

# MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	1	319
PROJECT FILE NO.		608164	

TITLE SHEET & INDEX

PLAN AND PROFILE OF  
**BRUCE FREEMAN RAIL TRAIL**  
**PHASE 2D**  
IN THE TOWN OF  
**SUDBURY & CONCORD**  
**MIDDLESEX COUNTY**

FEDERAL AID PROJECT NO. CMQ/TAP/STP-0033(028)X

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.

**SHARED-USE PATH DESIGN DESIGNATION**

**BRUCE FREEMAN RAIL TRAIL**

DESIGN SPEED	18 MPH
FUNCTIONAL CLASSIFICATION	OFF ROAD PEDESTRIAN/BICYCLE FACILITY

\* 18 MPH FOR GRADES LESS THAN 2%, 20 MPH FOR GRADES BETWEEN 2% & 4%

**DESIGN DESIGNATION (HUDSON RD RTE 27)**

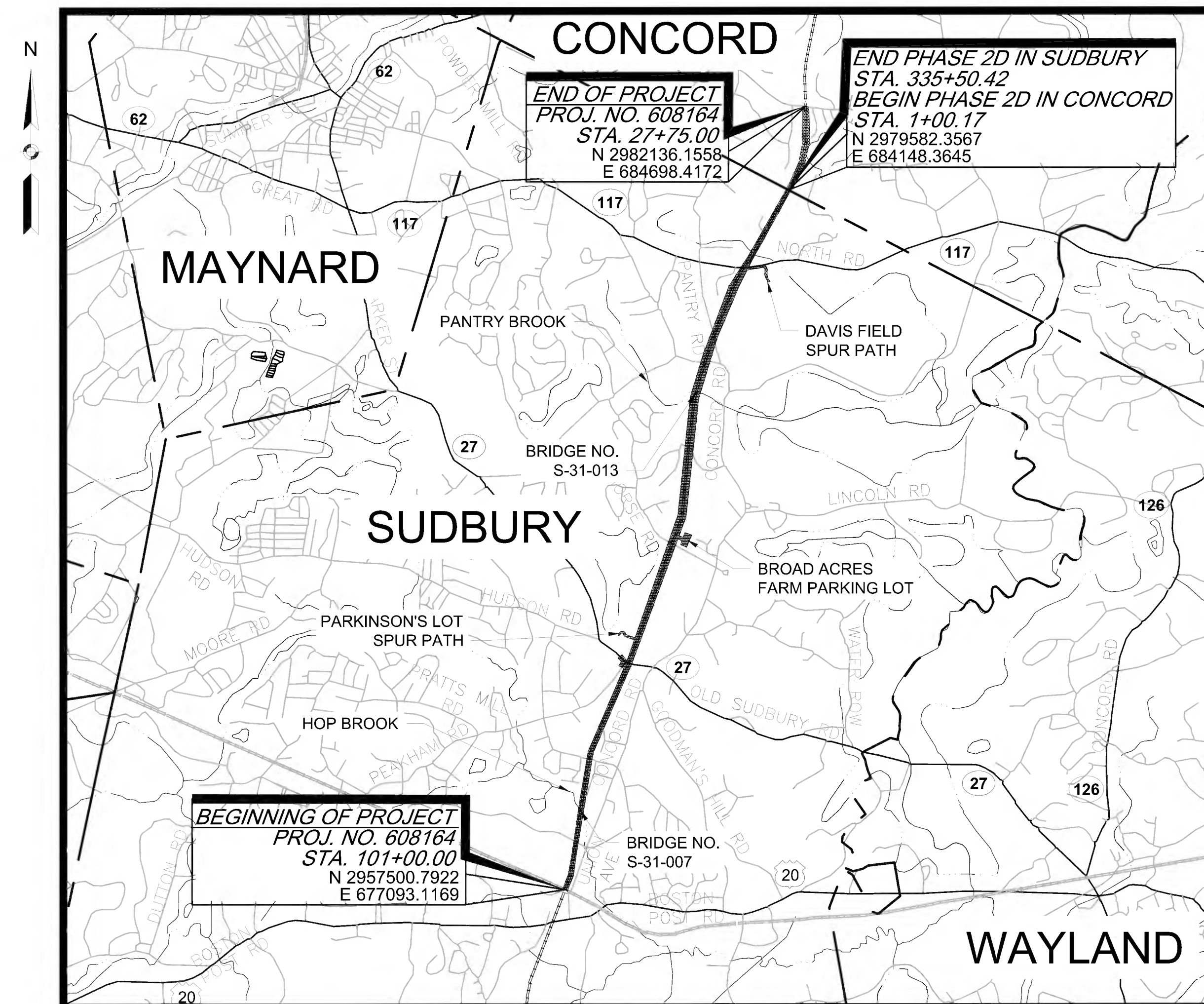
DESIGN SPEED	30 MPH
ADT (2021)	20,404 vpd
ADT (2041)	20,609 vpd
T (PEAK HOUR)	2.6%
T (AVERAGE DAY)	4.7%
FUNCTIONAL CLASSIFICATION	URBAN PRINCIPAL ARTERIAL (EB/WB)

**DESIGN DESIGNATION (NORTH RD)**

DESIGN SPEED	40 MPH
ADT (2021)	12654 vpd
ADT (2041)	12780 vpd
T (PEAK HOUR)	2.9%
T (AVERAGE DAY)	3.2%
FUNCTIONAL CLASSIFICATION	URBAN MINOR ARTERIAL (EB/WB)

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SCALE: 1" = 3000'

LENGTH OF PHASE 2D IN SUDBURY = 23,449.63 FEET = 4.441 MILES  
LENGTH OF PHASE 2D IN CONCORD = 2,675.00 FEET = 0.507 MILES

FUSS & O'NEILL, INC. - CIVIL	FUSS & O'NEILL, INC. - STRUCTURAL SHEETS 223-244
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TOWN OF SUDBURY DESIGN CONSULTANT:  
**f** **FUSS & O'NEILL**  
190 HIGH STREET  
BOSTON, MA 02110  
617.282.4675  
www.fando.com

GREENMAN-PEDERSEN, INC. - CIVIL

TOWN OF CONCORD DESIGN CONSULTANT:  
**GPI** Engineering Design Planning Construction Management  
978.570.2999 GPINET.COM  
Greenman Pedersen, Inc.  
181 Ballardvale Street, Suite 202  
Wilmington, MA 01887



APPROVED

CHIEF ENGINEER

DATE

**GENERAL ABBREVIATIONS**

ABAN	ABANDON
ADJ	ADJUST
APPROX	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS / CONTINUED
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DIA	DIAMETER
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EQ	EQUAL
EXIST (or EX)	EXISTING
EXC	EXCAVATION
FDN.	FOUNDATION
FDP	FULL DEPTH PAVEMENT
FLDSTN	FIELDSTONE
GAR	GARAGE
GD	GROUND
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HWY	HIGHWAY
JCT	JUNCTION
LOAM	LOAM BORROW
LSA	LANDSCAPED AREA
LT	LEFT
MAHWL	MEAN AVERAGE HIGH WATER LINE
MAX	MAXIMUM
MB	MAILBOX
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
MOD	MODIFIED
MSE	MECHANICALLY STABILIZED EARTH
NERR	NEW ENGLAND RAILROAD
NIC	NOT IN CONTRACT
NO.	NUMBER
NTS	NOT TO SCALE
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
P.G.L.	PROFILE GRADE LINE
PREV	PREVIOUS/PREVIOUSLY
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PVMT	PAVEMENT
R&D	REMOVE AND DISCARD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RD	ROAD
RDWY	ROADWAY
REB	REBUILD
REM	REMOVE
REMOD	REMODEL
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT OF WAY
RR	RAILROAD
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SHLO/S.H.L.O.	STATE HIGHWAY LAYOUT LINE

**GENERAL ABBREVIATIONS (CONT)**

ST	STREET
STA	STATION
STD	STANDARD
SW	SIDEWALK
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TRANS	TRANSITION
TRM	TURF REINFORCING MAT
TYP	TYPICAL
VAR	VARIES
VERT	VERTICAL
WCR	WHEEL CHAIR RAMP
WP	WORKING POINT
X-SECT	CROSS SECTION

**UTILITY ABBREVIATIONS**

CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CIP	CAST IRON PIPE
CIT	CHANGE IN TYPE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
DI	DROP INLET
DIP	DUCTILE IRON PIPE
FES	FLARED END SECTION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HDW	HEADWALL
HYD	HYDRANT
INV	INVERT
LB	LEACH BASIN
LP	LIGHT POLE
MH	MANHOLE
MW	MONITORING WELL
OHW	OVERHEAD WIRE
PVC	POLYVINYLCHLORIDE PIPE
PWW	PAVED WATER WAY
RCP	REINFORCED CONCRETE PIPE
SMH	SEWER MANHOLE
TSV&B	TAPPING SLEEVE VALVE & BOX
UP	UTILITY POLE
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN

**ALIGNMENT & GRADING ABBREVIATIONS**

CC	CENTER OF CURVE
HP	HIGH POINT
I.T.	INTERSECTION OF TANGENT
LP	LOW POINT
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PI	POINT OF INTERSECTION
PNT	POINT
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PT	POINT OF TANGENCY
LPT	ANGLE POINT
R	RADIUS OF CURVATURE
T	TANGENT DISTANCE OF CURVE
TAN	TANGENT
25.45	SPOT ELEVATION

**PROFILE ABBREVIATIONS**

AD	ALGEBRAIC DIFFERENCE IN RATES OF GRADE
HSD	HORIZONTAL SIGHT DISTANCE
K	RATE OF VERTICAL CURVATURE
L	LENGTH OF CURVE
PVC	POINT OF VERTICAL CURVATURE
PVCC	POINT OF VERTICAL COMPOUND CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVRC	POINT OF VERTICAL REVERSE CURVATURE
PVT	POINT OF VERTICAL TANGENCY
SSD	STOPPING SIGHT DISTANCE
VC	VERTICAL CURVE

**TRAFFIC SIGNAL**

CAB.	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY DON'T WALK
FDW	FLASHING DON'T WALK
FR	FLASHING CIRCULAR RED
← FR	FLASHING RED LEFT ARROW
→ FR	FLASHING RED RIGHT ARROW
FY	FLASHING CIRCULAR YELLOW
← FY	FLASHING YELLOW LEFT ARROW
→ FY	FLASHING YELLOW RIGHT ARROW
G	STEADY CIRCULAR GREEN
← G	STEADY GREEN LEFT ARROW
→ G	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
⊥ G	STEADY GREEN VERTICAL ARROW
OL	OVERLAP
PEP	PEDESTRIAN
PTZ	PAN, TILT, ZOOM
R	STEADY CIRCULAR RED
← R	STEADY RED LEFT ARROW
→ R	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALK
Y	STEADY CIRCULAR YELLOW
← Y	STEADY YELLOW LEFT ARROW
→ Y	STEADY YELLOW RIGHT ARROW

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**GENERAL NOTES**

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- EXISTING CONDITIONS AND TOPOGRAPHICAL INFORMATION FROM AN ACTUAL FIELD SURVEY CONDUCTED BY VHB, INC. IN DECEMBER 2015 THROUGH APRIL 2016. SUPPLEMENTARY FIELD SURVEY WAS CONDUCTED BY GCG ASSOCIATES FROM NOVEMBER 2020 THROUGH DECEMBER 2020.
- 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 AMERICAN VERTICAL DATUM OF 1988 (NAV88).
- THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND GRADES IN THE FIELD BEFORE COMMENCING WORK AND PROMPTLY NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
- INFORMATION REGARDING THE LOCATION OF EXISTING UTILITIES HAS BEEN BASED UPON AVAILABLE INFORMATION AND MAY BE INCOMPLETE, AND WHERE SHOWN SHOULD BE CONSIDERED APPROXIMATE. NO GUARANTEE TO THE ACCURACY OF THE EXISTING UTILITIES FACILITIES SHOWN IN THIS PROJECT IS EXPRESSED OR IMPLIED UNLESS OTHERWISE NOTED. CONTRACTOR SHALL CONTACT "Mass DIG-SAFE", 1-888-344-7233. CONTRACTOR SHALL MAINTAIN MARKINGS WHERE NEEDED DURING PROJECT. ALL UTILITY LOCATIONS THAT DO NOT MATCH THE VERTICAL OR HORIZONTAL CONTROL SHOWN ON THE PLANS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION. THE CONTRACTOR SHALL VERIFY LOCATIONS OF UTILITIES AND SERVICE LATERALS PRIOR TO CONSTRUCTION. ANY CONFLICTS WITH LOCATIONS OF LIGHT POLES, TREES, ETC. SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION PRIOR TO CONSTRUCTION.
- DRAINAGE ELEVATIONS ARE PROVIDED FOR DESIGN PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH THE PROPOSED DRAINAGE DESIGN. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR DIRECTED BY THE ENGINEER. ONLY AFTER THE CONTRACTOR VERIFIES ELEVATIONS FOR THE CONSTRUCTABILITY OF THE DRAINAGE SYSTEM SHALL ANY STRUCTURES BE ORDERED. ANY FIELD ADJUSTMENTS TO LINE & GRADE UP TO A DEPTH OF 5' SHALL BE INCLUDED IN THE COST OF THE PIPE. PIPE EXCAVATION GREATER THAN 5' WILL BE PAID UNDER CLASS B TRENCH EXCAVATION.
- THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH PROPOSED CONDUIT AND SIGNAL EQUIPMENT. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR DIRECTED BY THE ENGINEER.
- 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.
- 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.
- THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
- EXISTING UTILITY POLES WILL BE RELOCATED BY OTHERS IF REQUIRED.
- PRIOR TO ONSET OF TREE REMOVAL ACTIVITIES, THE CONTRACTOR, RESIDENT ENGINEER AND MASSDOT LANDSCAPE ARCHITECT AND TOWN REPRESENTATIVE SHALL WALK SITE TO IDENTIFY TREES TO BE REMOVED.
- 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.
- 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).
- JOINTS BETWEEN NEW ASPHALT CONCRETE ROADWAY PAVEMENT AND SAWCUT EXISTING PAVEMENT SHALL BE SEALED WITH BITUMEN AND BACKSANDED.
- AFTER MILLING OPERATIONS AND PRIOR TO PAVING THE SUPERPAVE INTERMEDIATE OR SURFACES COURSES THE ENGINEER SHALL EVALUATE THE MILLED SURFACE AND SHALL APPLY THE APPROPRIATE REPAIR METHOD IF REQUIRED.
- EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
- 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.
- ALL PROPOSED HOT MIX ASPHALT CURB SHALL BE MASSDOT TYPE 3.
- 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.
- 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.
- DISPOSAL OF ALL SURPLUS MATERIAL SHALL BE AS APPROVED BY THE ENGINEER AND OWNER.
- LATERAL DRAIN PIPES SHALL BE INSTALLED WITH A PITCH OF 0.01 FOOT PER FOOT (MINIMUM) UNLESS NOTED OTHERWISE ON THE PLANS.



**GENERAL SYMBOLS**

EXISTING	PROPOSED	DESCRIPTION
		JERSEY BARRIER
		CATCH BASIN
		CATCH BASIN CURB INLET
		FLAG POLE
		GAS PUMP
		MAIL BOX
		POST SQUARE
		POST CIRCULAR
		WELL
		ELECTRIC HANDHOLE
		FENCE GATE POST
		GAS GATE
		BORING HOLE
		MONITORING WELL
		TEST PIT
		HYDRANT
		LIGHT POLE
		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
		MASSACHUSETTS HIGHWAY BOUND
		MONUMENT
		STONE BOUND
		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
		TROLLEY POLE OR GUY POLE
		TRANSMISSION POLE
		UTILITY POLE W/ FIREBOX
		UTILITY POLE WITH DOUBLE LIGHT
		UTILITY POLE W / 1 LIGHT
		UTILITY POLE
		BUSH
		TREE
		STUMP
		SWAMP / MARSH
		WATER GATE
		PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
		CONTOURS (ON-THE-GROUND SURVEY DATA)
		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		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
		CHAIN LINK OR METAL FENCE
		WOOD FENCE
		EROSION CONTROL
		DRAINAGE SWALE
		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
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

**TRAFFIC SYMBOLS**

EXISTING	PROPOSED	DESCRIPTION
		CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)
		VIDEO DETECTION CAMERA
		MICROWAVE DETECTOR
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
		EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD, (TYPE AS NOTED OR AS SPECIFIED)
		RAILROAD SIGNAL
		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
		MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (2 POSTS)
		MAST ARM WITH LUMINAIRE
		OPTICAL PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL AND METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"x12" (OR AS NOTED)
		ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)
		TRAFFIC SIGNAL CONDUIT

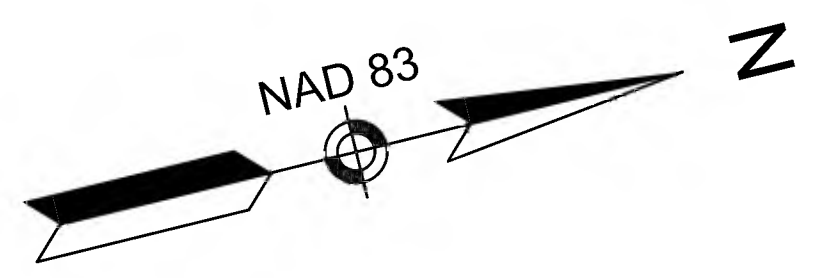
**PAVEMENT MARKINGS SYMBOLS**

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
		LEGEND "ONLY" - WHITE
		STOP LINE
		CROSSWALK
		SOLID WHITE LINE
		SOLID YELLOW LINE
		BROKEN WHITE LINE
		BROKEN YELLOW LINE
		DOTTED WHITE LINE
		DOTTED YELLOW LINE
		DOTTED WHITE LINE EXTENSION
		DOTTED YELLOW LINE EXTENSION
		DOUBLE WHITE LINE
		DOUBLE YELLOW LINE
		LONG DASHED YELLOW LINE

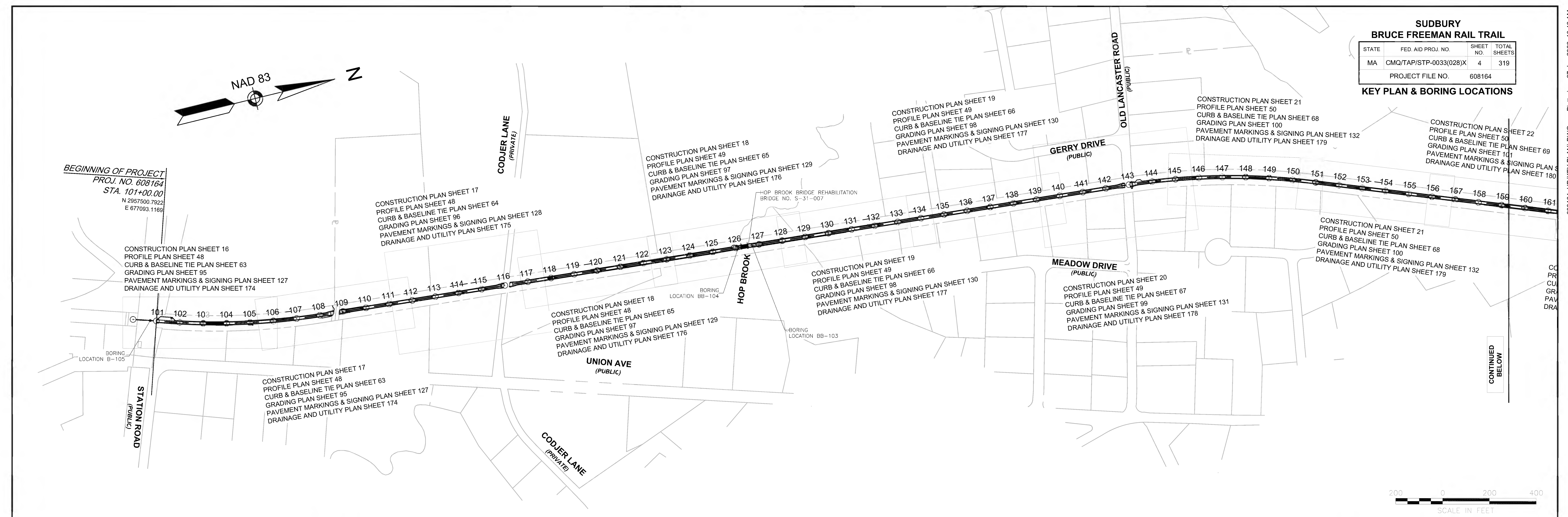
**SUBBURY**  
**BRUCE FREEMAN RAIL TRAIL**

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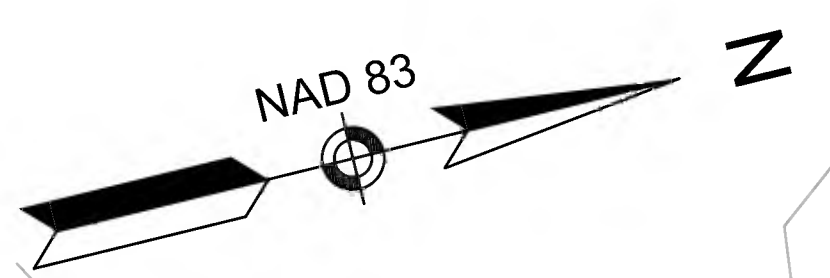
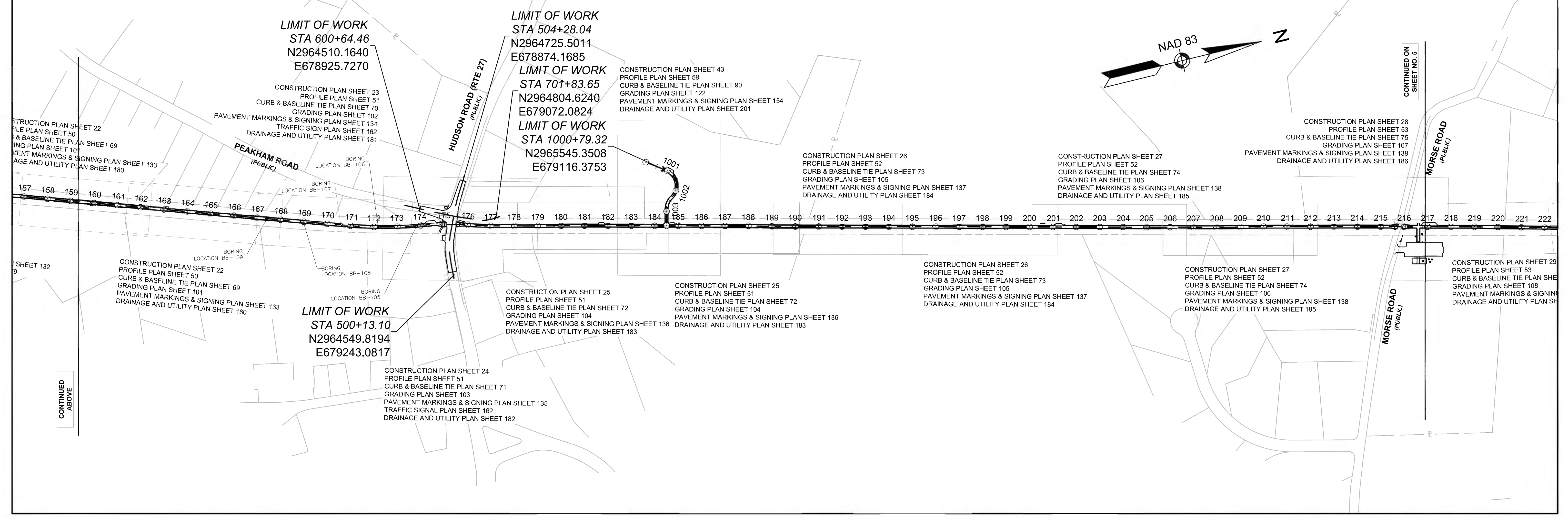
**KEY PLAN & BORING LOCATIONS**



**BEGINNING OF PROJECT**  
PROJ. NO. 608164  
STA. 101+00.00  
N 2957500.7922  
E 677093.1189



CONTINUED BELOW



**LIMIT OF WORK**  
STA 600+64.46  
N2964510.1640  
E678925.7270

**LIMIT OF WORK**  
STA 504+28.04  
N2964725.5011  
E678874.1685

**LIMIT OF WORK**  
STA 701+83.65  
N2964804.6240  
E679072.0824

**LIMIT OF WORK**  
STA 1000+79.32  
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**LIMIT OF WORK**  
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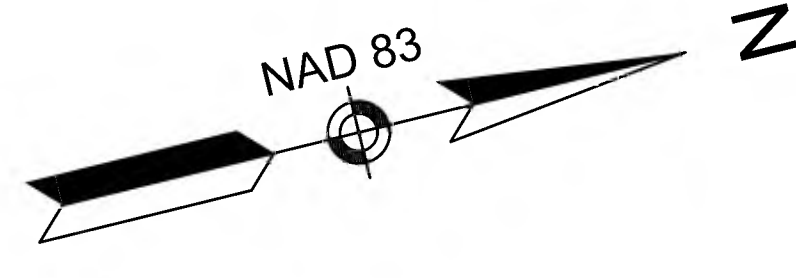
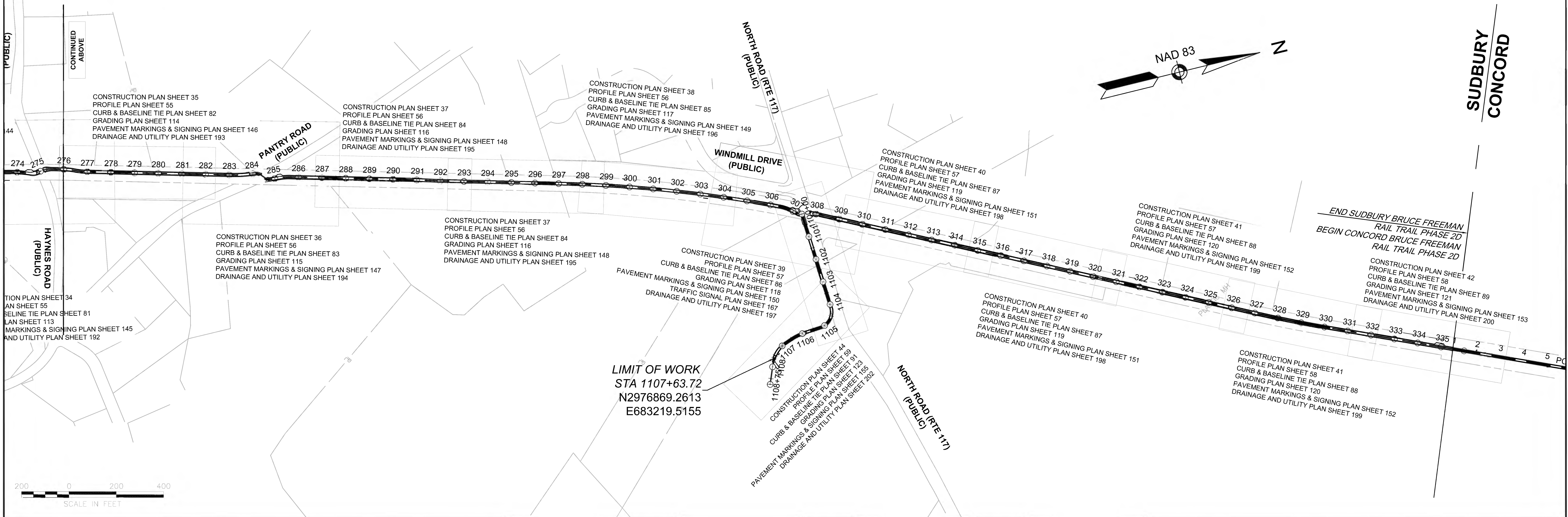
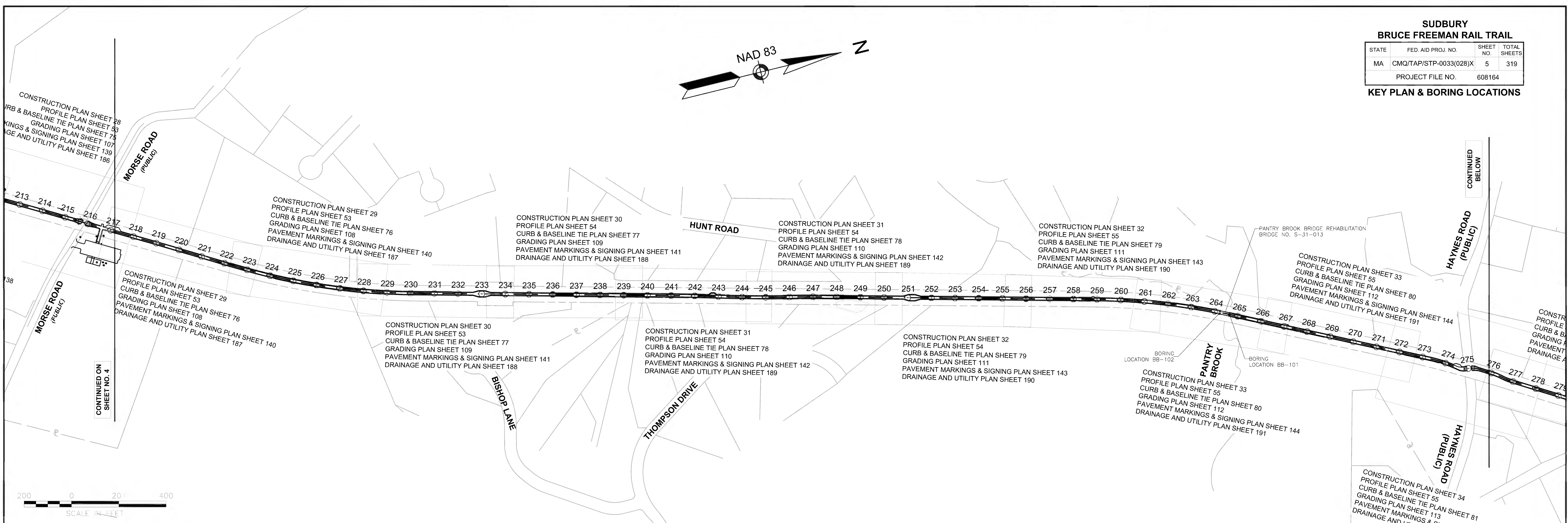
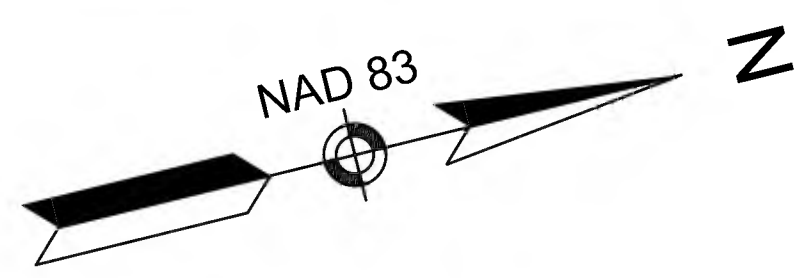
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BRUCE FREEMAN RAIL TRAIL**

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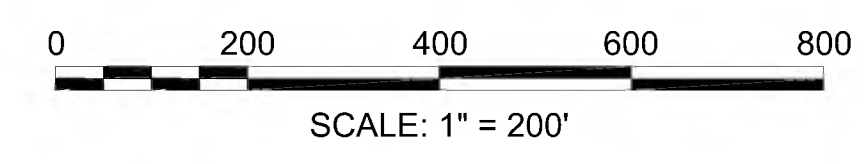
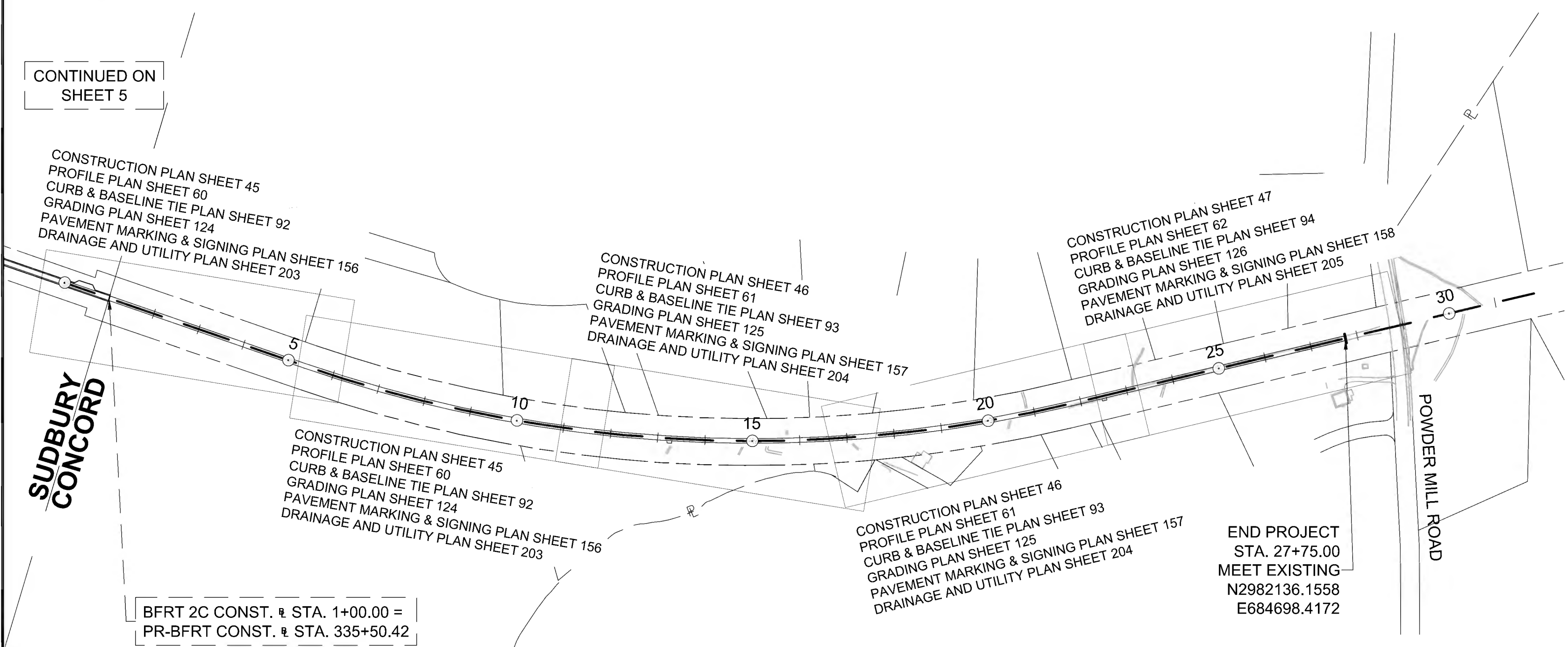
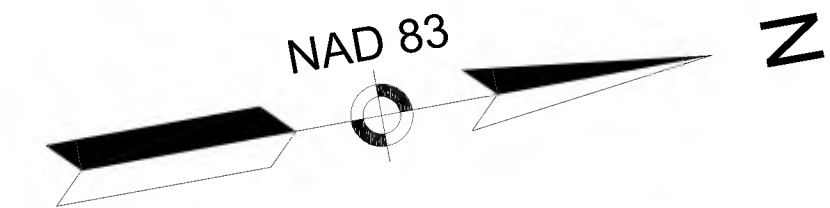
**KEY PLAN & BORING LOCATIONS**



