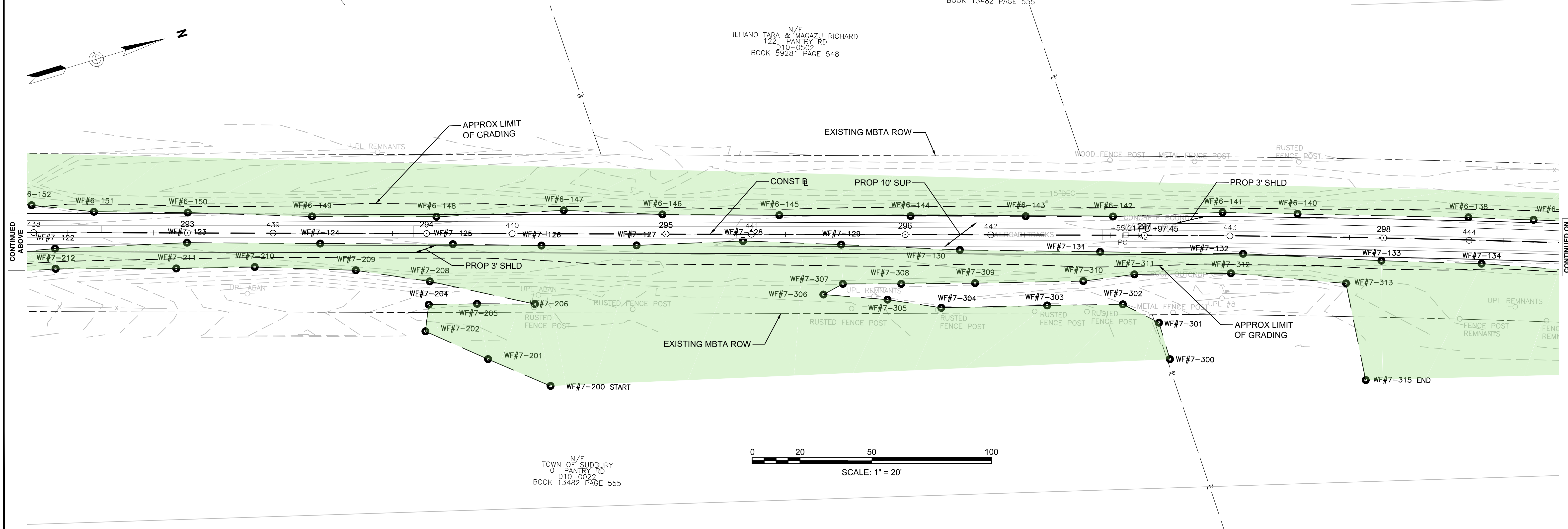
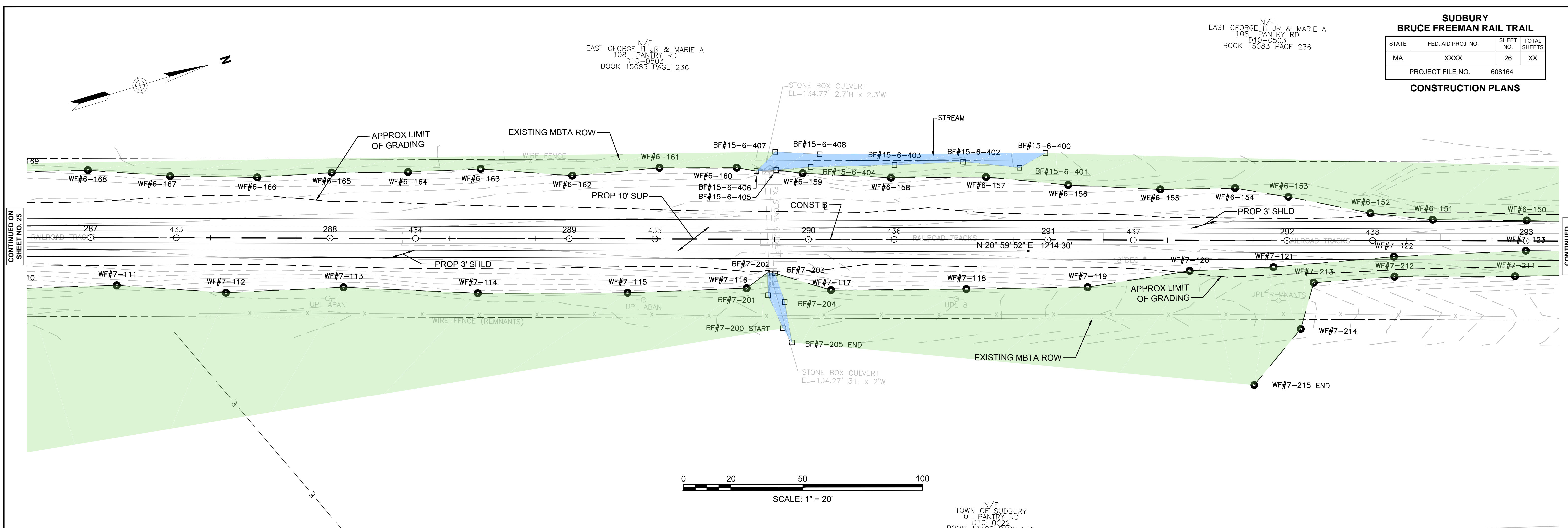