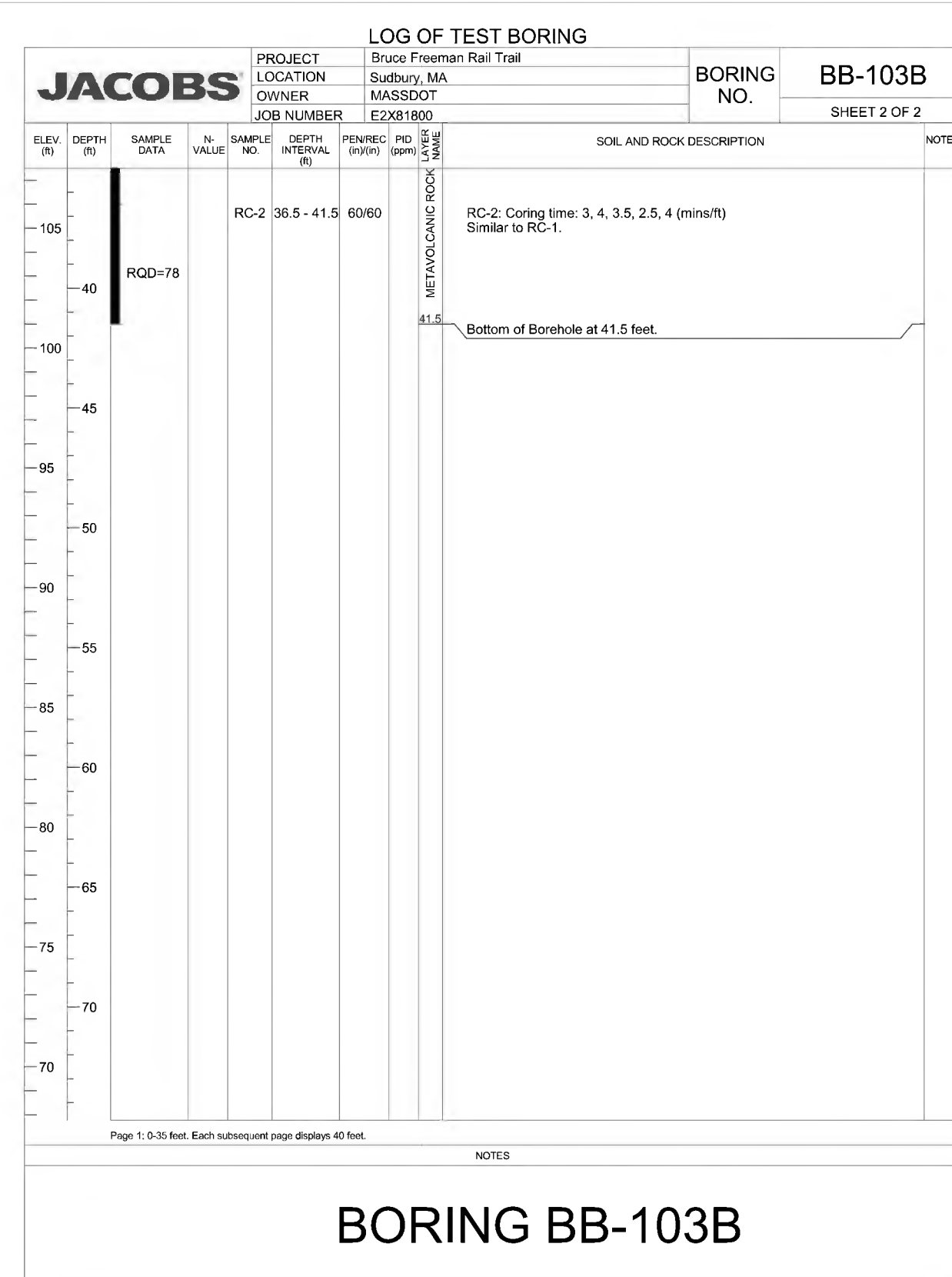
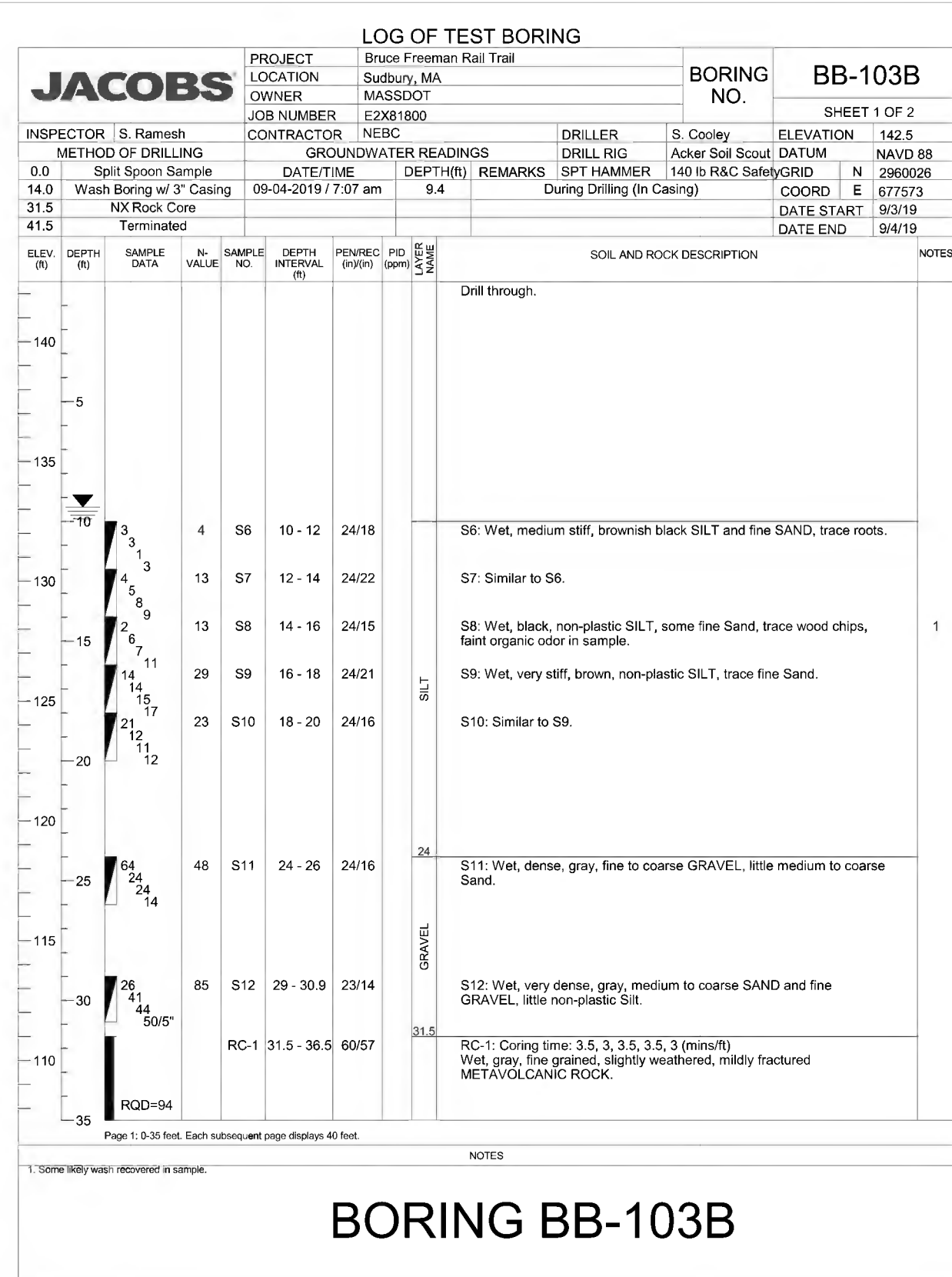
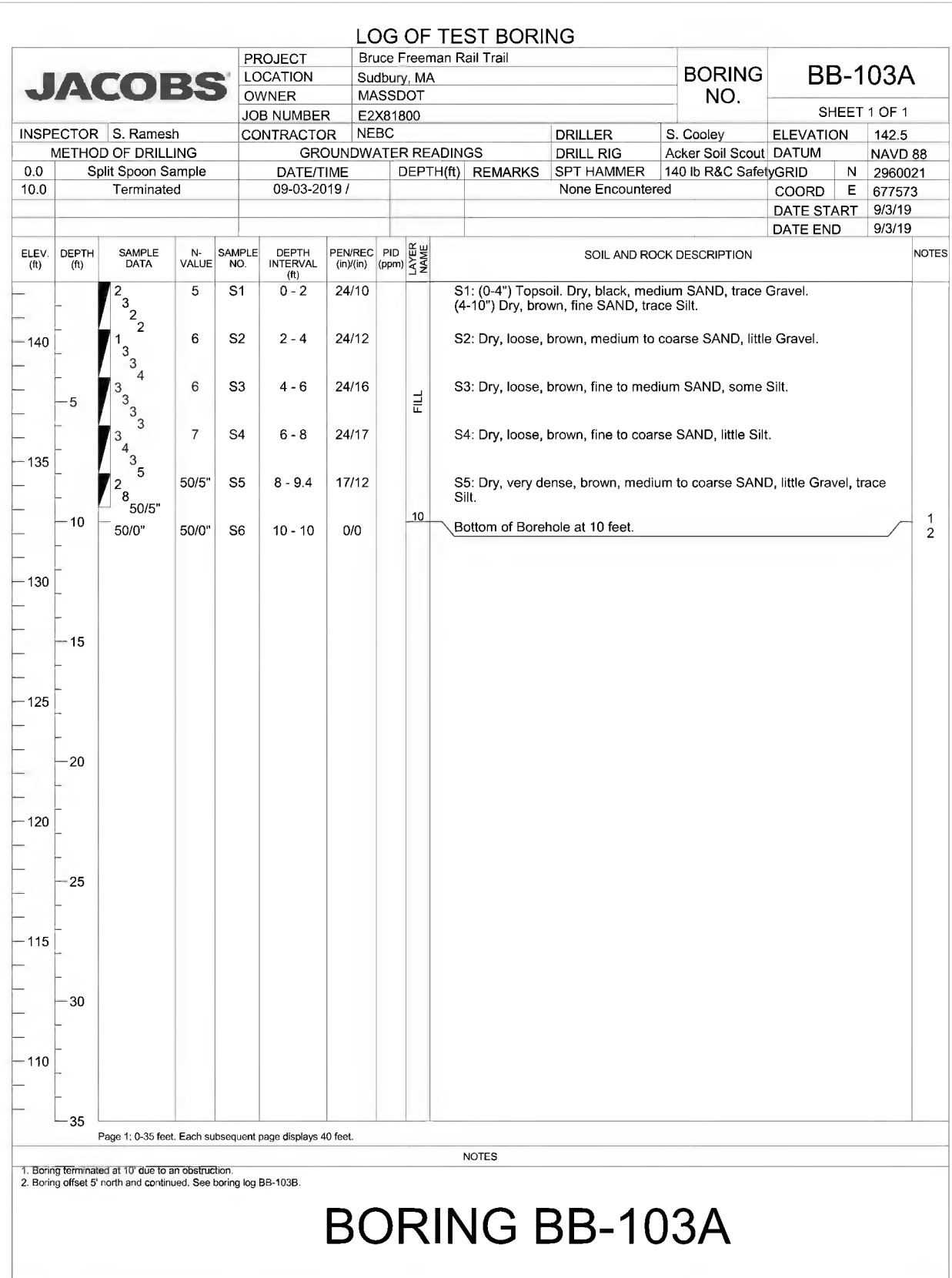
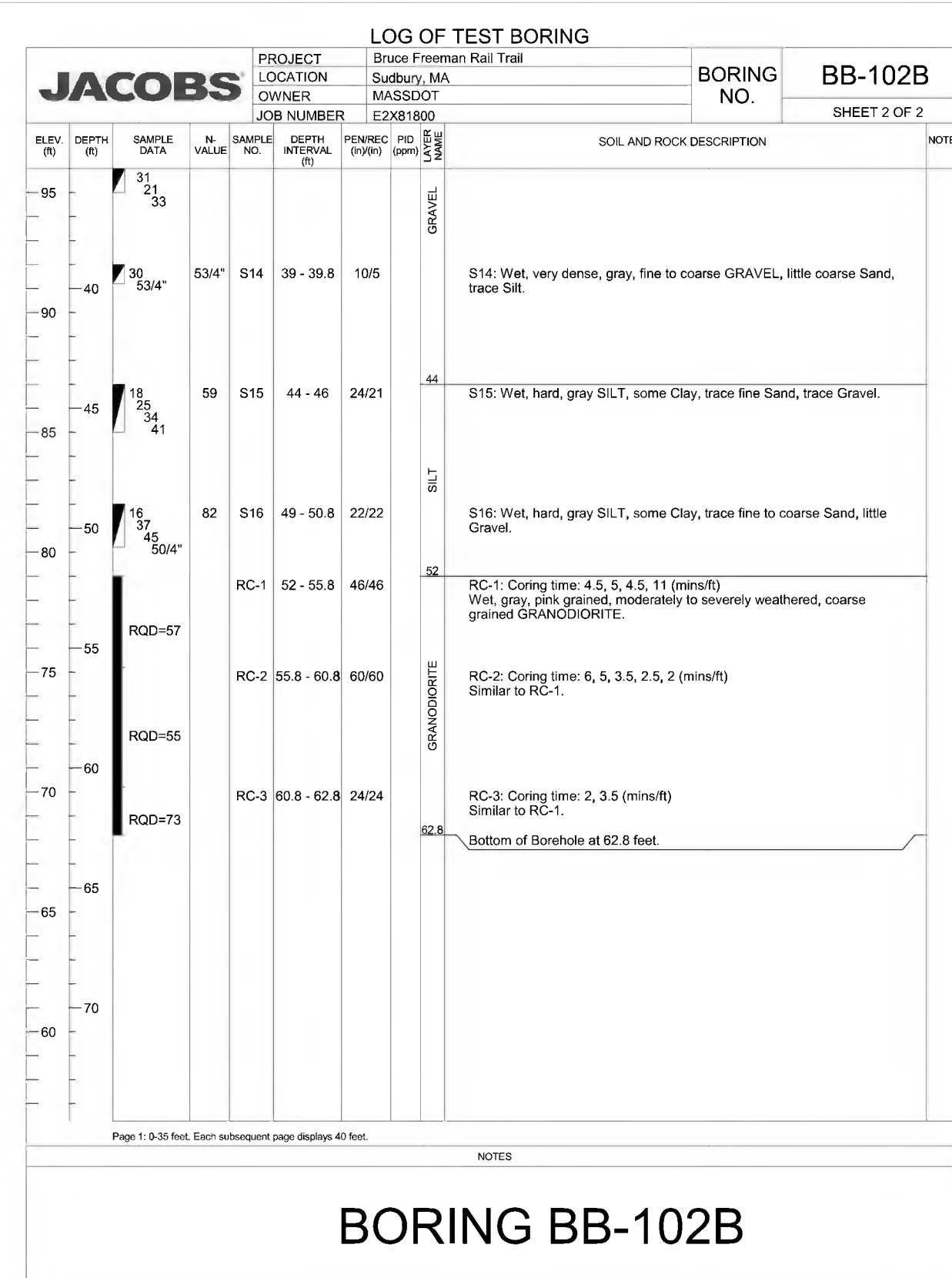
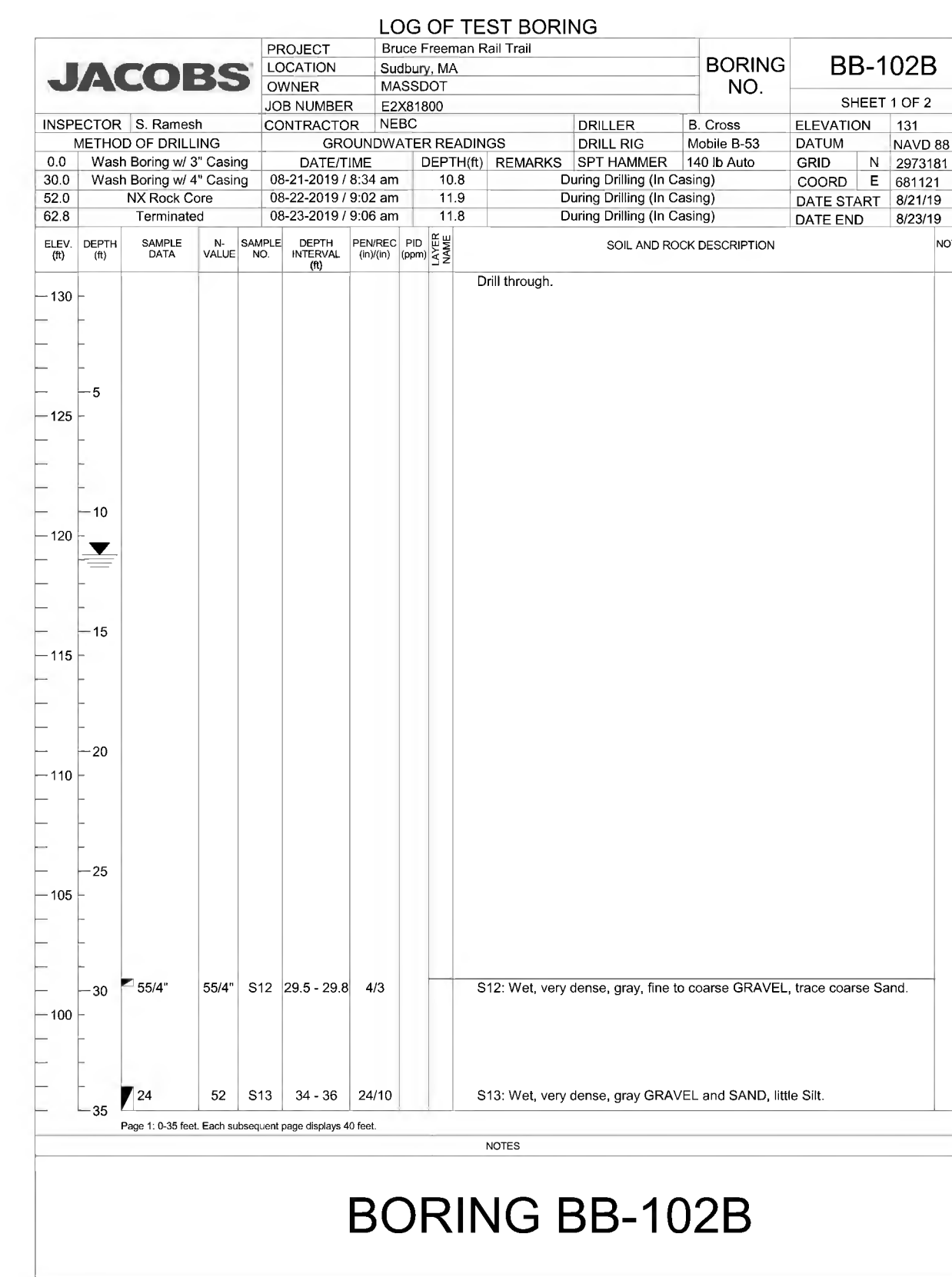
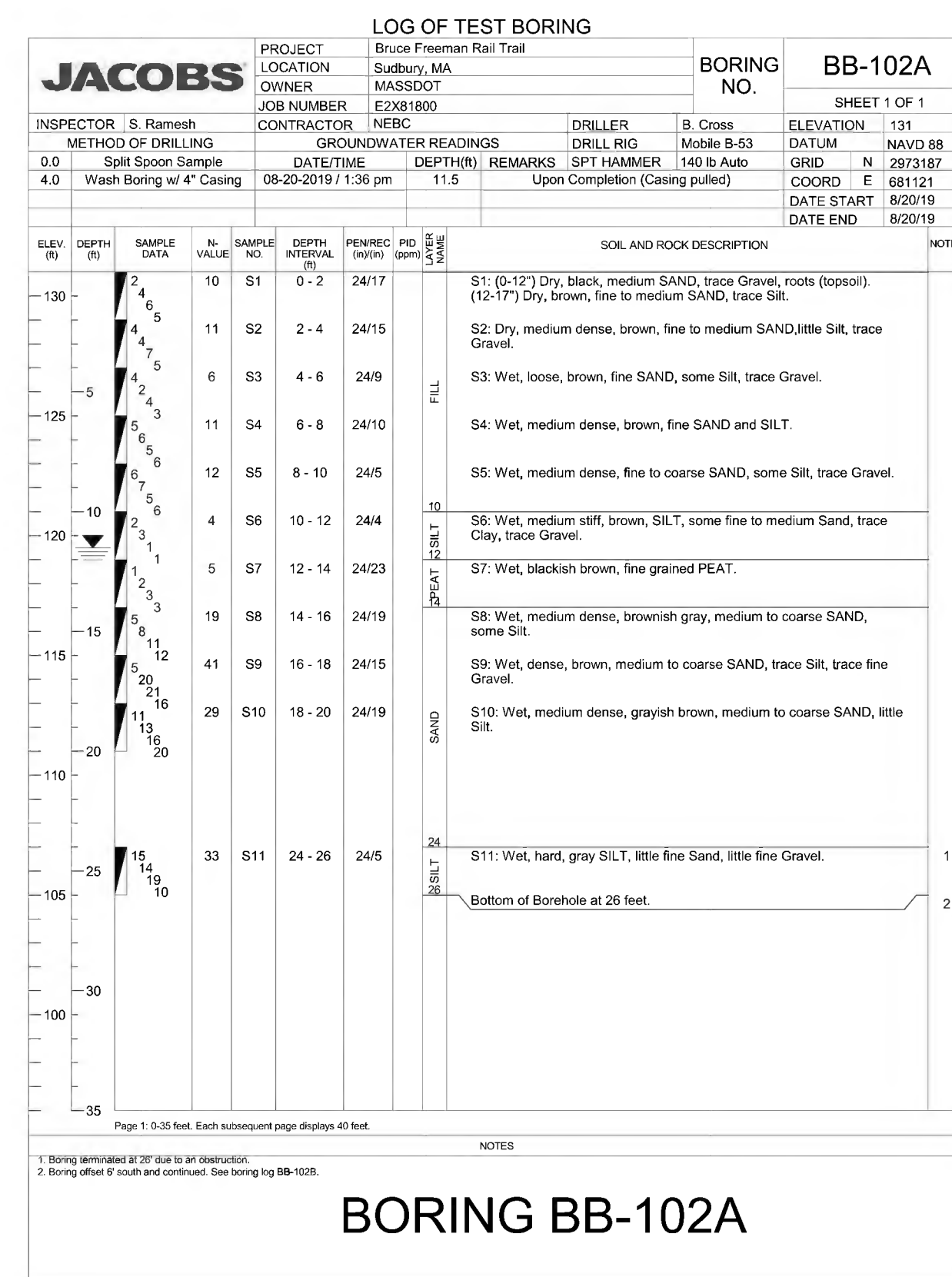
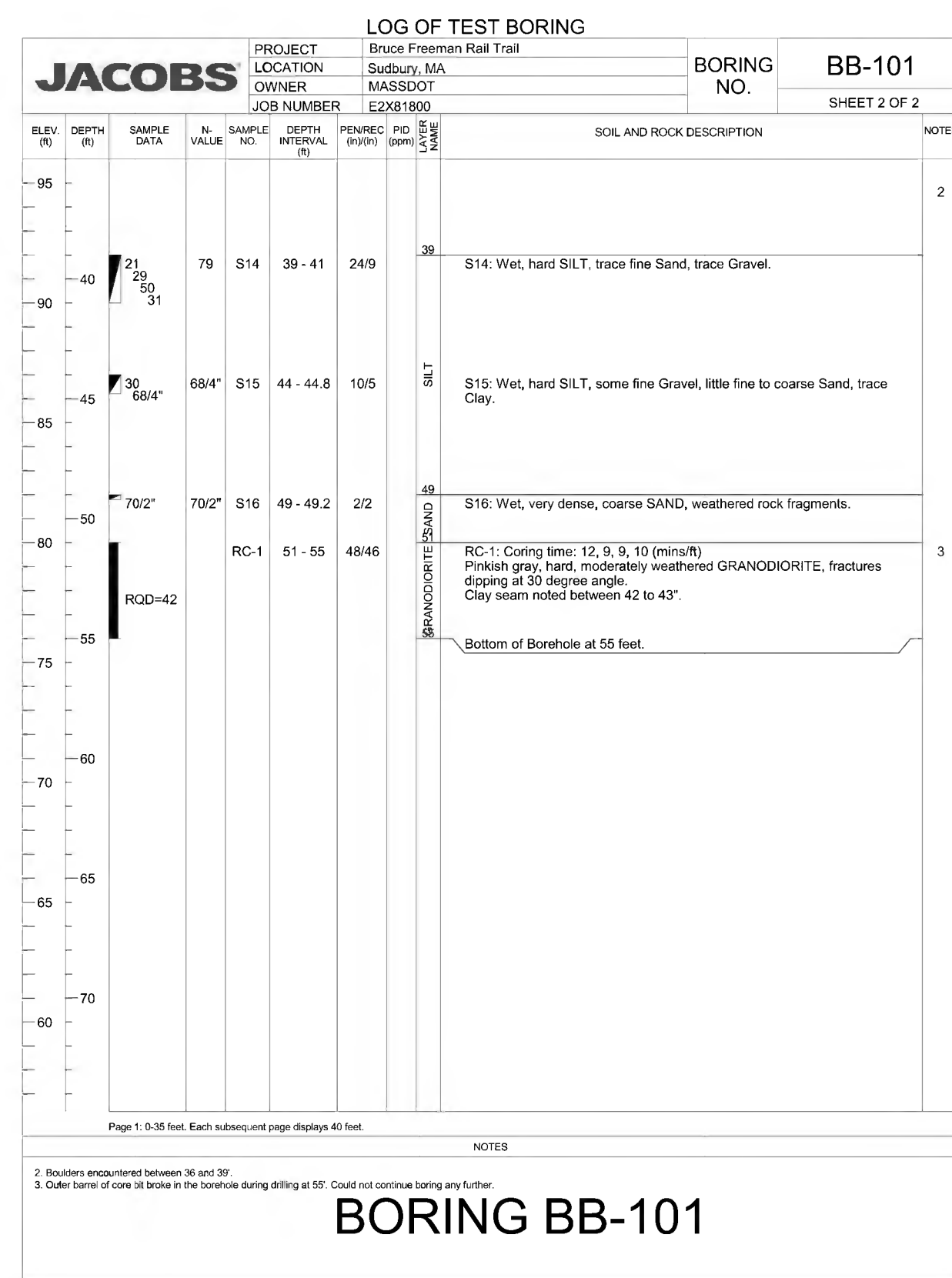
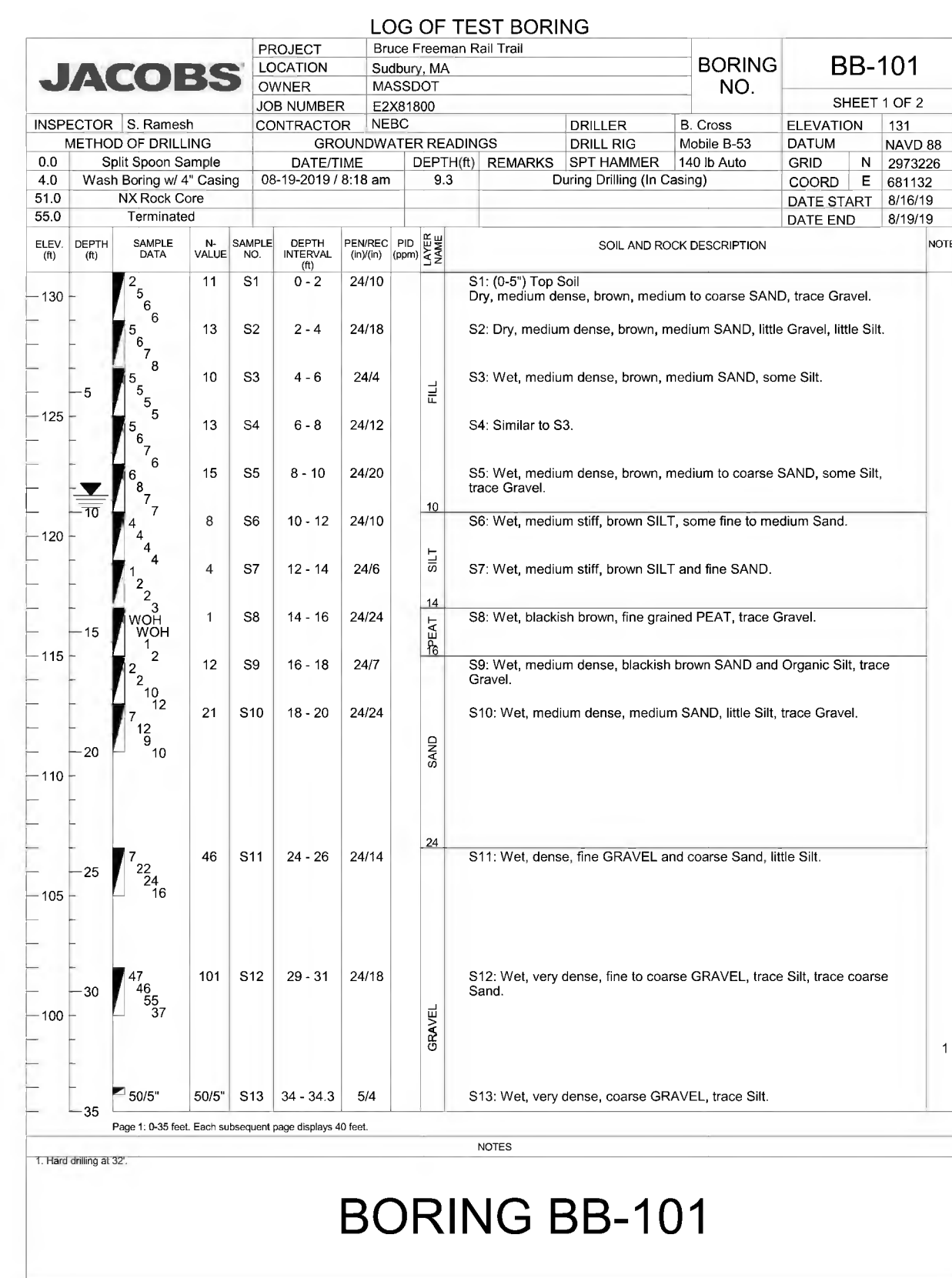
CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	6	319
PROJECT FILE NO.		608164	

KEY PLAN











**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	9	319
PROJECT FILE NO.		608164	

**BORING LOGS**

608164\_HDBORING LOGS.DWG 27-Jun-2022

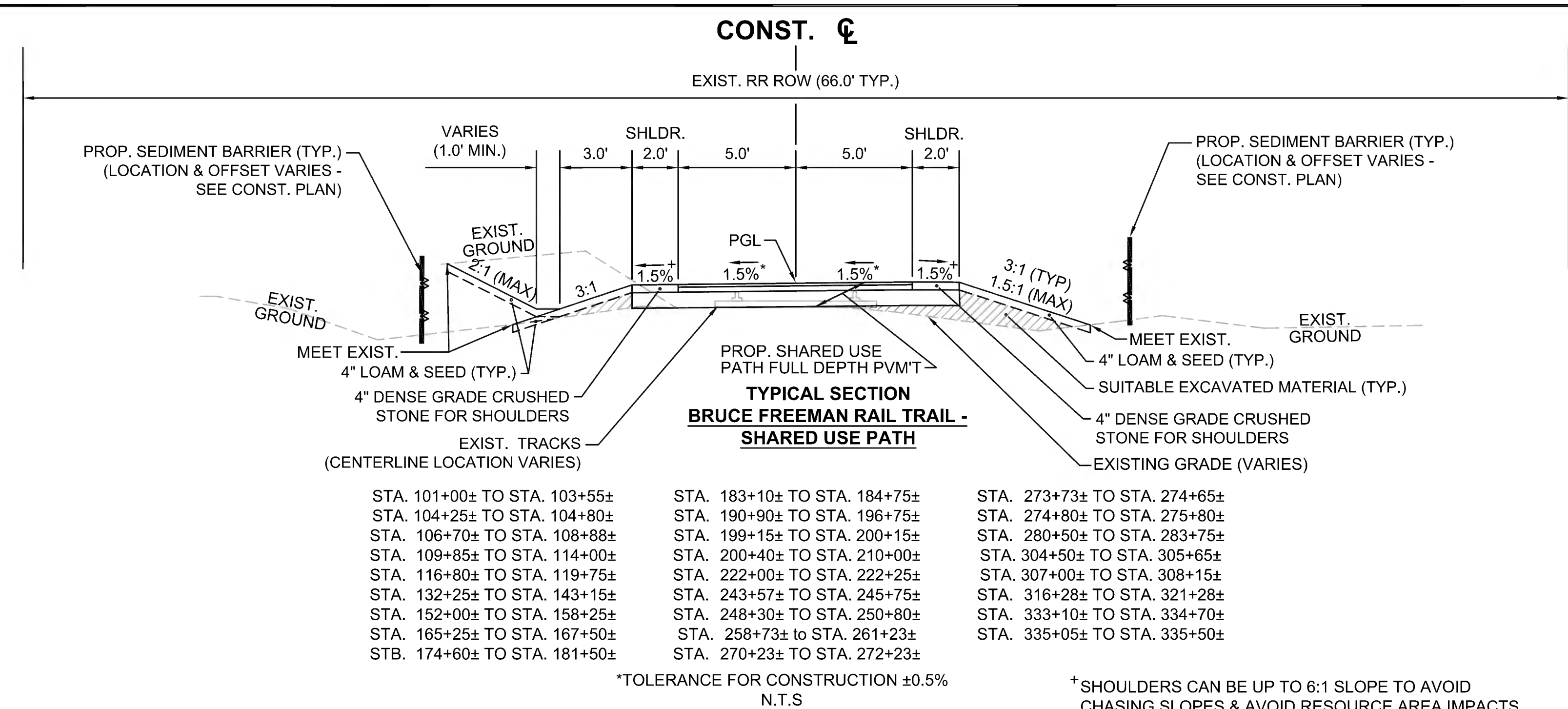
<b>Client:</b> Fuss & O'Neill		<b>SEABOARD DRILLING, INC.</b>		<b>Test Boring/ Monitor Well ID: B-1</b>	
<b>Location:</b> North Road Sudbury		649 Meadow St., Chicopee, MA 01013			
<b>Project:</b> Bruce Freeman Rail Trail		<b>DRILLING/SOIL LOG</b>		<b>Sheet No. 1 of 1</b>	
<b>Contractor:</b> Seaboard Drilling, Inc.					
<b>Type</b>	<b>Casing</b>	<b>SS</b>	<b>Core Barrel</b>	<b>Hammer (Weight-lb./fall-30")</b>	<b>Start:</b> 3/26/2021
	HSA		N/A	140/30 300/24	3/26/2021
<b>O.D. Inch</b>	<b>8-1/2"</b>			<b>Rig Type: Mobile B-53</b>	<b>Driller: Dale Griffin</b>
<b>I.D. Inch</b>	<b>4-1/4"</b>				
<b>Depth (ft.) Range</b>	<b>Blows</b>	<b>Sample No.</b>	<b>Recovery</b>	<b>FIELD CLASSIFICATIONS AND REMARKS</b>	
0-2'	2-3-4-3	S-1	9"	fine to coarse SAND	
5-7'	2-5-2-13	S-2	14"	fine to coarse SAND to fine Sand, trace Silt (wet)	
10-12'	13-13-9-12	S-3	12"	Similar to S-2 above	
15-17'	woh-3-4	S-4	24"	fine SAND & Silt	
20-22'	8-25-35-50/3	S-5	18"	weathered rock	
25-27'	50/3"	S-6	0	Auger refusal @ 23' End of Boring @ 23'	
SAMPLE PENETRATION RESISTANCE - 140 lb. Wt. Falling 30" on 2" O.D. sampler					
<b>Density (# Hammer Blows)</b>	<b>Cohesive Consistence (# Hammer Blows)</b>			<b>PROPORTIONS</b>	
0-4 Very Loose	0-2 Very Soft	3-4 Soft	Trace	0 to 10%	
5-9 Loose	5-8 Medium-Stiff	9-15 Stiff	Little	10 to 20%	
10-29 Medium-Dense	16-30 Very Stiff	31+ Hard	Some and	20 to 35%	
30-49 Dense				30 to 50%	
50+ Very Dense					

<b>Client:</b> Fuss & O'Neill		<b>SEABOARD DRILLING, INC.</b>		<b>Test Boring/ Monitor Well ID: B-2</b>	
<b>Location:</b> Peakham/Hudson Sudbury Ma		649 Meadow St., Chicopee, MA 01013			
<b>Project:</b> Bruce Freeman Rail Trail		<b>DRILLING/SOIL LOG</b>		<b>Sheet No. 1 of 1</b>	
<b>Contractor:</b> Seaboard Drilling, Inc.					
<b>Type</b>	<b>Casing</b>	<b>SS</b>	<b>Core Barrel</b>	<b>Hammer (Weight-lb./fall-30")</b>	<b>Start:</b> 3/26/2021
	HSA		N/A	140/30 300/24	3/26/2021
<b>O.D. Inch</b>	<b>8-1/2"</b>			<b>Rig Type: Mobile B-53</b>	<b>Driller: Dale Griffin</b>
<b>I.D. Inch</b>	<b>4-1/4"</b>				
<b>Depth (ft.) Range</b>	<b>Blows</b>	<b>Sample No.</b>	<b>Recovery</b>	<b>FIELD CLASSIFICATIONS AND REMARKS</b>	
0-2'	3-2-10-11	S-1	18"	fine to coarse SAND, littlr Gravel, wood	
5-7'	8-43-50-50/4	S-2	20"	fine to coarse SAND and Gravel	
10-12'	15-20-50/4"	S-3	8"	Similar to S-2 above (wet)	
15-17'	50/2"	S-4	0	Auger refusal @ 15.5' very dense from 12-15.5' End of Boring @ 15.5'	
SAMPLE PENETRATION RESISTANCE - 140 lb. Wt. Falling 30" on 2" O.D. sampler					
<b>Density (# Hammer Blows)</b>	<b>Cohesive Consistence (# Hammer Blows)</b>			<b>PROPORTIONS</b>	
0-4 Very Loose	0-2 Very Soft	3-4 Soft	Trace	0 to 10%	
5-9 Loose	5-8 Medium-Stiff	9-15 Stiff	Little	10 to 20%	
10-29 Medium-Dense	16-30 Very Stiff	31+ Hard	Some and	20 to 35%	
30-49 Dense				30 to 50%	
50+ Very Dense					

MAST ARM & STRAIN POLE LOCATION KEY						
NO.	STATION/OFFSET	INTERSECTION	MAST ARM SIZE	SOIL BORING NO.	SOIL TYPE	FOUNDATION DEPTH
1	502+54/ 32.5 RT	HUDSON/ PEAKHAM	45'-0"	B-2	WET SAND (DENSE)	15'-6"
2	307+80 / 9.8 LT	BFRT/ NORTH ROAD	25'-0"	B-1	WET SAND (LOOSE)	9'-0"

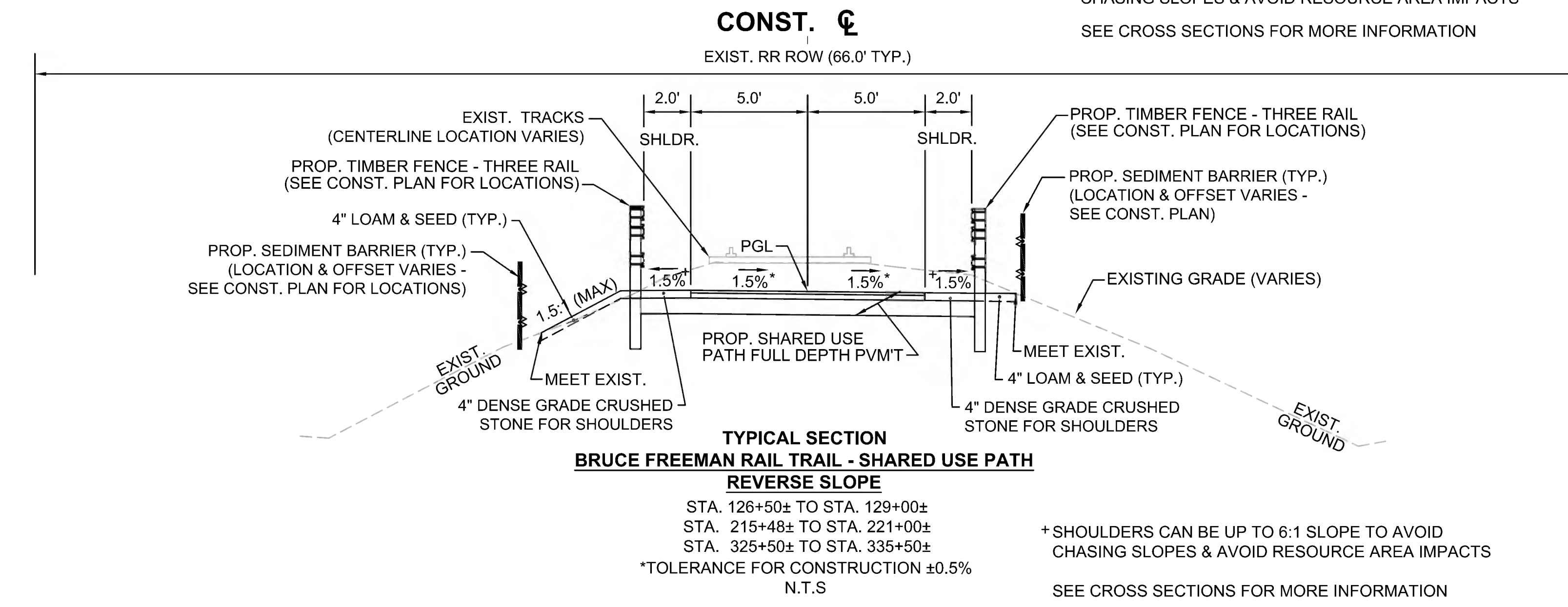
\*FOR BIDDING PURPOSES ONLY. ACTUAL FOUNDATION DEPTH TO BE DETERMINED BY THE CONTRACTORS STRUCTURAL ENGINEER/SUPPLIER AND APPROVED THROUGH STAMPED SHOP DRAWINGS.

SUBURBY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	10	319
PROJECT FILE NO.		608164	



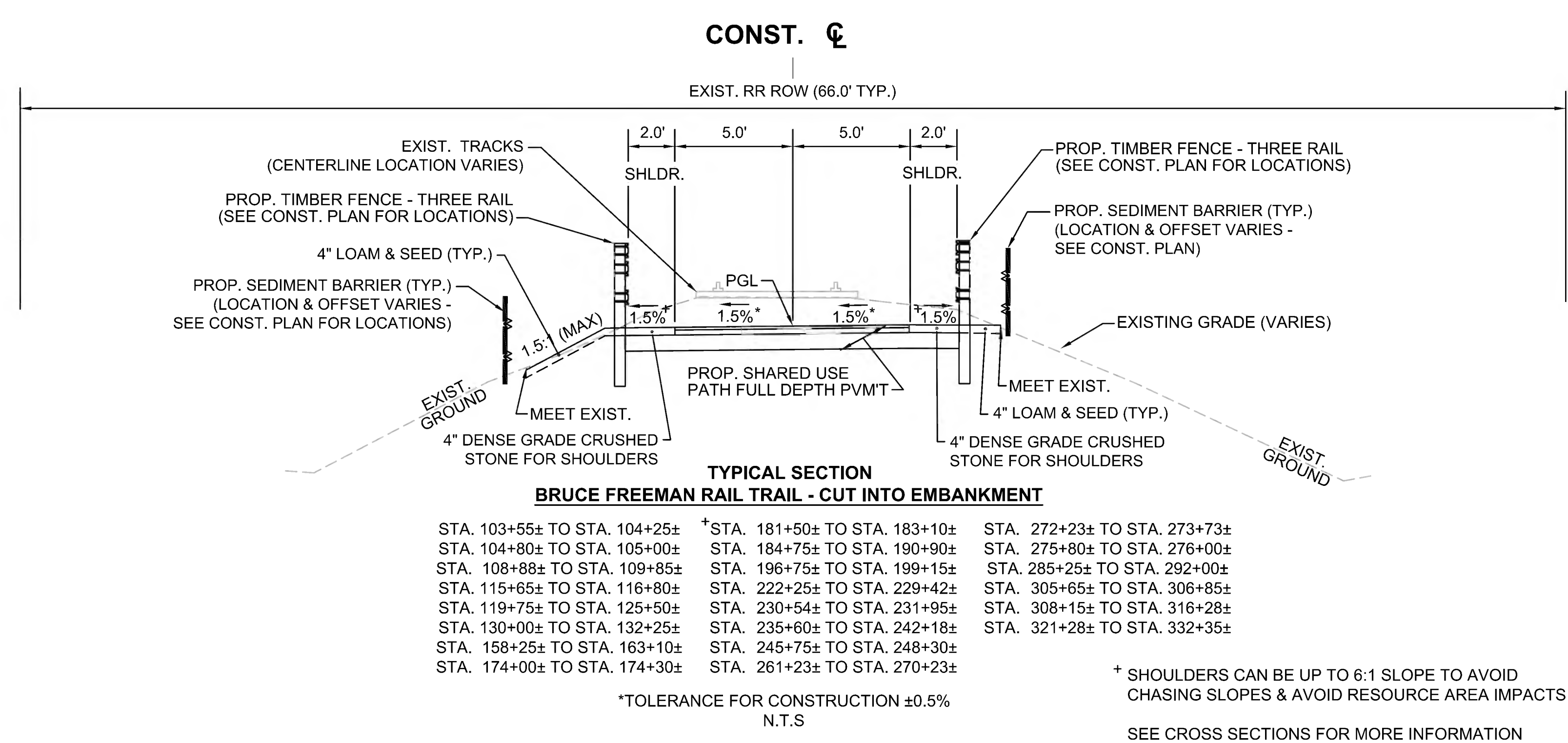
Station Range	Station Range	Station Range
STA. 101+00± TO STA. 103+55±	STA. 183+10± TO STA. 184+75±	STA. 273+73± TO STA. 274+65±
STA. 104+25± TO STA. 104+80±	STA. 190+90± TO STA. 196+75±	STA. 274+80± TO STA. 275+80±
STA. 106+70± TO STA. 108+88±	STA. 199+15± TO STA. 200+15±	STA. 280+50± TO STA. 283+75±
STA. 109+85± TO STA. 114+00±	STA. 200+40± TO STA. 210+00±	STA. 304+50± TO STA. 305+65±
STA. 116+80± TO STA. 119+75±	STA. 222+00± TO STA. 222+25±	STA. 307+00± TO STA. 308+15±
STA. 132+25± TO STA. 143+15±	STA. 243+57± TO STA. 245+75±	STA. 316+28± TO STA. 321+28±
STA. 152+00± TO STA. 158+25±	STA. 248+30± TO STA. 250+80±	STA. 333+10± TO STA. 334+70±
STA. 165+25± TO STA. 167+50±	STA. 258+73± TO STA. 261+23±	STA. 335+05± TO STA. 335+50±
STB. 174+60± TO STA. 181+50±	STA. 270+23± TO STA. 272+23±	

\*TOLERANCE FOR CONSTRUCTION ±0.5% N.T.S.      \*SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES & AVOID RESOURCE AREA IMPACTS SEE CROSS SECTIONS FOR MORE INFORMATION



Station Range	Station Range	Station Range
STA. 126+50± TO STA. 129+00±	STA. 215+48± TO STA. 221+00±	STA. 325+50± TO STA. 335+50±

\*TOLERANCE FOR CONSTRUCTION ±0.5% N.T.S.      \*SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES & AVOID RESOURCE AREA IMPACTS SEE CROSS SECTIONS FOR MORE INFORMATION



Station Range	Station Range	Station Range
STA. 103+55± TO STA. 104+25±	*STA. 181+50± TO STA. 183+10±	STA. 272+23± TO STA. 273+73±
STA. 104+80± TO STA. 105+00±	STA. 184+75± TO STA. 190+90±	STA. 275+80± TO STA. 276+00±
STA. 108+88± TO STA. 109+85±	STA. 196+75± TO STA. 199+15±	STA. 285+25± TO STA. 292+00±
STA. 115+65± TO STA. 116+80±	STA. 222+25± TO STA. 229+42±	STA. 305+65± TO STA. 306+85±
STA. 119+75± TO STA. 125+50±	STA. 230+54± TO STA. 231+95±	STA. 308+15± TO STA. 316+28±
STA. 130+00± TO STA. 132+25±	STA. 235+60± TO STA. 242+18±	STA. 321+28± TO STA. 332+35±
STA. 158+25± TO STA. 163+10±	STA. 245+75± TO STA. 248+30±	
STA. 174+00± TO STA. 174+30±	STA. 261+23± TO STA. 270+23±	

\*TOLERANCE FOR CONSTRUCTION ±0.5% N.T.S.      \*SHOULDERS CAN BE UP TO 6:1 SLOPE TO AVOID CHASING SLOPES & AVOID RESOURCE AREA IMPACTS SEE CROSS SECTIONS FOR MORE INFORMATION

### PAVEMENT NOTES:

- PROPOSED SHARED-USE PATH**
  - SURFACE:** 1-1/2" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5)
  - INTERMEDIATE:** 2-1/2" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0)
  - SUBBASE:** 4" to 8" GRAVEL BORROW, TYPE b (FOR LEVELING) OVER RESHAPED EXISTING RAILROAD BALLAST
- PROPOSED PARKING LOT FULL DEPTH PAVEMENT**
  - SURFACE:** 1-1/2" SUPERPAVE SURFACE COURSE - POLYMER (SSC - 12.5 - P) - OVER
  - BASE:** 2-1/2" SUPERPAVE INTERMEDIATE COURSE (SIC - 19.0) - OVER
  - FOUNDATION:** 8" GRAVEL BORROW, TYPE b
- PROPOSED FULL DEPTH CONSTRUCTION (LESS THAN 4.00' WIDE) - PEAKHAM ROAD & HUDSON ROAD**
  - SURFACE:** 1-3/4" SUPERPAVE SURFACE COURSE - POLYMER (SSC - 12.5 - P) - OVER
  - INTERMEDIATE:** 2-1/2" SUPERPAVE INTERMEDIATE COURSE (SIC - 19.0) - OVER
  - BASE:** 6" HIGH EARLY STRENGTH CEMENT CONCRETE BASE COURSE 4000psi, 610, 3/4" OVER
  - SUBBASE:** 8" GRAVEL BORROW, TYPE b.
- PROPOSED PAVEMENT MILLING & OVERLAY - PEAKHAM ROAD & HUDSON ROAD**
  - 1-3/4" PAVEMENT MILLING
  - 1-3/4" SUPERPAVE SURFACE COURSE - POLYMER (SSC - 12.5 - P)
- PROPOSED HOT MIX ASPHALT SIDEWALK & DRIVEWAY**
  - SURFACE:** 1-1/2" SUPERPAVE SURFACE COURSE (SSC - 9.5) - OVER 2-1/2" SUPERPAVE INTERMEDIATE COURSE (SIC - 12.5)
  - FOUNDATION:** 8" GRAVEL BORROW, TYPE b
- PROPOSED CEMENT CONCRETE WALK, REST AREA & WHEELCHAIR RAMP**
  - SURFACE:** 4" CEMENT CONCRETE AIR ENTRAINED 4000 PSI, 3/4", 610
  - SUBBASE:** 8" GRAVEL BORROW, TYPE b

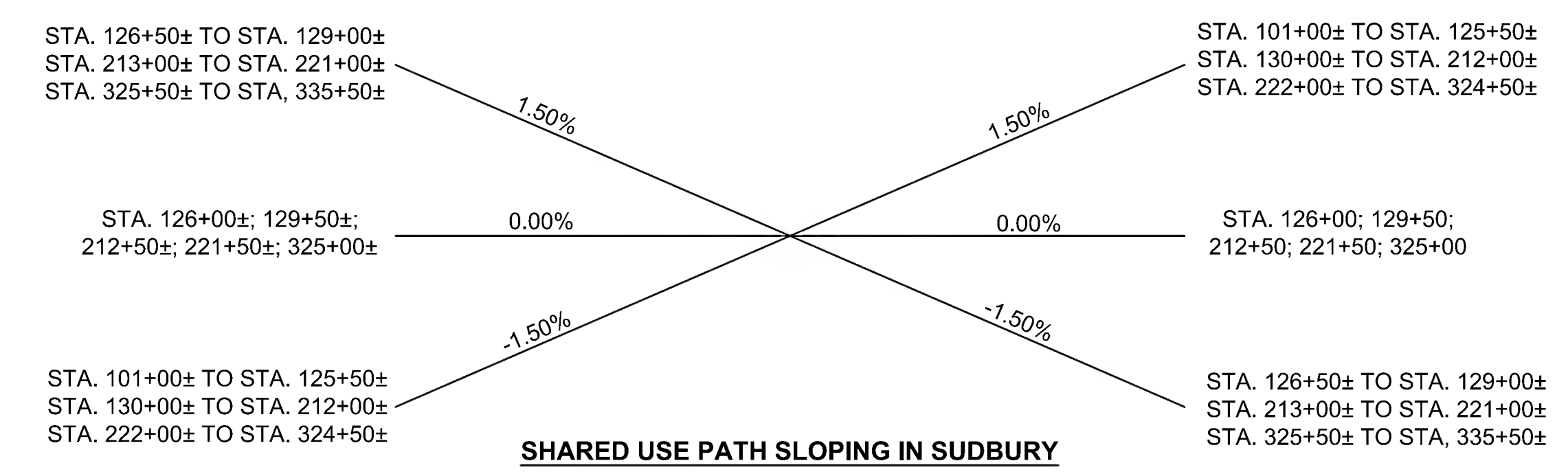
**NOTES:** EXIST. GRAVEL/BALLAST SUBGROUND MATERIAL DETERMINED BY THE ENGINEER TO BE SUITABLE SHALL REMAIN. THE DEPTH OF THE GRAVEL BORROW WILL BE AS REQUIRED BASED ON THE PROPOSED SUB-BASE ELEVATIONS.

AFTER REMOVAL OF STEEL RAILS AND WOOD TIMBER, ROUGH GRADE AND COMPACT SUBGROUND AREA. THEN PLACE AND COMPACT GRAVEL BORROW SUB-BASE MATERIAL IN MULTIPLE LIFTS.

ASPHALT EMULSION FOR TACK COAT AND HMA JOINT SEALANT SHALL BE APPLIED PER SECTION 450 QA OF THE SPECIAL PROVISIONS.

HMA FOR PATCHING SHALL BE USED FOR ALL PERMANENT, PARTIAL, AND FULL DEPTH PAVEMENT REPAIRS OF UNSOUND PAVEMENT PER SECTION 450 IN AREAS OUTSIDE OF PROPOSED FULL DEPTH RECLAMATION OR RECONSTRUCTION ROADWAY AREAS.

HMA FOR MISCELLANEOUS WORK SHALL BE USED FOR ALL TEMPORARY CONSTRUCTION, TAPER RAMPS, CURB CUT RAMPS, TEMPORARY TRENCH REPAIR, ETC.



**NOTES:**  
1. THE SECTIONS OF PROPOSED ROADWAY NOT COVERED IN THE RANGE OF STATIONS ASSOCIATED WITH THE TYPICAL SECTIONS ARE EITHER IN TRANSITION OR ARE LOCATED AT INTERSECTIONS AND THEREFOR HAVE NOT BEEN SHOWN. REFER TO CROSS SECTION SHEETS FOR MORE DETAILS.

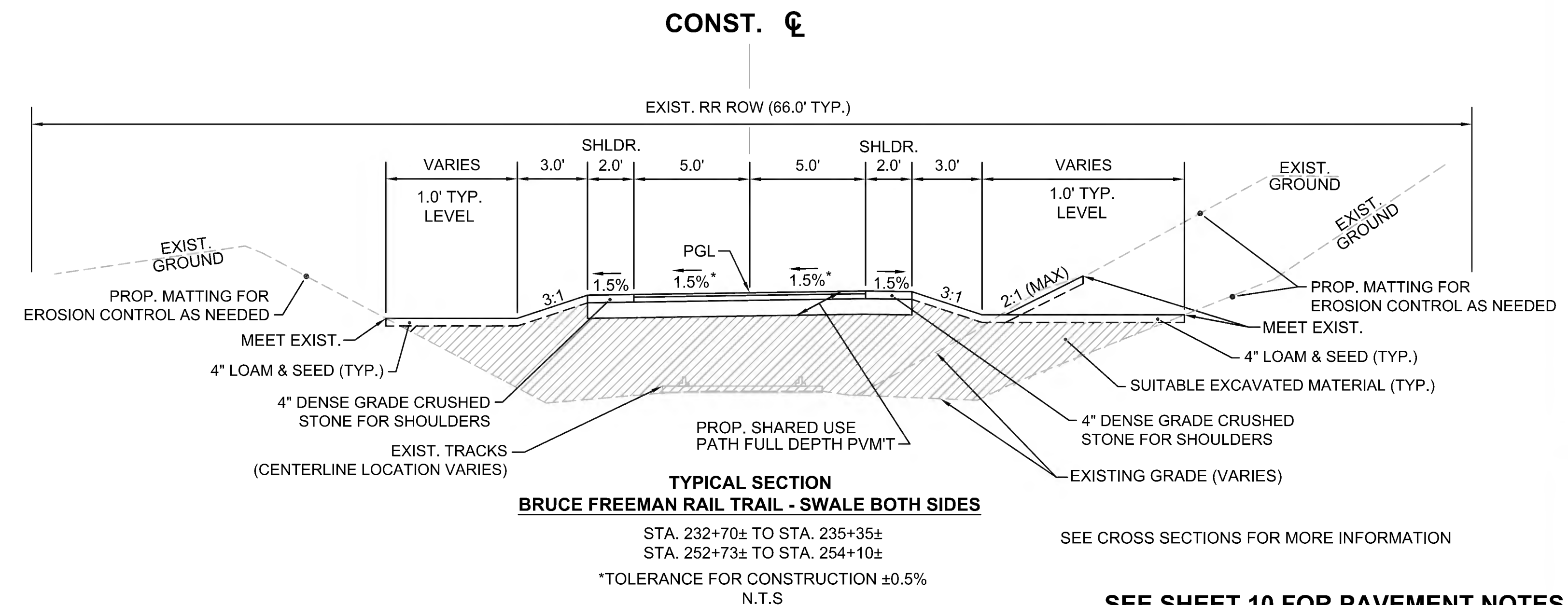
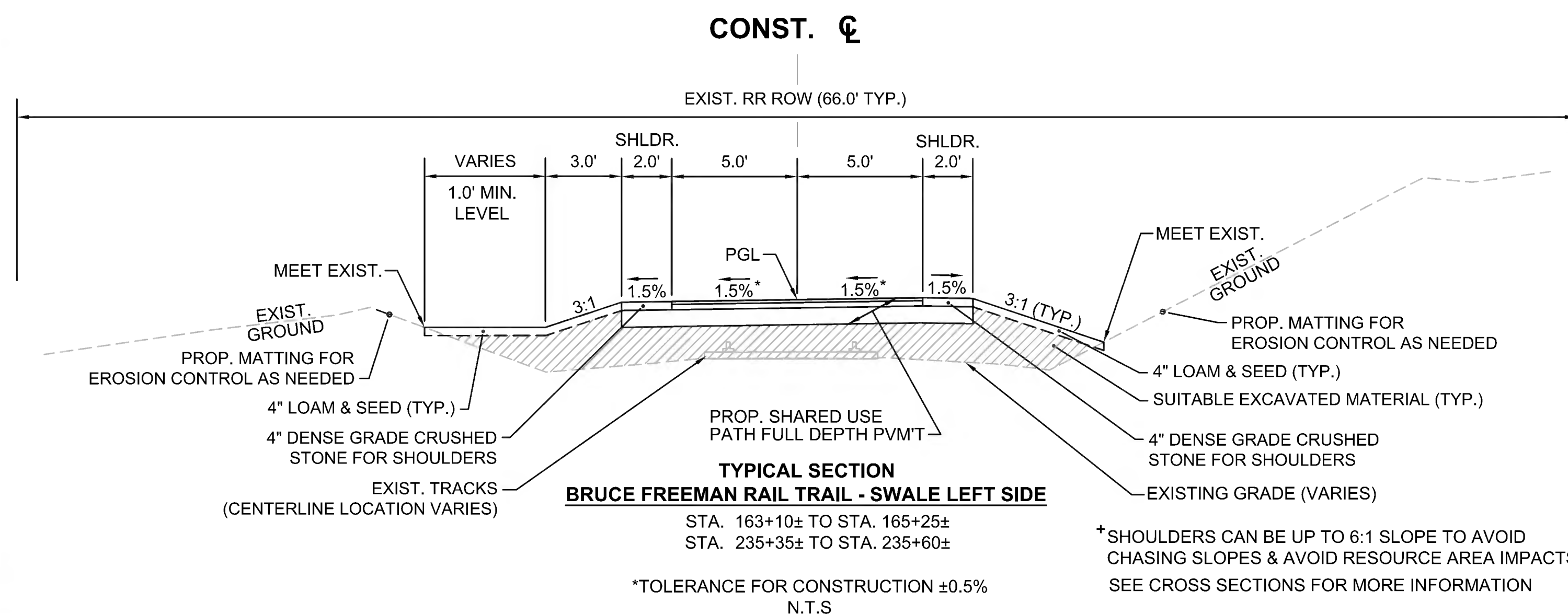
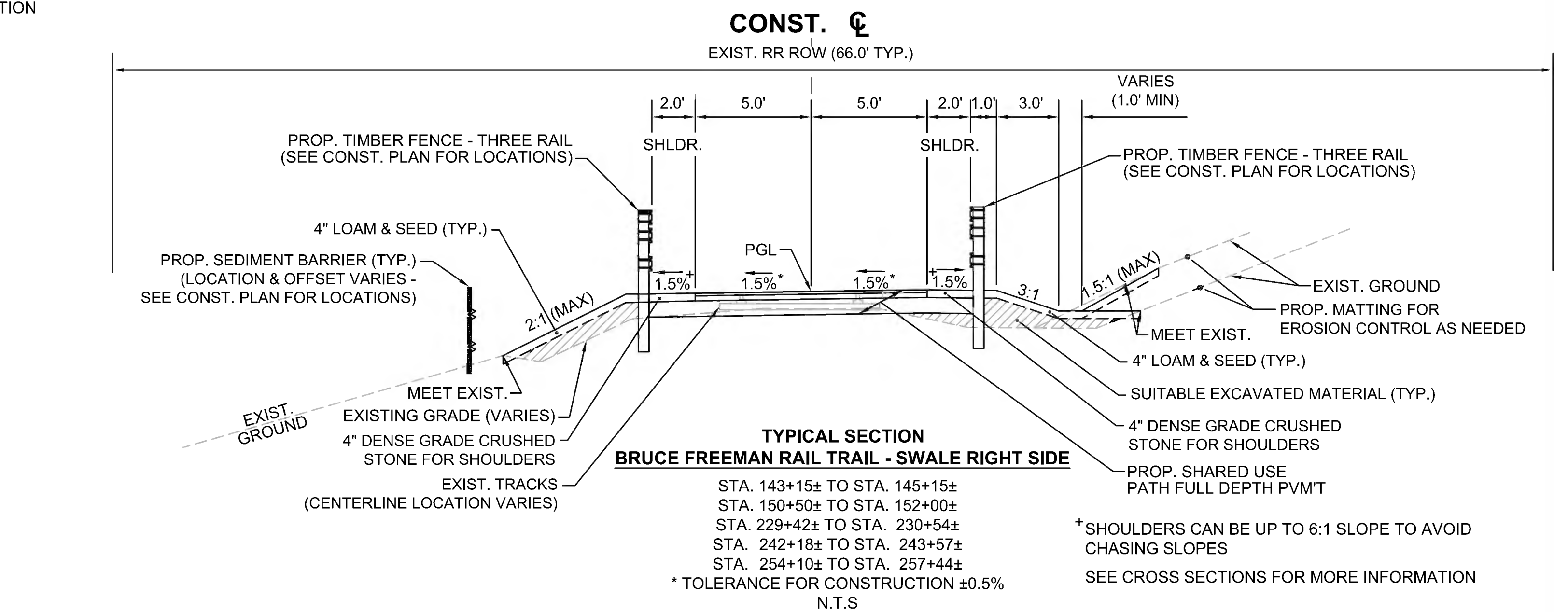
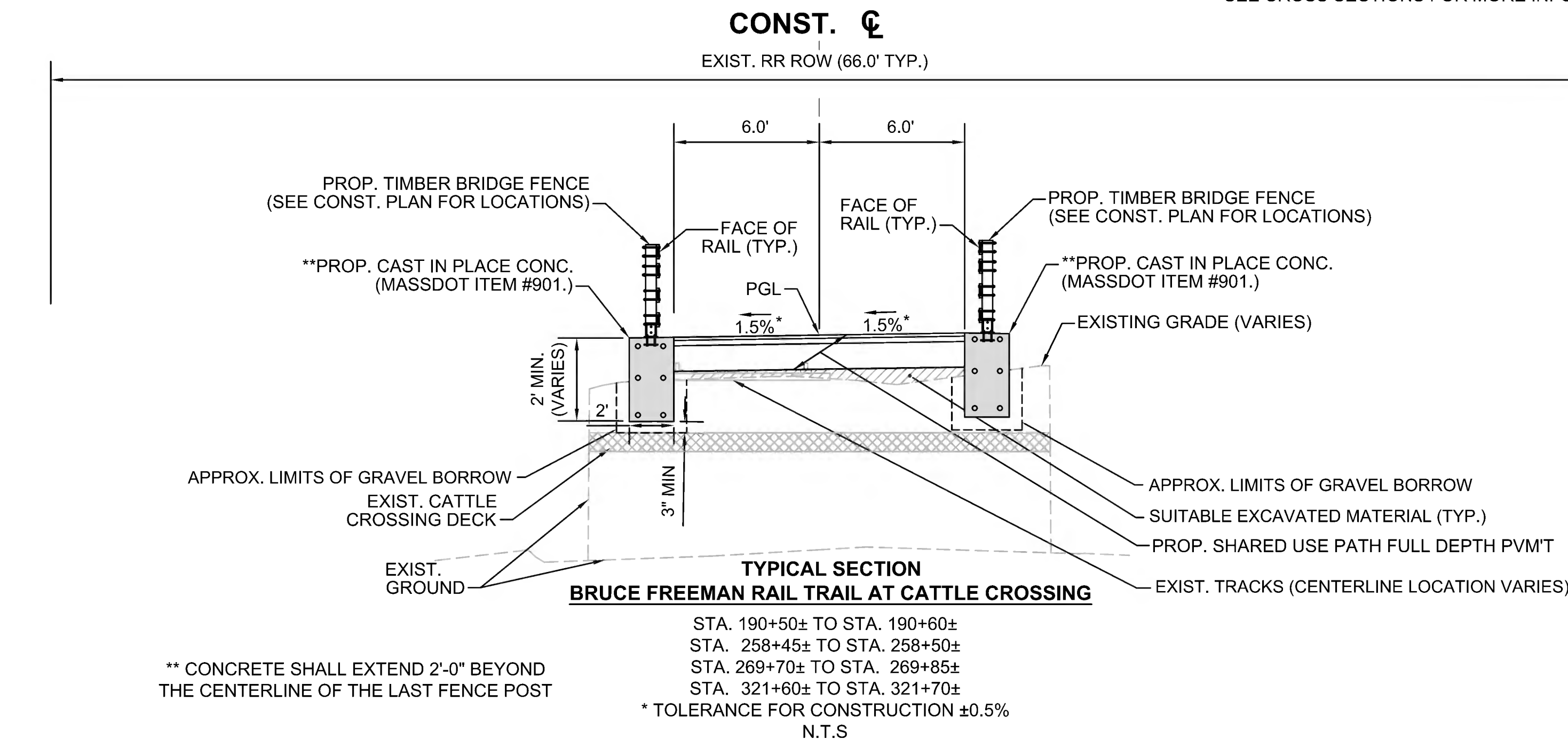
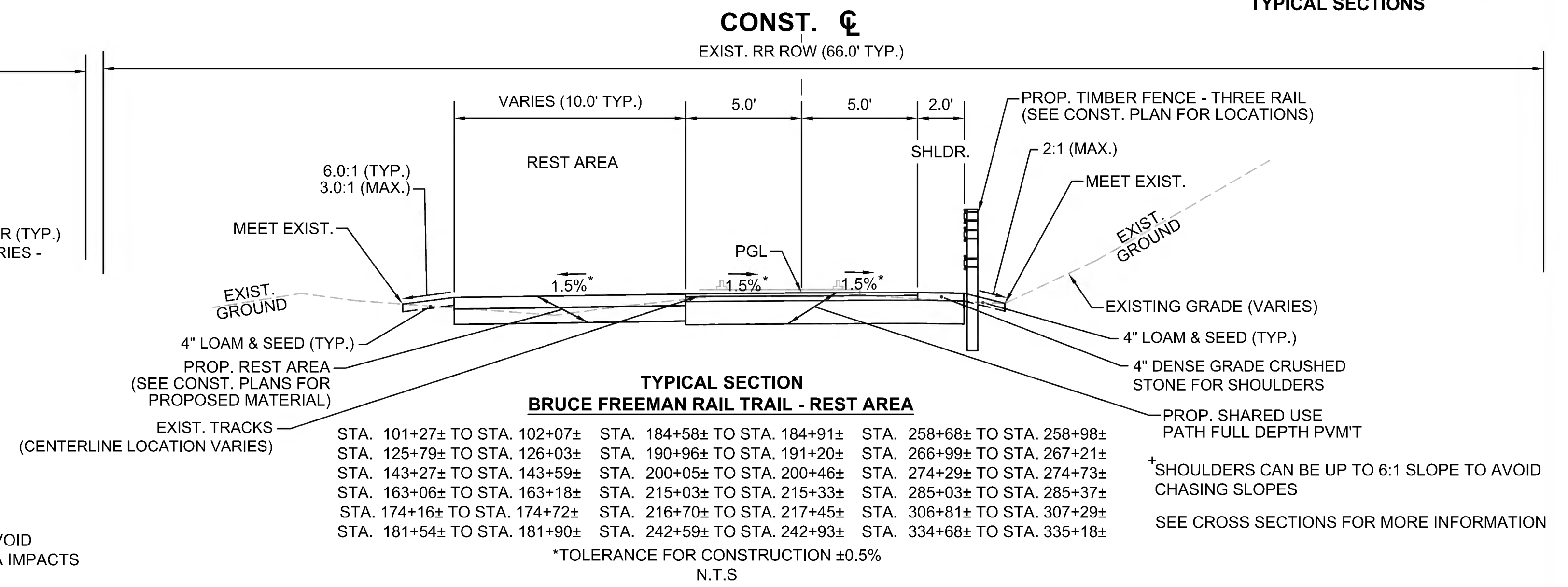
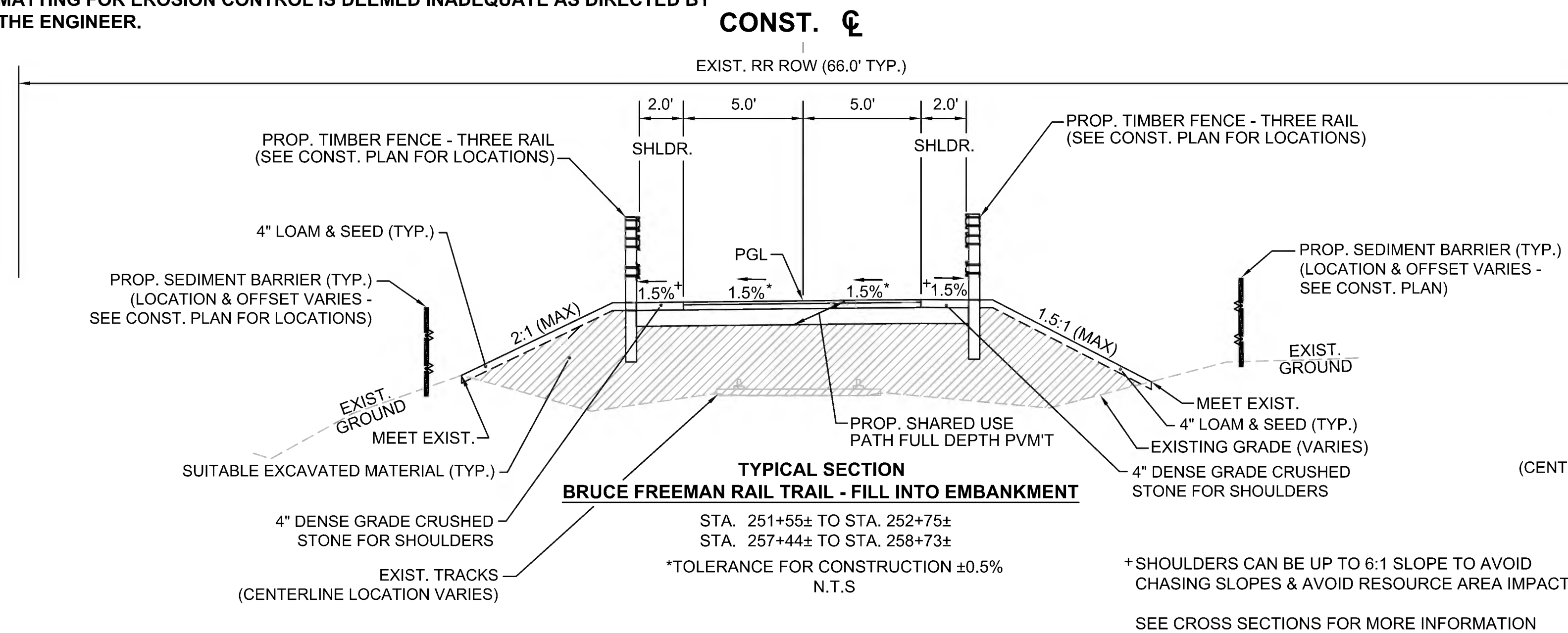


**NOTES:**

- MATTING FOR EROSION CONTROL SHALL BE INSTALLED ON EXISTING SIDE SLOPES THAT ARE 2:1 OR STEEPER THAT ARE NOT WITHIN JUTE MESH WATERWAY AREAS.
- MODIFIED ROCK FILL SHALL BE USED AS NEEDED ON ANY CUT OR FILL SLOPES STEEPER THAN 2:1 WHERE POOR SOIL CONDITIONS EXIST AND MATTING FOR EROSION CONTROL IS DEEMED INADEQUATE AS DIRECTED BY THE ENGINEER.

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	11	319
PROJECT FILE NO.		608164	

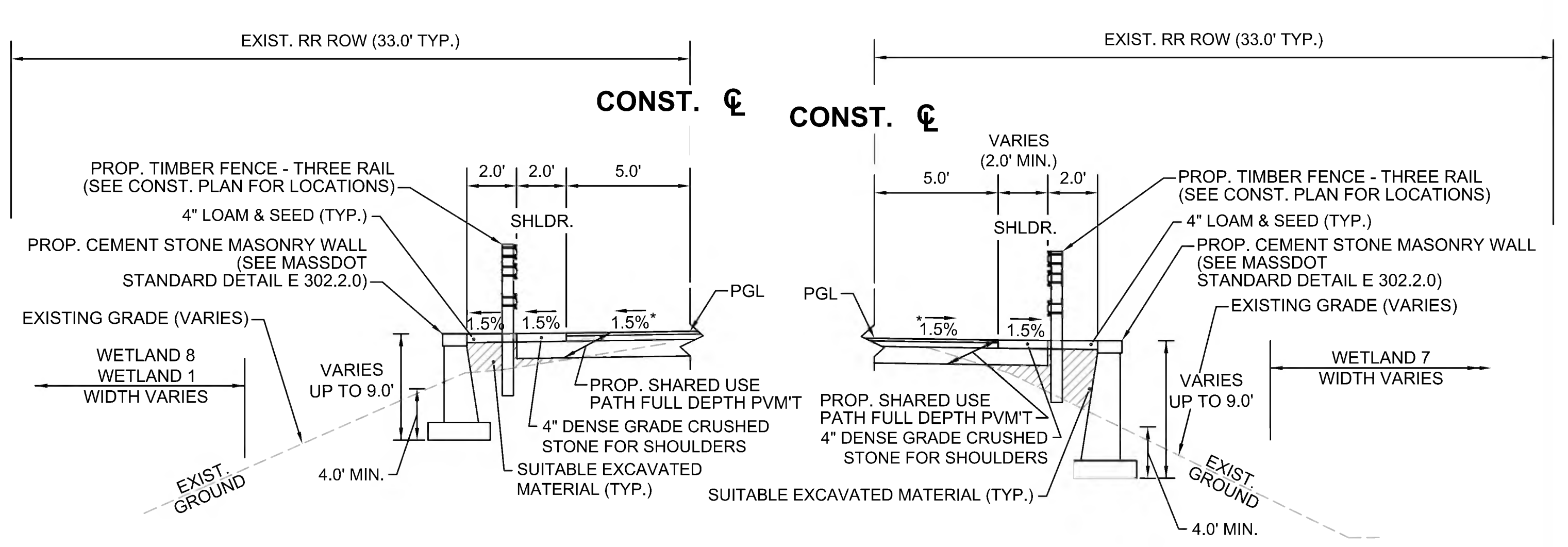
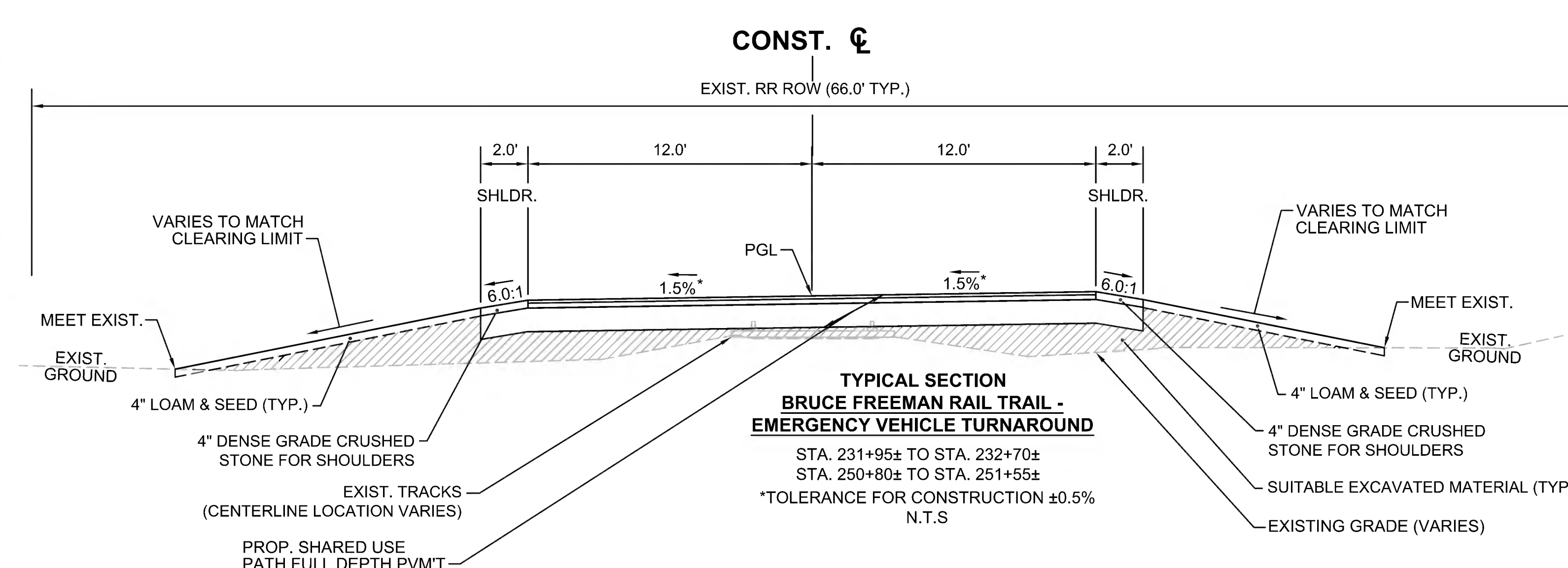
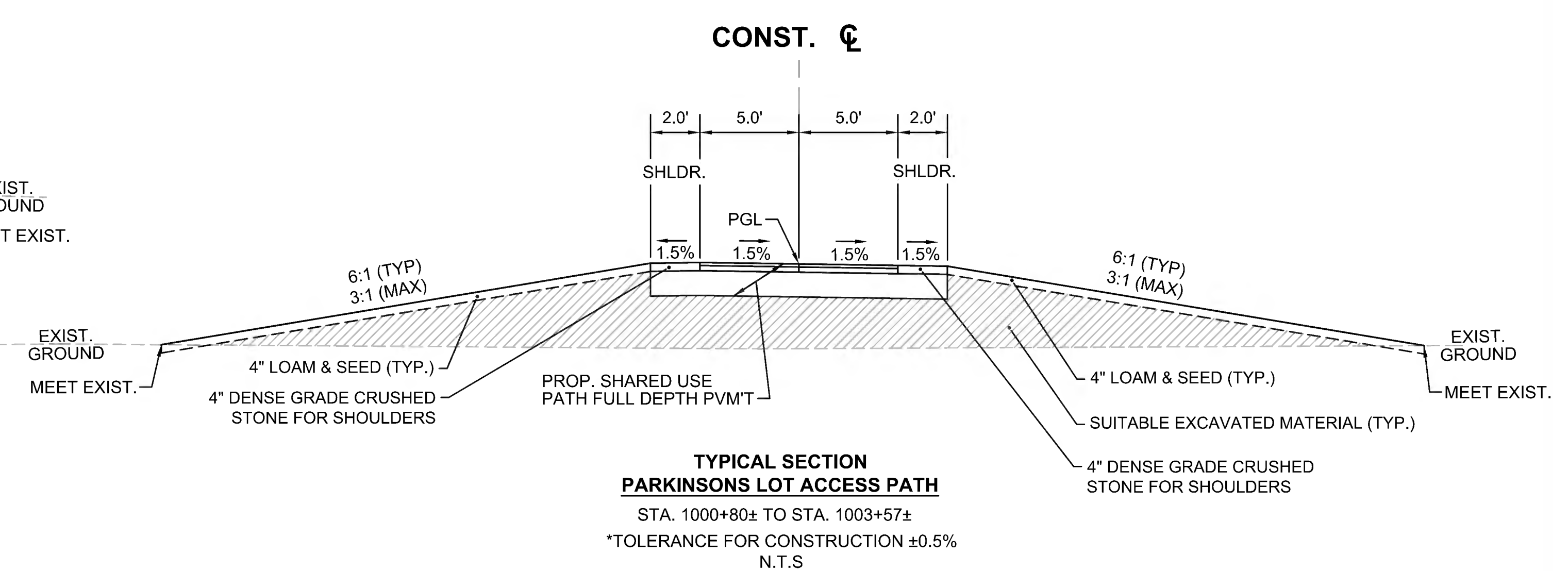
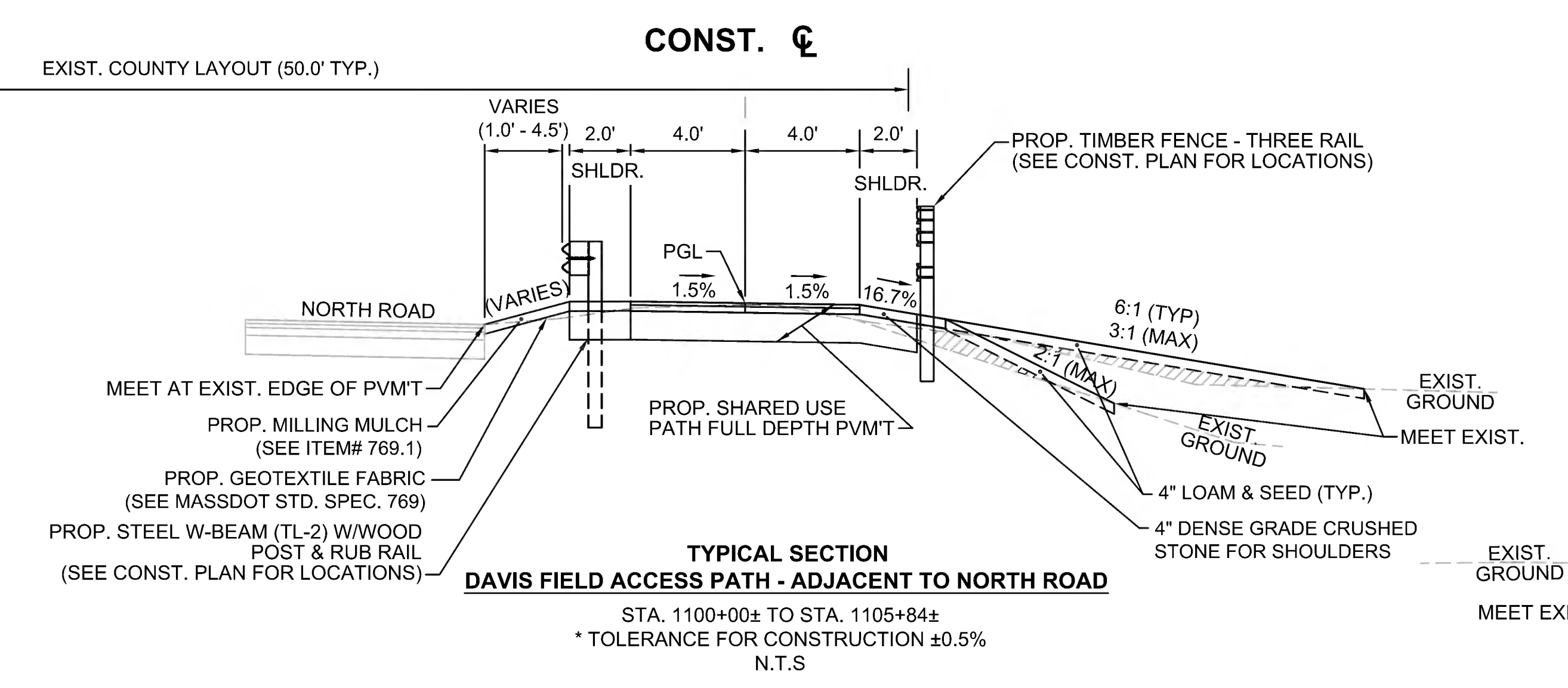
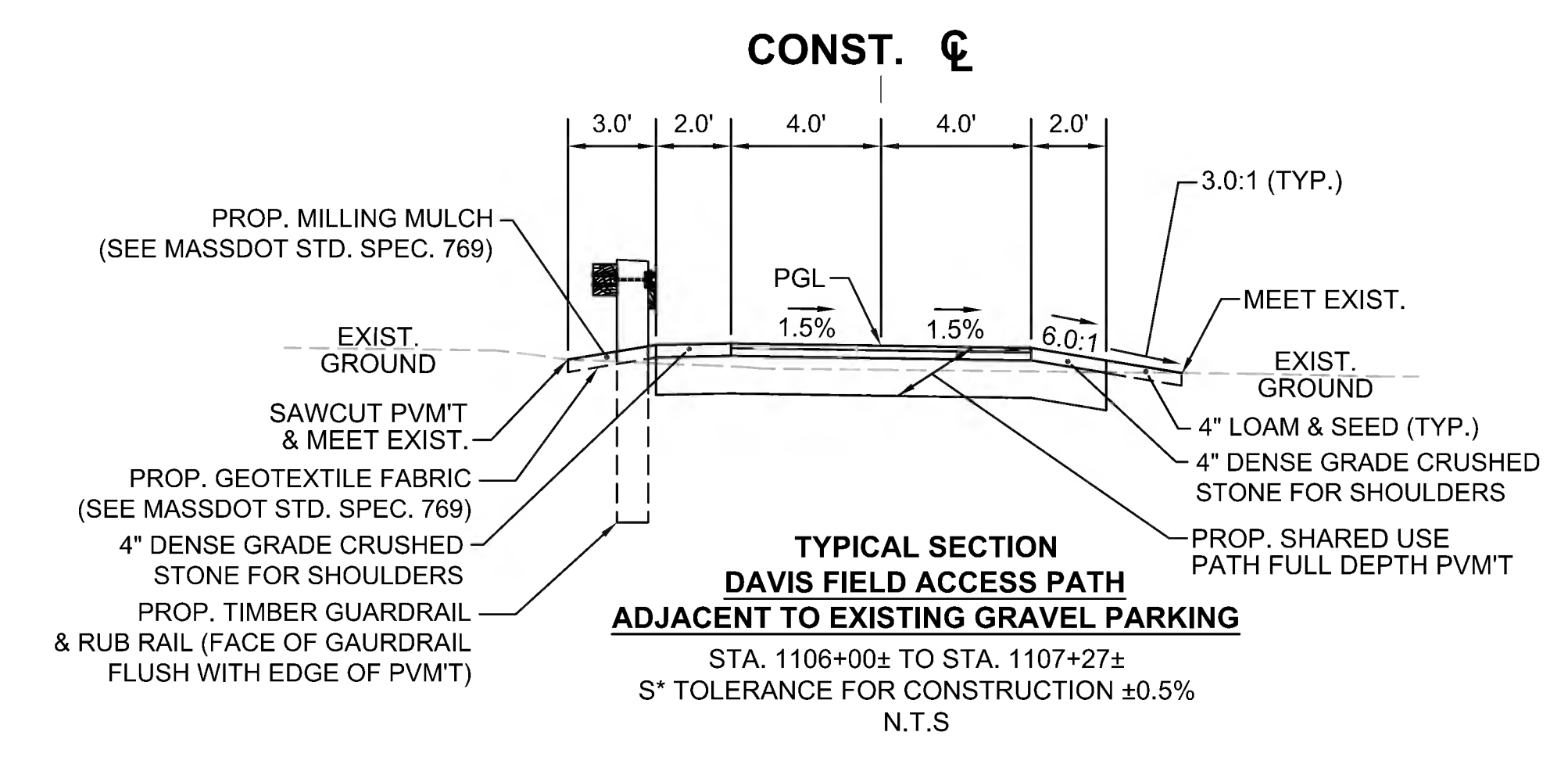
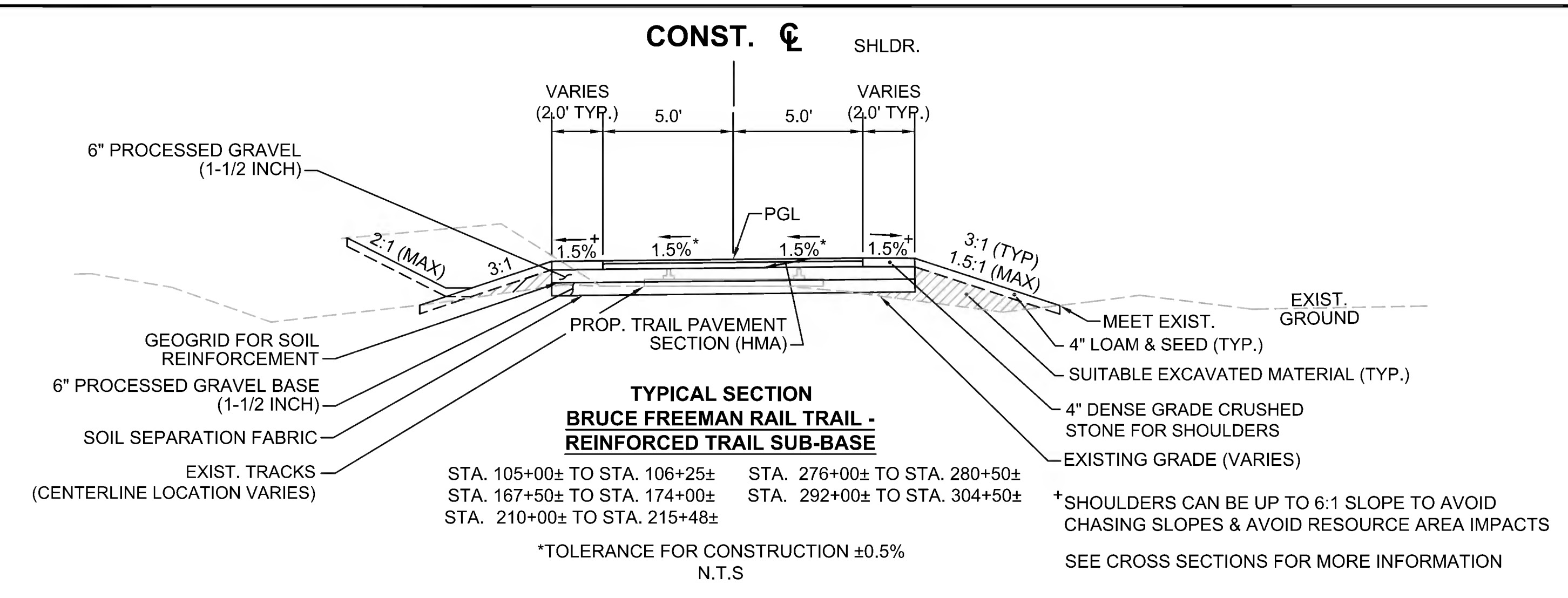
**TYPICAL SECTIONS**



SEE SHEET 10 FOR PAVEMENT NOTES

SUBBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	12	319
PROJECT FILE NO.		608164	

**TYPICAL SECTIONS**



SEE CROSS SECTIONS FOR MORE INFORMATION  
SEE GRADING PLANS FOR ELEVATIONS

SEE CROSS SECTIONS FOR MORE INFORMATION  
SEE GRADING PLANS FOR ELEVATIONS

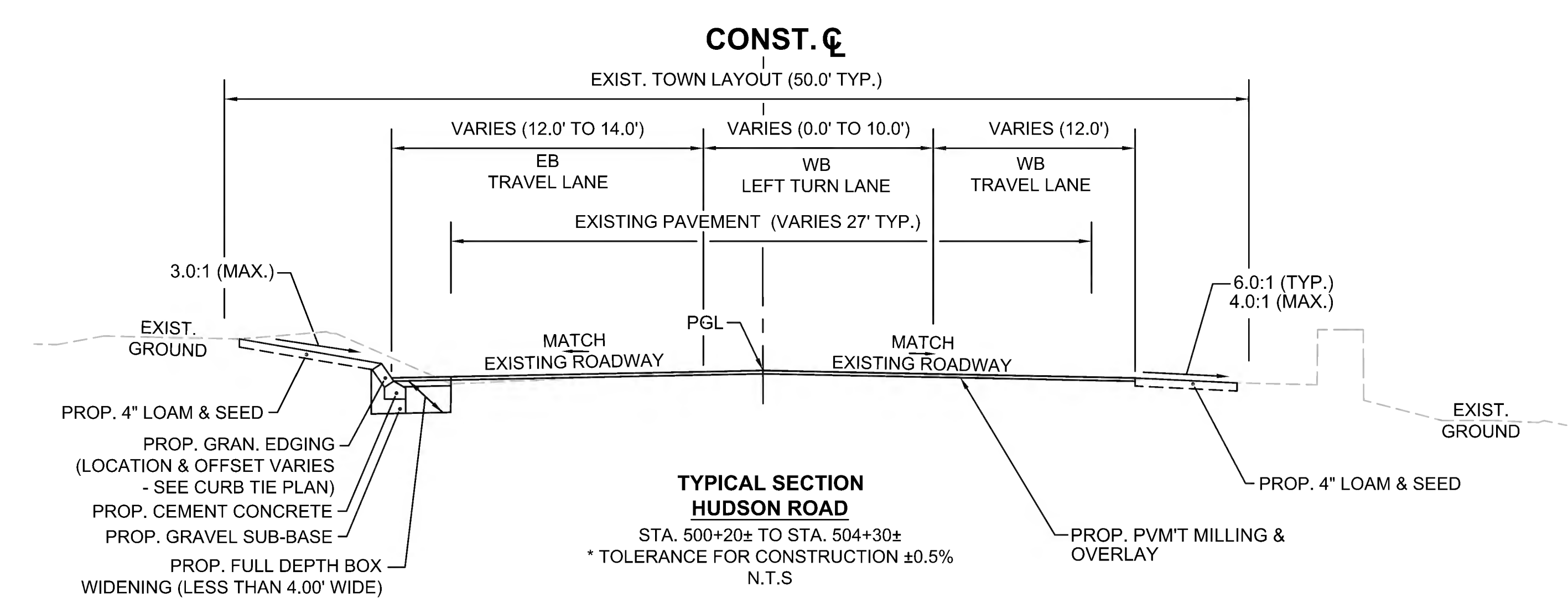
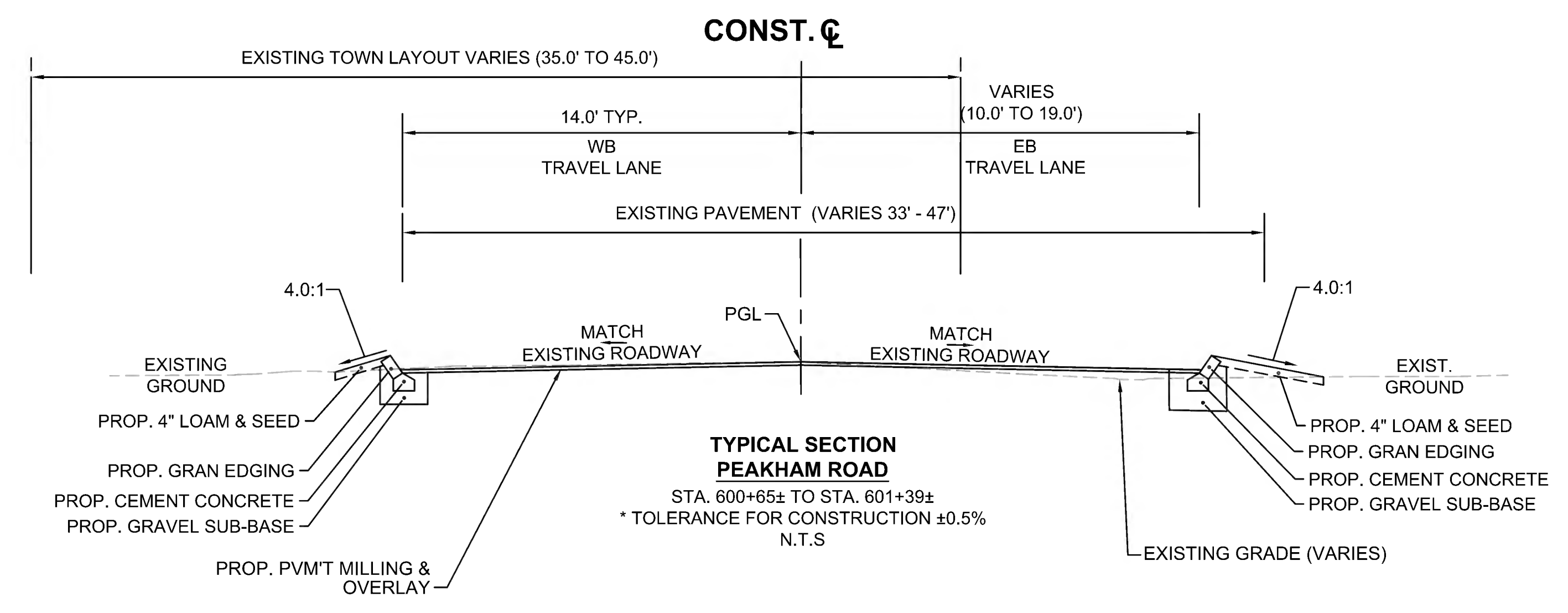
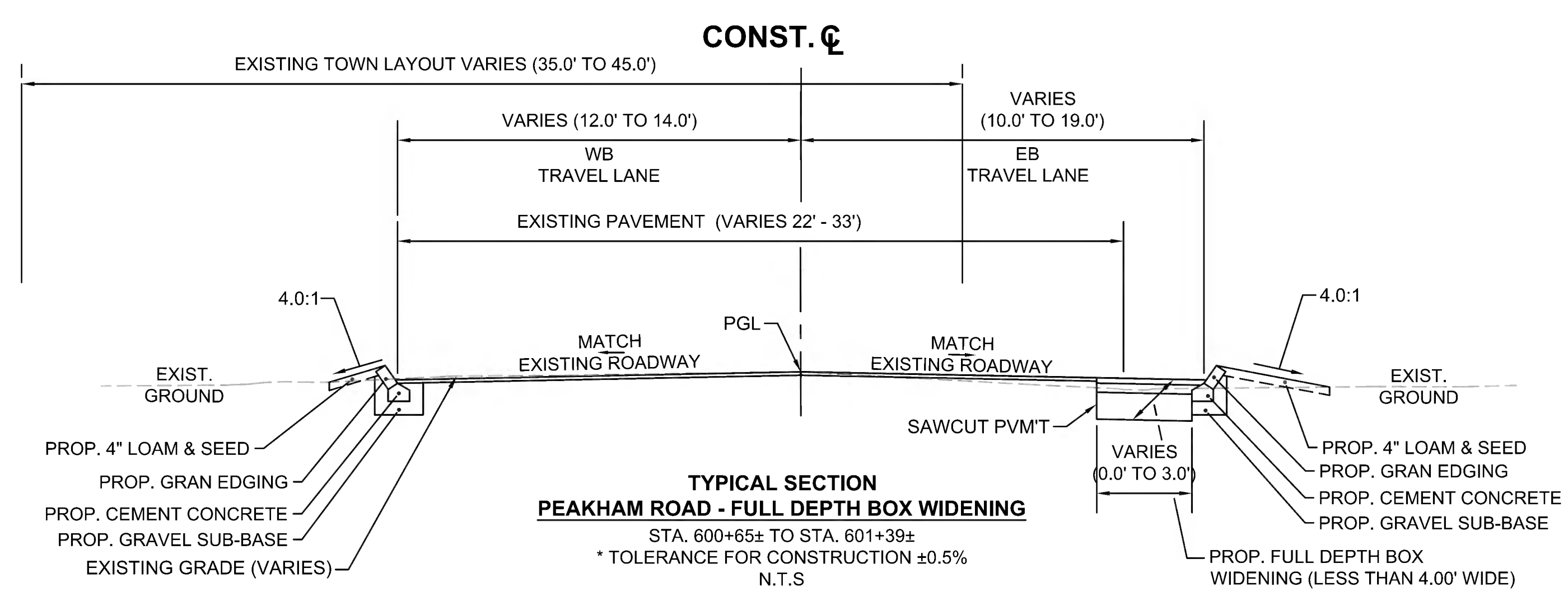
**SEE SHEET 10 FOR PAVEMENT NOTES**



**SUBBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	13	319
PROJECT FILE NO.		608164	

**TYPICAL SECTIONS**

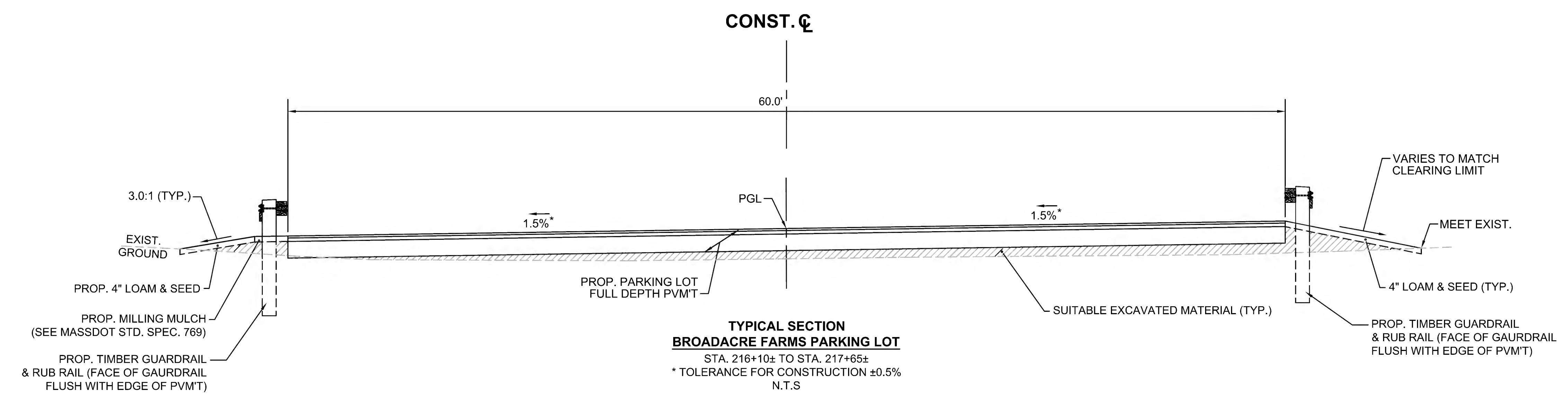
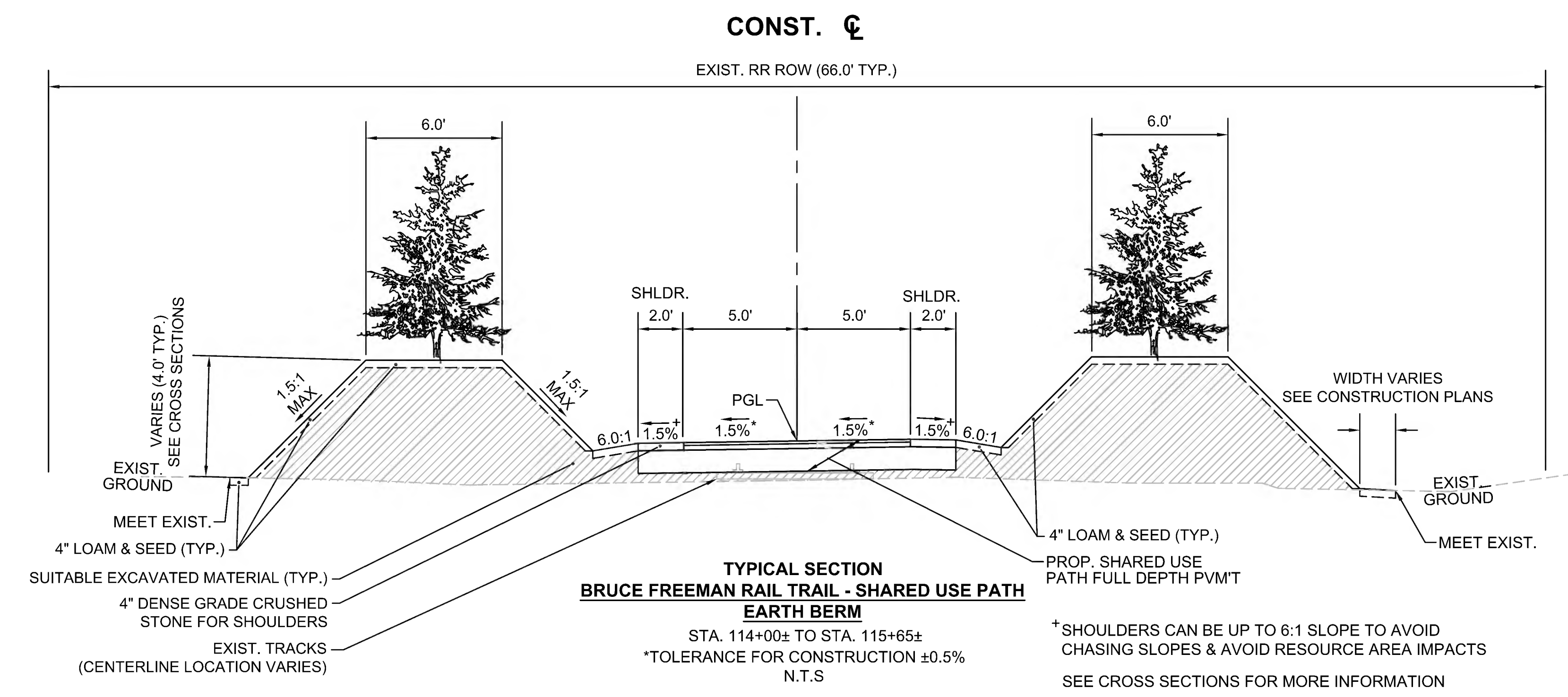
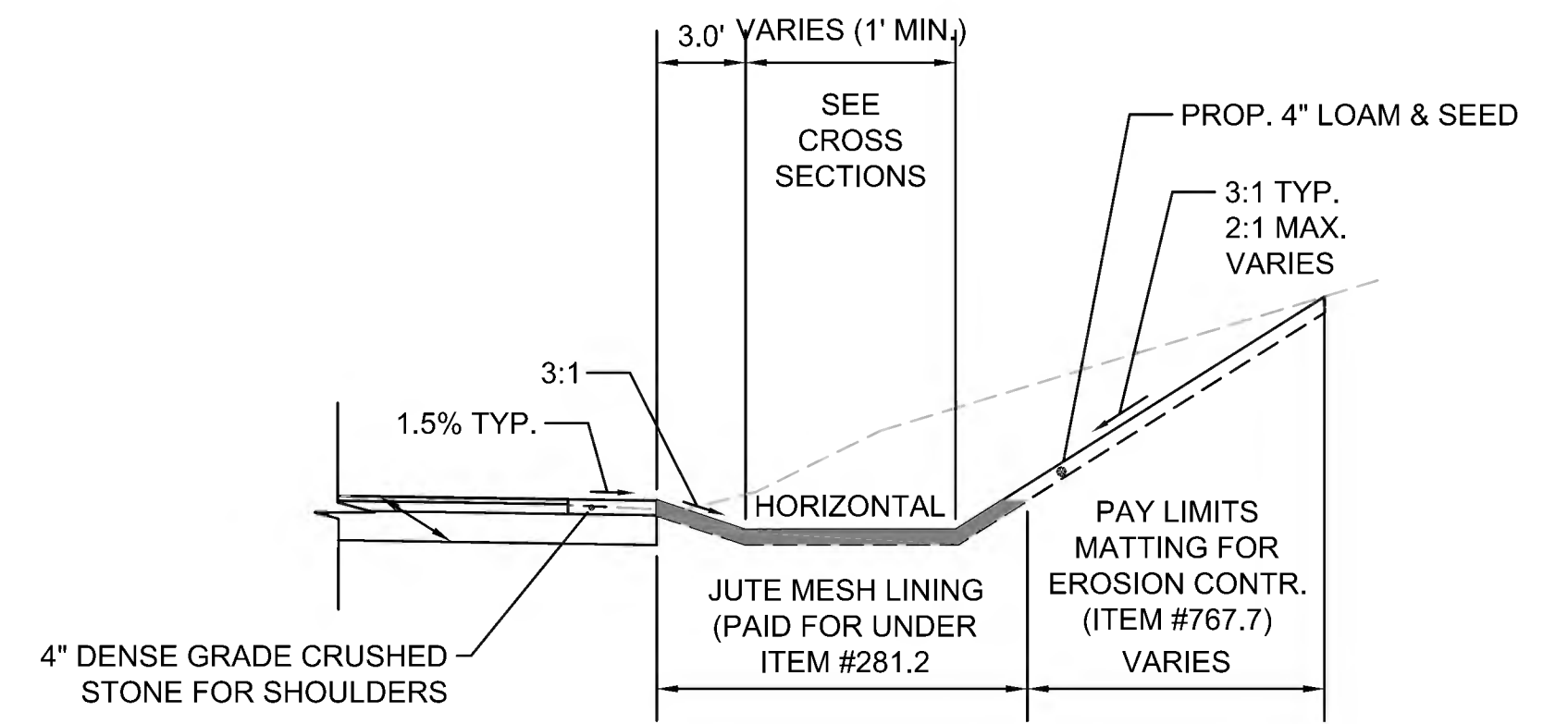
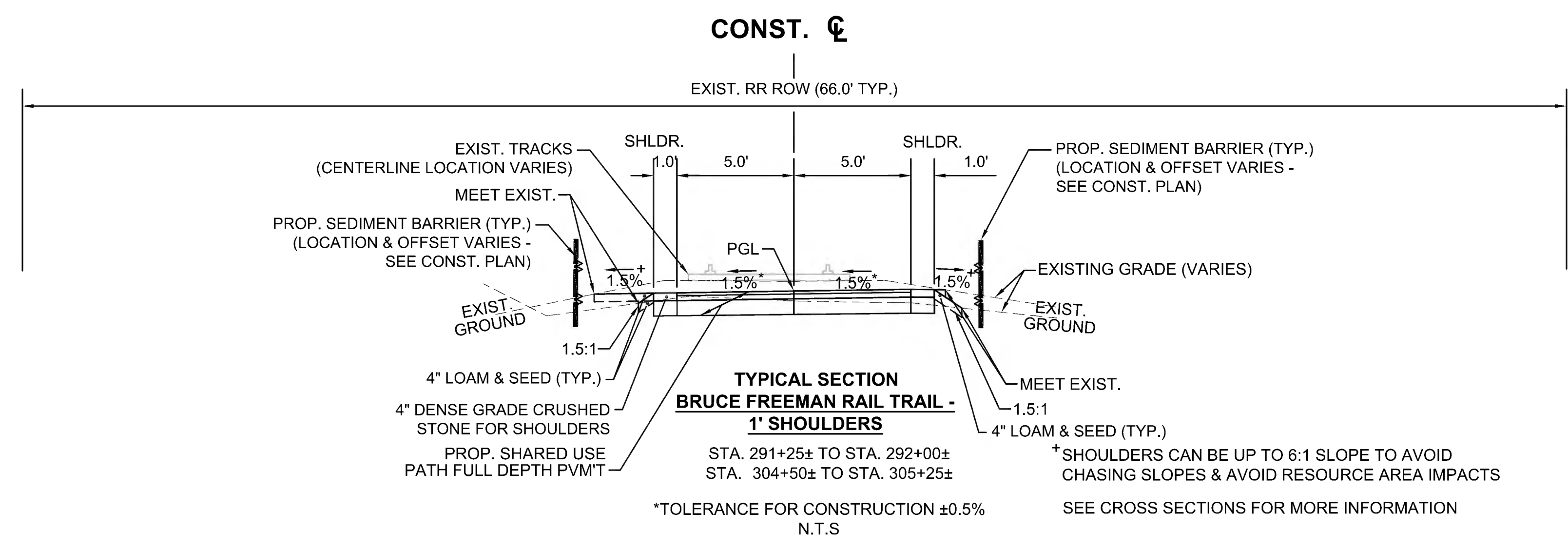


SEE SHEET 10 FOR PAVEMENT NOTES

**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	14	319
PROJECT FILE NO.		608164	

**TYPICAL SECTIONS**

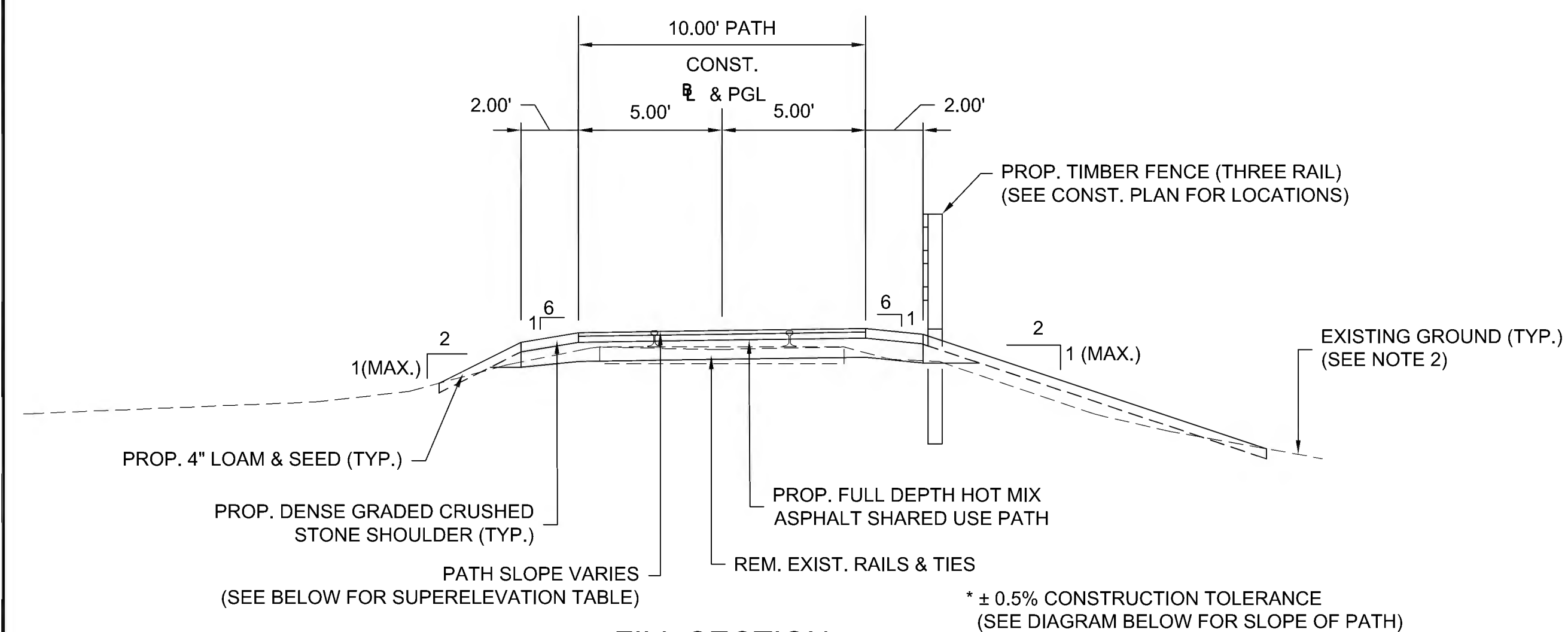


**SEE SHEET 10 FOR PAVEMENT NOTES**



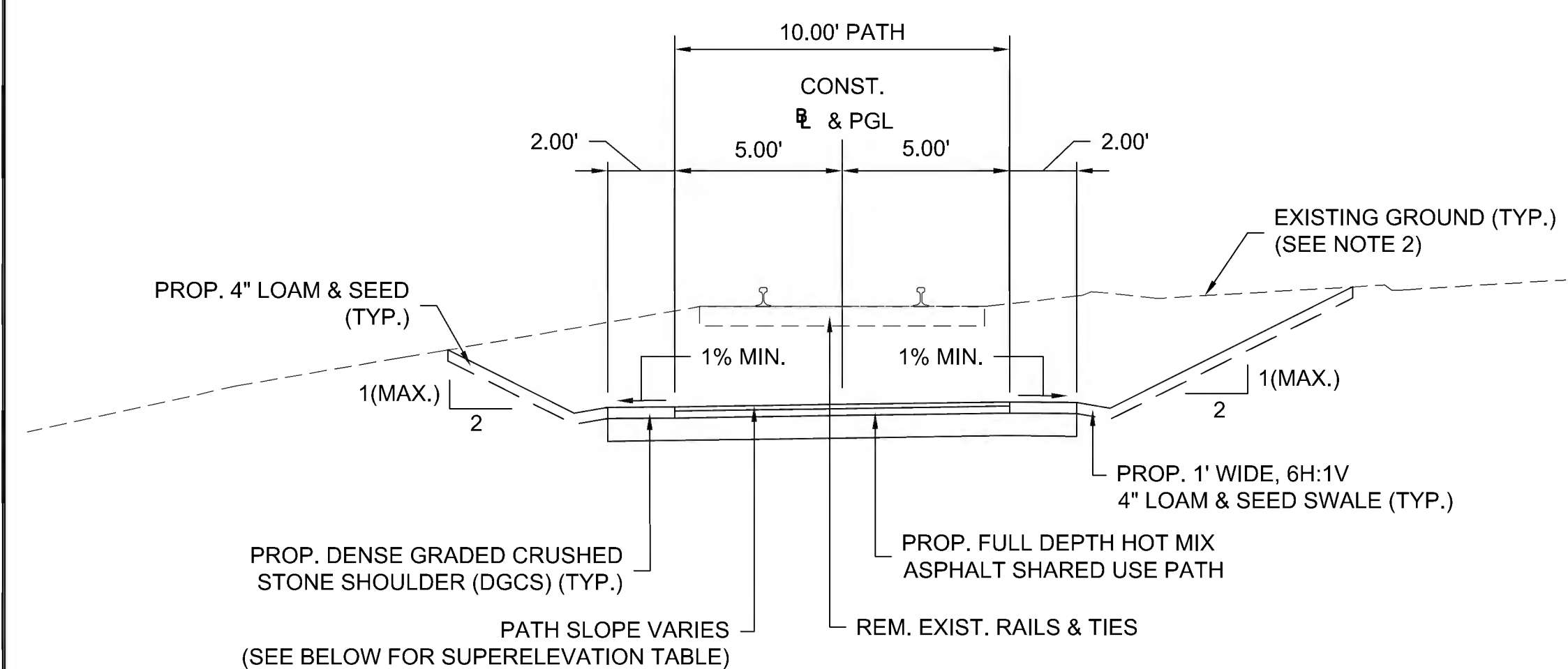
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MA	CMQ/TAP/STP-0033(028)X	15	319
PROJECT FILE NO.		608164	

TYPICAL SECTIONS



**FILL SECTION**

\* ± 0.5% CONSTRUCTION TOLERANCE  
(SEE DIAGRAM BELOW FOR SLOPE OF PATH)

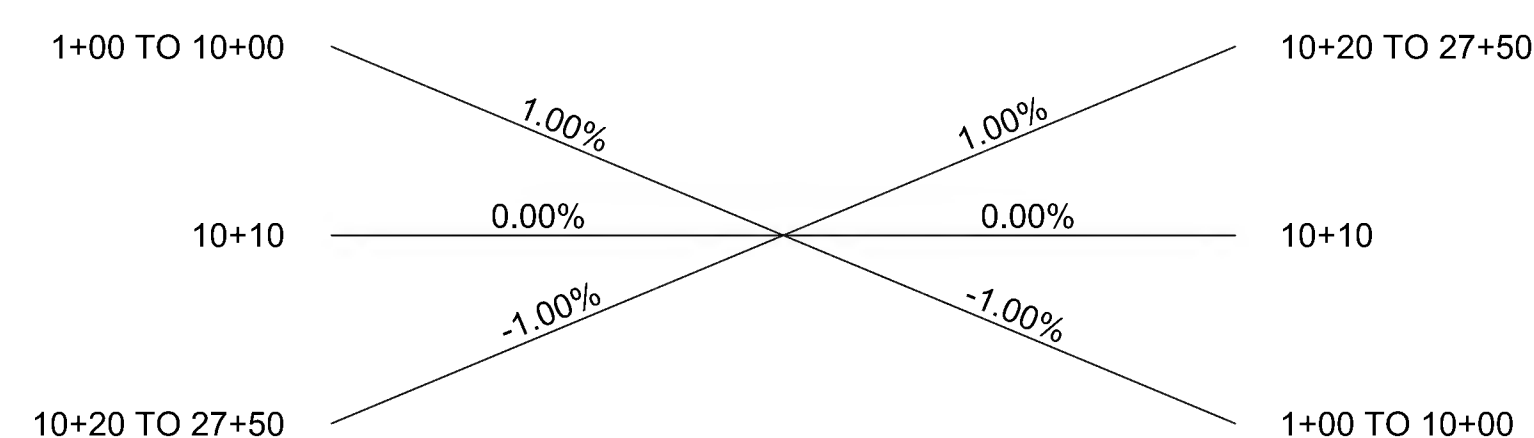


**CUT SECTION**

\* ± 0.5% CONSTRUCTION TOLERANCE  
(SEE DIAGRAM BELOW FOR SLOPE OF PATH)

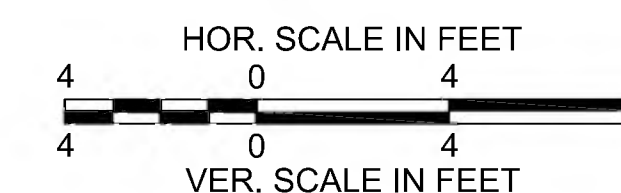
**TYPICAL SECTION - 10' WIDE PATH**

SCALE 1" = 4'  
STA. 1+00± TO STA. 27+50±



**SHARED USE PATH SLOPING - CONCORD**  
(SEE SHEET 10 FOR SUDBURY)

SEE SHEET 10 FOR PAVEMENT NOTES











FENCING DETAILS

TIMBER FENCE (THREE-RAIL) STA. 119+75 LT TO STA. 132+25 LT  
TIMBER FENCE (THREE-RAIL) STA. 119+75 RT TO STA. 130+75 RT

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

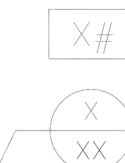
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PLANT LIST

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
VISUAL SCREEN MIX				
JV	JUNIPERUS VIRGINIANA	EASTERN RED CEDAR	6	4-5' HT.
VT	VILBURUM TRILOBUM	HIGHBUSH CRANBERRY	37	3 GAL.
IG	ILEX GLABRA	INKBERRY	34	3 GAL.
EROSION CONTROL MIX				
SS	CAREX PENNSYLVANIA	PENNSYLVANIA SEDGE	130	PLUG
CS	CORNUS SERICEA & SALIX SSP	DOGWOOD AND WILLOW	5	1 GAL.

LEGEND:

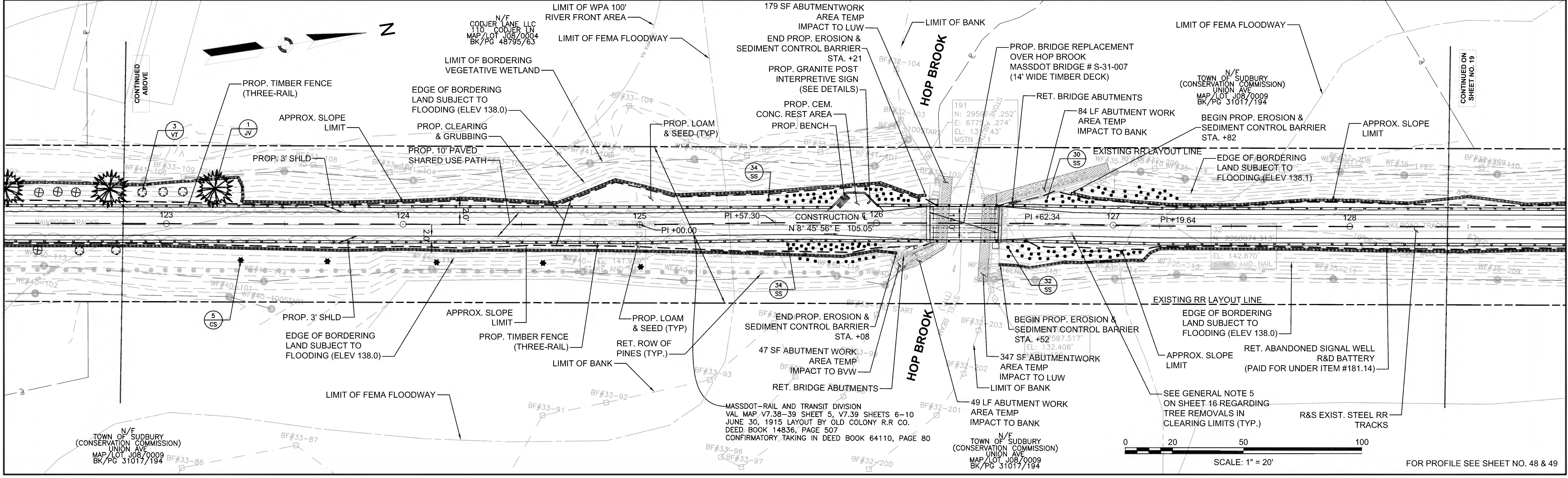
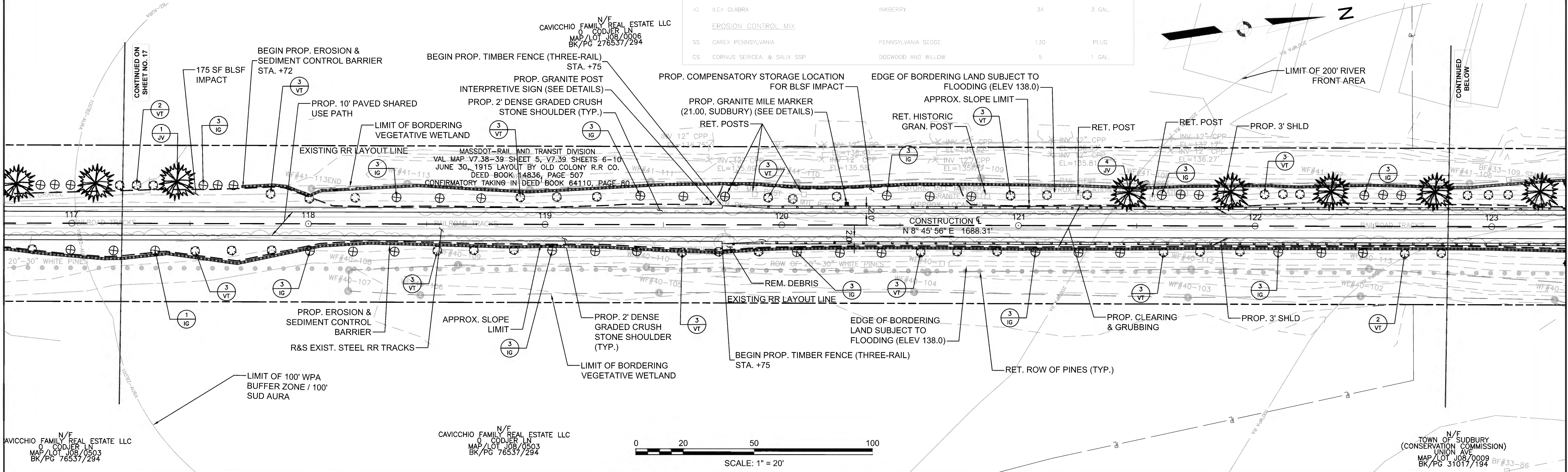
PROPOSED WHEELCHAIR RAMP DETAIL #  
PLANT QUANTITY AND SPECIES



**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	18	319
PROJECT FILE NO.		608164	

**CONSTRUCTION PLANS**



608164 - HD(CONSTRUCTION PLANS).DWG Plotted on 27-Jun-2022 8:49 AM







FENCING DETAILS  
NONE

HIGHWAY GUARD DETAILS  
NONE  
TRAFFIC SIGNAL CONDUIT  
NONE

WATER SUPPLY ALTERATIONS  
NONE  
DRAINAGE DETAILS  
NONE

### PLANT LIST

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
VISUAL SCREEN MIX				
VT	VIBURNUM TRILOBUM	HIGHBUSH CRANBERRY	27	3 GAL.
IG	ILEX GLABRA	INKBERRY	24	3 GAL.
PS	PINUS STROBUS	EASTERN WHITE PINE	10	4-5' HT.
AC	ABIES CONCOLOR	WHITE FIR	8	5-6' HT.
ORNAMENTAL MIX				
CCR	CERCIS CANADENSIS	REDBUD	8	2-3" CAL.
HA	HYDRANGEA ARBORESCENS	SMOOTH HYDRANGEA	6	3 GAL.

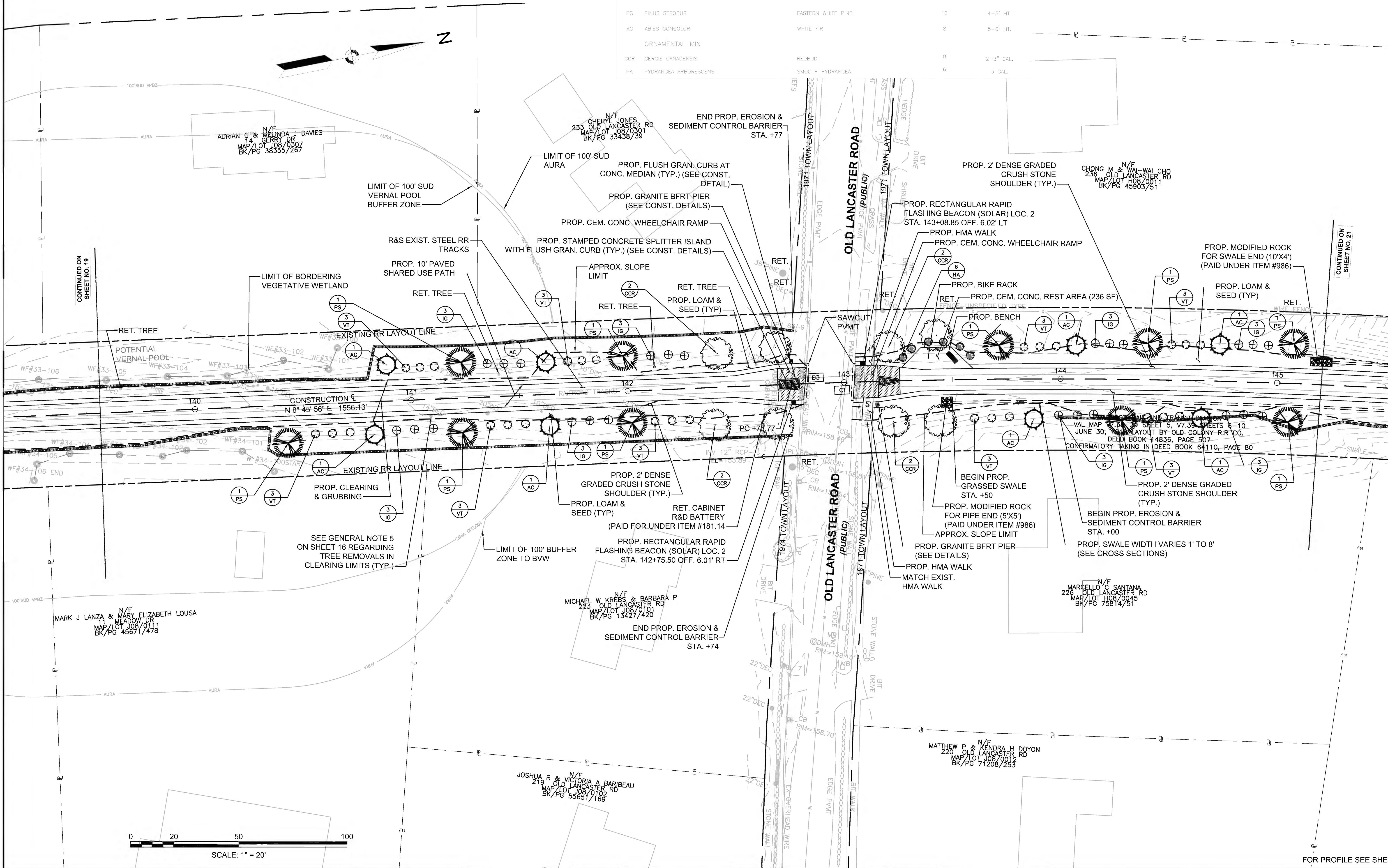
LEGEND:

PROPOSED WHEELCHAIR RAMP DETAIL # X#  
PLANT QUANTITY AND SPECIES X  
XX

**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	20	319
PROJECT FILE NO.		608164	

**CONSTRUCTION PLANS**



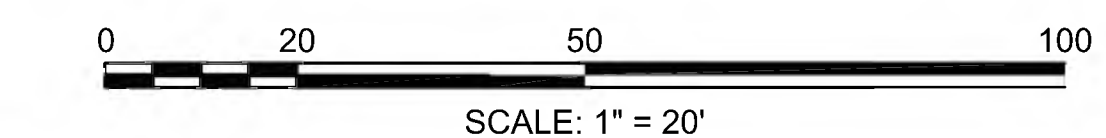
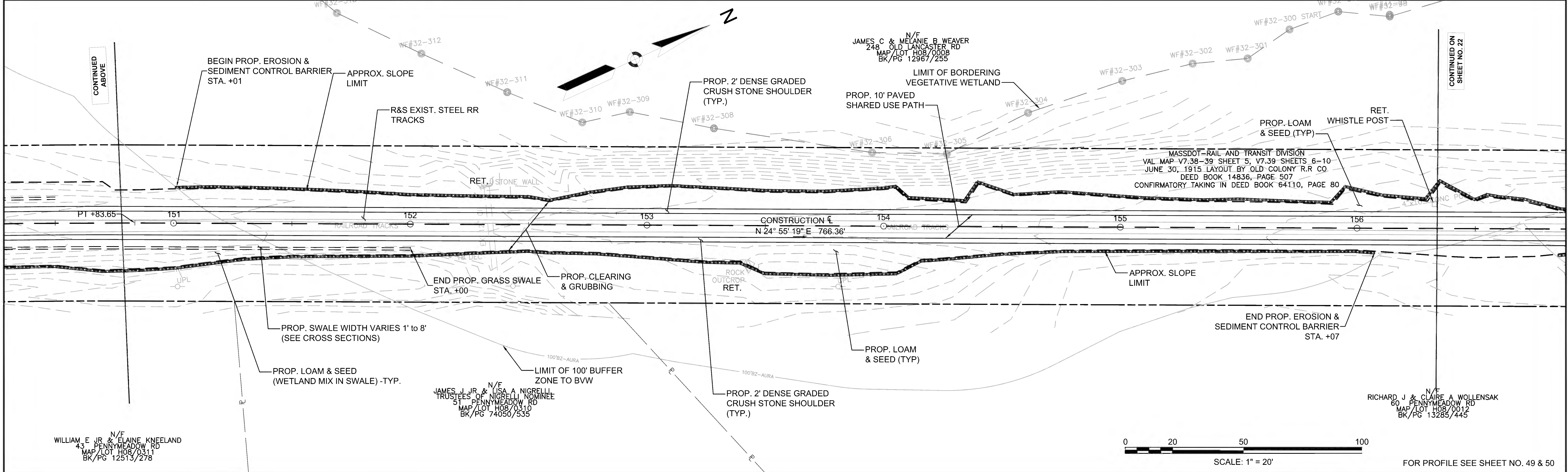
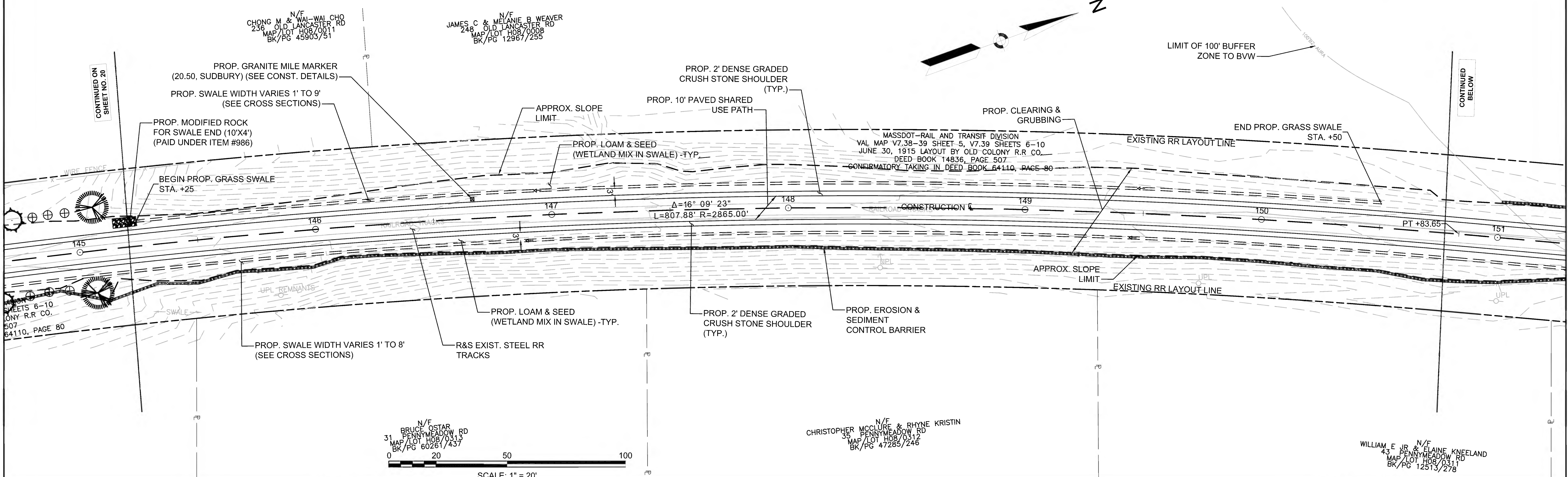
CONTINUED ON SHEET NO. 19

CONTINUED ON SHEET NO. 21

FOR PROFILE SEE SHEET NO. 49



HIGHWAY GUARD DETAILS NONE  
 TRAFFIC SIGNAL CONDUIT NONE  
 WATER SUPPLY ALTERATIONS NONE  
 DRAINAGE DETAILS NONE



FOR PROFILE SEE SHEET NO. 49 & 50



FENCING DETAILS

TIMBER FENCE (THREE-RAIL) STA. 159+25 LT TO STA. 162+90 LT  
 TIMBER FENCE (THREE-RAIL) STA. 158+25 RT TO STA. 161+25 RT  
 TIMBER FENCE (THREE-RAIL) STA. 166+75 RT TO STA. 167+50 RT  
 TIMBER FENCE (THREE-RAIL) STA. 166+75 RT TO STA. 167+50 RT

HIGHWAY GUARD DETAILS

NONE

WATER SUPPLY ALTERATIONS

SHEET 180

TRAFFIC SIGNAL CONDUIT

NONE

DRAINAGE DETAILS

SHEET 180

PLANT LIST

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
<b>EROSION CONTROL MIX</b>				
SS	CAREX PENNSYLVANIA	PENNSYLVANIA SEDGE	7	PLUG
<b>ORNAMENTAL MIX</b>				
CCR	CERCIS CANADENSIS	REDBUD	2	2-3" CAL.
HA	HYDRANGEA ARBORESCENS	SMOOTH HYDRANGEA	2	5 CAL.

LEGEND:

PROPOSED WHEELCHAIR RAMP DETAIL #

PLANT QUANTITY AND SPECIES

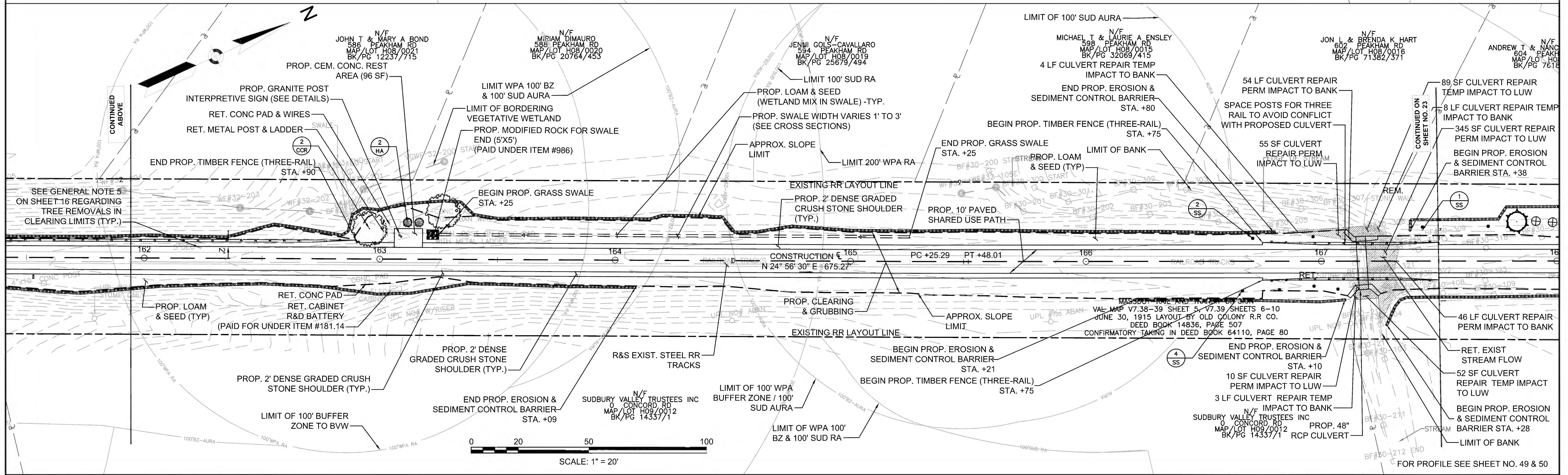
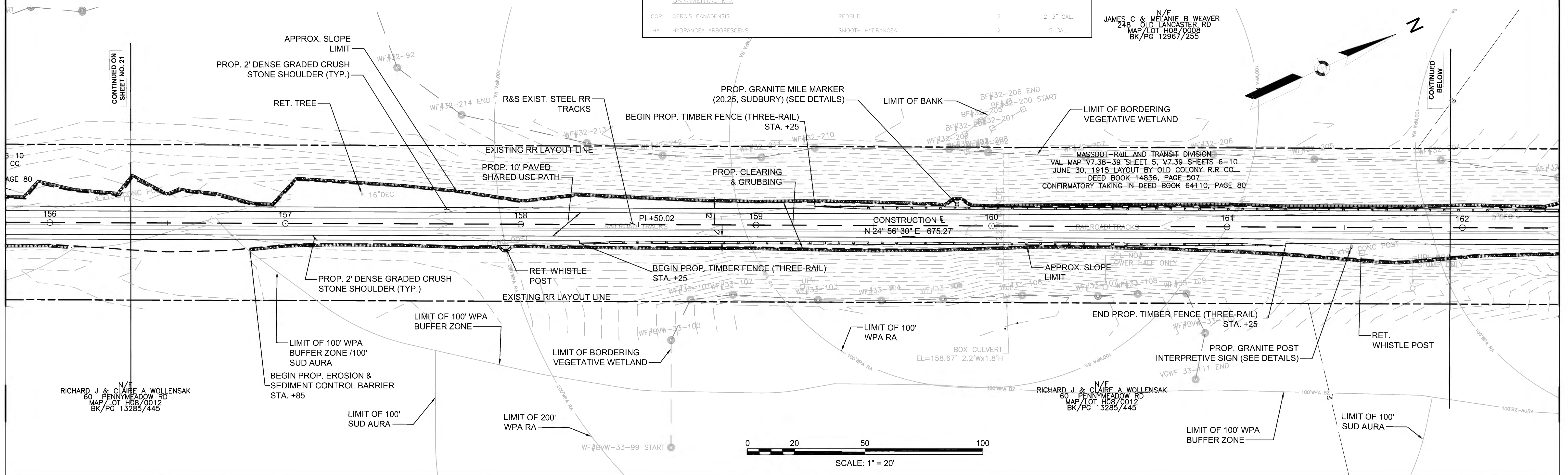
SUDBURY BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	22	319

PROJECT FILE NO. 608164

CONSTRUCTION PLANS

JAMES C & MELANIE B WEAVER  
 248 OLD LANCASTER RD  
 MAP/LOT H08/0008  
 BK/PG 12967/255





FENCING DETAILS

TIMBER FENCE (THREE-RAIL) STA. 166+75 RT TO STA. 167+50 RT  
 TIMBER FENCE (THREE-RAIL) STA. 166+75 LT TO STA. 167+50 LT

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

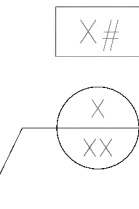
NONE

PLANT LIST

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
<u>VISUAL SCREEN MIX</u>				
VT	VILBURUM TRILOBUM	HIGHBUSH CRANBERRY	3	3 GAL.
IG	ILEX GLABRA	INKBERRY	6	3 GAL.
PS	PINUS STROBUS	EASTERN WHITE PINE	2	4-5' HT.
AC	ABIES CONCOLOR	WHITE FIR	2	5-6' HT.
<u>EROSION CONTROL MIX</u>				
SS	CAREX PENNSYLVANIA	PENNSYLVANIA SEDGE	1	PLUG

LEGEND:

PROPOSED WHEELCHAIR RAMP DETAIL #



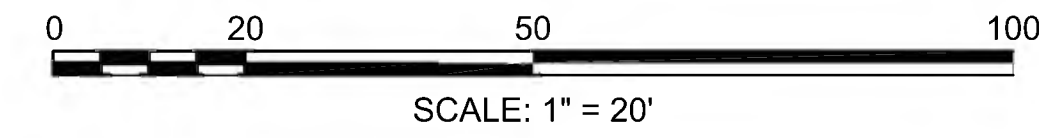
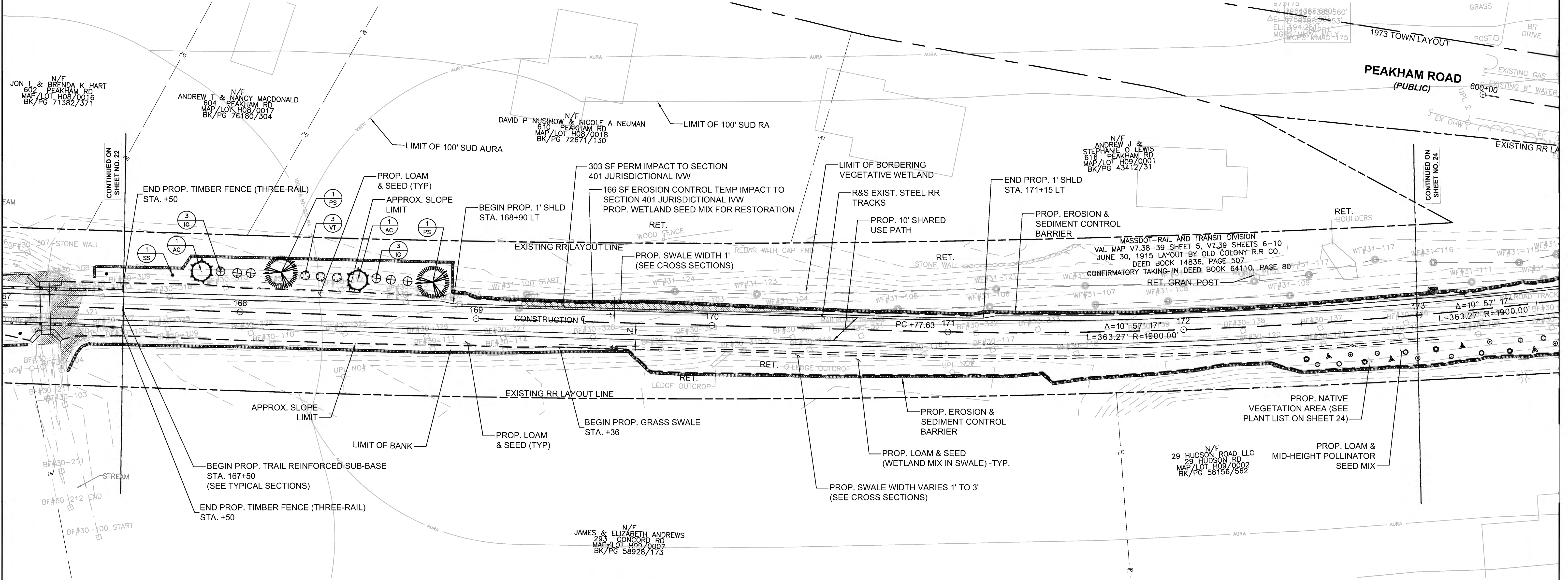
PLANT QUANTITY AND SPECIES