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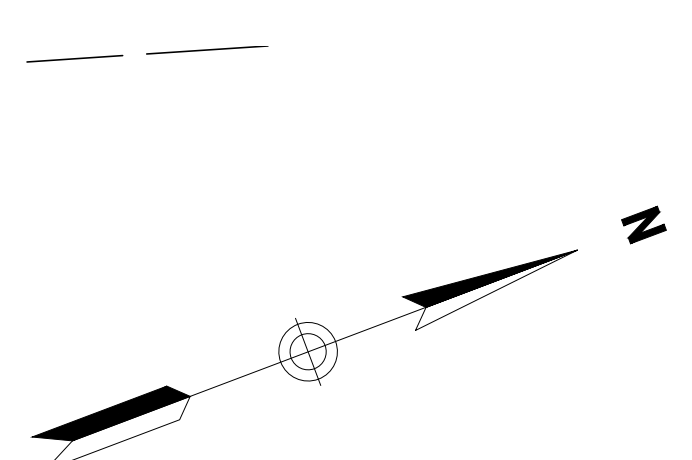
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 EAST GEORGE H. JR. & MARIE A
 108 PANTRY RD
 D10-0503
 BOOK 15083 PAGE 236

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 EAST GEORGE H. JR. & MARIE A
 108 PANTRY RD
 D10-0503
 BOOK 15083 PAGE 236

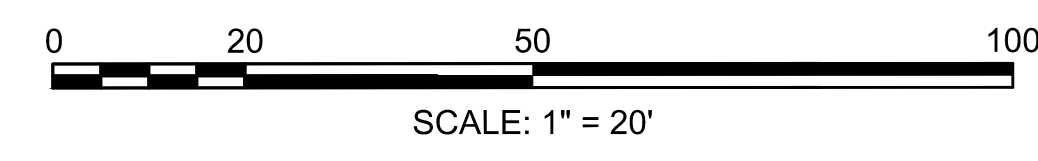
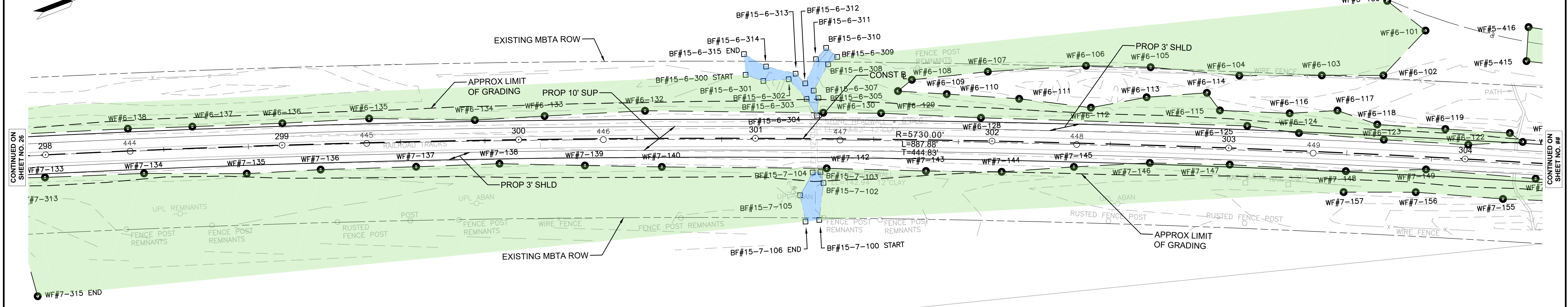


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 TOWN OF SUDBURY
 0 PANTRY RD
 D10-0022
 BOOK 13482 PAGE 555

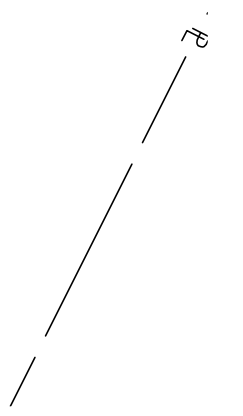
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N/E
 BROCHU MARY F TRUSTEE
 0 WINDMILL DR
 C19-0006
 BOOK 16775 PAGE 585



N/E
 TOWN OF SUDBURY
 211 NORTH RD
 D10-0300
 BOOK 12726 PAGE 603



SUDBURY
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXXX	28	XX

PROJECT FILE NO. 608164
CONSTRUCTION PLANS

NORMAN JOHN C & DORIS
O NORTH RD
C10-0013
BOOK 13793 PAGE 342

CONTINUED ON SHEET NO. ##

POPE BROTHERS
70 WINDMILL DR
BOOK 58785 PAGE 2-41

GRANT N/E CORNER
225 NORTH RD
C10-0014
BOOK 12344 PAGE 611

N/E SUDBURY
TOWN OF CONCORD RD
D10-0018
BOOK 12754 PAGE 314

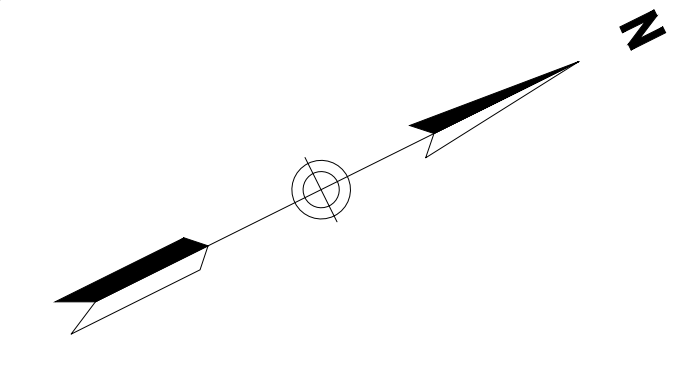
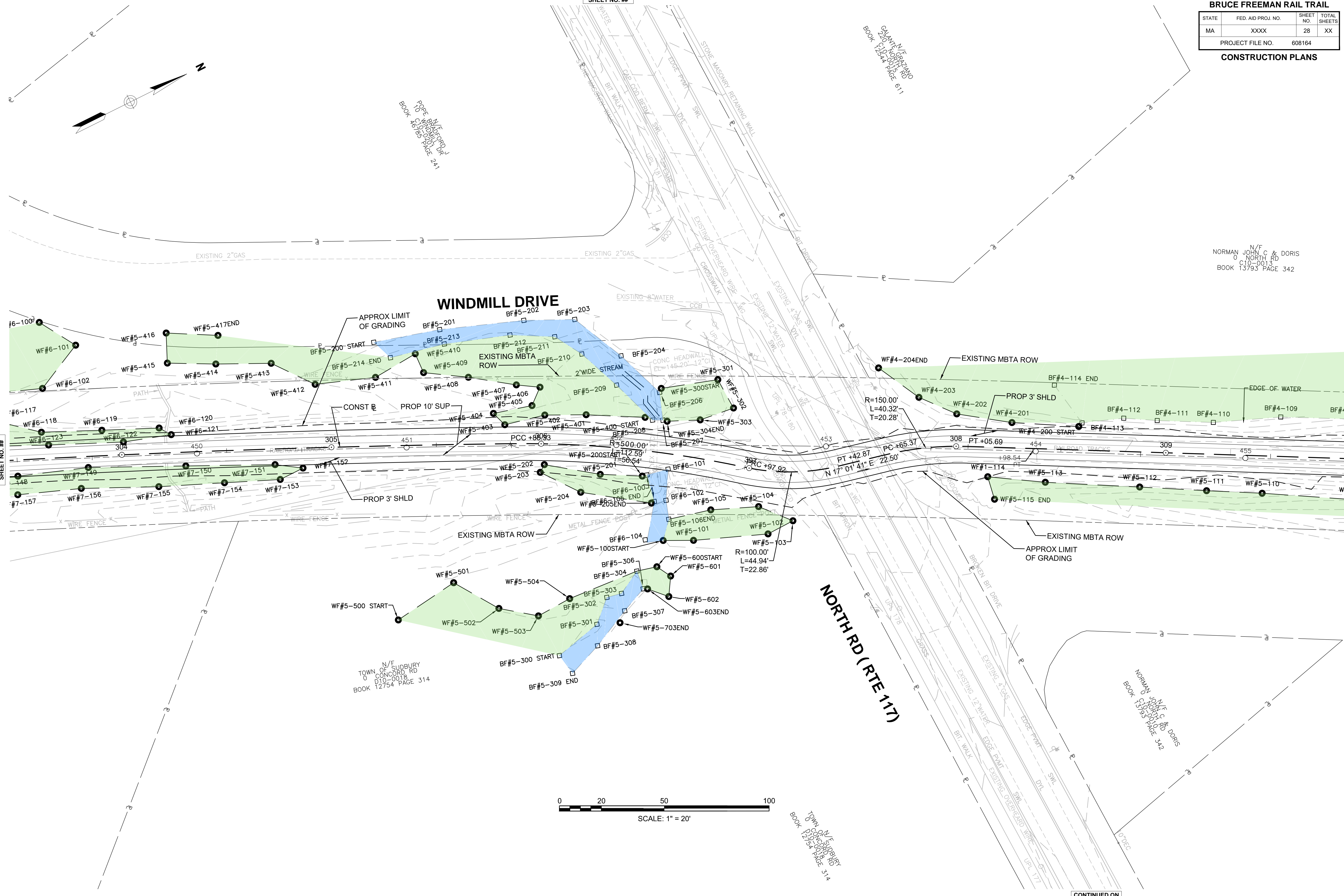
TOWN OF SUDBURY
O CONCORD RD
D10-0018
BOOK 12754 PAGE 314