SUDBURY  
 BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	23	319

PROJECT FILE NO. 608164

CONSTRUCTION PLANS





FENCING DETAILS

NONE

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

SEE SHEET 162

WATER SUPPLY ALTERATIONS

SEE SHEET 182

DRAINAGE DETAILS

SEE SHEET 182

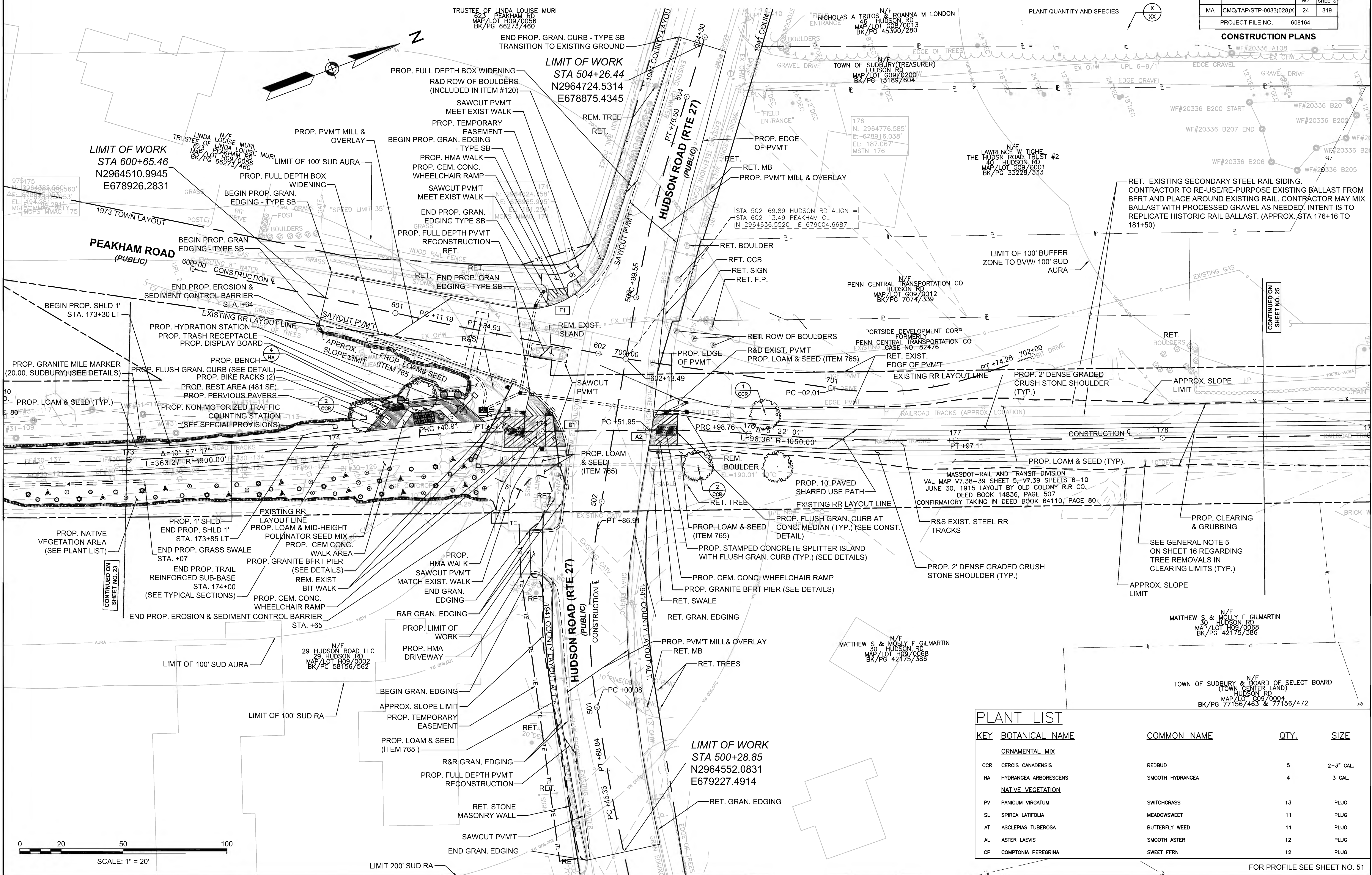
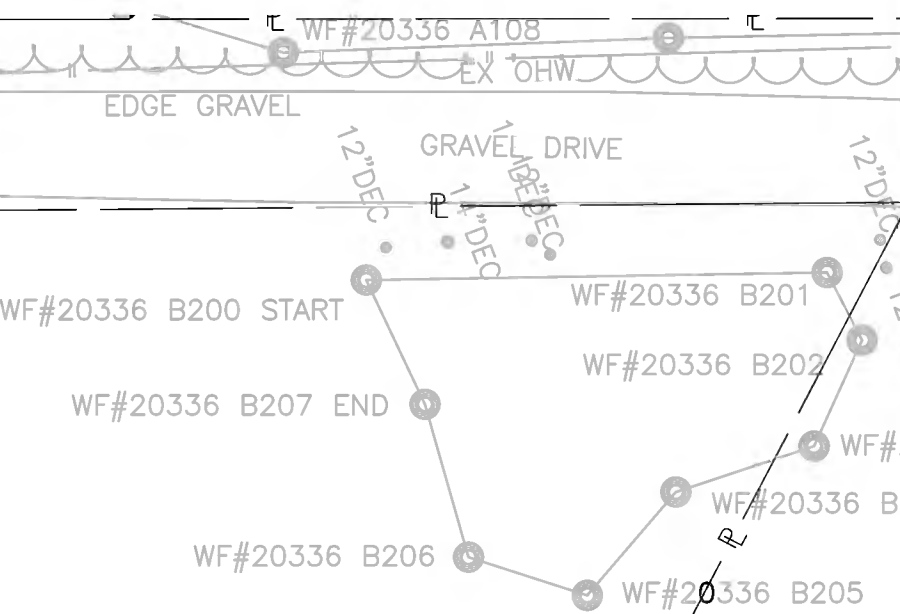
LEGEND:

PROPOSED WHEELCHAIR RAMP DETAIL # X#  
PLANT QUANTITY AND SPECIES X

BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003(028)X	24	319
PROJECT FILE NO. 608164			

CONSTRUCTION PLANS



**LIMIT OF WORK**  
STA 600+65.46  
N2964510.9945  
E678926.2831

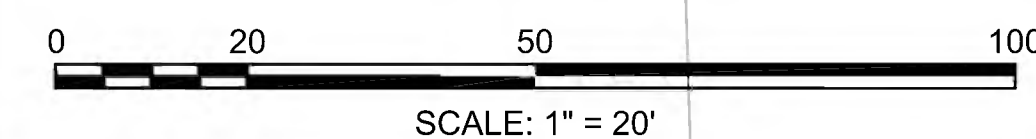
**LIMIT OF WORK**  
STA 504+26.44  
N2964724.5314  
E678875.4345

**LIMIT OF WORK**  
STA 500+28.85  
N2964552.0831  
E679227.4914

PLANT LIST

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
<b>ORNAMENTAL MIX</b>				
CCR	CERCIS CANADENSIS	REDBUD	5	2-3" CAL.
HA	HYDRANGEA ARBORESCENS	SMOOTH HYDRANGEA	4	3 GAL.
<b>NATIVE VEGETATION</b>				
PV	PANICUM VIRGATUM	SWITCHGRASS	13	PLUG
SL	SPIREA LATIFOLIA	MEADOWSWEET	11	PLUG
AT	ASCLEPIAS TUBEROSA	BUTTERFLY WEED	11	PLUG
AL	ASTER LAEVIS	SMOOTH ASTER	12	PLUG
CP	COMPTONIA PEREGRINA	SWEET FERN	12	PLUG

FOR PROFILE SEE SHEET NO. 51



SCALE: 1" = 20'

608164\_HD(CONSTRUCTION PLANS).DWG Printed on 13-Sep-2022 9:22 AM







**FENCING DETAILS**

TIMBER FENCE (THREE-RAIL) STA. 186+50 RT TO STA. 190+90 RT  
 TIMBER FENCE (THREE-RAIL) STA. 190+15 LT TO STA. 190+90 LT  
 TIMBER FENCE (THREE-RAIL) STA. 196+75 RT TO STA. 198+70 RT  
 TIMBER FENCE (THREE-RAIL) STA. 196+75 LT TO STA. 199+15 LT

**HIGHWAY GUARD DETAILS**

NONE  
 WATER SUPPLY ALTERATIONS  
 NONE

**TRAFFIC SIGNAL CONDUIT**

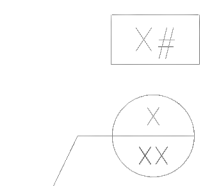
NONE  
 DRAINAGE DETAILS  
 NONE

**PLANT LIST**

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
<b>ORNAMENTAL MIX</b>				
ACS	AMELANCHIER CANADENSIS	CANADIAN SERVICEBERRY	2	2-3" CAL.
HA	HYDRANGEA ARBORESCENS	SMOOTH HYDRANGEA	4	3 GAL.

**LEGEND:**

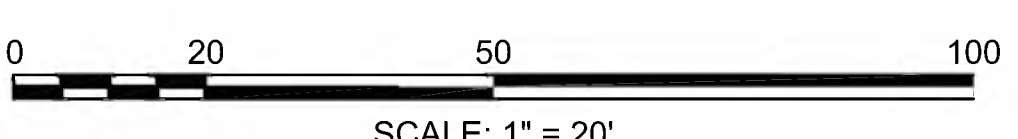
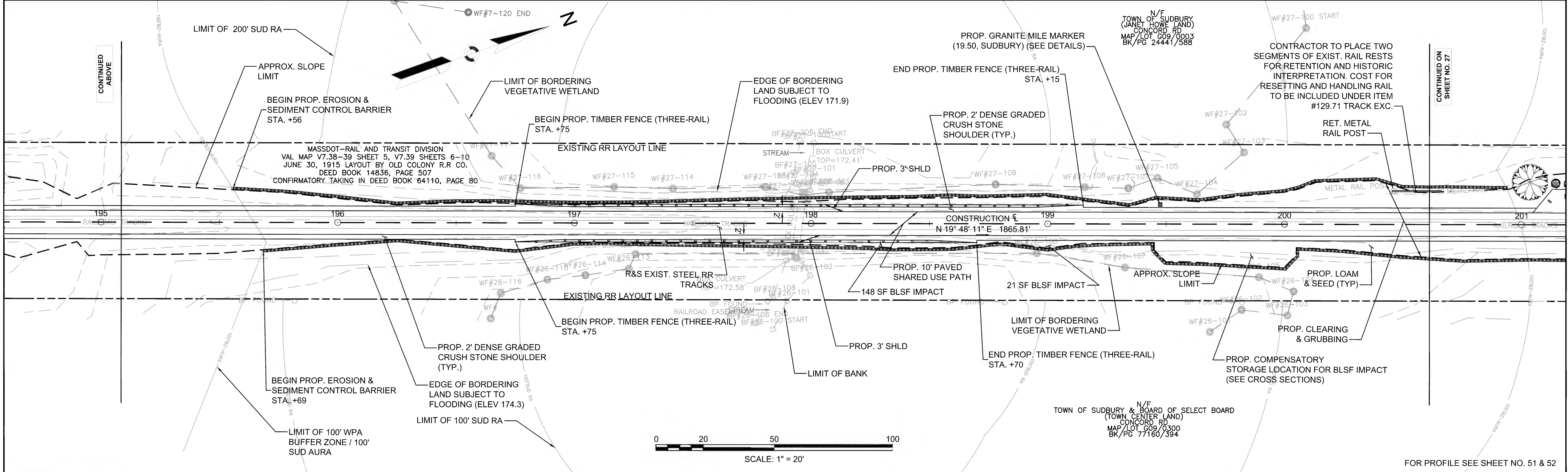
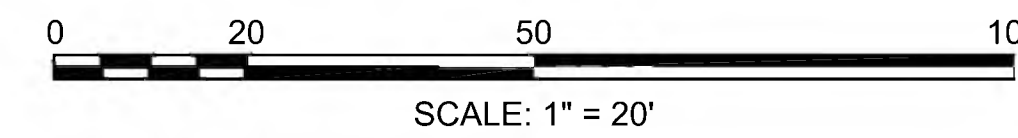
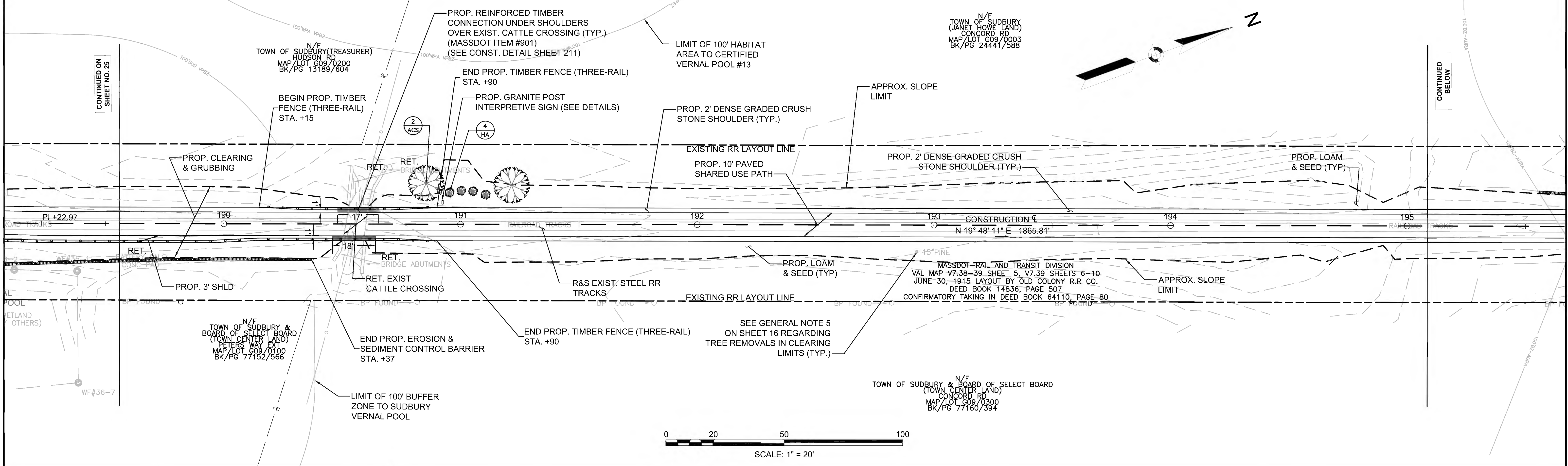
PROPOSED WHEELCHAIR RAMP DETAIL #  
 PLANT QUANTITY AND SPECIES



**SUDBURY BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	26	319

PROJECT FILE NO. 608164  
**CONSTRUCTION PLANS**



FOR PROFILE SEE SHEET NO. 51 & 52

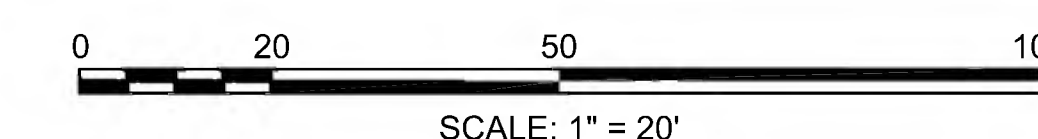
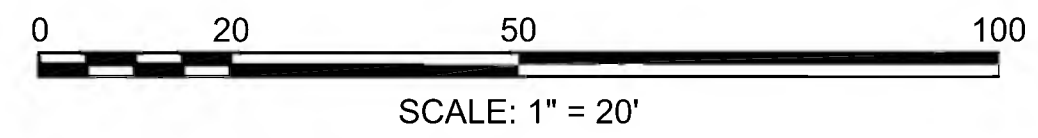
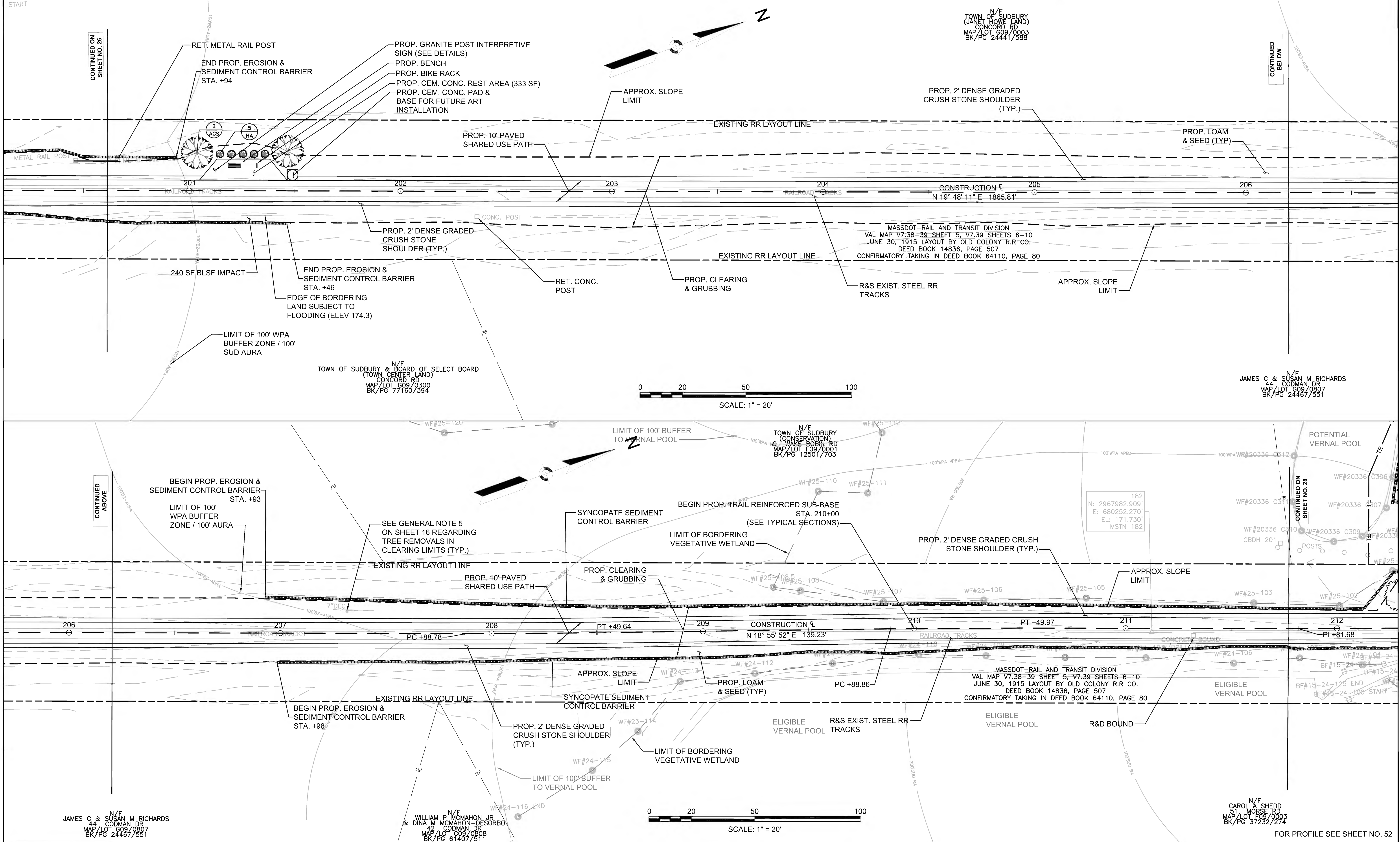


HIGHWAY GUARD DETAILS NONE  
 TRAFFIC SIGNAL CONDUIT NONE  
 WATER SUPPLY ALTERATIONS NONE  
 DRAINAGE DETAILS NONE

PLANT LIST				
KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
ORNAMENTAL MIX				
ACS	AMELANCHIER CANADENSIS	CANADIAN SERVICEBERRY	2	2-3" CAL.
HA	HYDRANGEA ARBORESCENS	SMOOTH HYDRANGEA	5	3 CAL.

LEGEND:  
 PROPOSED WHEELCHAIR RAMP DETAIL # X#

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	27	319
PROJECT FILE NO.		608164	
CONSTRUCTION PLANS			



TOWN OF SUDBURY  
 (JANET HOWE LAND)  
 CONCORD RD  
 MAP/LOT G09/0003  
 BK/PG 24441/588

TOWN OF SUDBURY & BOARD OF SELECT BOARD  
 (TOWN CENTER LAND)  
 CONCORD RD  
 MAP/LOT G09/0300  
 BK/PG 77160/394

TOWN OF SUDBURY  
 (CONSERVATION)  
 WAKE ROBIN RD  
 MAP/LOT F09/0001  
 BK/PG 12501/703

JAMES C & SUSAN M RICHARDS  
 44 CODMAN DR  
 MAP/LOT G09/0807  
 BK/PG 24467/551

JAMES C & SUSAN M RICHARDS  
 44 CODMAN DR  
 MAP/LOT G09/0807  
 BK/PG 24467/551

WILLIAM P MCMAHON JR  
 & DINA M MCMAHON-DESORBO  
 42 CODMAN DR  
 MAP/LOT G09/0908  
 BK/PG 61407/511

CAROL A SHEDD  
 51 MORSE RD  
 MAP/LOT F09/0003  
 BK/PG 37232/274

FOR PROFILE SEE SHEET NO. 52







FENCING DETAILS

TIMBER FENCE (THREE-RAIL) STA. 222+25 LT TO STA. 231+73 LT  
 TIMBER FENCE (THREE-RAIL) STA. 224+23 RT TO STA. 228+73 RT

HIGHWAY GUARD DETAILS

NONE

WATER SUPPLY ALTERATIONS

NONE

PLANT LIST

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
	ORNAMENTAL MIX			
ACS	AMELANCHIER	CANADENSIS	1	2-3" CAL.
HA	HYDRANGEA ARBORESCENS	SMOOTH HYDRANGEA	2	3 GAL.
	SHADE TREES			
AS	ACER SACCHARUM	SUGAR MAPLE	1	2-3" CAL.

TRAFFIC SIGNAL CONDUIT

NONE

DRAINAGE DETAILS

NONE

LEGEND:

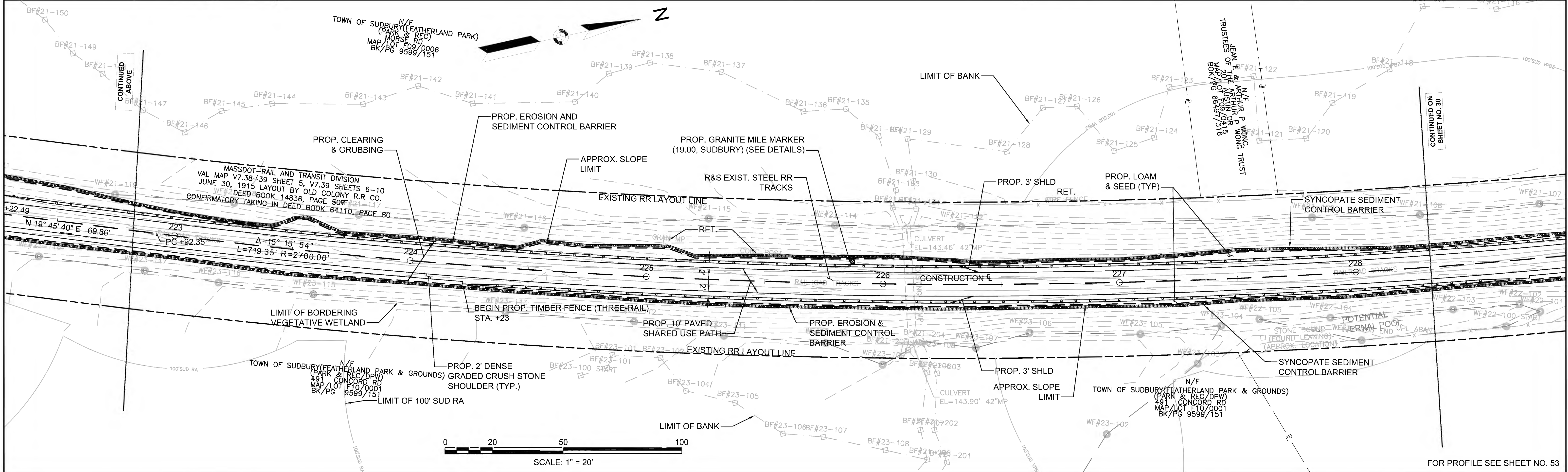
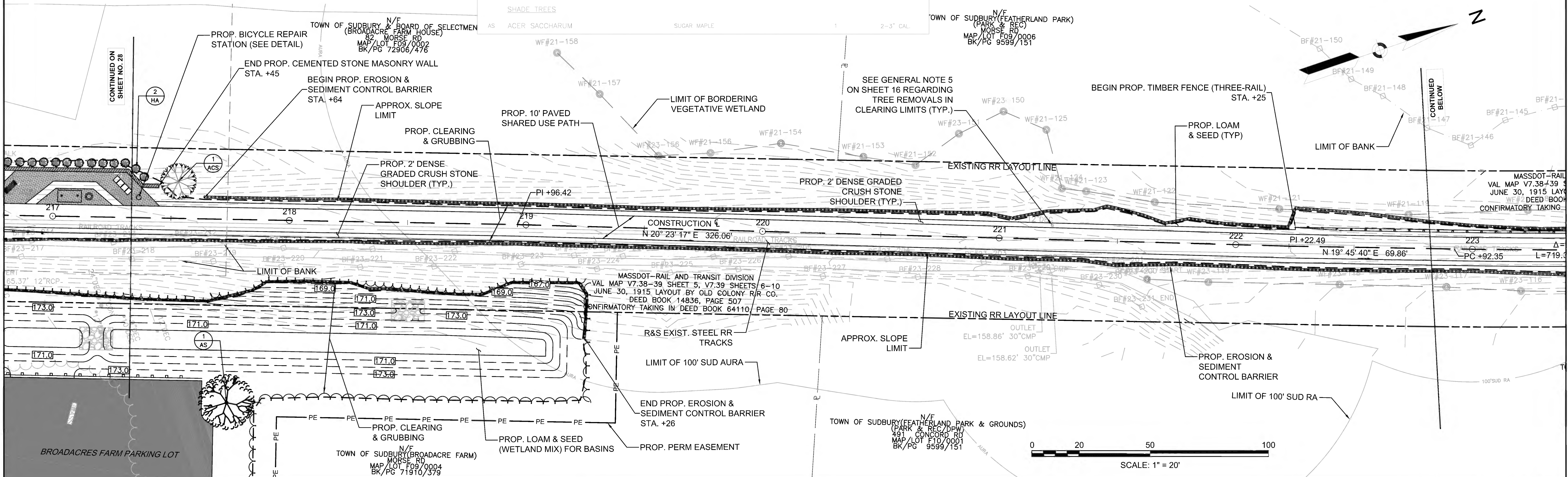
PROPOSED WHEELCHAIR RAMP DETAIL #  
 PLANT QUANTITY AND SPECIES

SUDBURY BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003(028)X	29	319

PROJECT FILE NO. 608164

CONSTRUCTION PLANS



FOR PROFILE SEE SHEET NO. 53



FENCING DETAILS

TIMBER FENCE (THREE-RAIL) STA. 222+25 LT TO STA. 231+73 RT  
TIMBER FENCE (THREE-RAIL) STA. 224+23 RT TO STA. 228+73 RT  
TIMBER FENCE (THREE-RAIL) STA. 236+90 LT TO STA. 243+45 LT  
TIMBER FENCE (THREE-RAIL) STA. 236+90 RT TO STA. 241+73 RT

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

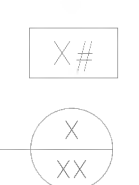
WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

LEGEND:  
PROPOSED WHEELCHAIR RAMP DETAIL #  
PLANT QUANTITY AND SPECIES



PLANT LIST

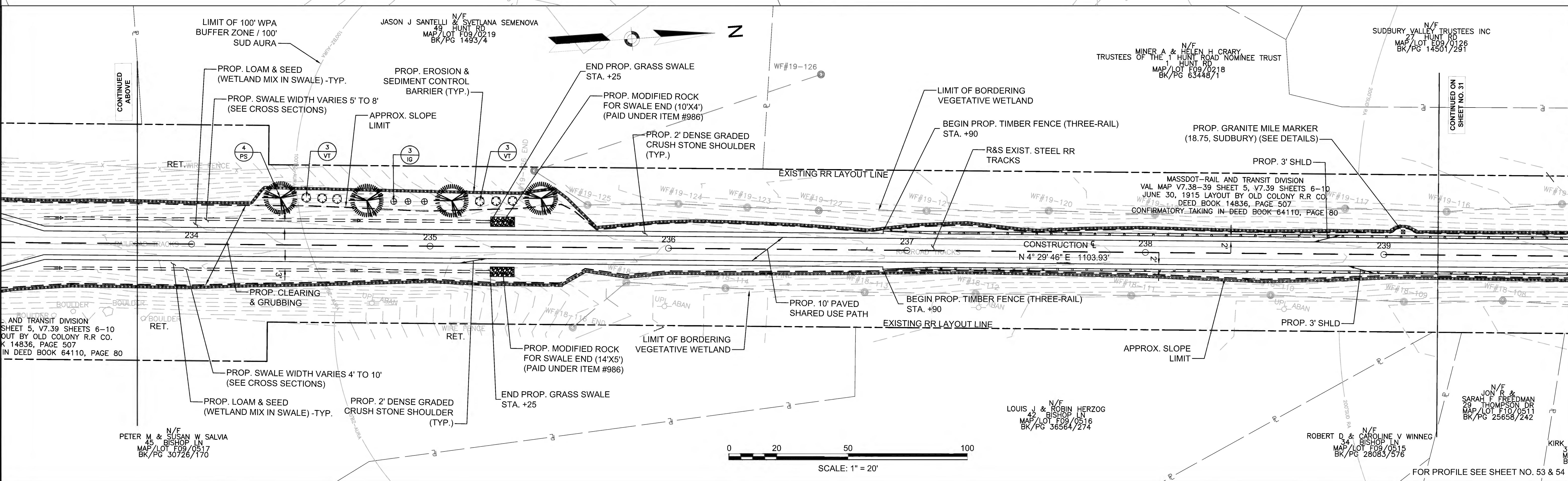
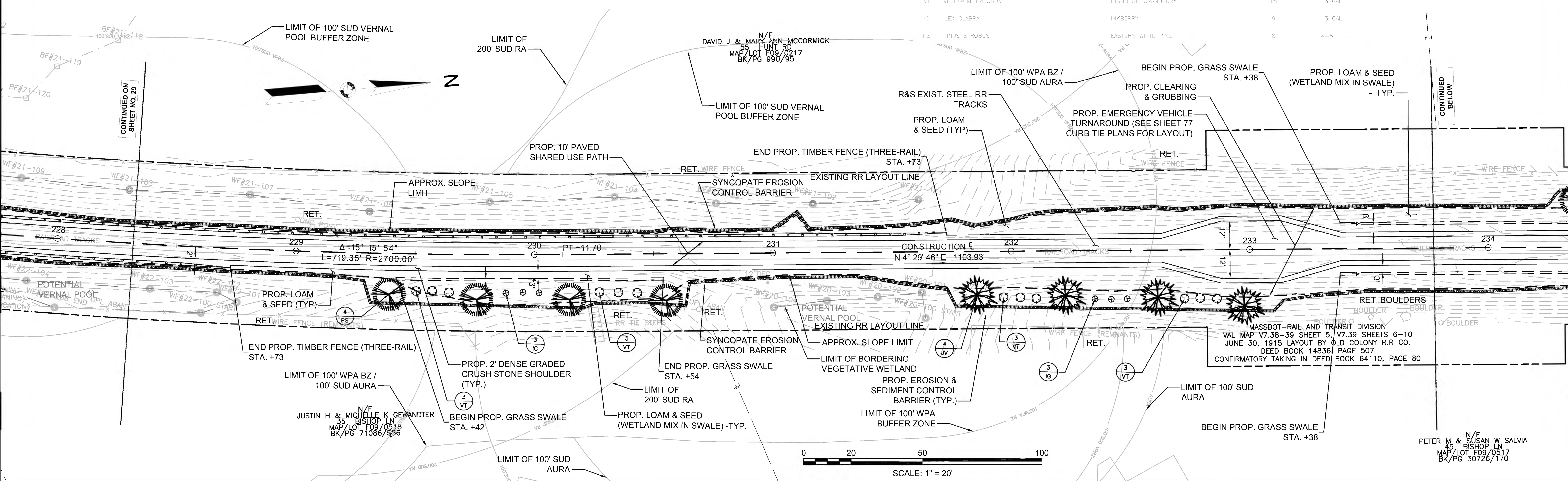
KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
JV	JUNIPERUS VIRGINIANA	EASTERN RED CEDAR	4	4-5' HT.
VT	VIBURNUM TRILOBUM	HIGHBUSH CRANBERRY	18	3 GAL.
IG	ILEX GLABRA	HOLLY	9	3 GAL.
PS	PINUS STROBUS	EASTERN WHITE PINE	8	4-5' HT.

BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	30	319

PROJECT FILE NO. 608164

CONSTRUCTION PLANS



FOR PROFILE SEE SHEET NO. 53 & 54



**FENCING DETAILS**

TIMBER FENCE (THREE-RAIL) STA. 236+90 LT TO STA. 243+45 LT  
 TIMBER FENCE (THREE-RAIL) STA. 236+90 RT TO STA. 241+73 RT  
 TIMBER FENCE (THREE-RAIL) STA. 245+75 LT TO STA. 248+30 LT  
 TIMBER FENCE (THREE-RAIL) STA. 245+75 RT TO STA. 248+30 RT

**HIGHWAY GUARD DETAILS**

NONE

**TRAFFIC SIGNAL CONDUIT**

NONE

**WATER SUPPLY ALTERATIONS**

NONE

**DRAINAGE DETAILS**

NONE

**PLANT LIST**

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
<b>VISUAL SCREEN MIX</b>				
VT	VILBURUM TRILOBUM	HIGHBUSH CRANBERRY	28	3 GAL.
IG	ILEX GLABRA	INKBERRY	22	3 GAL.
PS	PINUS STROBUS	EASTERN WHITE PINE	10	4-5' HT.
AC	ABIES CONCOLOR	WHITE FIR	6	5-6' HT.
<b>ORNAMENTAL MIX</b>				
ACS	AMELANCHIER	CANADENSIS	2	2-3" CAL.
HA	HYDRANGEA ARBORESCENS	SMOOTH HYDRAGEA	4	3 GAL.

**LEGEND:**

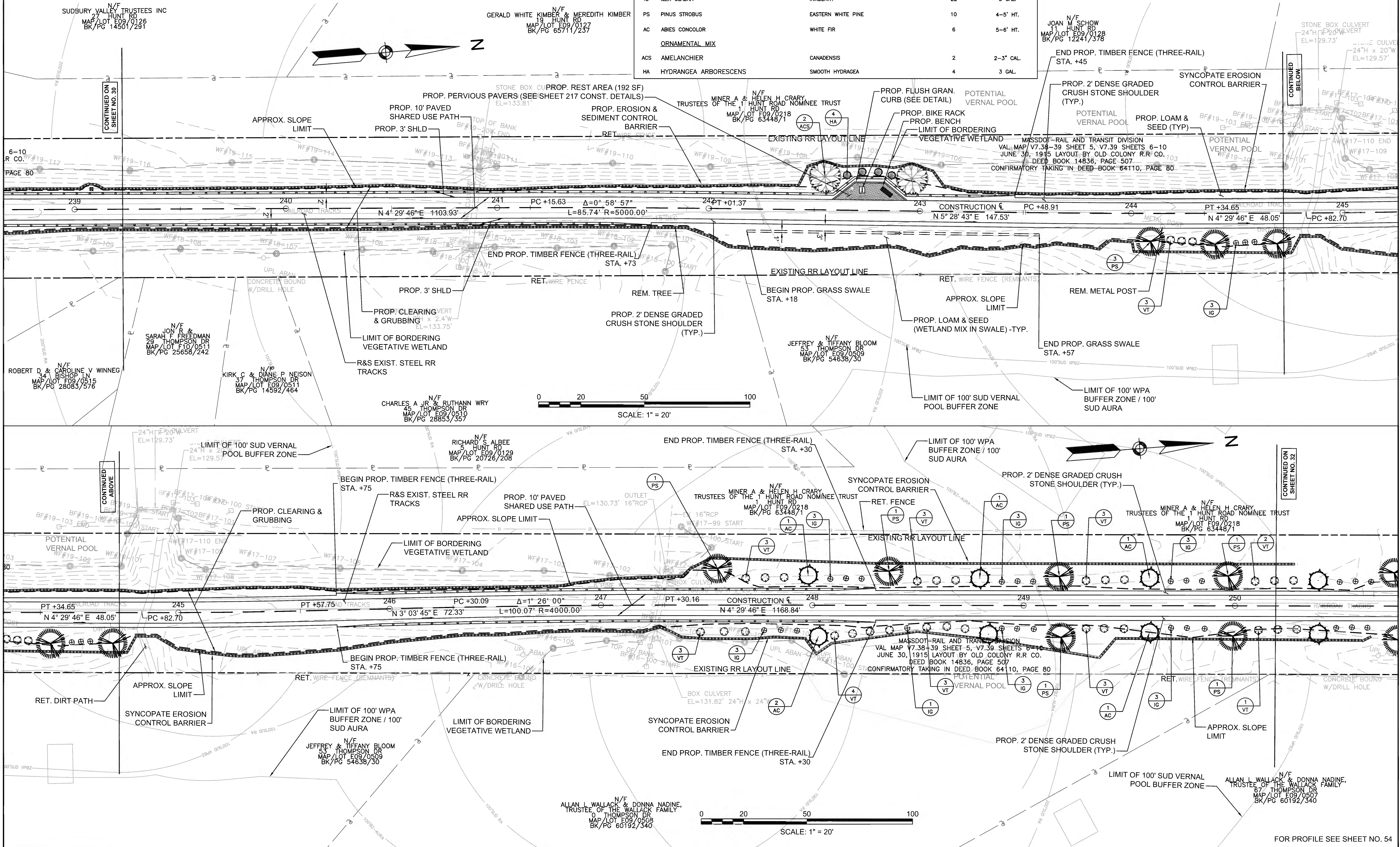
PROPOSED WHEELCHAIR RAMP DETAIL # X#  
 PLANT QUANTITY AND SPECIES X XX

**SUBBURY BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	31	319

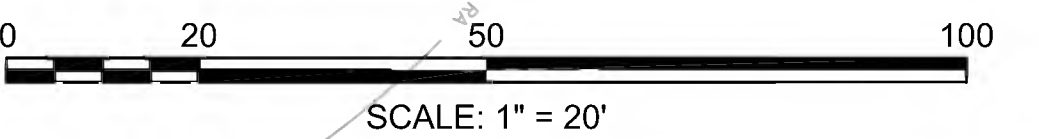
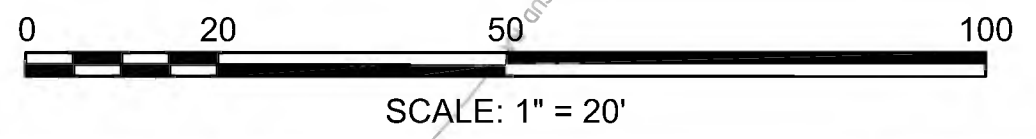
PROJECT FILE NO. 608164

**CONSTRUCTION PLANS**



CONTINUED ON SHEET NO. 30

CONTINUED ON SHEET NO. 32



FOR PROFILE SEE SHEET NO. 54



**FENCING DETAILS**  
 TIMBER FENCE (THREE-RAIL) STA. 258+22 RT TO STA. 258+72 RT  
 TIMBER FENCE (THREE-RAIL) STA. 258+22 LT TO STA. 258+72 LT

**HIGHWAY GUARD DETAILS**  
 NONE

**WATER SUPPLY ALTERATIONS**  
 NONE

**PLANT LIST**

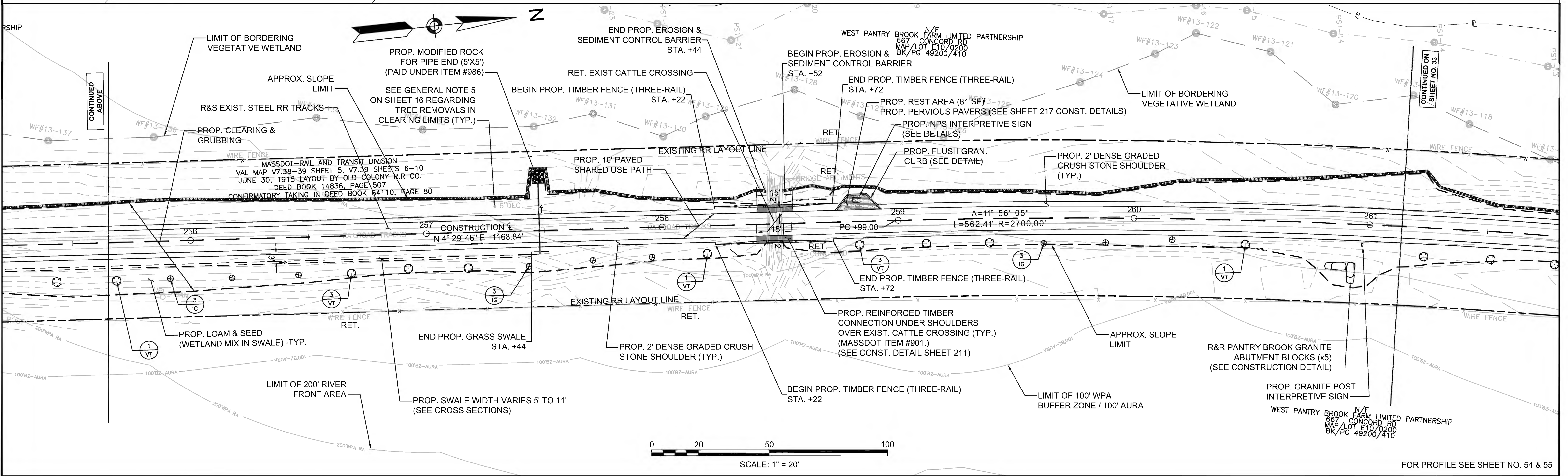
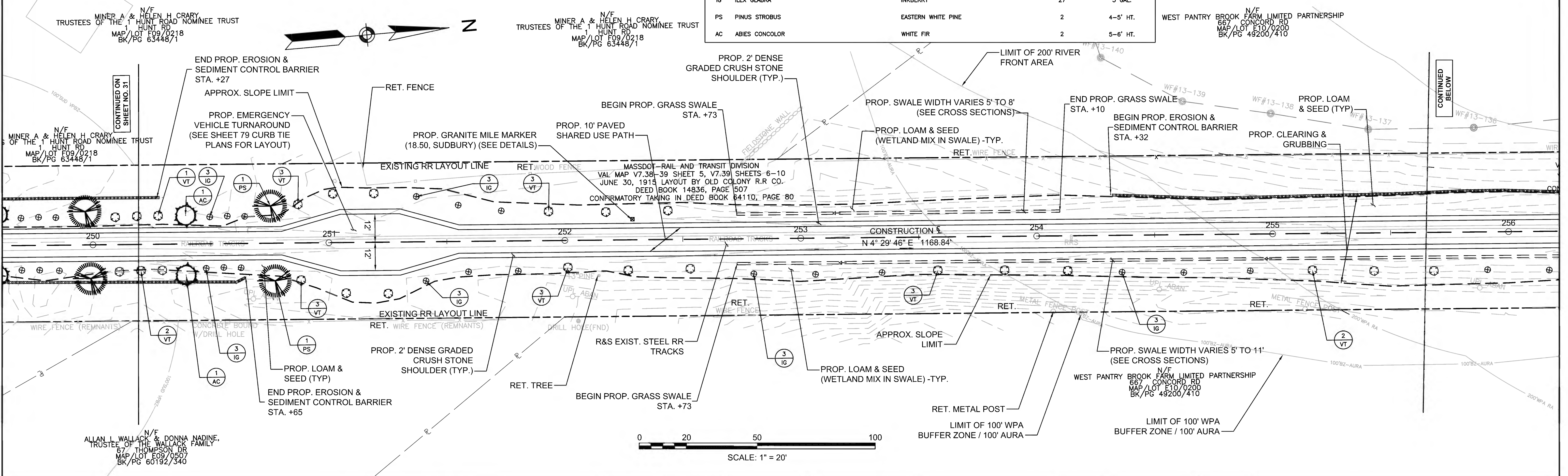
KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
<b>VISUAL SCREEN MIX</b>				
VT	VILBURUM TRILOBUM	HIGHBUSH CRANBERRY	29	3 GAL
IG	ILEX GLABRA	INKBERRY	27	3 GAL
PS	PINUS STROBUS	EASTERN WHITE PINE	2	4-5' HT.
AC	ABIES CONCOLOR	WHITE FIR	2	5-6' HT.