NORMAN JOHN C & DORIS
O NORTH RD
C10-0013
BOOK 13793 PAGE 342

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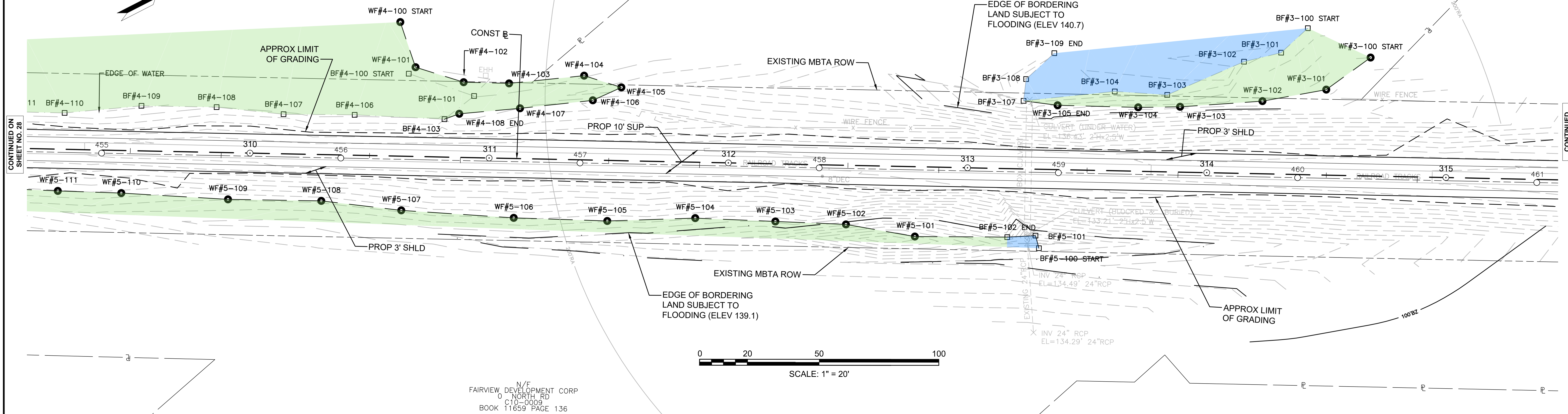
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CONTINUED ON SHEET NO. ##



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JOHN C & DORIS
0 NORTH RD
C10-0013
BOOK 13793 PAGE 342

NORMAN JOHNSON
0 NORTH RD
C10-0013
BOOK 13793 PAGE 342

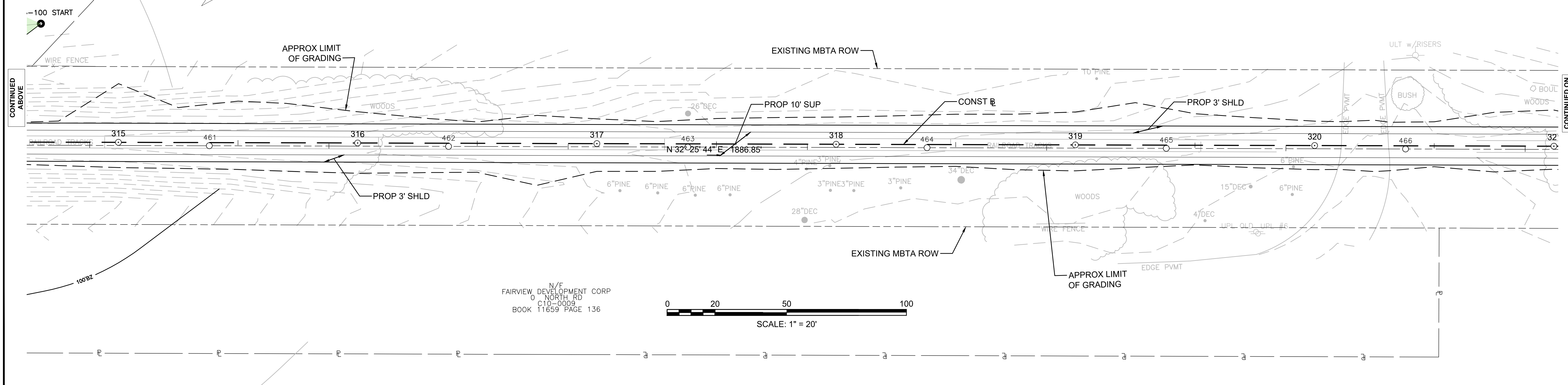


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FAIRVIEW DEVELOPMENT CORP
0 NORTH RD
C10-0009
BOOK 11659 PAGE 136

N/F
FAIRVIEW DEVELOPMENT CORP
0 NORTH RD
C10-0401
BOOK 9512 PAGE 83

N/F
JOHN C & DORIS
0 NORTH RD
C10-0012
BOOK 13793 PAGE 342

N/F
FAIRVIEW DEVELOPMENT CORP
0 NORTH RD
C10-0401
BOOK 9512 PAGE 83



N/F
FAIRVIEW DEVELOPMENT CORP
0 NORTH RD
C10-0009
BOOK 11659 PAGE 136

N/F
JOHN C & DORIS
0 NORTH RD
C10-0012
BOOK 13793 PAGE 342

N/F
FAIRVIEW DEVELOPMENT CORP
0 NORTH RD
C10-0401
BOOK 9512 PAGE 83

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SHEET NO. 28

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BELOW

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ABOVE

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ON
SHEET NO. 30

SUDBURY
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXXX	30	XX

PROJECT FILE NO. 608164

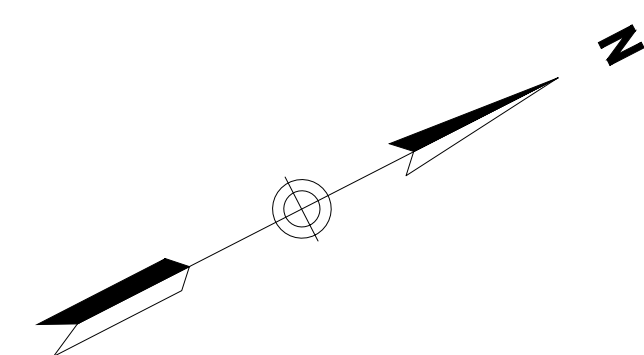
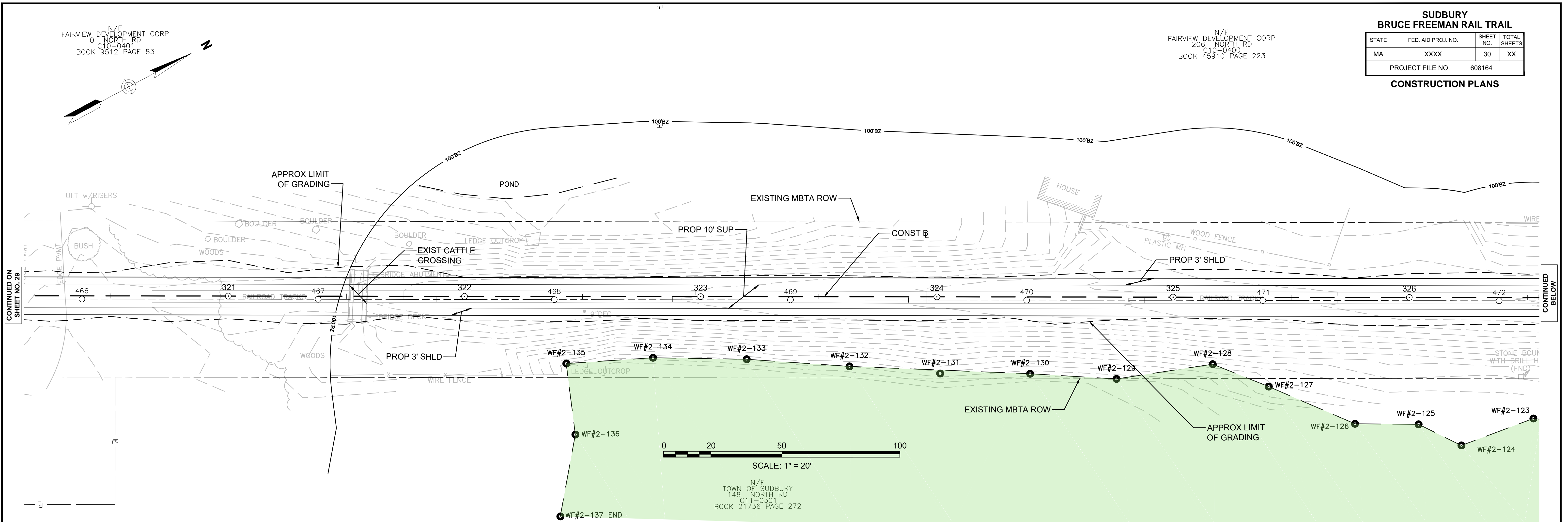
CONSTRUCTION PLANS

N/F
FAIRVIEW DEVELOPMENT CORP
0 NORTH RD
C10-0401
BOOK 9512 PAGE 83

N/F
FAIRVIEW DEVELOPMENT CORP
208 NORTH RD
C10-0400
BOOK 45910 PAGE 223

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SHEET NO. 29

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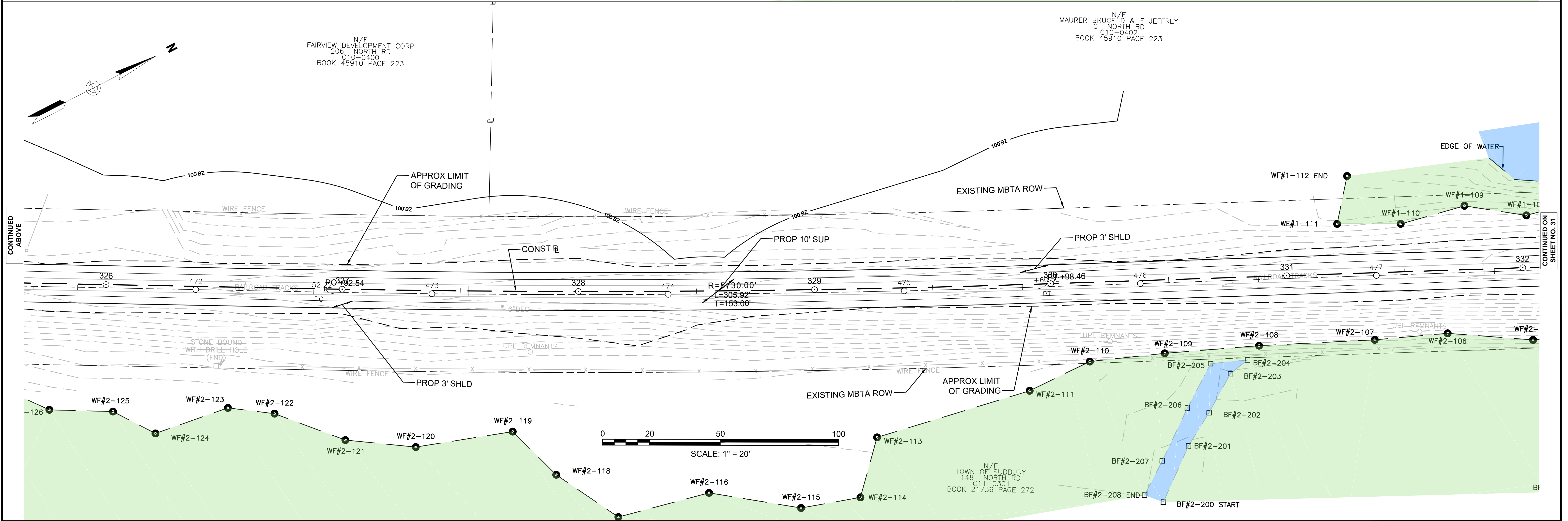