**LEGEND:**  
 PROPOSED WHEELCHAIR RAMP DETAIL # [Symbol]  
 PLANT QUANTITY AND SPECIES [Symbol]

**SUBURRY**  
**BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	32	319

PROJECT FILE NO. 608164  
**CONSTRUCTION PLANS**



FOR PROFILE SEE SHEET NO. 54 & 55



**PLANT LIST**

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
VT	VILBURUM TRILOBUM	HIGHBUSH CRANBERRY	3	3 GAL.
IG	ILEX GLABRA	INKBERRY	3	3 GAL.
AC	ABIES CONCOLOR	WHITE FIR	5	5-6' HT.
<b>EROSION CONTROL MIX</b>				
SS	CAREX PENNSYLVANIA	PENNSYLVANIA SEDGE	86	PLUG

**FENCING DETAILS**

TIMBER FENCE (THREE-RAIL) STA. 262+25 LT TO STA. 266+25 LT  
 TIMBER FENCE (THREE-RAIL) STA. 264+00 RT TO STA. 268+75 RT  
 TIMBER FENCE (THREE-RAIL) STA. 269+52 LT TO STA. 270+02 LT  
 TIMBER FENCE (THREE-RAIL) STA. 269+52 RT TO STA. 270+02 RT

**HIGHWAY GUARD DETAILS**

NONE  
 TRAFFIC SIGNAL CONDUIT  
 NONE

**WATER SUPPLY ALTERATIONS**

NONE  
 DRAINAGE DETAILS  
 NONE

**LEGEND:**

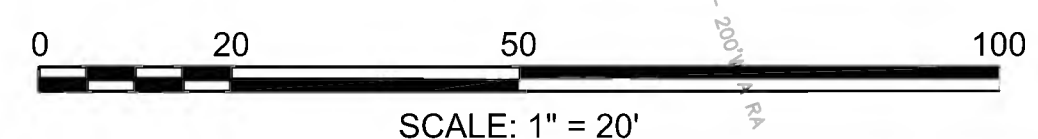
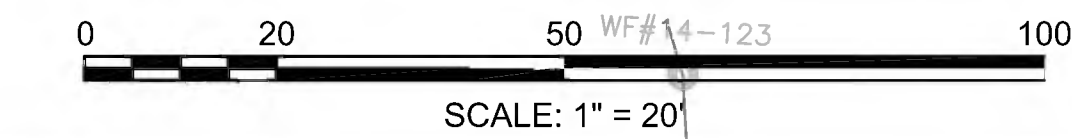
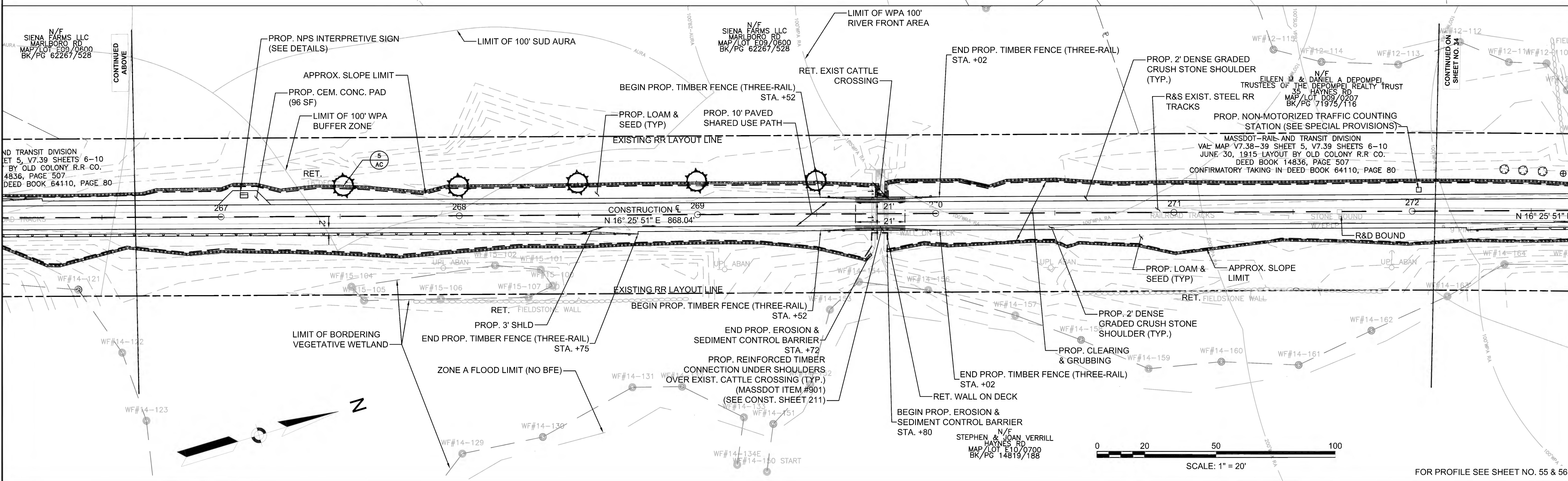
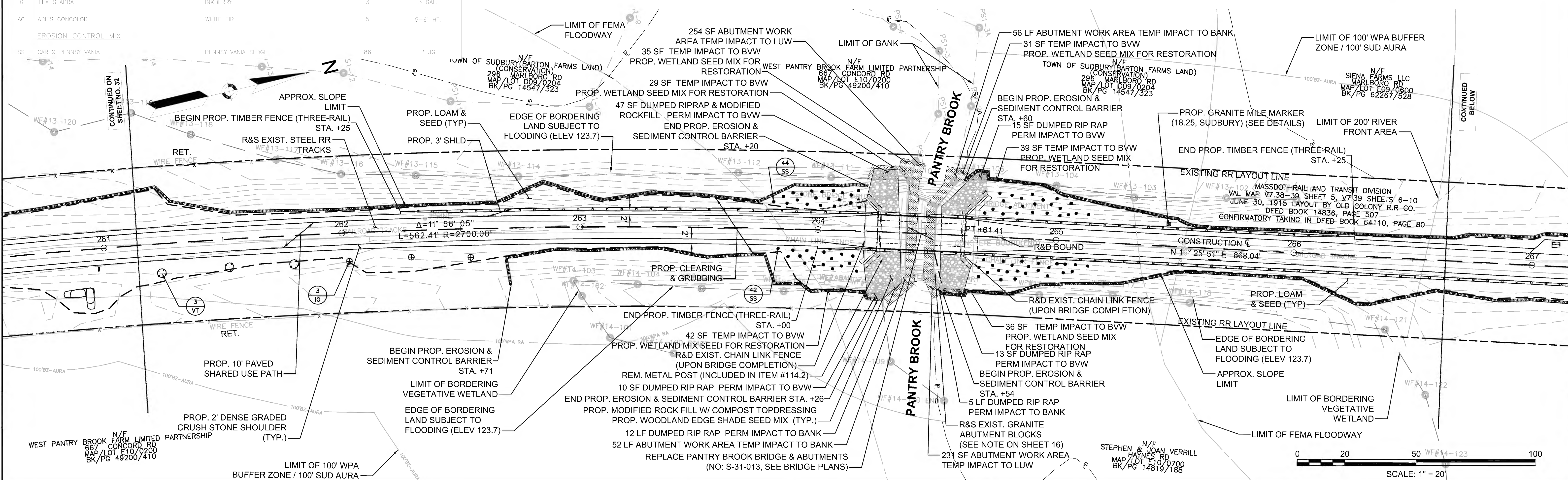
PROPOSED WHEELCHAIR RAMP DETAIL # X#  
 PLANT QUANTITY AND SPECIES XX

**SUDBURY BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	33	319

PROJECT FILE NO. 608164

**CONSTRUCTION PLANS**



FOR PROFILE SEE SHEET NO. 55 & 56



FENCING DETAILS

TIMBER FENCE (THREE-RAIL) STA. 272+23 RT TO STA. 273+73 RT

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

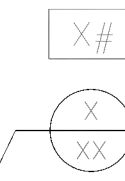
NONE

PLANT LIST

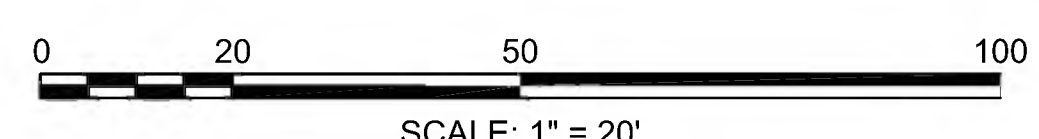
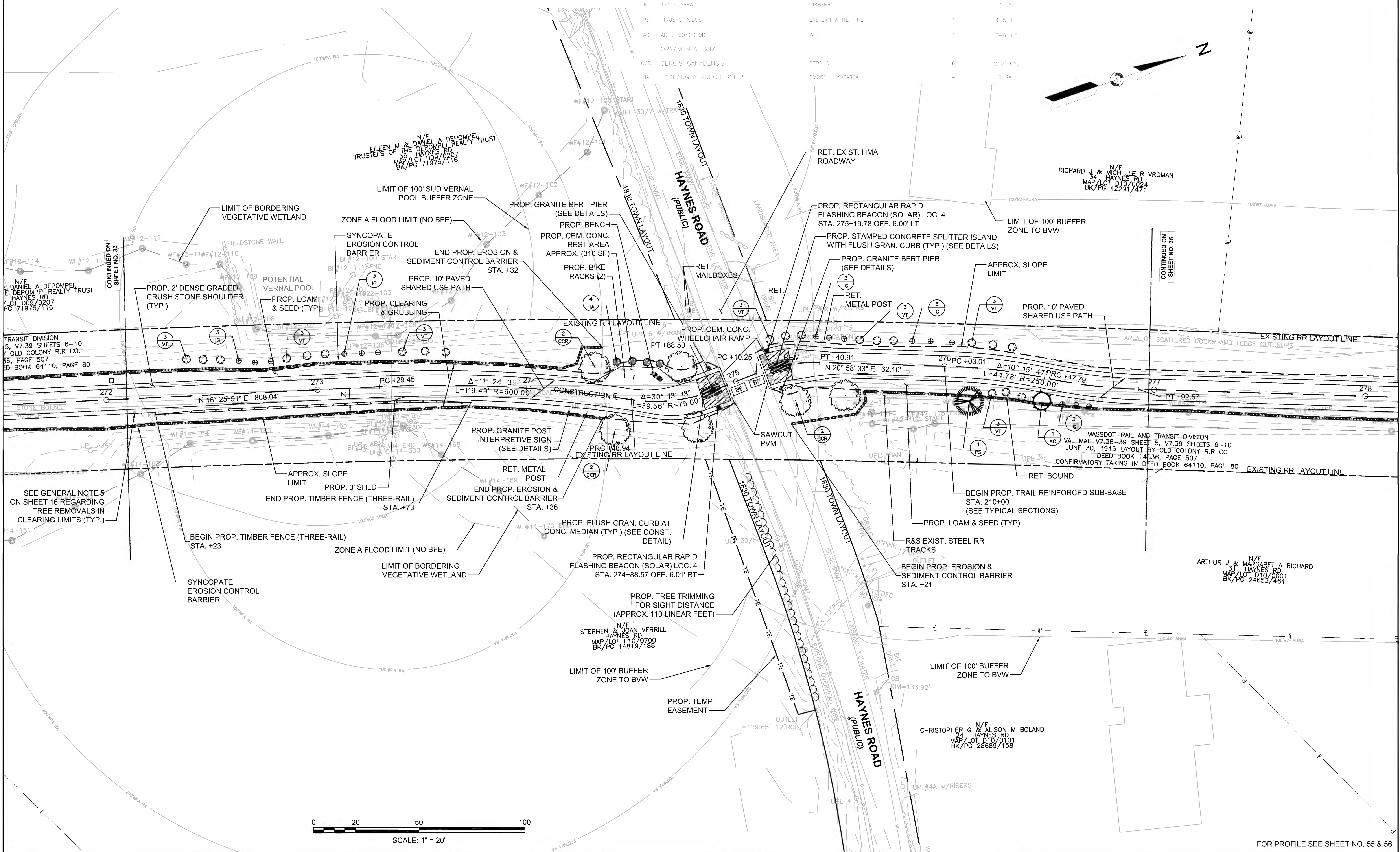
KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
VISUAL SCREEN MIX				
VT	VIBURNUM TRILOBUM	HIGHBUSH CRANBERRY	21	3 GAL.
IG	ILEX GLABRA	INKBERRY	15	3 GAL.
PS	PINUS STROBUS	EASTERN WHITE PINE	1	4-5' HT.
AC	ABIES CONCOLOR	WHITE FIR	1	5-6' HT.
ORNAMENTAL MIX				
CCR	CERCIS CANADENSIS	REDBUD	6	2-3" CAL.
HA	HYDRANGEA ARBORESCENS	SMOOTH HYDRANGEA	4	3 GAL.

LEGEND:

PROPOSED WHEELCHAIR RAMP DETAIL #  
PLANT QUANTITY AND SPECIES



SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	34	319
PROJECT FILE NO.		608164	
CONSTRUCTION PLANS			



FOR PROFILE SEE SHEET NO. 55 & 56



FENCING DETAILS

NONE

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

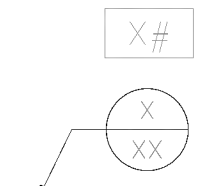
DRAINAGE DETAILS

NONE

LEGEND:

PROPOSED WHEELCHAIR RAMP DETAIL #

PLANT QUANTITY AND SPECIES



SUDBURY BRUCE FREEMAN RAIL TRAIL

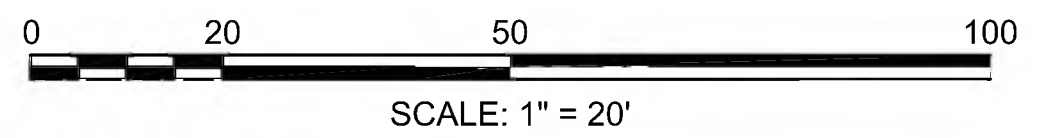
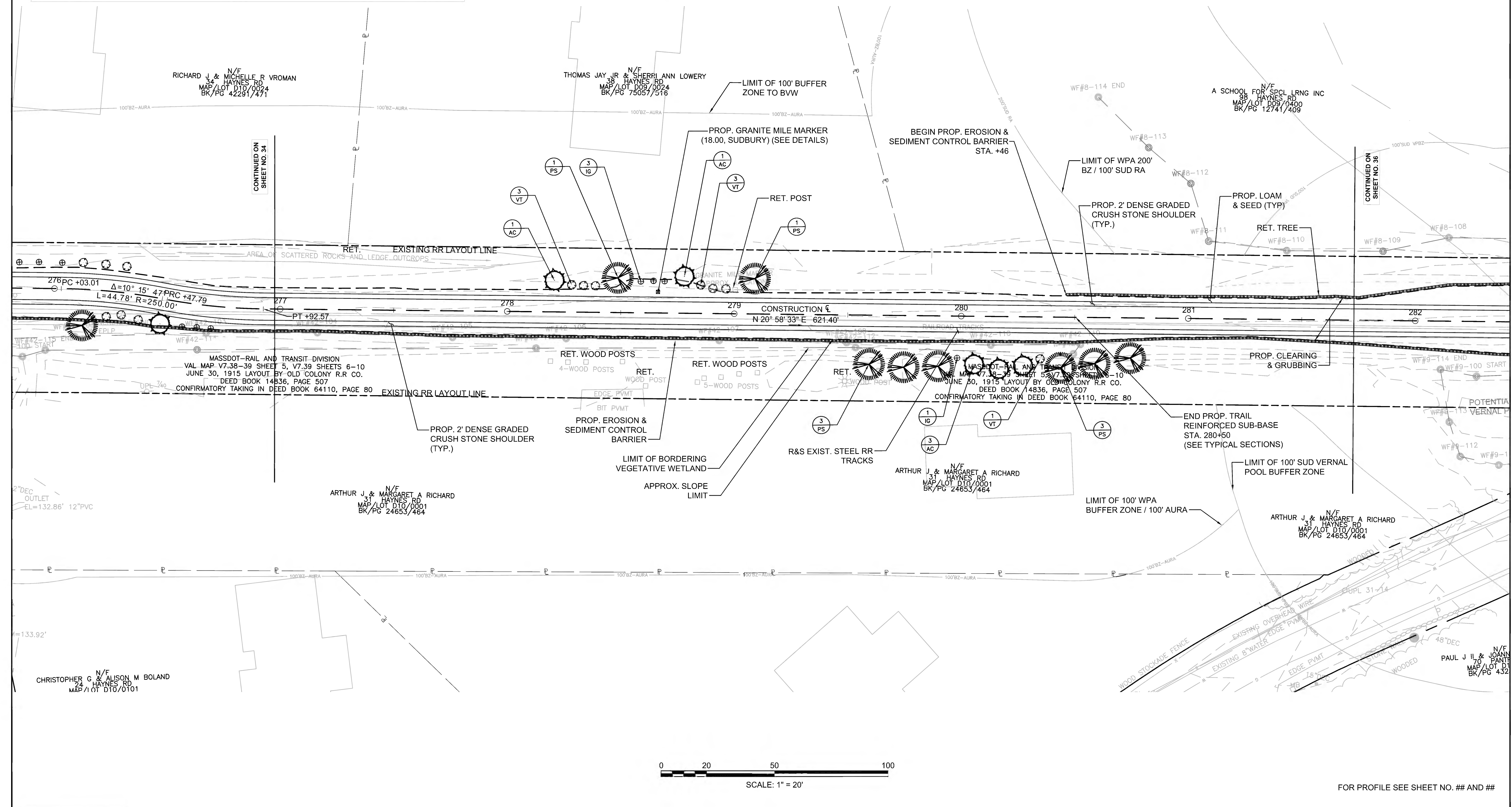
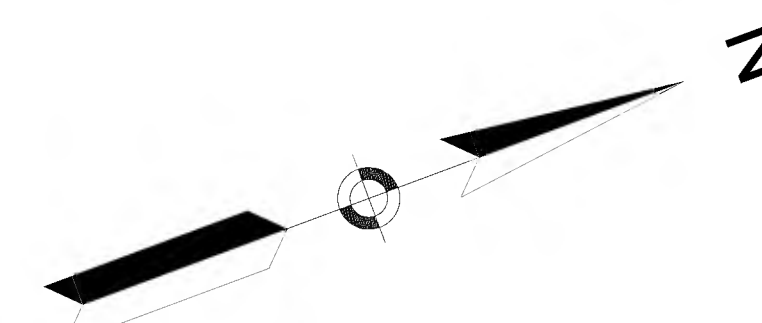
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	35	319

PROJECT FILE NO. 608164

CONSTRUCTION PLANS

PLANT LIST

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
<u>VISUAL SCREEN MIX</u>				
VT	VIBURNUM TRILOBUM	HIGH-BUSH CRANBERRY	7	3 GAL.
IG	ILEX GLABRA	INKBERRY	4	3 GAL.
PS	FINUS STROBUS	EASTERN WHITE PINE	8	4-5' HT.
AC	ABIES CONCOLOR	WHITE FIR	5	5-6' HT.



SCALE: 1" = 20'

FOR PROFILE SEE SHEET NO. ## AND ##



FENCING DETAILS

TIMBER FENCE (THREE-RAIL) STA. 283+73 LT TO STA. 284+28 LT  
 TIMBER FENCE (THREE-RAIL) STA. 284+65 RT TO STA. 290+25 RT

HIGHWAY GUARD DETAILS

STEEL W-BEAM GUARDRAIL (TL-2) W/ WOOD POST STA. 284+28 LT TO STA. 284+46 LT  
 STEEL W-BEAM GUARDRAIL (TL-2) W/ WOOD POST STA. 284+75 LT TO STA. 285+18 LT  
 STEEL W-BEAM GUARDRAIL (TL-2) W/ WOOD POST STA. 284+51 RT TO STA. 284+63 RT

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

LEGEND:

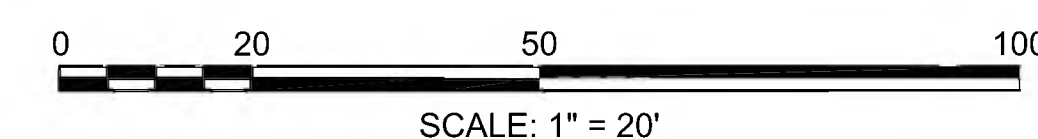
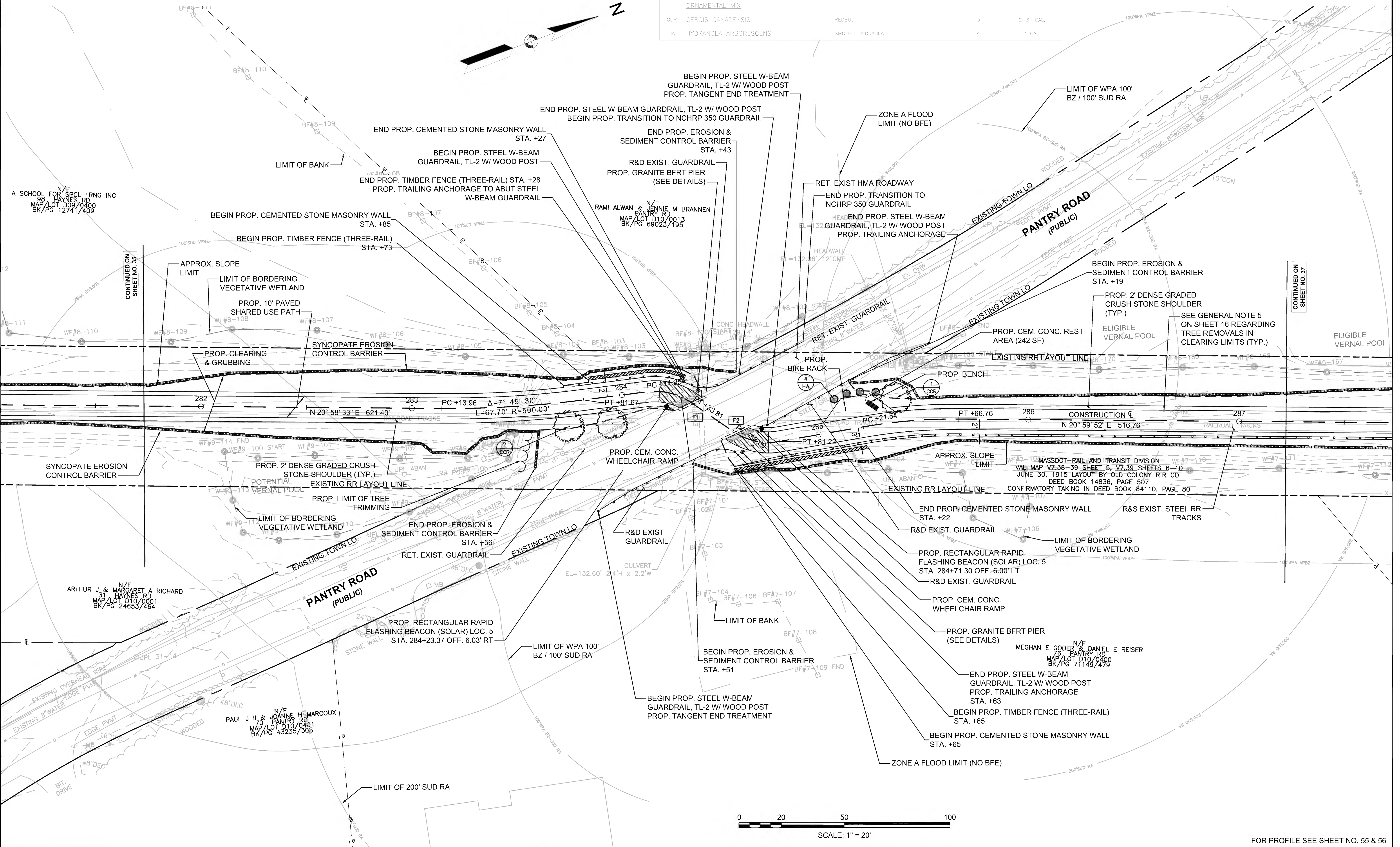
PROPOSED WHEELCHAIR RAMP DETAIL #  
 PLANT QUANTITY AND SPECIES



SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	36	319
PROJECT FILE NO.		608164	
CONSTRUCTION PLANS			

PLANT LIST

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
ORNAMENTAL MIX				
CCR	CERCIS CANADENSIS	REDBUD	3	2-3" CAL.
HA	HYDRANGEA ARBORESCENS	SMOOTH HYDRANGEA	4	3 CAL.



FOR PROFILE SEE SHEET NO. 55 & 56



FENCING DETAILS

TIMBER FENCE (THREE-RAIL) STA. 284+68 RT TO STA. 288+00 RT  
TIMBER FENCE (THREE-RAIL) STA. 284+65 RT TO STA. 290+25 RT

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

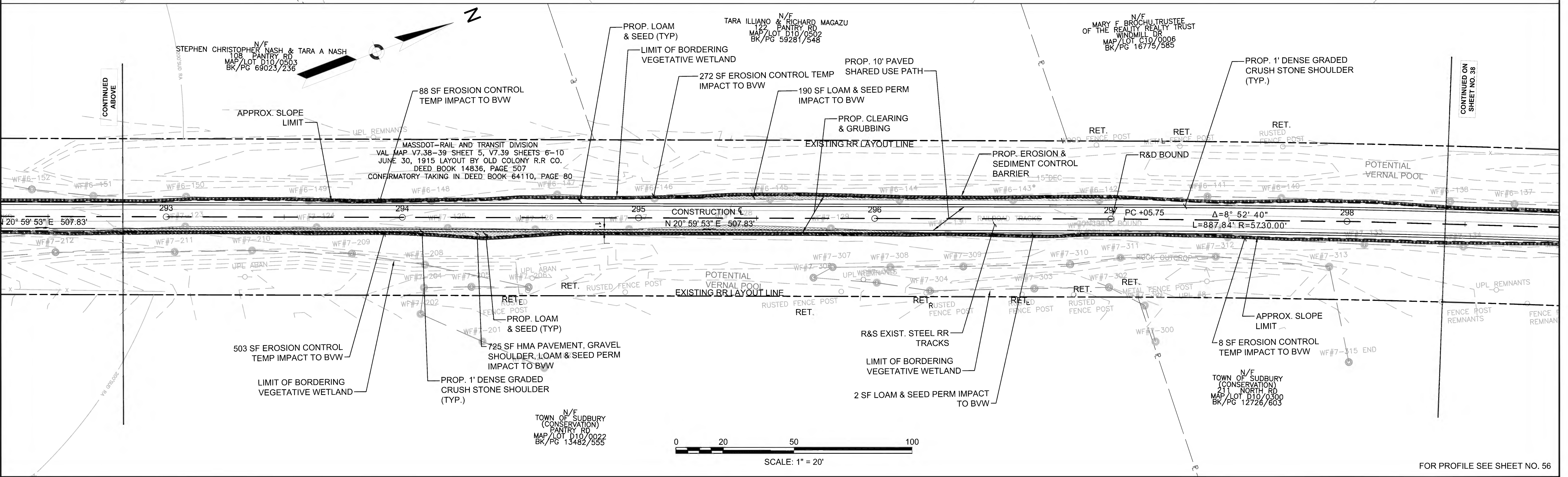
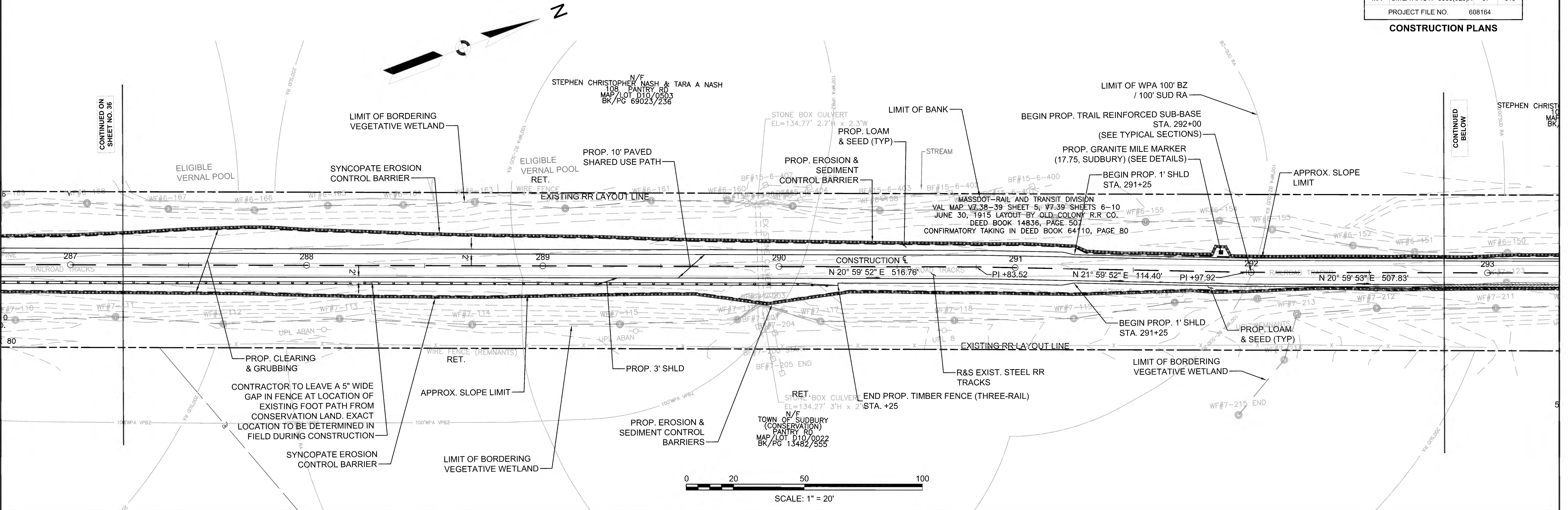
DRAINAGE DETAILS

NONE

LEGEND:

PROPOSED WHEELCHAIR RAMP DETAIL #

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	37	319
PROJECT FILE NO.		608164	
CONSTRUCTION PLANS			



608164\_HD(CONSTRUCTION PLANS).DWG Plotted on 27-Jun-2022 9:10 AM

FOR PROFILE SEE SHEET NO. 56



FENCING DETAILS

NONE

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

SEE SHEET 196

LEGEND:

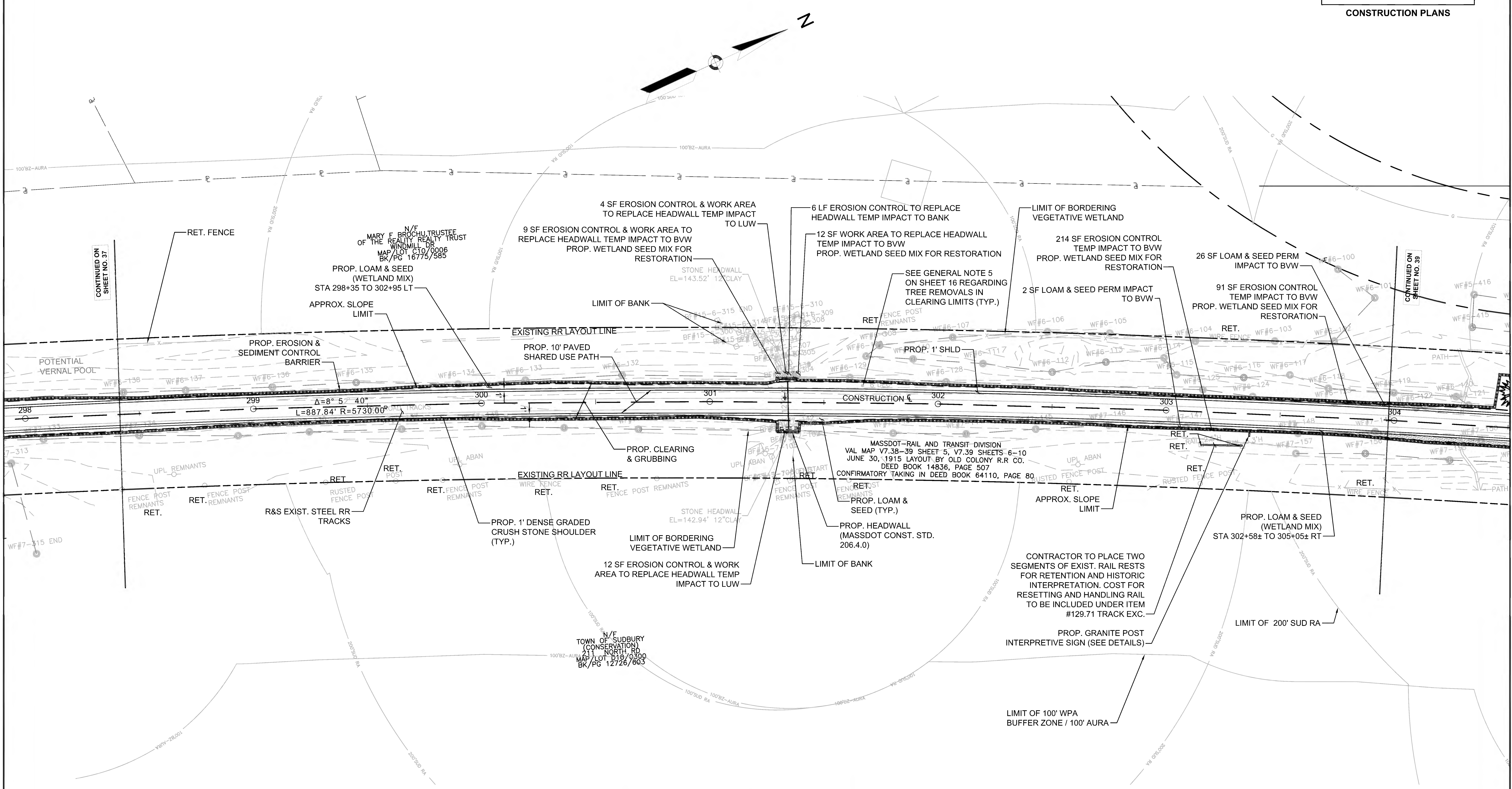
PROPOSED WHEELCHAIR RAMP DETAIL # X#

**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	38	319

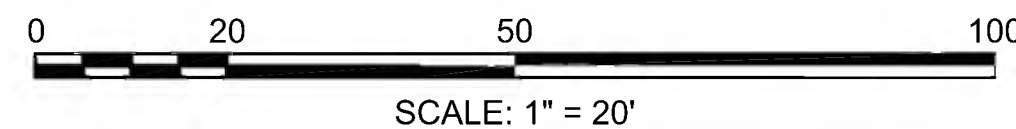
PROJECT FILE NO. 608164

**CONSTRUCTION PLANS**



CONTINUED ON SHEET NO. 37

CONTINUED ON SHEET NO. 39



FOR PROFILE SEE SHEET NO. 56 & 57

608164\_HD.CONSTRUCTION PLANS.DWG Plotted on 27-Jun-2022 9:11 AM



**FENCING DETAILS**

TIMBER FENCE (THREE-RAIL) STA. 308+79 LT TO STA. 309+79 LT  
 TIMBER FENCE (THREE-RAIL) STA. 308+16 RT TO STA. 315+79 RT

**HIGHWAY GUARD DETAILS**

NONE

**TRAFFIC SIGNAL CONDUIT**

SEE SHEET 167

**WATER SUPPLY ALTERATIONS**

NONE

**DRAINAGE DETAILS**

SEE SHEET 197

**LEGEND:**

PROPOSED WHEELCHAIR RAMP DETAIL # X#  
 PLANT QUANTITY AND SPECIES X XX

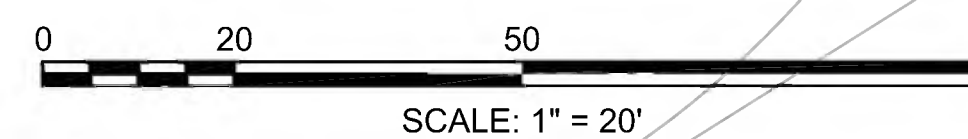
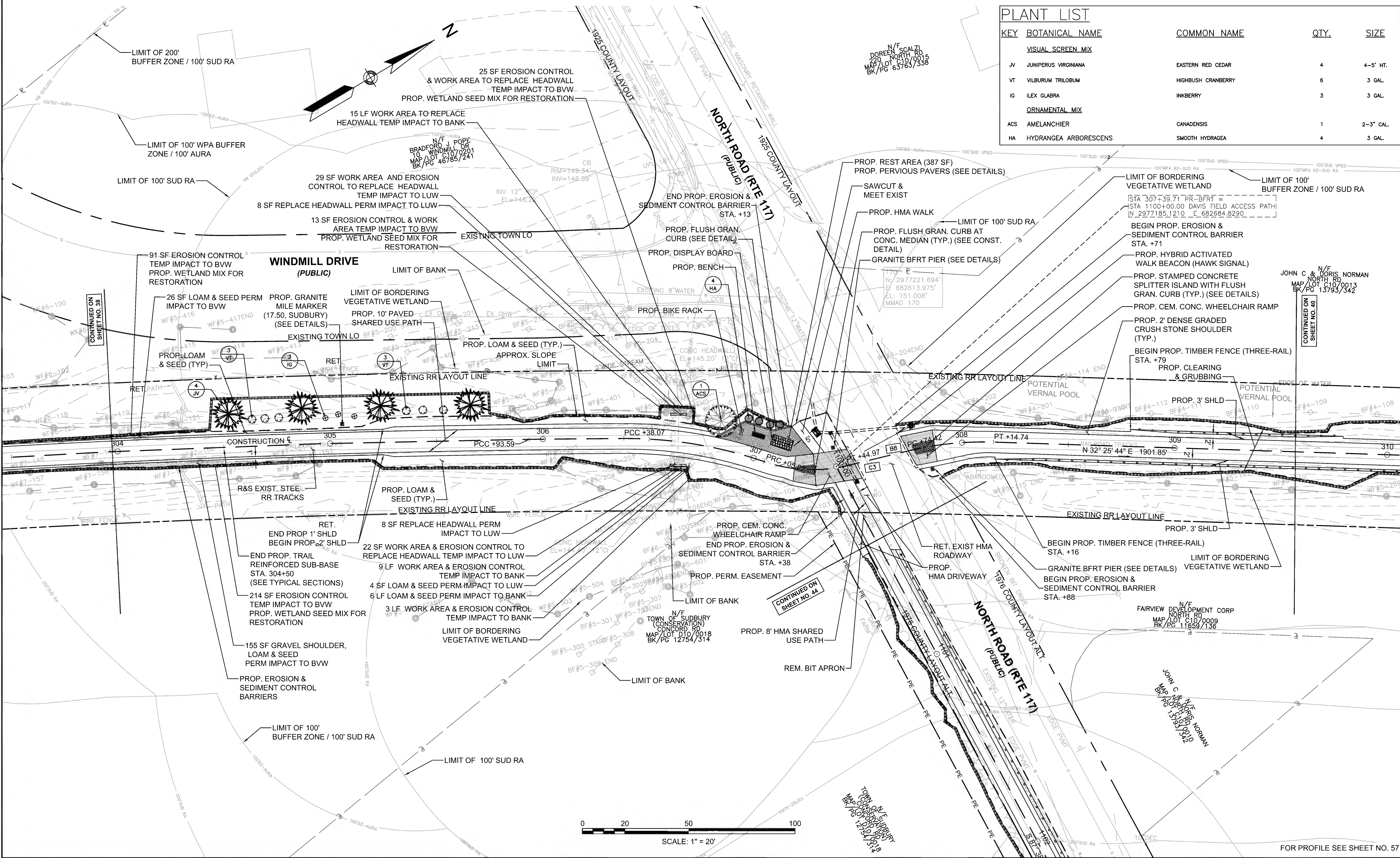
**SUBURRY BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	39	319
PROJECT FILE NO.		608164	

**CONSTRUCTION PLANS**

**PLANT LIST**

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
<b>VISUAL SCREEN MIX</b>				
JV	JUNIPERUS VIRGINIANA	EASTERN RED CEDAR	4	4-5' HT.
VT	VILBURUM TRILOBUM	HIGHBUSH CRANBERRY	6	3 GAL.
IG	ILEX GLABRA	INKBERRY	3	3 GAL.
<b>ORNAMENTAL MIX</b>				
ACS	AMELANCHIER	CANADENSIS	1	2-3" CAL.
HA	HYDRANGEA ARBORESCENS	SMOOTH HYDRANGEA	4	3 GAL.



FOR PROFILE SEE SHEET NO. 57

608164 - HD(CONSTRUCTION PLANS).DWG Plotted on 13-Sep-2022 9:34 AM



FENCING DETAILS

TIMBER FENCE (THREE-RAIL) STA. 308+79 LT TO STA. 309+79 LT  
 TIMBER FENCE (THREE-RAIL) STA. 313+29 LT TO STA. 316+29 LT  
 TIMBER FENCE (THREE-RAIL) STA. 308+16 RT TO STA. 315+79 RT

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

LEGEND:  
 PROPOSED WHEELCHAIR RAMP DETAIL # [Symbol]  
 PLANT QUANTITY AND SPECIES [Symbol]

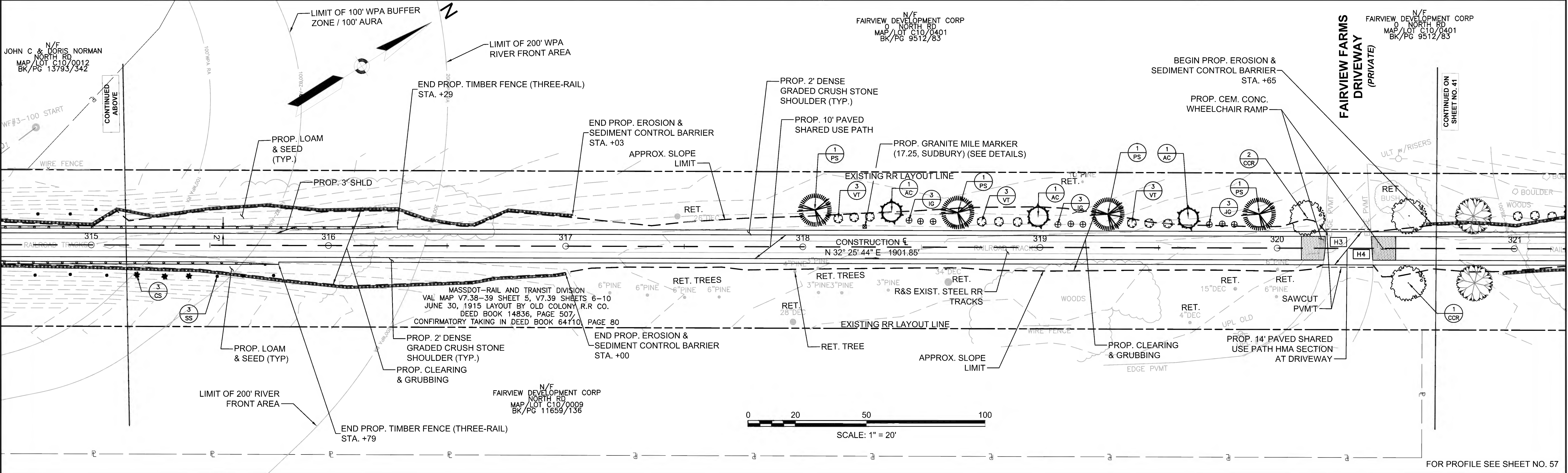
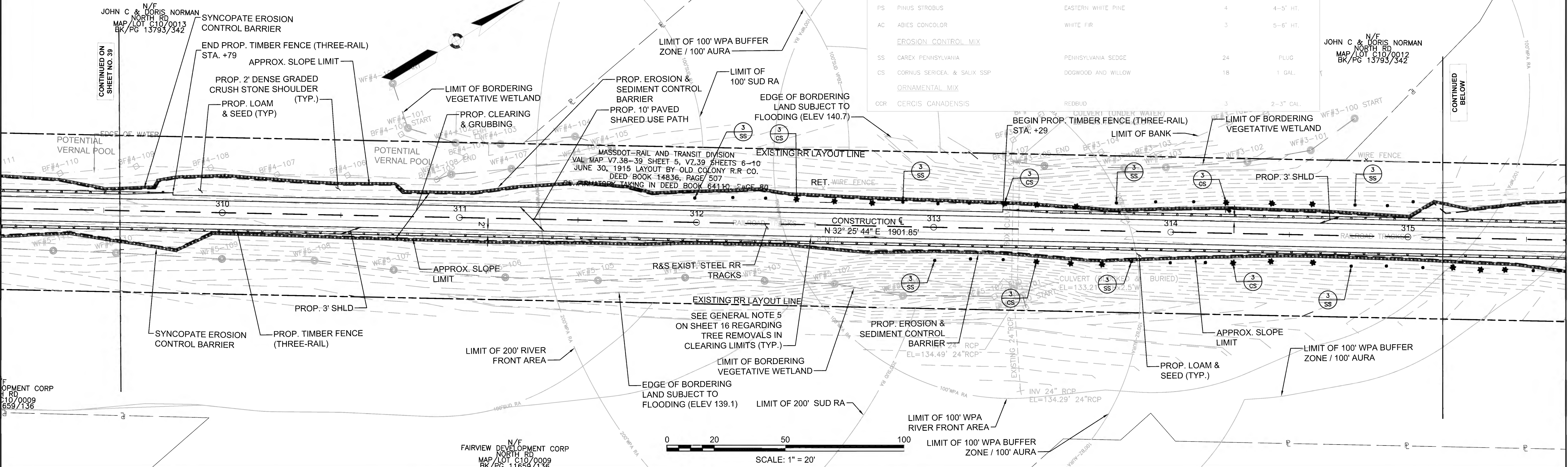
PLANT LIST

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
<b>VISUAL SCREEN MIX</b>				
VT	VIBURNUM TRILOBUM	HIGHBUSH CRANBERRY	9	3 GAL.
IG	ILEX GLABRA	INKBERRY	9	3 GAL.
PS	PINUS STROBUS	EASTERN WHITE PINE	4	4-5' HT.
AC	ABIES CONCOLOR	WHITE FIR	3	5-6' HT.
<b>EROSION CONTROL MIX</b>				
SS	CAREX PENNSYLVANIA	PENNSYLVANIA SEDGE	24	PLUG
CS	CORNUS SERICEA & SALIX SSP	DOGWOOD AND WILLOW	18	1 GAL.
<b>ORNAMENTAL MIX</b>				
CCR	CERCIS CANADENSIS	REDBUD	3	2-3' CAL.

**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	40	319

PROJECT FILE NO. 608164  
**CONSTRUCTION PLANS**



FOR PROFILE SEE SHEET NO. 57



FENCING DETAILS

TIMBER FENCE (THREE-RAIL) STA. 321+25 LT TO STA. 324+79 RT  
 TIMBER FENCE (THREE-RAIL) STA. 321+25 RT TO STA. 322+00 RT  
 TIMBER FENCE (THREE-RAIL) STA. 322+79 RT TO STA. 329+79 RT

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

PLANT LIST

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
VT	VILBURUM TRILOBUM	HIGH-BUSH CRANBERRY	31	3 GAL.
IG	ILEX GLABRA	INKBERRY	35	3 GAL.
PS	PINUS STROBUS	EASTERN WHITE PINE	7	4-5' HT.
AC	ABIES CONCOLOR	WHITE FIR	6	5-6' HT.
ACS	AMELANCHIER	CANADENSIS	2	2-3" CAL.

LEGEND:

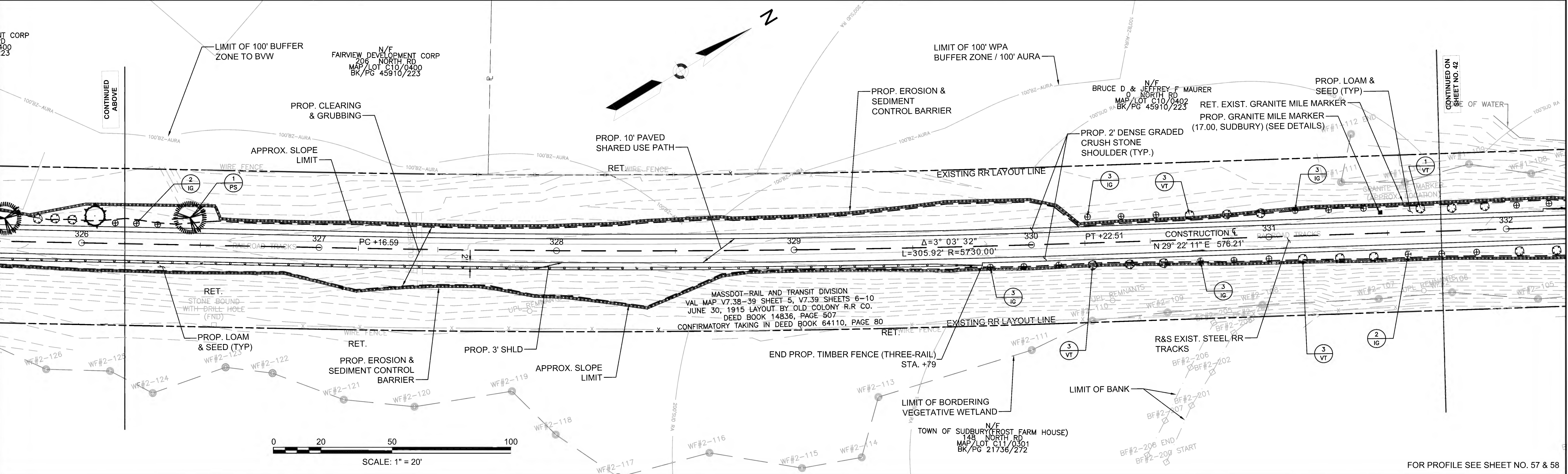
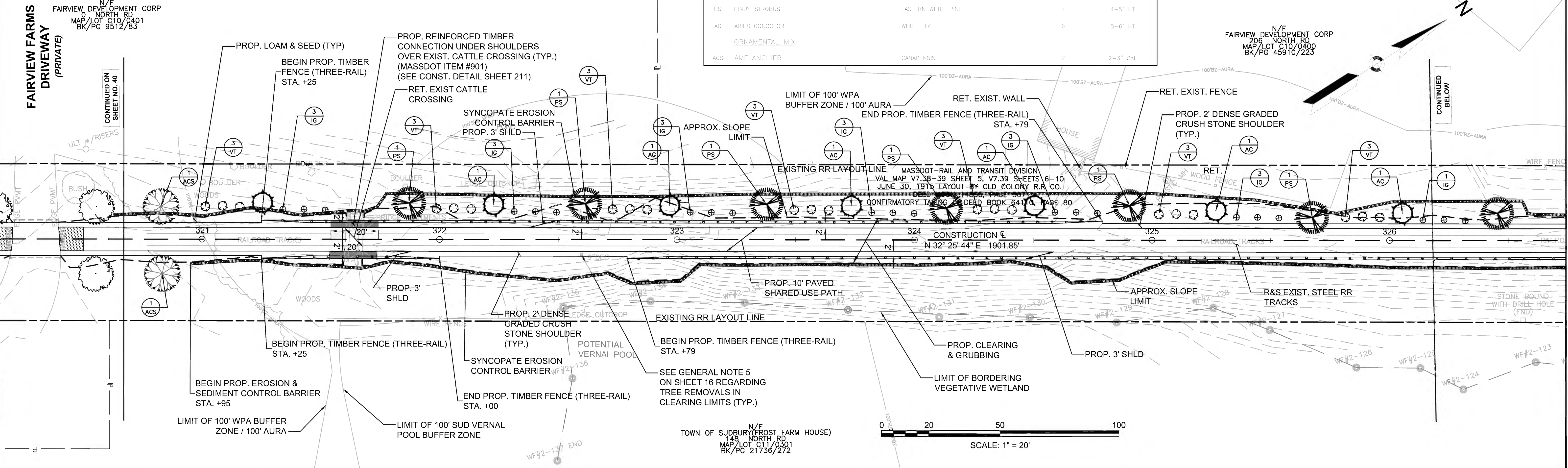
PROPOSED WHEELCHAIR RAMP DETAIL # X#  
 PLANT QUANTITY AND SPECIES XX

SUDBURY BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	41	319

PROJECT FILE NO. 608164

CONSTRUCTION PLANS



FOR PROFILE SEE SHEET NO. 57 & 58



FENCING DETAILS

TIMBER FENCE (THREE-RAIL) STA. 332+16 LT TO STA. 333+11 LT

HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

NONE

PLANT LIST

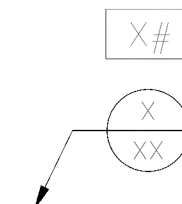
KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
	VISUAL SCREEN MIX			
VT	VILBURUM TRILOBUM	HIGHBUSH CRANBERRY	11	3 GAL.
IG	ILEX GLABRA	INKBERRY	11	3 GAL.
	ORNAMENTAL MIX			
CCR	CERCIS CANADENSIS	REDBUD	2	2-3" CAL.
HA	HYDRANGEA ARBORESCENS	SMOOTH HYDRAGEA	5	3 GAL.

LEGEND:

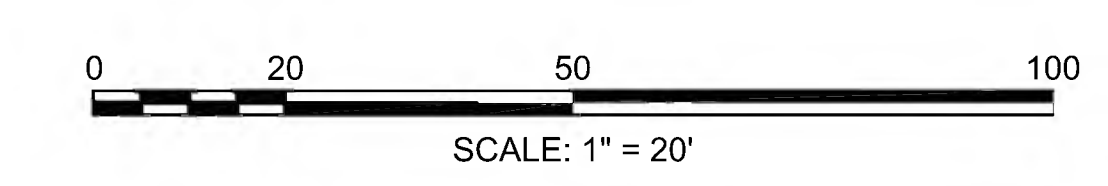
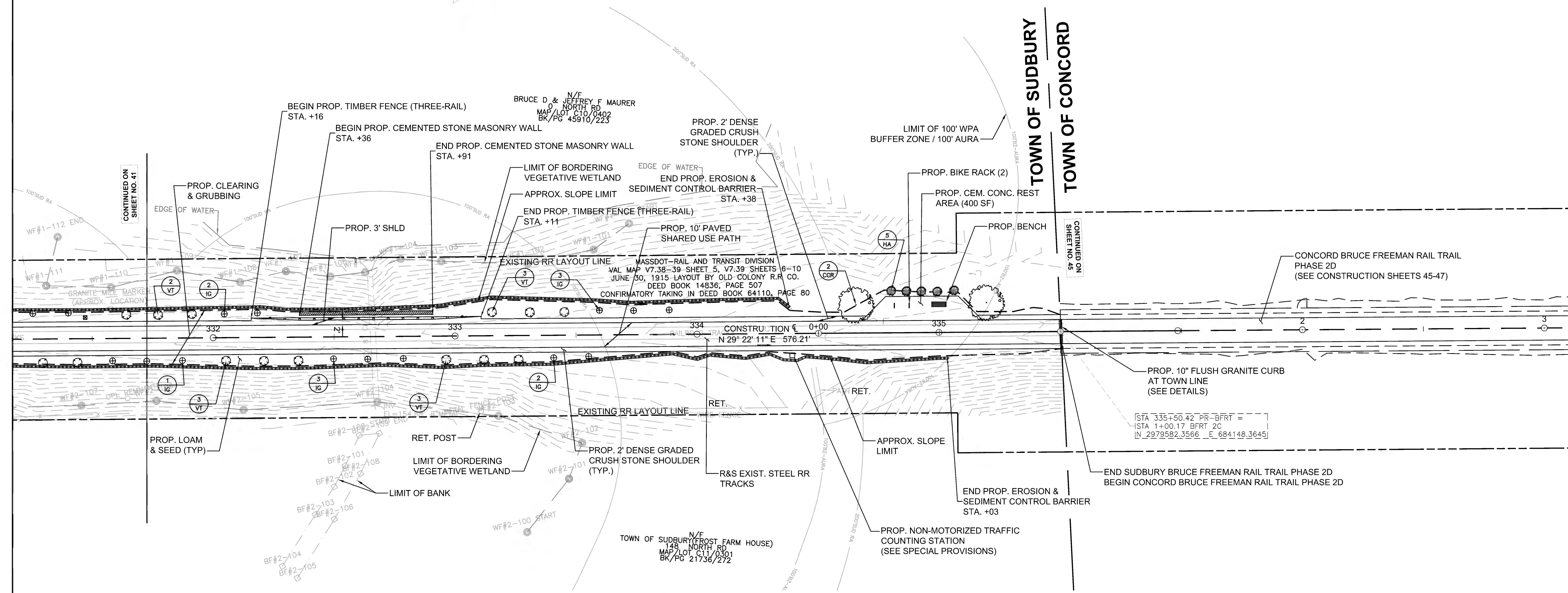
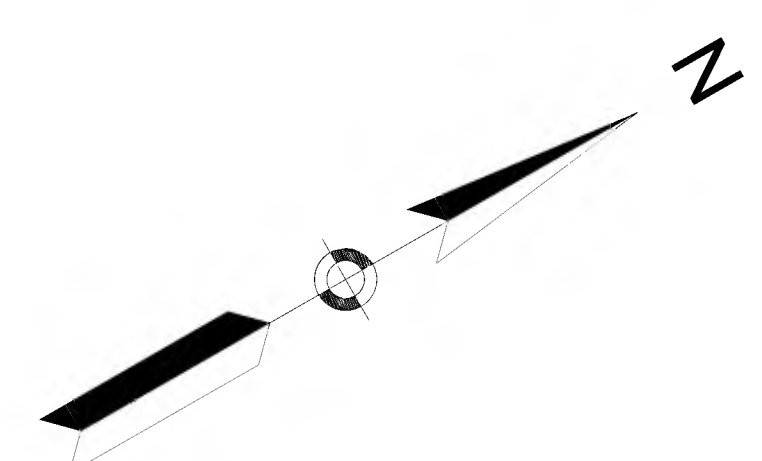
PROPOSED WHEELCHAIR RAMP DETAIL #

X#

PLANT QUANTITY AND SPECIES



SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	42	319
PROJECT FILE NO.		608164	
CONSTRUCTION PLANS			









FENCING DETAILS

TIMBER FENCE (THREE-RAIL) STA. 1102+10 RT TO STA. 1103+20 RT

HIGHWAY GUARD DETAILS

STEEL W-BEAM (TL-2) W/WOOD POST & RUB RAIL  
STA. 1100+51 LT TO STA. 1105+84 LT  
TIMBER GUARDRAIL W/ RUB RAIL  
STA. 1106+00 LT TO STA. 1107+27 LT

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE SHEET 202

DRAINAGE DETAILS

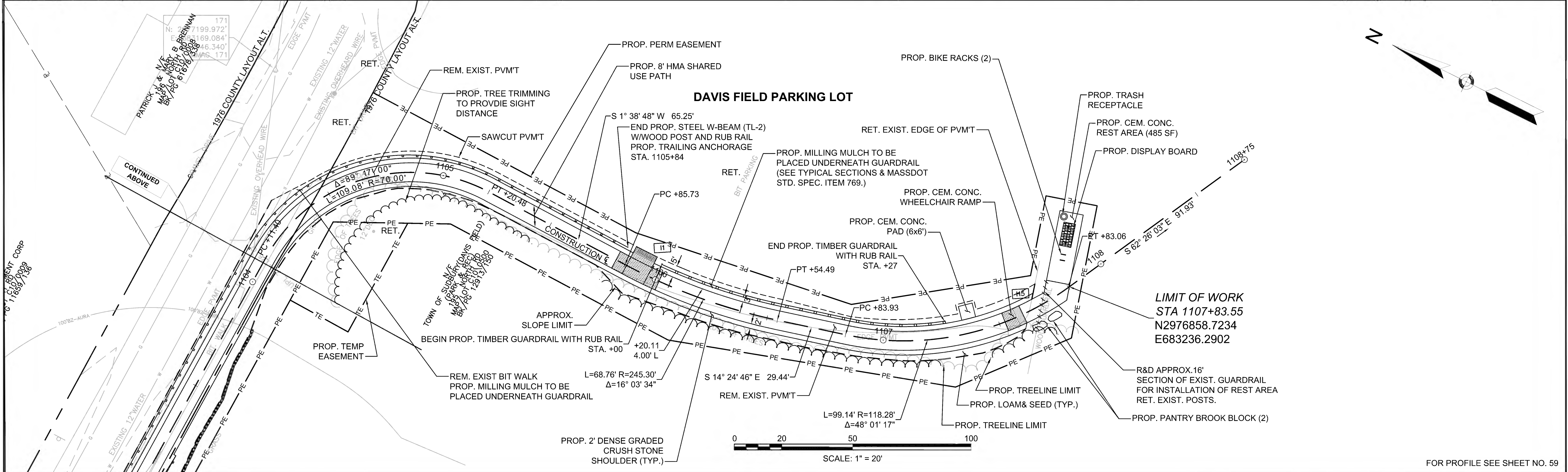
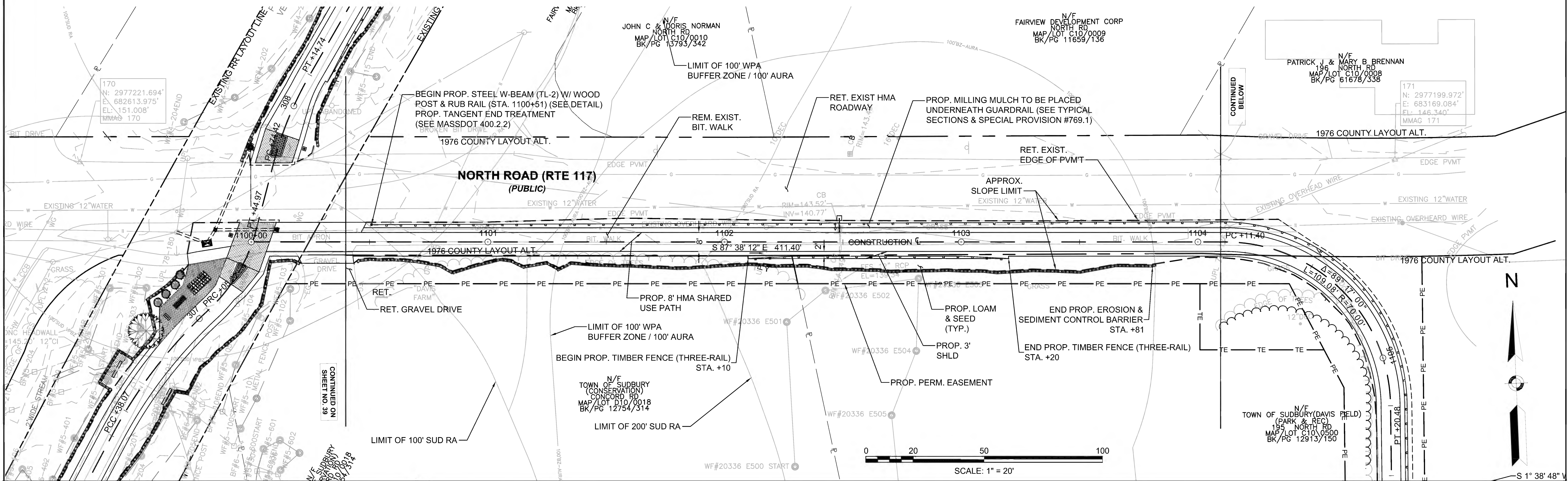
SEE SHEET 202

LEGEND:

PROPOSED WHEELCHAIR RAMP DETAIL #

X#

BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	44	319
PROJECT FILE NO.		608164	
CONSTRUCTION PLANS			



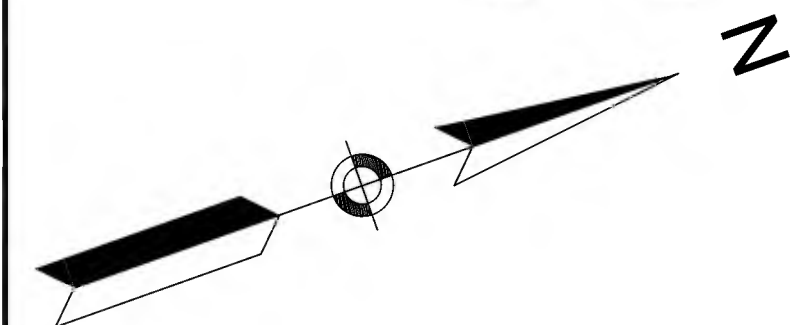
608164 - HD(CONSTRUCTION PLANS).DWG Plotted on 27-Jun-2022 9:17 AM

FOR PROFILE SEE SHEET NO. 59









**FENCING DETAILS**  
 TIMBER FENCE (THREE-RAIL) STA. 13+35 RT TO STA. 17+50 RT  
 TIMBER FENCE (THREE-RAIL) STA. 20+50 RT TO STA. 22+45 RT

**HIGHWAY GUARD DETAILS**  
 NONE

**TRAFFIC SIGNAL CONDUIT**  
 NONE

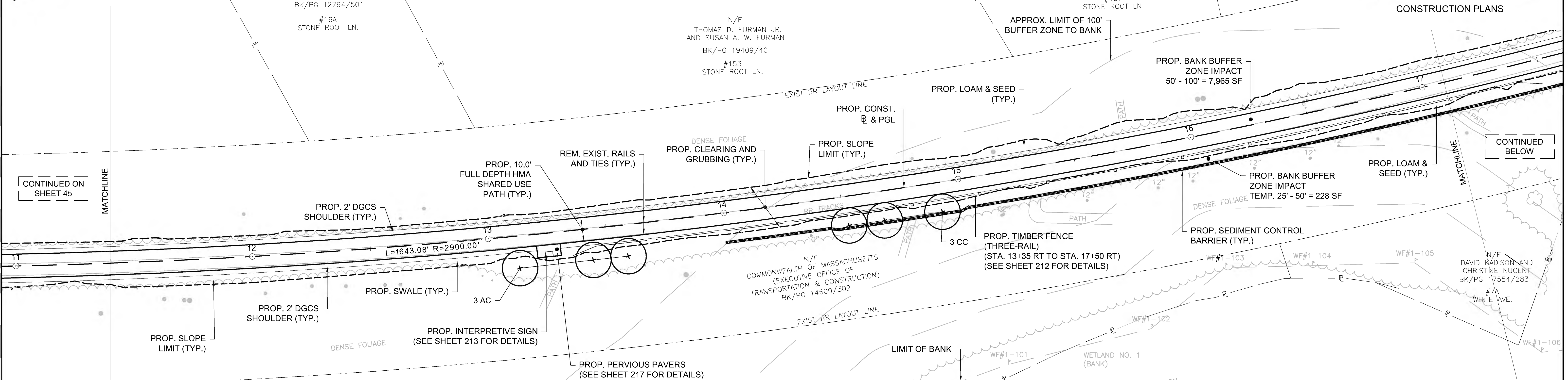
**WATER SUPPLY ALTERATIONS**  
 NONE

**DRAINAGE DETAILS**  
 SEE SHEET 204

CONCORD  
 BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	46	319
PROJECT FILE NO.		608164	

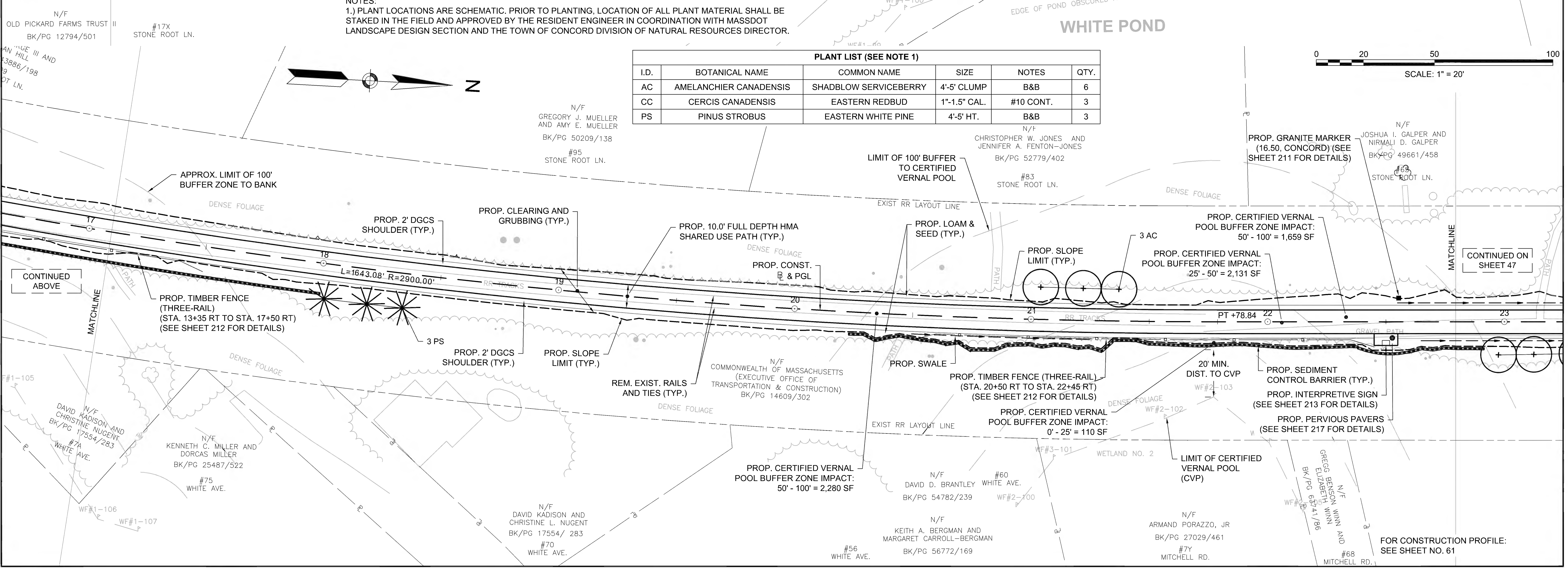
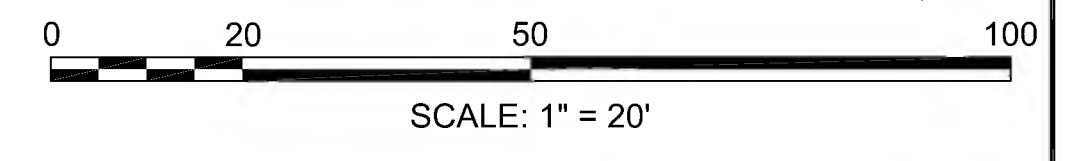
CONSTRUCTION PLANS



**NOTES:**  
 1.) PLANT LOCATIONS ARE SCHEMATIC. PRIOR TO PLANTING, LOCATION OF ALL PLANT MATERIAL SHALL BE STAKED IN THE FIELD AND APPROVED BY THE RESIDENT ENGINEER IN COORDINATION WITH MASSDOT LANDSCAPE DESIGN SECTION AND THE TOWN OF CONCORD DIVISION OF NATURAL RESOURCES DIRECTOR.

**PLANT LIST (SEE NOTE 1)**

I.D.	BOTANICAL NAME	COMMON NAME	SIZE	NOTES	QTY.
AC	AMELANCHIER CANADENSIS	SHADBLOW SERVICEBERRY	4'-5' CLUMP	B&B	6
CC	CERCIS CANADENSIS	EASTERN REDBUD	1"-1.5" CAL.	#10 CONT.	3
PS	PINUS STROBUS	EASTERN WHITE PINE	4'-5' HT.	B&B	3



FOR CONSTRUCTION PROFILE:  
 SEE SHEET NO. 61



FENCING DETAILS  
NONE

HIGHWAY GUARD DETAILS  
NONE

TRAFFIC SIGNAL CONDUIT  
NONE

WATER SUPPLY ALTERATIONS  
NONE

DRAINAGE DETAILS  
SEE SHEET 205

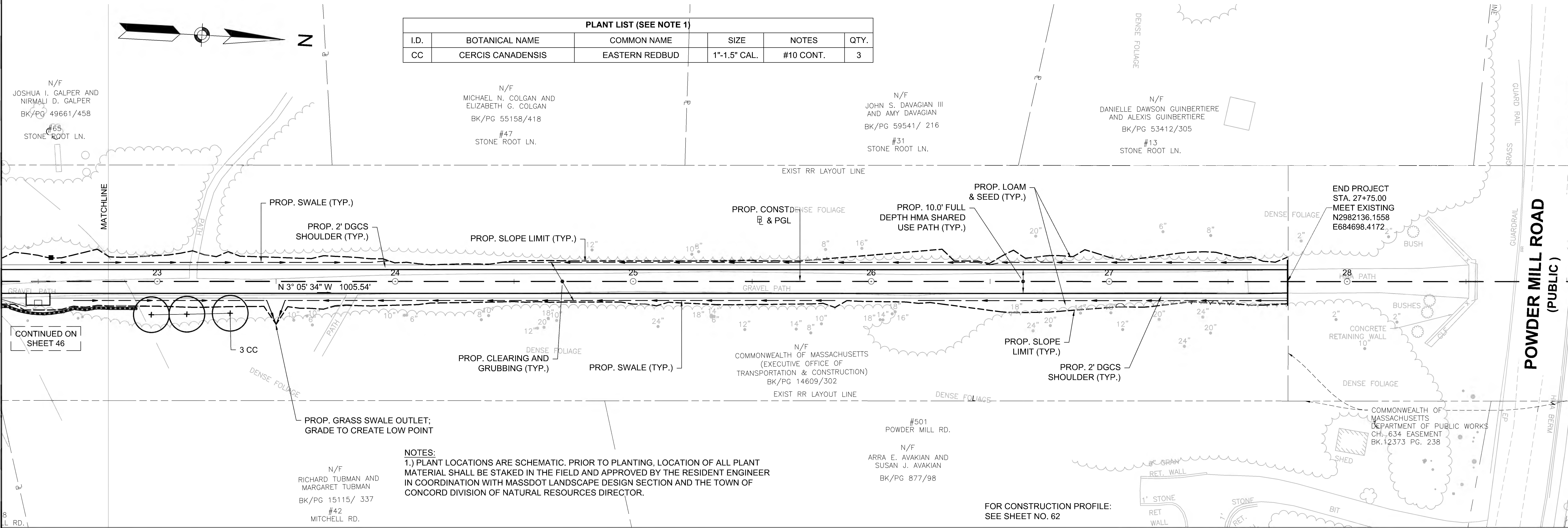
CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	47	319
PROJECT FILE NO.		608164	

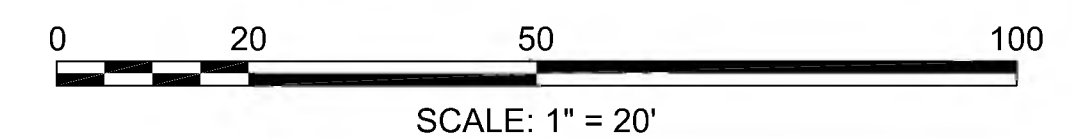
CONSTRUCTION PLANS

PLANT LIST (SEE NOTE 1)

I.D.	BOTANICAL NAME	COMMON NAME	SIZE	NOTES	QTY.
CC	CERCIS CANADENSIS	EASTERN REDBUD	1"-1.5" CAL.	#10 CONT.	3



**NOTES:**  
 1.) PLANT LOCATIONS ARE SCHEMATIC. PRIOR TO PLANTING, LOCATION OF ALL PLANT MATERIAL SHALL BE STAKED IN THE FIELD AND APPROVED BY THE RESIDENT ENGINEER IN COORDINATION WITH MASSDOT LANDSCAPE DESIGN SECTION AND THE TOWN OF CONCORD DIVISION OF NATURAL RESOURCES DIRECTOR.

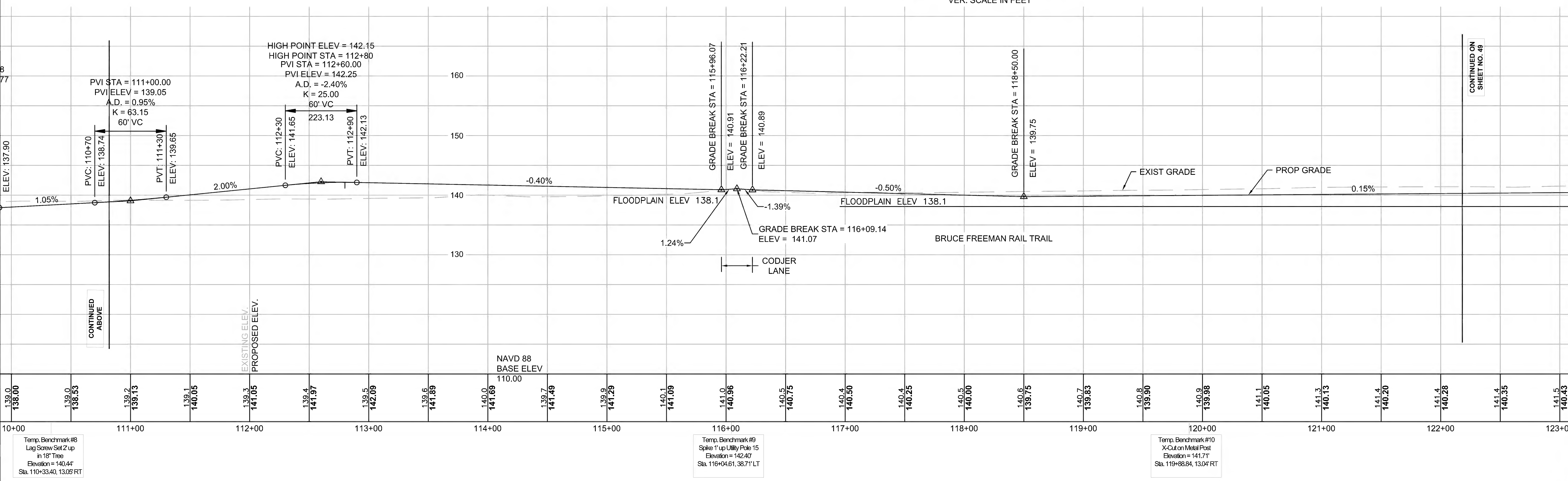
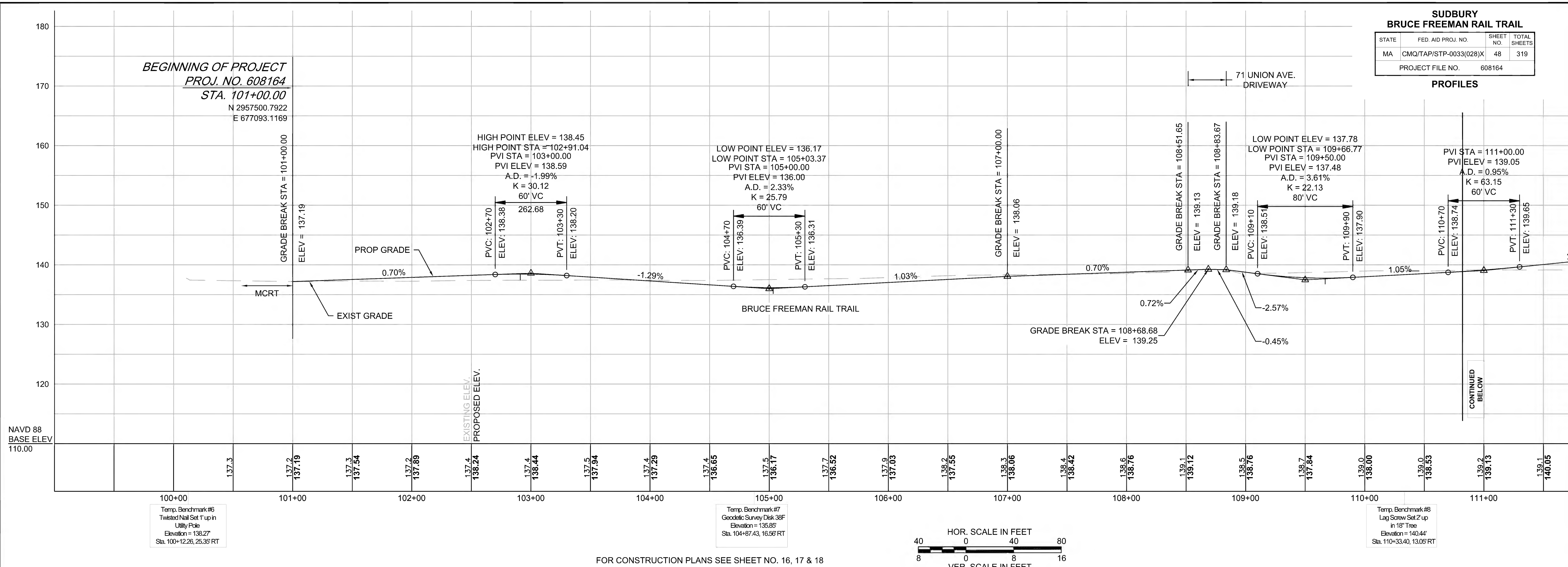


605188\_HD(CO).DWG Plotted on: 22-Jun-2022 1:49 PM



SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	48	319
PROJECT FILE NO.		608164	

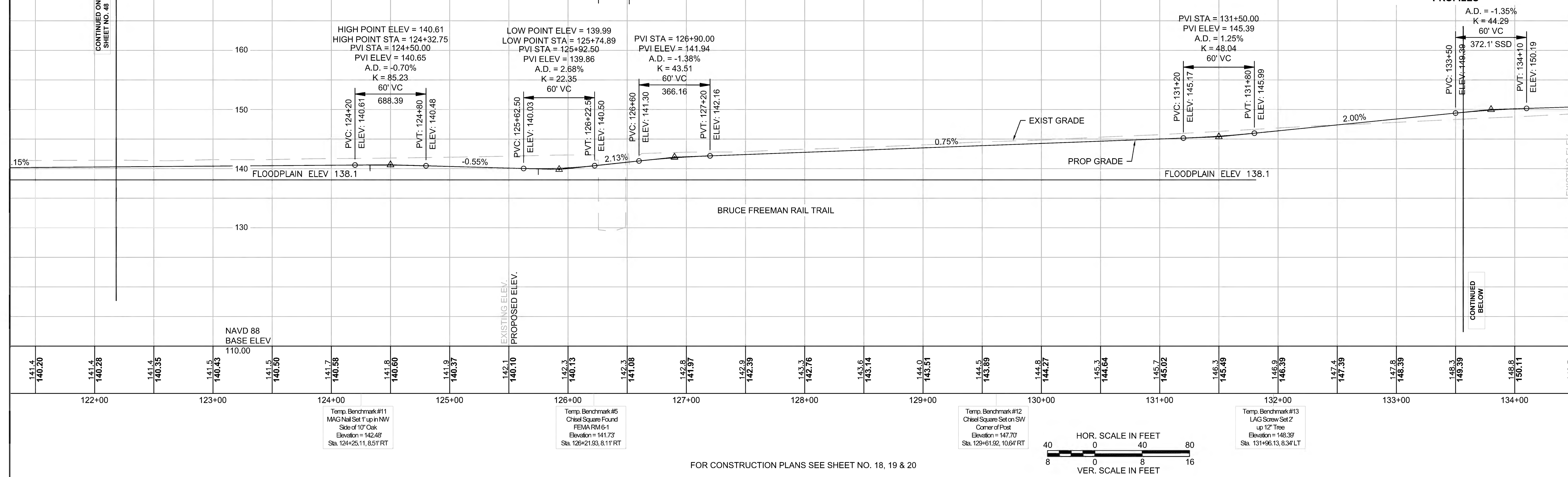
**PROFILES**





SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	49	319
PROJECT FILE NO.		608164	

**PROFILES**

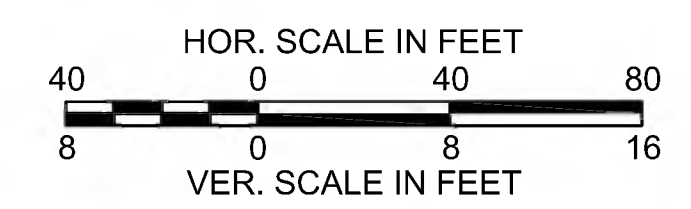


Temp. Benchmark #11  
MAG Nail Set 1' up in NW  
Side of 10' Oak  
Elevation = 142.48  
Sta. 124+25.11, 8.51' RT

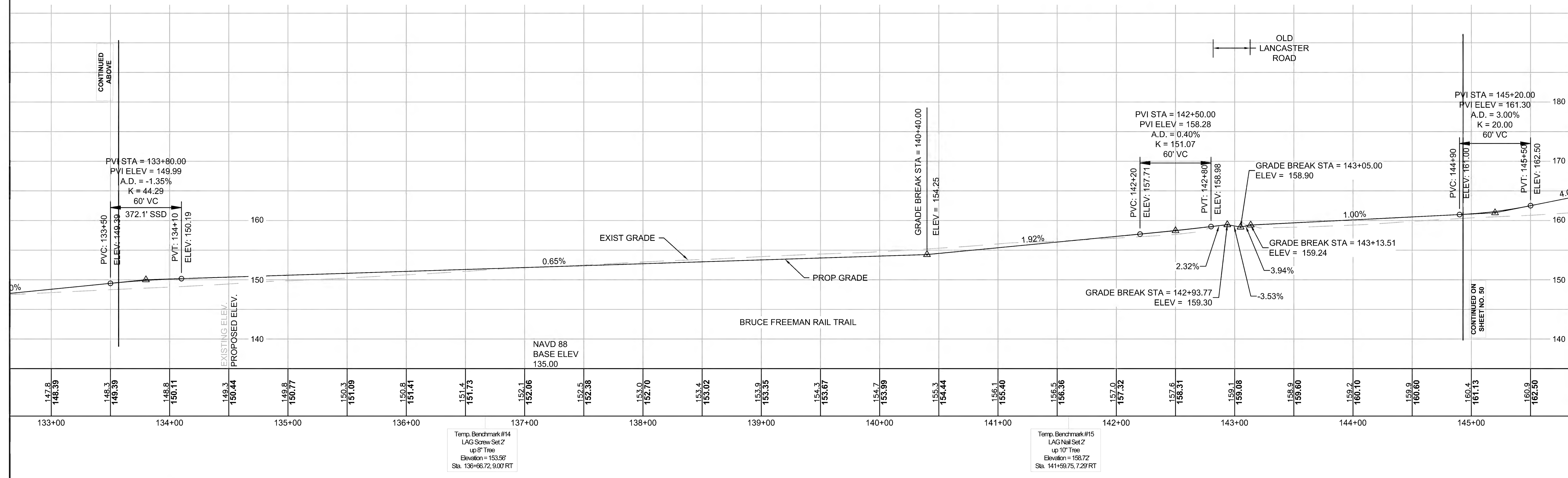
Temp. Benchmark #5  
Chisel Square Set on SW  
Corner of Post  
FEMARM6-1  
Elevation = 141.73  
Sta. 126+21.93, 8.11' RT

Temp. Benchmark #12  
Chisel Square Set on SW  
Corner of Post  
Elevation = 147.70  
Sta. 129+61.92, 10.64' RT

Temp. Benchmark #13  
LAG Screw Set 2'  
up 12" Tree  
Elevation = 148.39  
Sta. 131+96.13, 8.34' LT



FOR CONSTRUCTION PLANS SEE SHEET NO. 18, 19 & 20

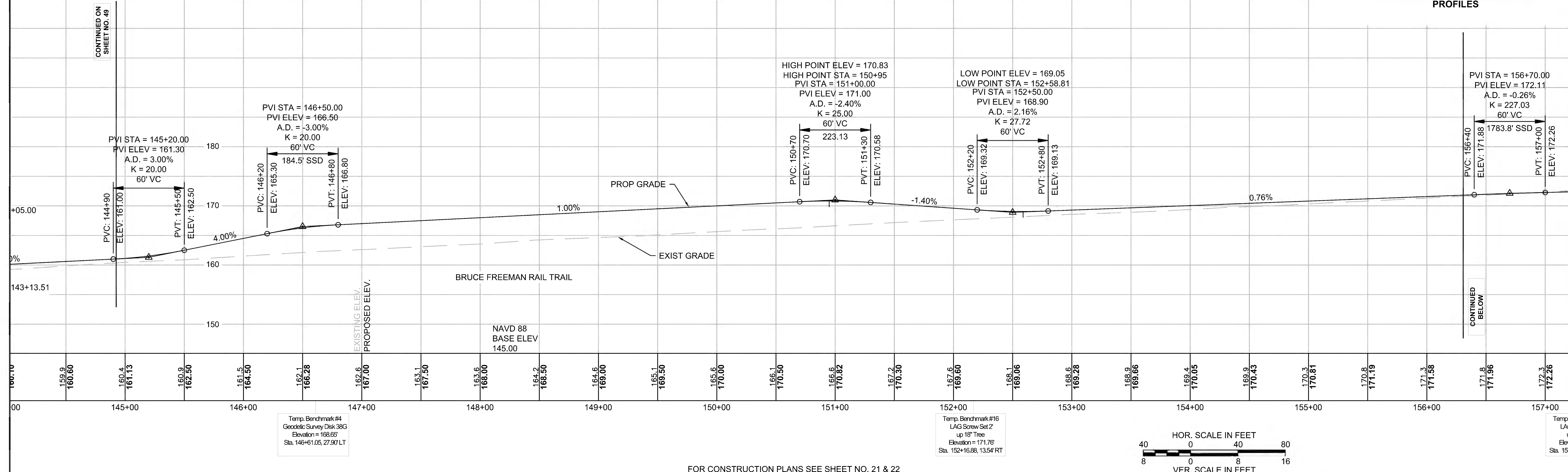


Temp. Benchmark #14  
LAG Screw Set 2'  
up 9" Tree  
Elevation = 153.56  
Sta. 136+66.72, 9.00' RT

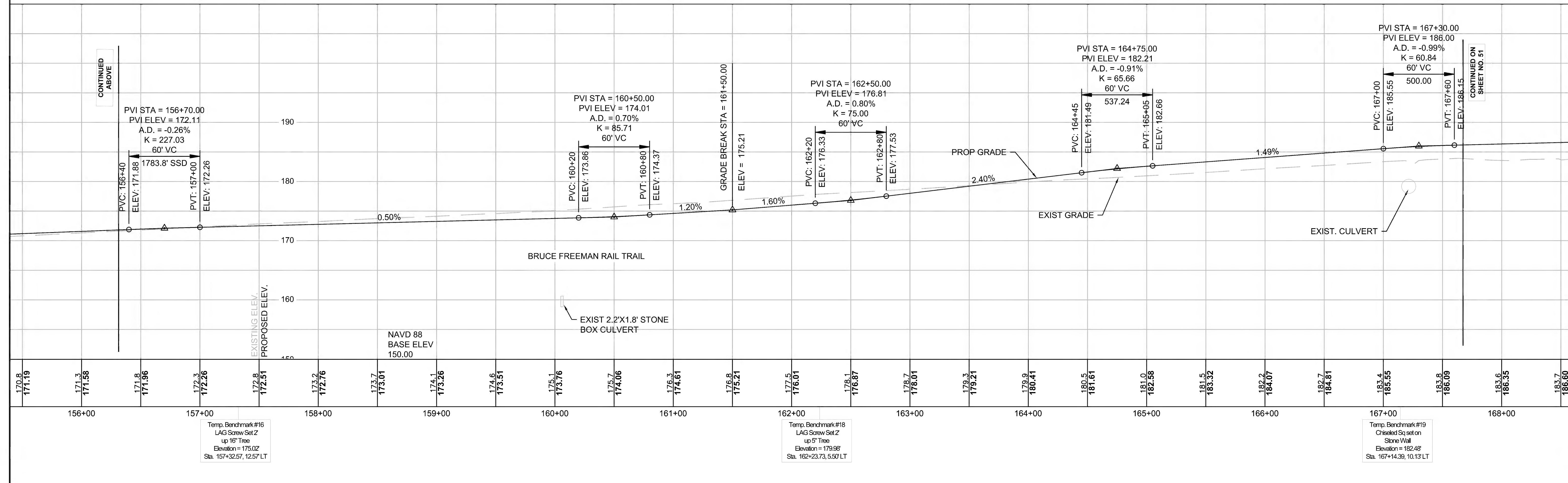
Temp. Benchmark #15  
LAG Nail Set 2'  
up 10" Tree  
Elevation = 158.72  
Sta. 141+59.75, 7.29' RT



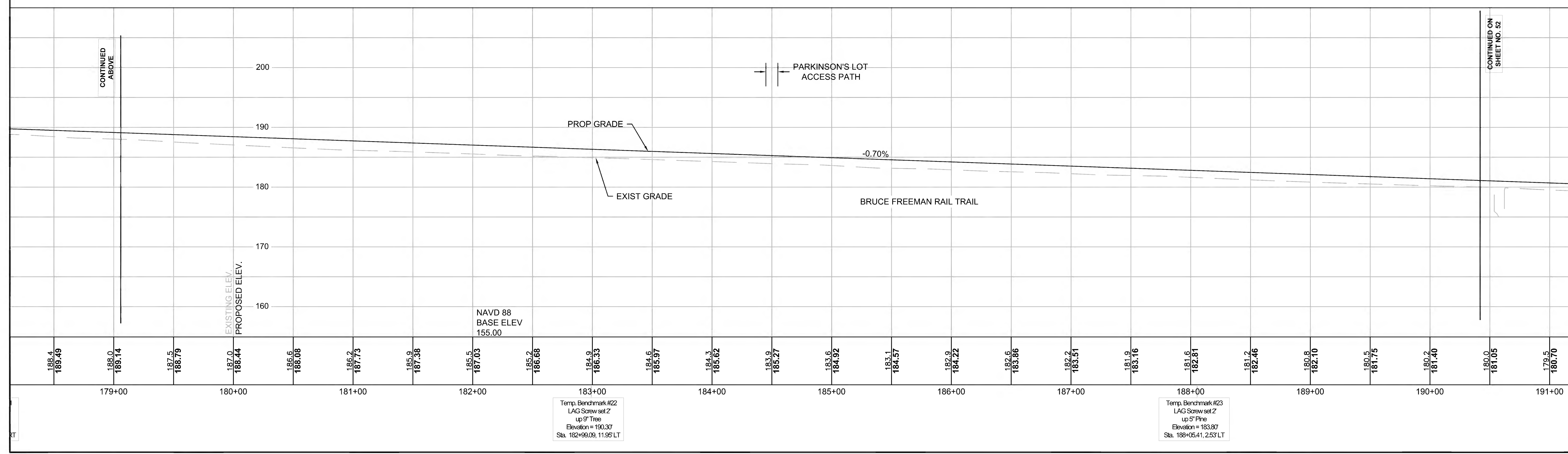
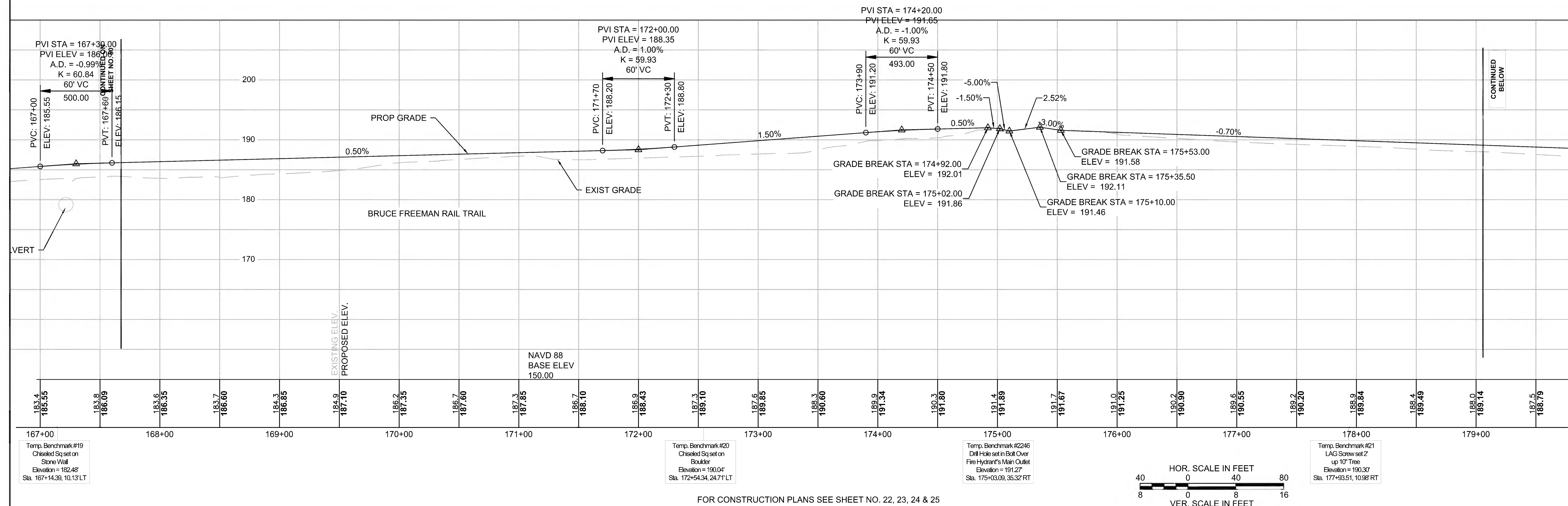
**PROFILES**