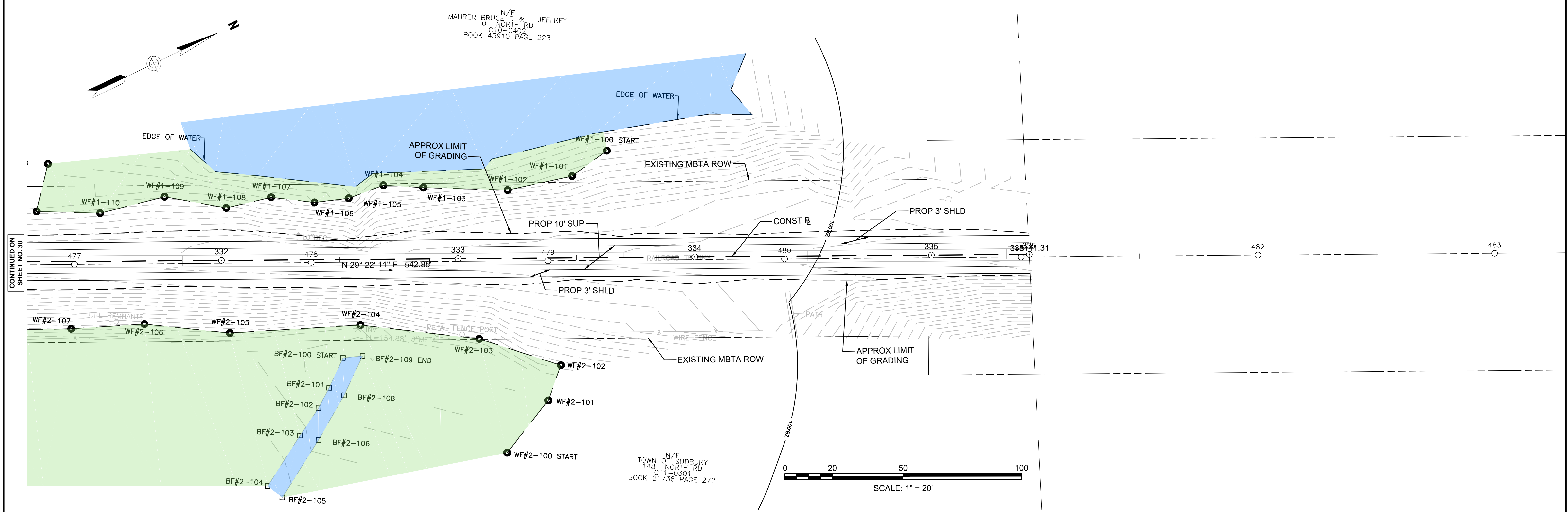
N/F
FAIRVIEW DEVELOPMENT CORP
206 NORTH RD
C10-0400
BOOK 45910 PAGE 223

N/F
MAURER BRUCE D & F JEFFREY
0 NORTH RD
C10-0402
BOOK 45910 PAGE 223

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SHEET NO. 31





CONTINUED ON SHEET NO. 30

GENERAL WILDLIFE HABITAT ASSESSMENT REPORT

Appendix B Preliminary Impact Tables
April 8, 2020

Appendix B PRELIMINARY IMPACT TABLES



SUMMARY QUANTITY SHEET

FROM EARTHWORKS SHEETS:

<u>Elevation</u>	<u>Fill FLP (CY)</u>	<u>Cutting FLP (CY)</u>
173.3'-174.3'	2.93	72.77
172.3'-173.3'	0.09	0.00

TOTALS: **3.02** **CY** **72.77** **CY**

Sections with Floodplain

Sta 116+00 to Sta 132+00	No Impacts
Sta 195+00 to 201+50	Impacts
Sta 263+50 to Sta 266+00	No Impacts
Sta 311+00 to 314+50	No Impacts

EARTHWORK QUANTITY SHEET

FILL FLOOD PLAIN

Station	Length (ft)	Fill Area (sf) 173.3'-174.3'	Avg Fill Area (sf)	Fill Vol (cy)	Fill Area (sf) 172.3'-173.3'	Avg Fill Area (sf)	Fill Vol (cy)	
195+00		0.00			0.00			
195+50	50	0.00	0.0	0.00	0.00	0.0	0.00	
196+00	50	0.00	0.0	0.00	0.00	0.0	0.00	
196+50	50	0.00	0.0	0.00	0.00	0.0	0.00	
197+00	50	0.00	0.0	0.00	0.00	0.0	0.00	
197+50	50	0.00	0.0	0.00	0.00	0.0	0.00	
198+00	50	0.23	0.1	0.21	0.00	0.0	0.00	
198+50	50	0.11	0.2	0.31	0.00	0.0	0.00	
199+00	50	0.06	0.1	0.16	0.00	0.0	0.00	
199+50	50	0.00	0.0	0.06	0.00	0.0	0.00	
200+00	50	1.08	0.5	1.00	0.05	0.0	0.05	
200+50	50	0.02	0.6	1.02	0.00	0.0	0.05	
201+00	50	0.00	0.0	0.02	0.00	0.0	0.00	
201+50	50	0.16	0.1	0.15	0.00	0.0	0.00	
TOTAL:				2.93	TOTAL: 0.09			

Calculated by: MAD
 Checked by: JCR 6/17

EARTHWORK QUANTITY SHEET

CUT FLOOD PLAIN

Station	Length (ft)	Cut Area (sf) 173.3'-174.3'	Avg Cut Area (sf)	Cut Vol (cy)	Cut Area (sf) 172.3'-173.3'	Avg Cut Area (sf)	Cut Vol (cy)		
195+00		0.00			0.00				
195+50	50	0.00	0.0	0.00	0.00	0.0	0.00		
196+00	50	0.00	0.0	0.00	0.00	0.0	0.00		
196+50	50	0.00	0.0	0.00	0.00	0.0	0.00		
197+00	50	5.99	3.0	5.55	0.00	0.0	0.00		
197+50	50	7.52	6.8	12.51	0.00	0.0	0.00		
198+00	50	7.62	7.6	14.02	0.00	0.0	0.00		
198+50	50	6.76	7.2	13.31	0.00	0.0	0.00		
199+00	50	6.44	6.6	12.22	0.00	0.0	0.00		
199+50	50	4.36	5.4	10.00	0.00	0.0	0.00		
200+00	50	0.00	2.2	4.04	0.00	0.0	0.00		
200+50	50	0.36	0.2	0.33	0.00	0.0	0.00		
201+00	50	0.19	0.3	0.51	0.00	0.0	0.00		
201+50	50	0.11	0.2	0.28	0.00	0.0	0.00		
TOTAL:				72.77	TOTAL:				0.00

Calculated by: MAD
 Checked by: JCR 6/17

Bordering Vegetated Wetland (BVW) Impacts

Wetland Flag Number	Wetland Impact Type		Station
	Temporary (sq. ft.)	Permanent (sq. ft.)	
1			
2			
3			
4	7	0	Sta 307+80 to 311+65 LT
5	28	1	Sta 305+40 to 312+90 RT
6	708	93	Sta 285+70 to 304+35 LT
7	2490	910	Sta 284+60 to 304+95 RT
8			
9	6	0	Sta 282+15 to 283+50 RT
10			
11			
12			
13			
14			
15			
16	11	4	Sta 246+65 to 248+20 RT
17			
18			
19			
20			
21			
22			
23			
24	1	0	Sta 208+25 to 212+15 RT
25	9	0	Sta 207+00 to 212+50 LT
26	6	0	Sta 196+70 to 200+00 RT
27			Sta 196+25 to 200+00 LT
28			
29			
30			
31	332	0	Sta 169+25 to 172+50 LT
32			
33			Sta 140 LT - Potential Vernal Pool
33A			Sta 160 RT
34			
35			
36	5	0	Sta 103+25 to 107+75 LT & RT
36			Sta 188+75 to 189+40 RT (SURVEYED BY OTHERS)
37			Potential Vernal Pool
38	3	0	
39			

Bordering Vegetated Wetland (BVW) Impacts

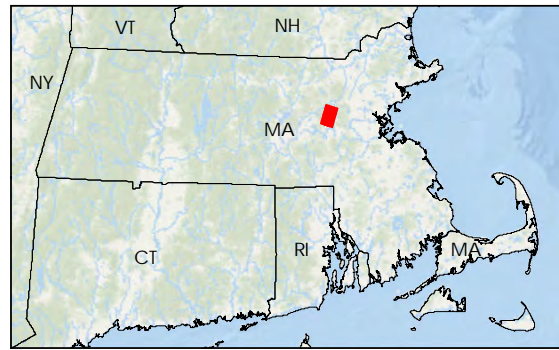
Wetland Flag Number	Wetland Impact Type		Station
	Temporary (sq. ft.)	Permanent (sq. ft.)	
40			
41			
42	64	3	Sta 275+70 to 280+55 RT
PROJECT	3670	1011	4,681

Bank Impacts

Bank Flag Number	Bank Impact Type				Station
	Temporary (ln. ft.)	Temporary (sq. ft.)	Permanent (ln. ft.)	Permanent (sq. ft.)	
1					
2					
3					
4					
5					
6	6	15	10	10	Sta 306+60 to 306+70 RT
7					
8					
9					
10					
11					
12					
13					Pantry Brook
14					Pantry Brook
15 - 6	3	1	0	0	Sta 301+10 to 301+40 LT
15 - 24	13	6	0	0	Sta 212+00 to 215+55 RT
16	5	7	8	4	Sta 247+20 to 247+30 RT
17					
18					
19					
20					
21					
22					
23	298	376	0	0	Sta 216+30 to 221+60 RT
24					
25					
26					
27					
28					
29					
30	1,380	4,180	29	64	Sta 167 to 174
31					
32					
33					Sta 140 LT - Potential Vernal Pool
33A					Sta 160 RT
34					
35					
36					
37					Potential Vernal Pool
38					
39					

Bank Impacts

Bank Flag Number	Bank Impact Type				Station
	Temporary (ln. ft.)	Temporary (sq. ft.)	Permanent (ln. ft.)	Permanent (sq. ft.)	
40					
41					
42					
PROJECT	1705	4585	47	78	



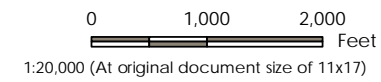
Legend

Vernal Pool Location

- NHESP Certified Vernal Pool
- Eligible to be Certified by NHESP
- Not Eligible to be Certified by NHESP
- Town Boundary
- Sudbury Rail Trail

Data Sources

1. Vernal pools 1 - 19 were digitized from the Existing Conditions Survey Plan At Proposed Rail Trail in Sudbury Mass., prepared by Atlantic Engineering and Survey Consultants Inc., dated June 30, 2008.
2. Potential Vernal Pools 12a, 20 - 22 were located by Stantec on 4/17/2018 and 4/18/2018.
3. Sudbury Rail Trail provided by MassGIS Sudbury parcel data layer.



Project Location: Sudbury, Massachusetts
 179410498
 Prepared by GC on 2018-05-01
 Reviewed by DN on 2018-05-01

Client/Project: Sudbury Rail Trail

Figure No.: 1
 Title: 2018 Potential Vernal Pool Survey

Notes
 1. Coordinate System: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001
 2. Orthoimagery: MassGIS 2013-2014 USGS Color Orthoimagery

Table 1. Vernal Pool Survey Results: 2015, 2017 & 2018: Bruce Freeman Rail Trail, Sudbury, Massachusetts

2015	VHB		2017	VHB		2018	Stantec	
	Water Depth (in)	Findings		Volume (>200 cubic ft.)	Findings		Water Depth (in)	Findings
PVP 1	<1	No VP species found.	PVP 1	Yes	No VP species found.	PVP 1	2	No VP species found.
PVP 2	24-48	No VP species found.	PVP 2	Yes	No VP species found.	PVP 2	25	No VP species found.
PVP 3	2-3	No VP species found.	PVP 3	Yes	No VP species found.	PVP 3	8	No VP species found.
PVP 4	6-15	1 wood frog egg mass and 2 spotted salamander egg masses	PVP 4	Yes	12 wood frog egg masses, 100+ wood frog tadpoles, and 1 dead adult wood frog	PVP 4	12	Appx. 20 wood frog egg masses.
PVP 5	2-12	No VP species found. 1 predacious diving beetle observed.	PVP 5	No	No VP species found.	PVP 5	20	No VP species found.
PVP 6	2-6	No VP species found. Direct outlet to adjacent stream	PVP 6	Yes	No VP species found.	PVP 6	12	No VP species found. Pooled area in stream floodplain and fish observed.
PVP 7	6-8	No VP species found. Limited opportunity for egg mass attachment.	PVP 7	No	No VP species found.	PVP 7	11	No VP species found.
PVP 8	2-3	No VP species found. Water was flowing through area instead of ponding due to topography.	PVP 8	Yes	No VP species found. 1 adult green frog found.	PVP 8	0	No VP species found. Stream floodplain with no discernable pool boundary or pooled area.
SVP 9 ¹	2-5	No VP species found.	SVP 9 ¹	Yes	No VP species found.	SVP 9 ¹	24	2 dead salamanders; lead phase of eastern red-backed salamander (NHESP confirmed species identification).
PVP 10	0	No VP species found. Area was dry at time of inspection.	PVP 10	No	No VP species found.	PVP 10	0	No VP species found; area dry at time of inspection.
PVP 11	10-12	8 spotted salamander egg masses. Appx. 5 small (4in) fish swimming near some of the egg masses.	PVP 11	Yes	1 dead adult wood frog.	PVP 11	11	20 mole salamander spermatophores.
PVP 12	12-24	No VP species found. Limited opportunity for egg mass attachment.	PVP 12	Yes	No VP species found. Limited opportunity for egg mass attachment (2015 results).	PVP 12	>12	Farm pond beyond fence noted in 2015 and 2017. Expected to be permanent wetland.
						PVP 12a ^{2, 4}	10	9 wood frog egg masses.
CVP 13 ³	5-24	15+ spotted salamander egg masses, 15+ blue spotted salamander egg masses, 10+ wood frog egg masses found.	CVP 13 ³	Yes	15+ spotted salamander egg masses, 15+ blue spotted salamander egg masses, 15+ fairy shrimp.	CVP 13 ³	>36	52 spotted salamander egg masses, 73 blue-spotted salamander egg masses, 72 wood frog egg masses, and fairy shrimp.
PVP 14	4-6	No VP species found.	PVP 14	Yes	1 dead adult blue spotted salamander found. No other VP species found.	PVP 14		No VP species found.
PVP 15	4-18	1 wood frog egg mass found. No other signs of VP species.	PVP 15	No	No VP species found. No water present at time of inspection.	PVP 15	18	No VP species found.
PVP 16	2-10	No VP species found (10 wood frog egg masses found on 4/22/15).	PVP 16	Yes	No VP species found.	PVP 16		No VP species found.
PVP 17	0-6	No VP species found. Oil sheen present throughout isolated wetland.	PVP 17	No	No VP species found.	PVP 17	24	1 wood frog egg mass.
PVP 18	0-12	No VP species found.	PVP 18	Yes	No VP species found.	PVP 18	32	Intermittent spring peeper calls.
PVP 19	0	No VP species found. Area was dry at time of inspection.	PVP 19	Yes	No VP species found.	PVP 19	16	No VP species found.
						PVP 20 ⁴	6	1 adult gray treefrog.
						PVP 21 ⁴	16	No VP species found.
						PVP 22 ⁴	8	No VP species found.

Bold text were identified as eligible for NHESP certification.

Notes: ¹ Previously identified as Subdbury Vernal Pool.

² Potential Vernal Pool surveyed in 2018 and located south of the PVP 12 surveyed in 2015 and 2017.

³ Previously Certified by NHESP.

⁴ New Potential Vernal Pool identified in 2018.