FOR CONSTRUCTION PLANS SEE SHEET NO. 21 & 22





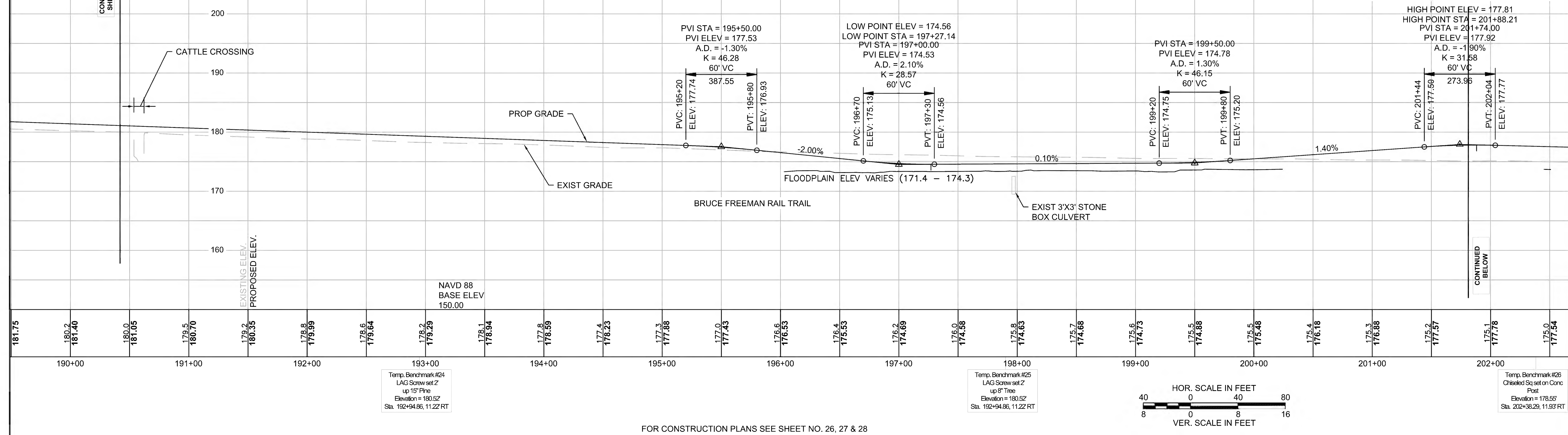




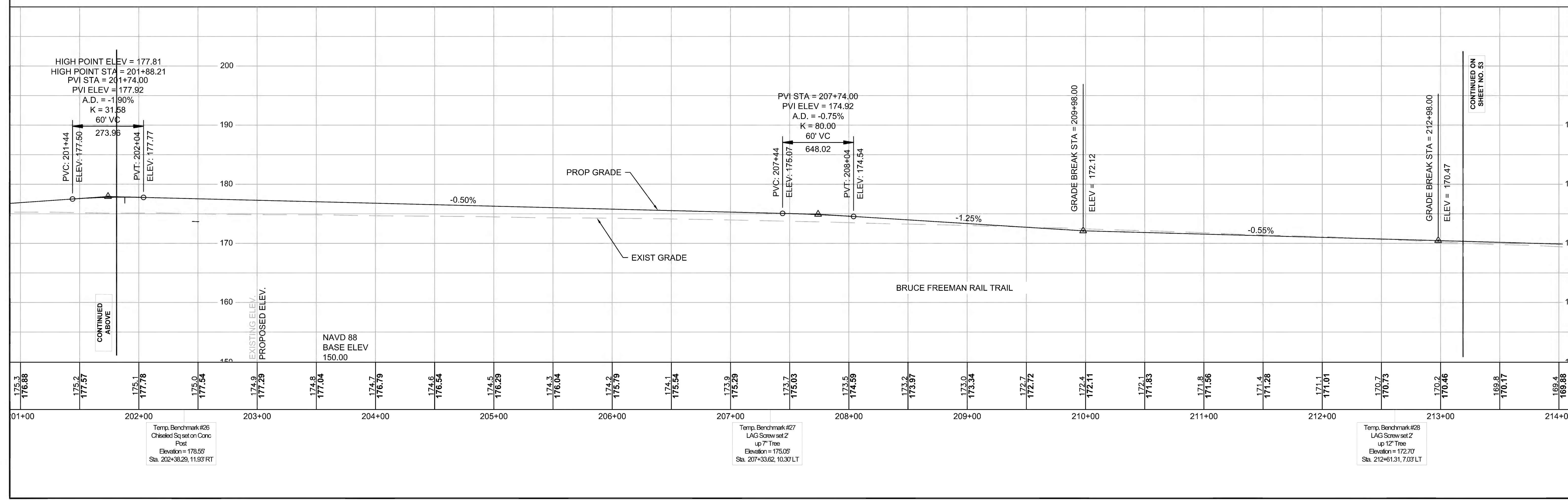
SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	52	319
PROJECT FILE NO.		608164	

**PROFILES**

HIGH POINT ELEV = 177.81  
HIGH POINT STA = 201+88.21  
PVI STA = 201+74.00  
PVI ELEV = 177.92



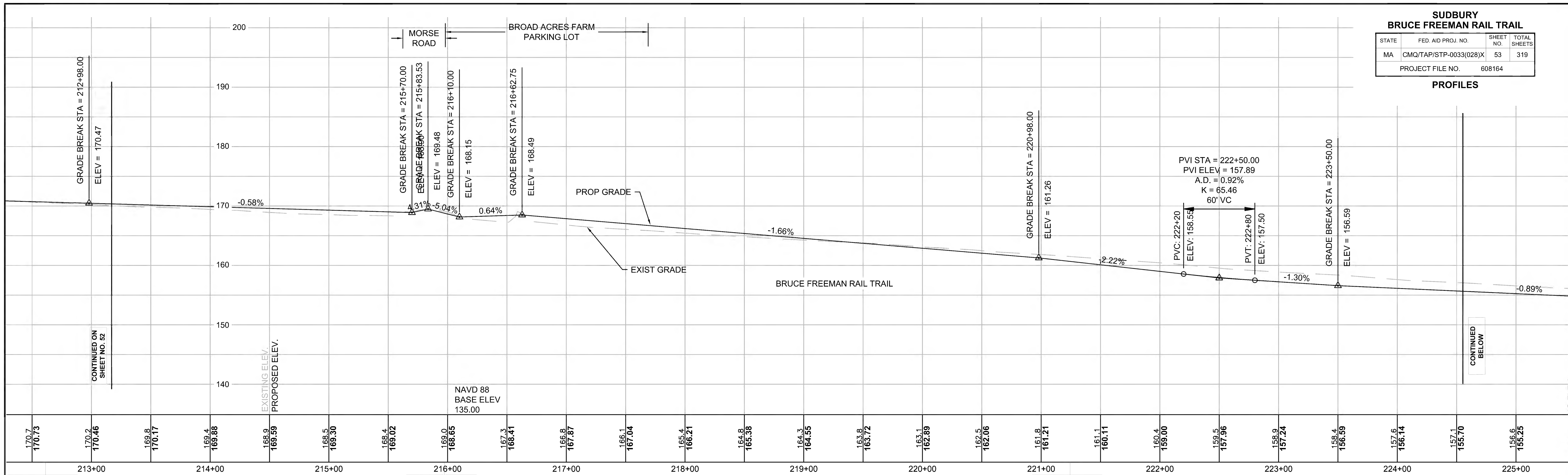
FOR CONSTRUCTION PLANS SEE SHEET NO. 26, 27 & 28





SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	53	319
PROJECT FILE NO.		608164	

**PROFILES**



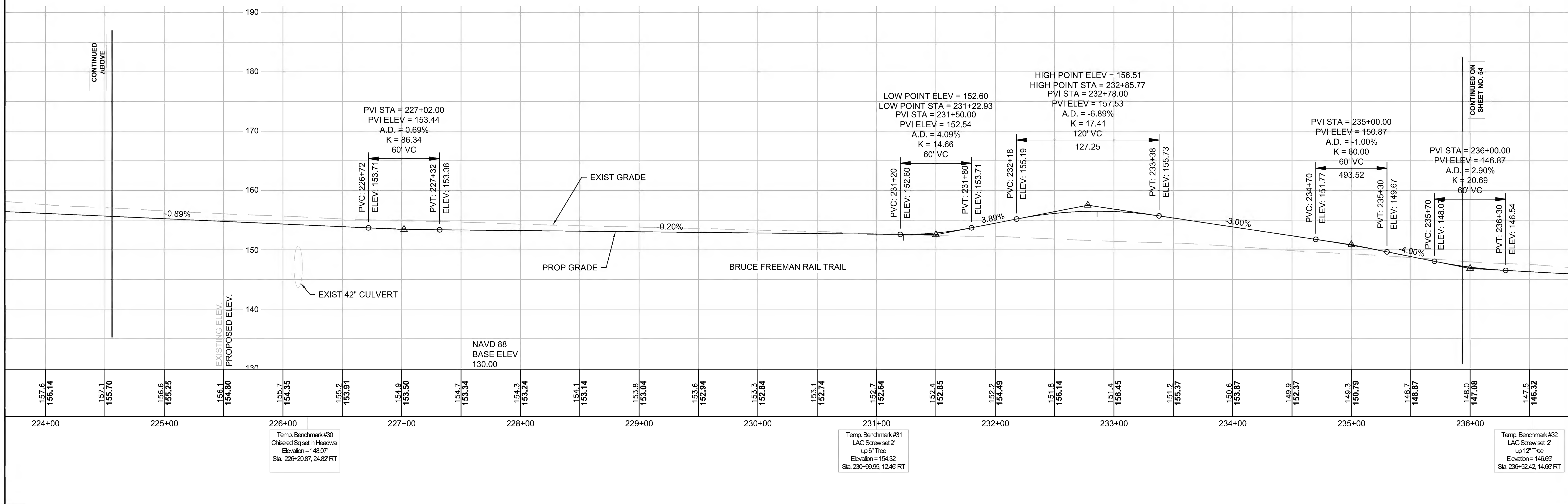
Temp. Benchmark #28  
LAG Screw set 2  
up 12" Tree  
Elevation = 172.70'  
Sta. 212+61.31, 7.03' LT

Temp. Benchmark #3  
Chisel Square on Boulder  
MDOOT #10061  
Elevation = 173.58'  
Sta. 215+97.36, 45.21' RT

Temp. Benchmark #29  
LAG Screw set 2  
up 12" Tree  
Elevation = 162.84'  
Sta. 221+24.44, 5.97' LT

FOR CONSTRUCTION PLANS SEE SHEET NO. 28, 29 & 30

HOR. SCALE IN FEET  
VER. SCALE IN FEET



Temp. Benchmark #30  
Chisel Sq set in Headwall  
Elevation = 148.07'  
Sta. 226+20.87, 24.82' RT

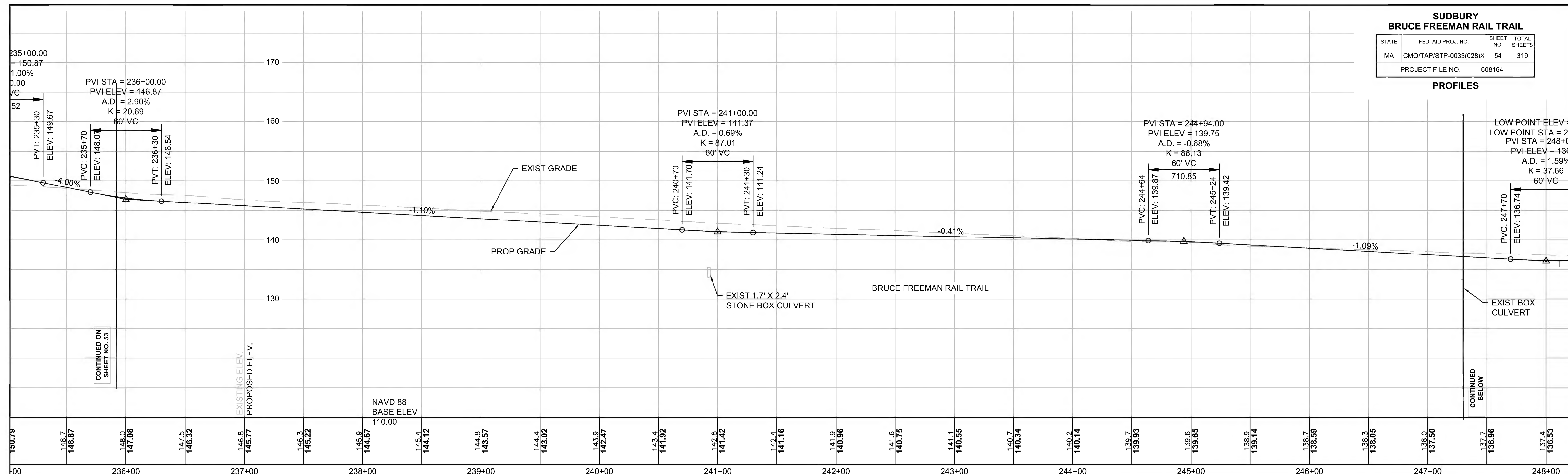
Temp. Benchmark #31  
LAG Screw set 2  
up 6" Tree  
Elevation = 154.32'  
Sta. 230+99.95, 12.46' RT

Temp. Benchmark #32  
LAG Screw set 2  
up 12" Tree  
Elevation = 146.68'  
Sta. 236+52.42, 14.66' RT



SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	54	319
PROJECT FILE NO.		608164	

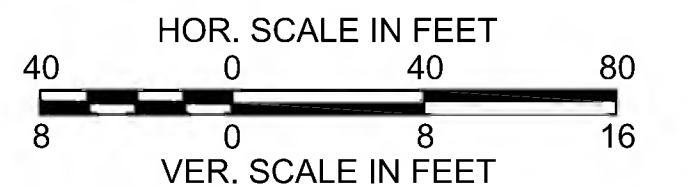
**PROFILES**



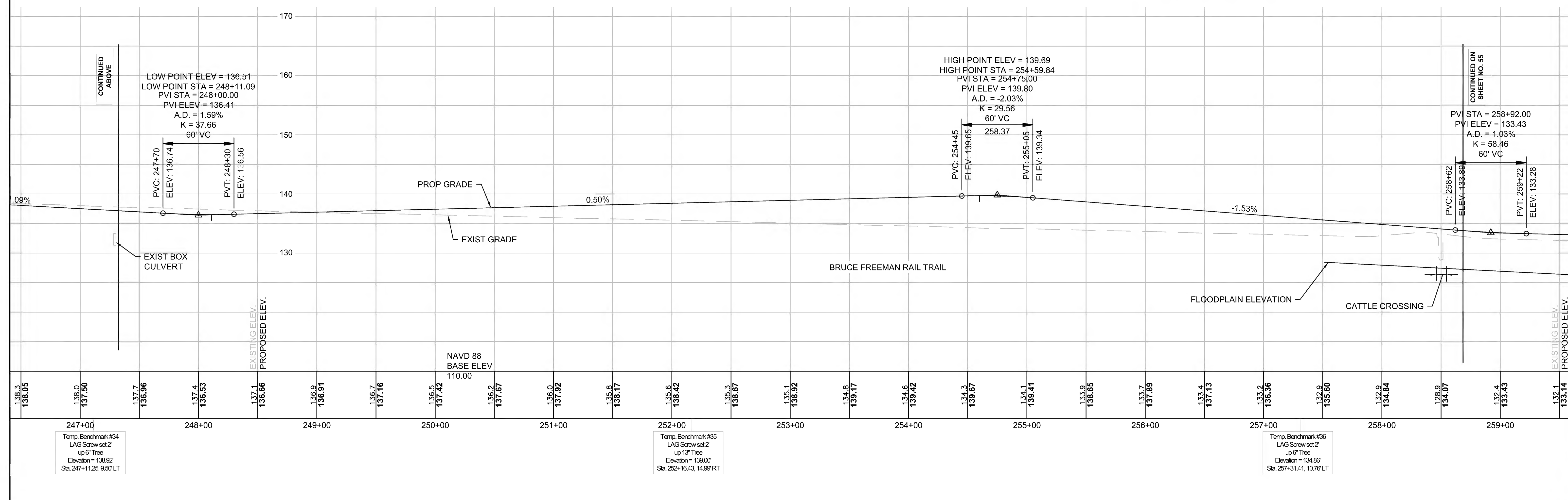
Temp. Benchmark #32  
LAG Screw set Z  
up 12" Tree  
Elevation = 146.69'  
Sta. 236+52.42, 14.66' RT

Temp. Benchmark #33  
LAG Screw set Z  
up 15" Tree  
Elevation = 143.77'  
Sta. 241+86.42, 8.50' RT

Temp. Benchmark #34  
LAG Screw set Z  
up 6" Tree  
Elevation = 138.92'  
Sta. 247+11.25, 9.50' LT



FOR CONSTRUCTION PLANS SEE SHEET NO. 30, 31 & 32



Temp. Benchmark #34  
LAG Screw set Z  
up 6" Tree  
Elevation = 138.92'  
Sta. 247+11.25, 9.50' LT

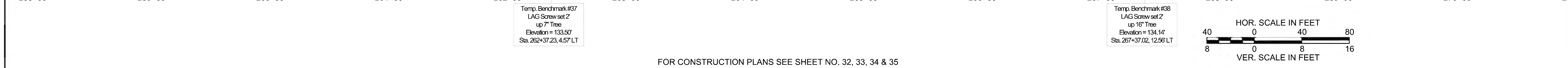
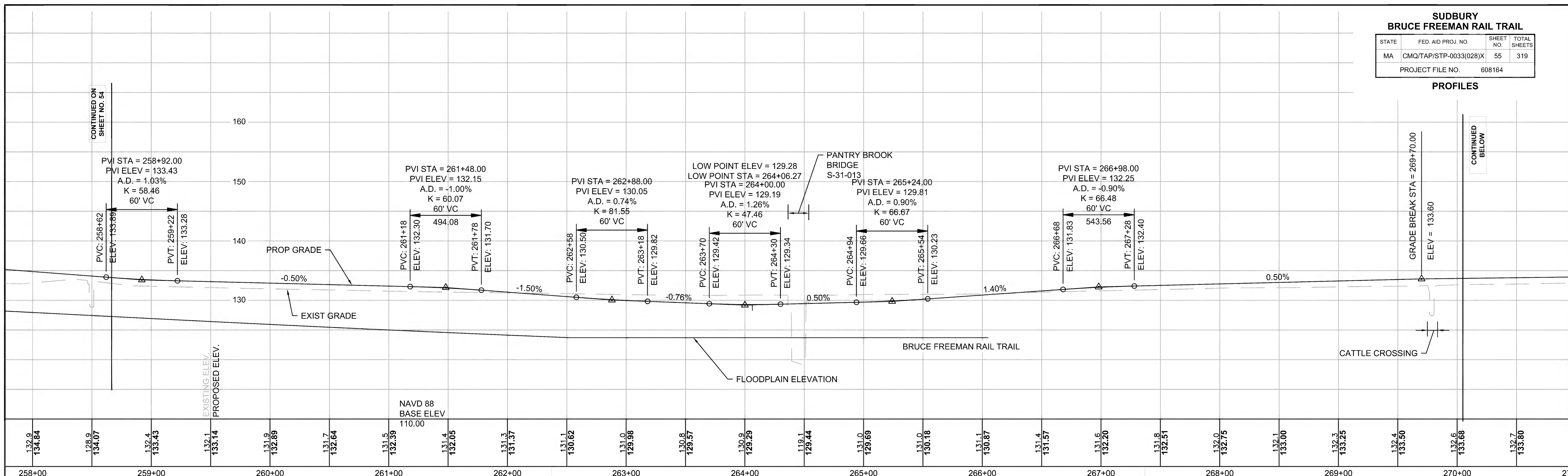
Temp. Benchmark #35  
LAG Screw set Z  
up 13" Tree  
Elevation = 139.00'  
Sta. 252+16.43, 14.99' RT

Temp. Benchmark #36  
LAG Screw set Z  
up 6" Tree  
Elevation = 134.86'  
Sta. 257+31.41, 10.76' LT

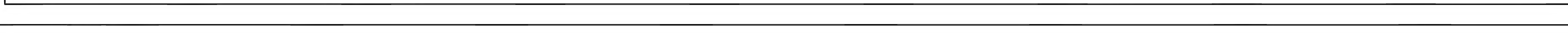
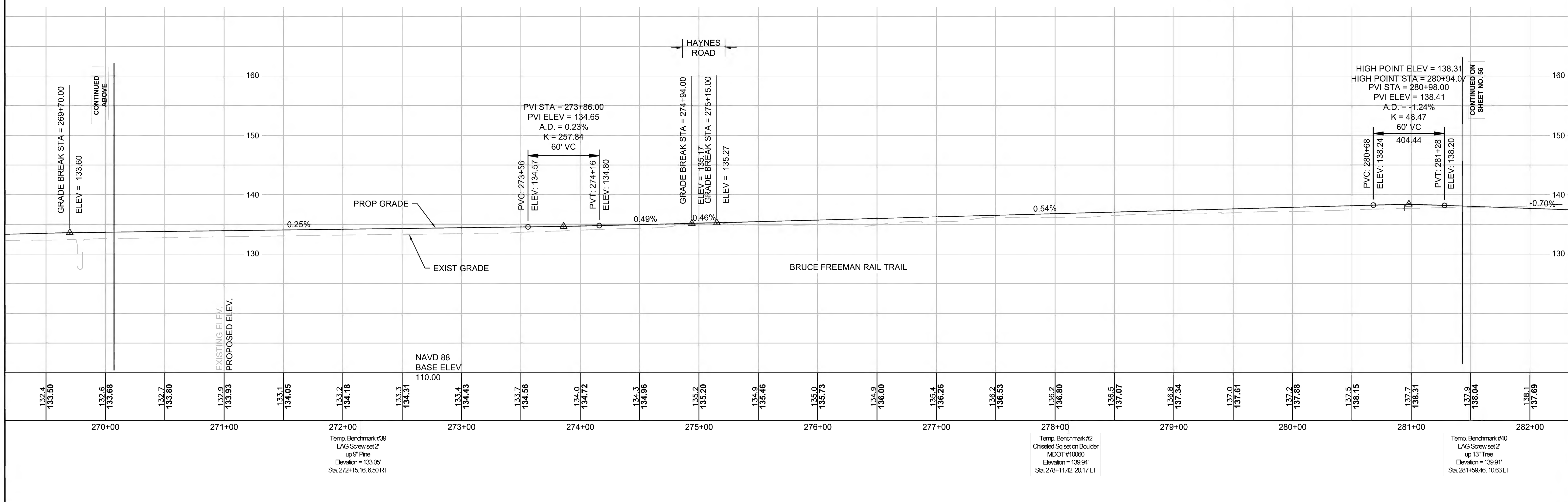
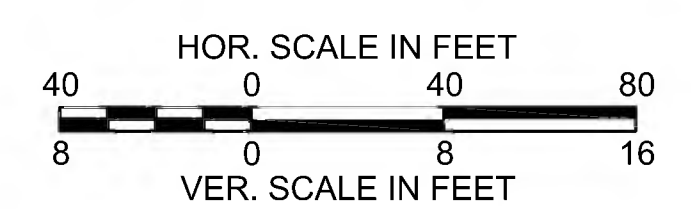


SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	55	319
PROJECT FILE NO.		608164	

**PROFILES**



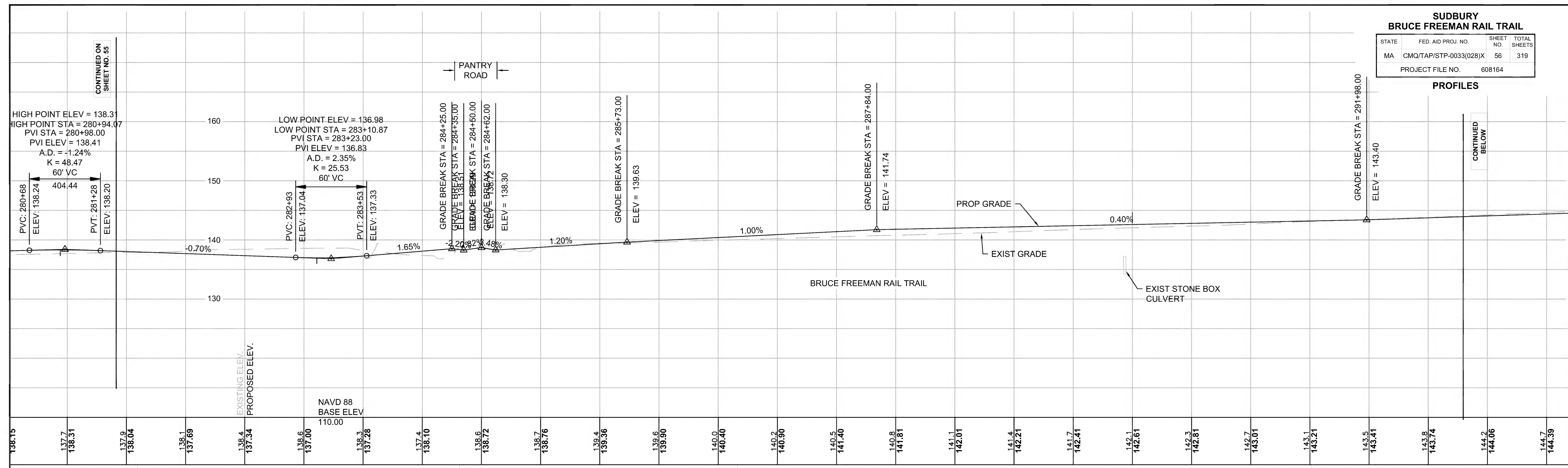
FOR CONSTRUCTION PLANS SEE SHEET NO. 32, 33, 34 & 35



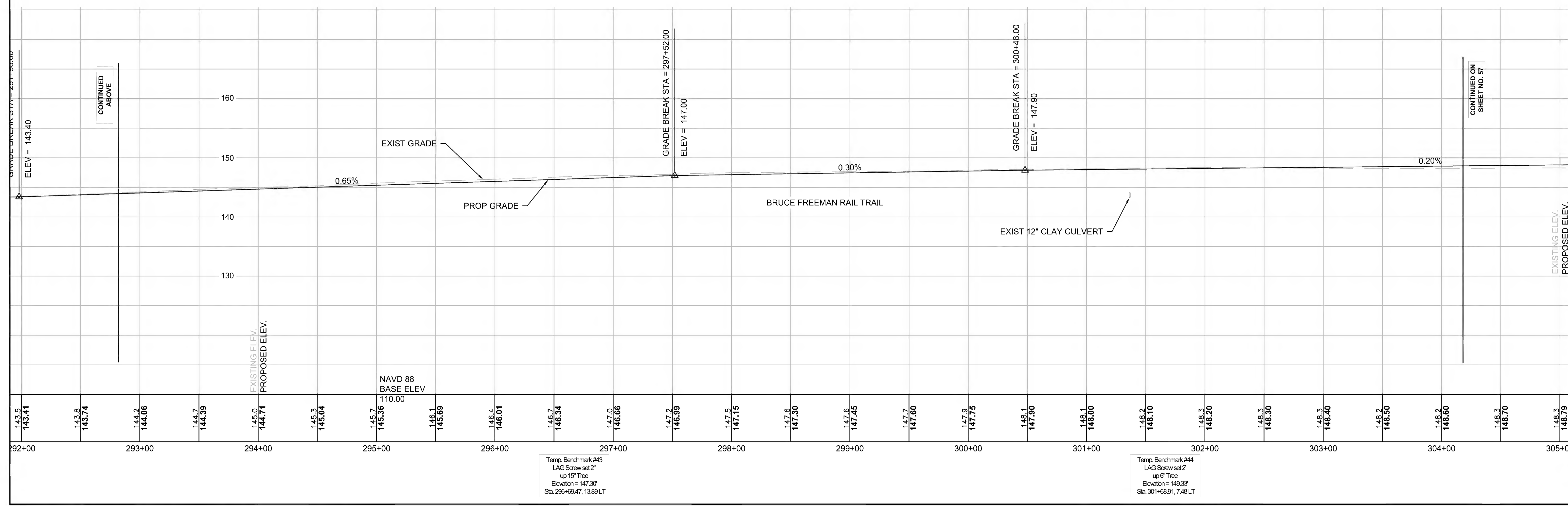
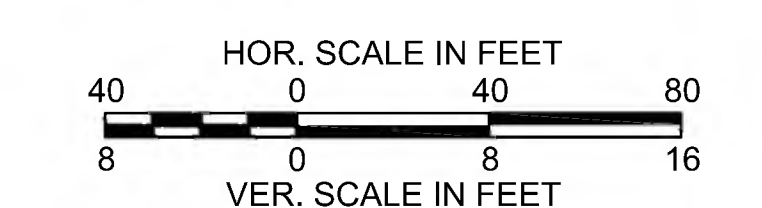


SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	56	319
PROJECT FILE NO.		608164	

**PROFILES**



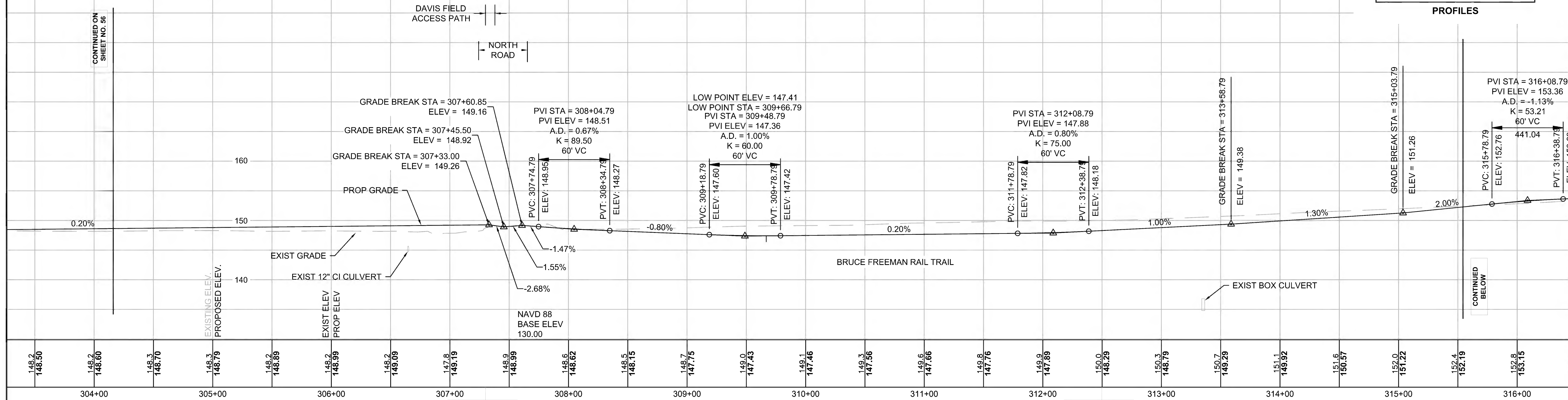
FOR CONSTRUCTION PLANS SEE SHEET NO. 35, 36, 37 & 38





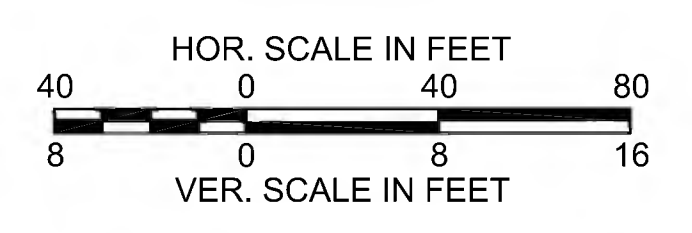
SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	57	319
PROJECT FILE NO.		608164	

**PROFILES**

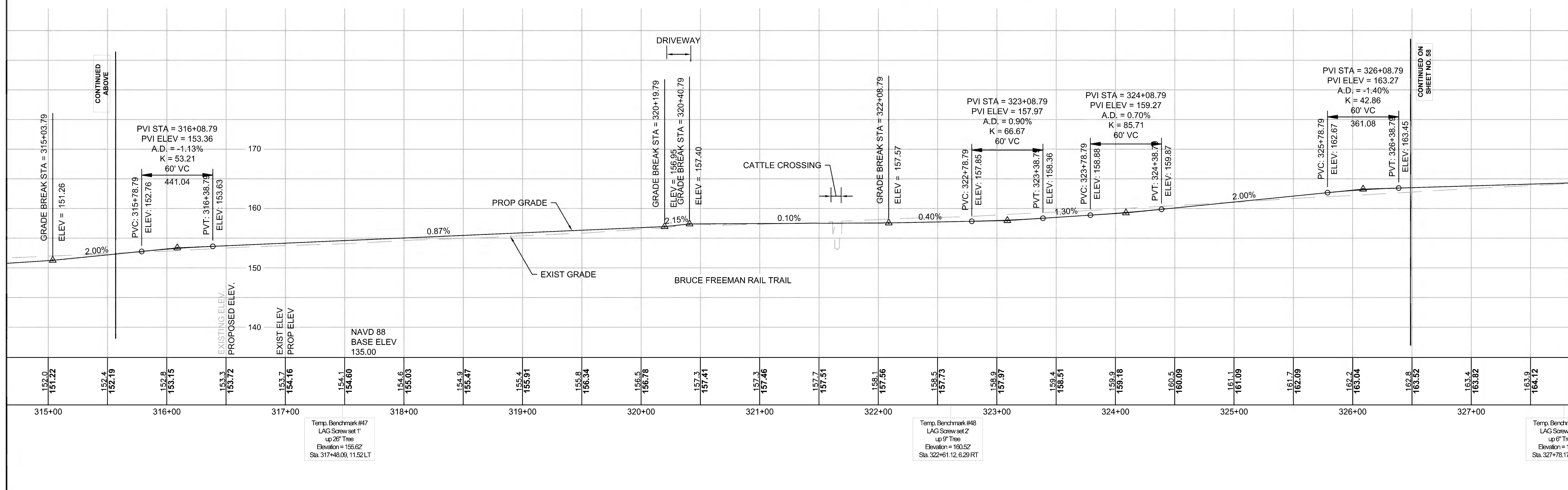


Temp. Benchmark #45  
Nail set up 1' UPL 78/180  
Elevation = 150.90'  
Sta. 307+30.00, 30.14 LT

Temp. Benchmark #46  
LAG Screw set 2' up 6" Tree  
Elevation = 151.84'  
Sta. 312+49.71, 4.80 RT



FOR CONSTRUCTION PLANS SEE SHEET NO. 38, 39, 40 & 41



Temp. Benchmark #47  
LAG Screw set 1'  
up 26" Tree  
Elevation = 155.62'  
Sta. 317+48.09, 11.52 LT

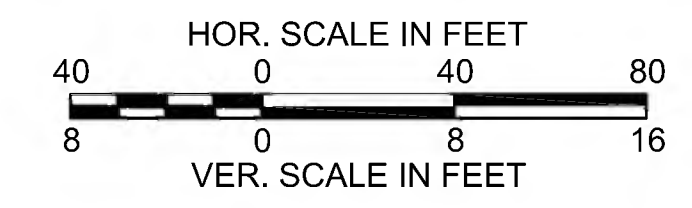
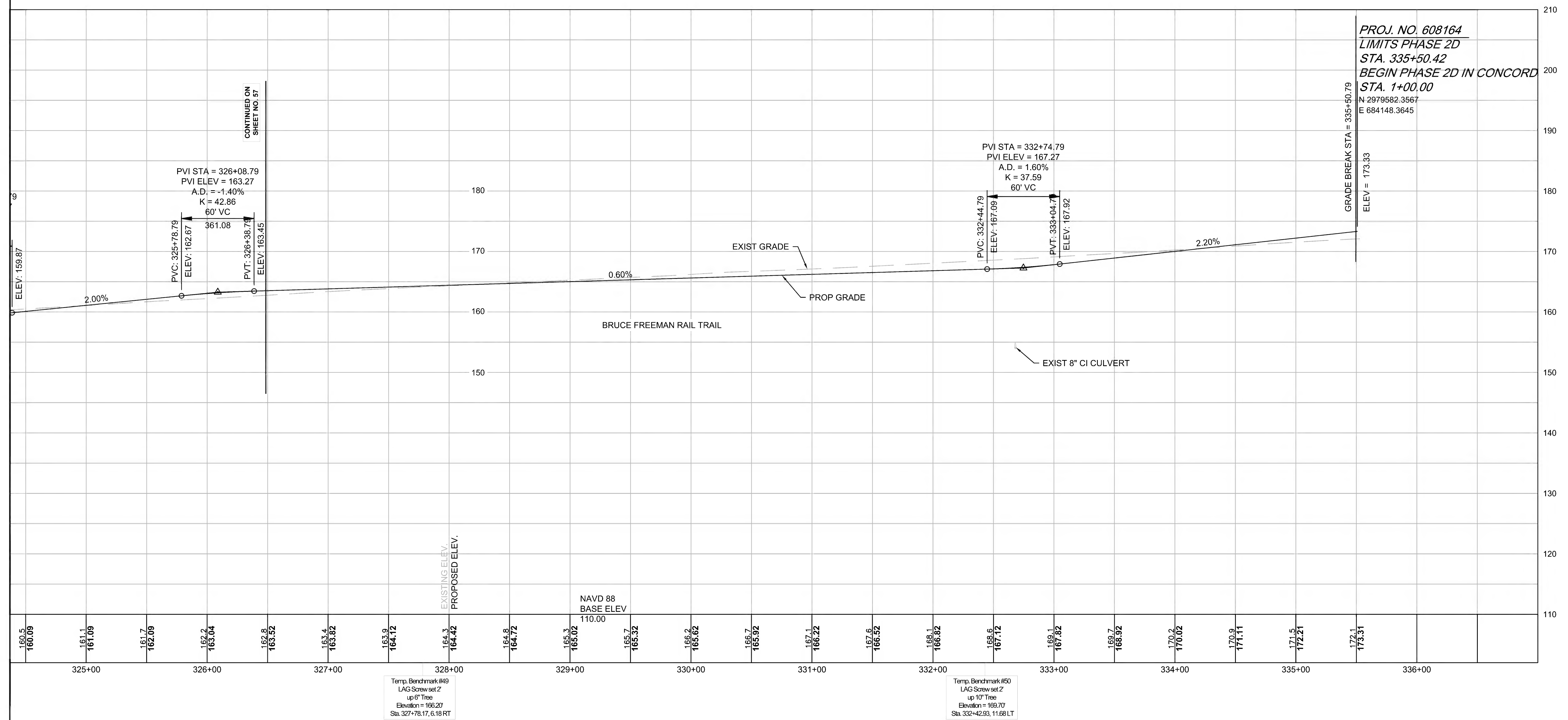
Temp. Benchmark #48  
LAG Screw set 2'  
up 9" Tree  
Elevation = 160.52'  
Sta. 322+61.12, 6.29 RT

Temp. Benchmark #49  
LAG Screw set 1'  
up 6" Tree  
Elevation = 161.52'  
Sta. 327+78.17



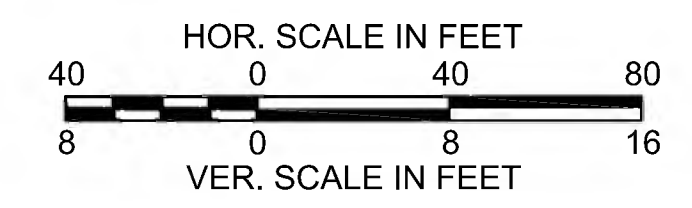
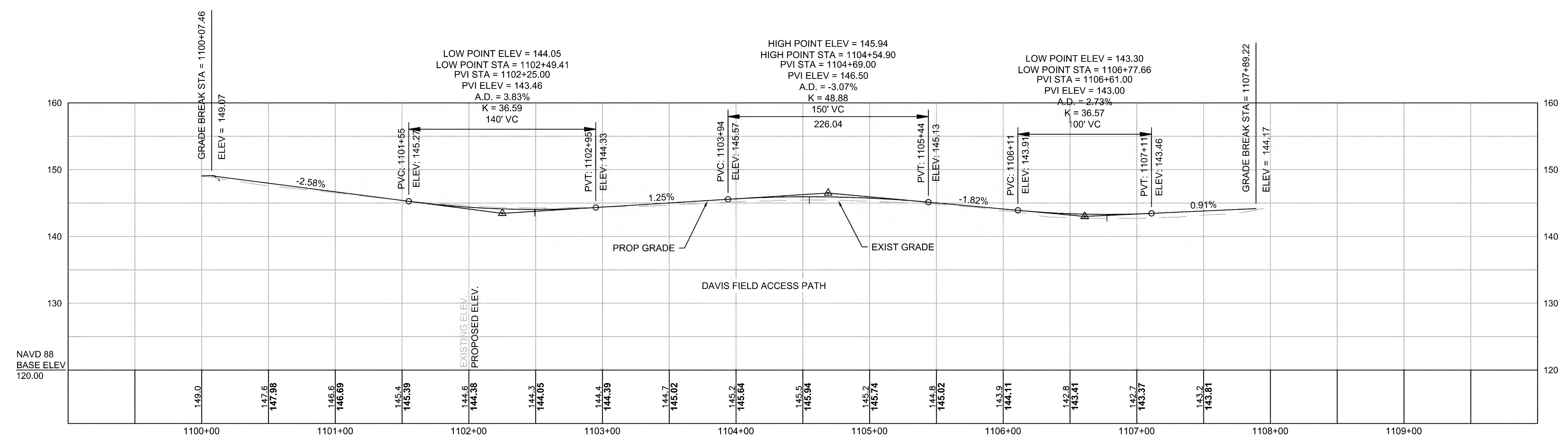
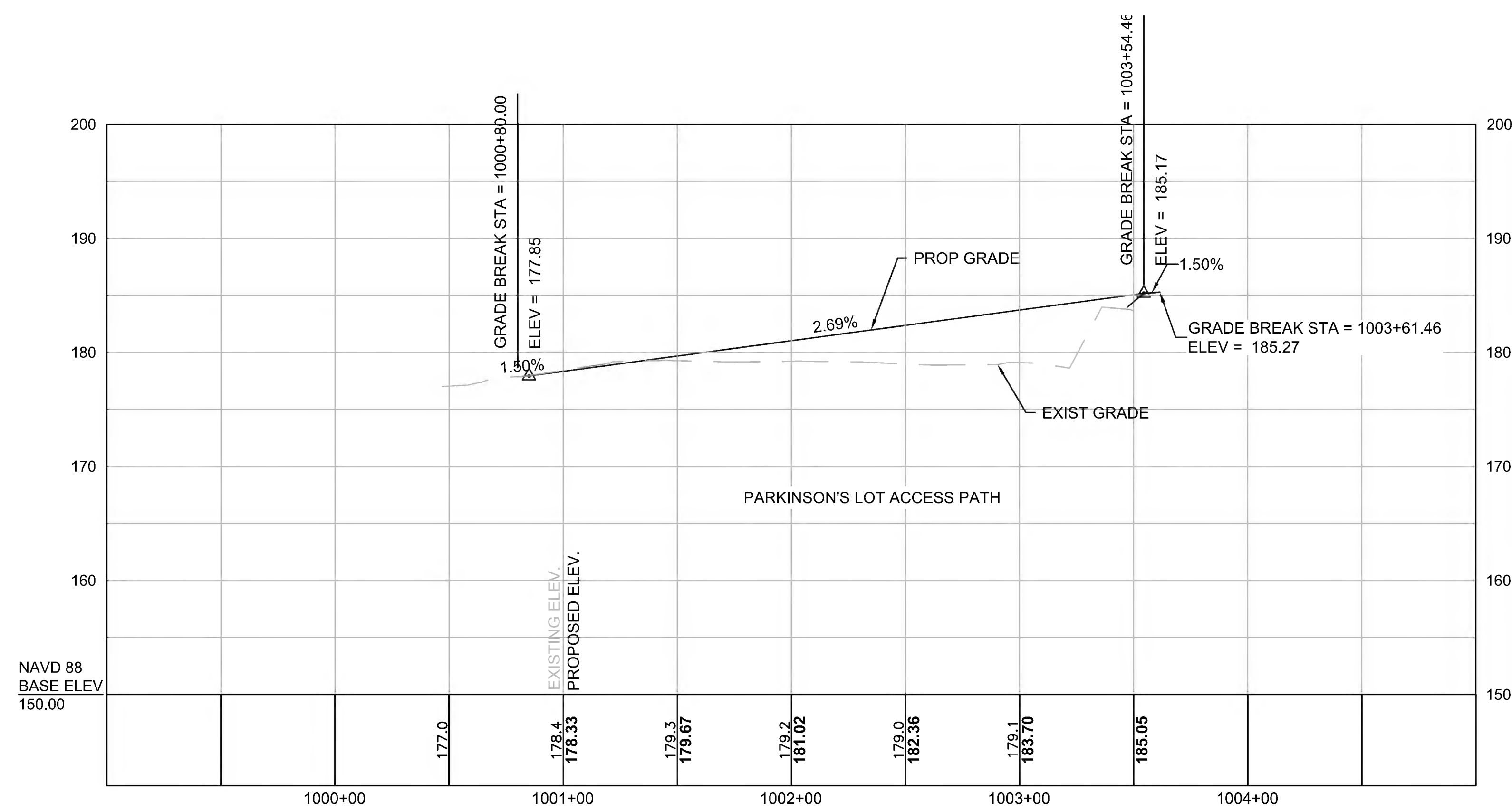
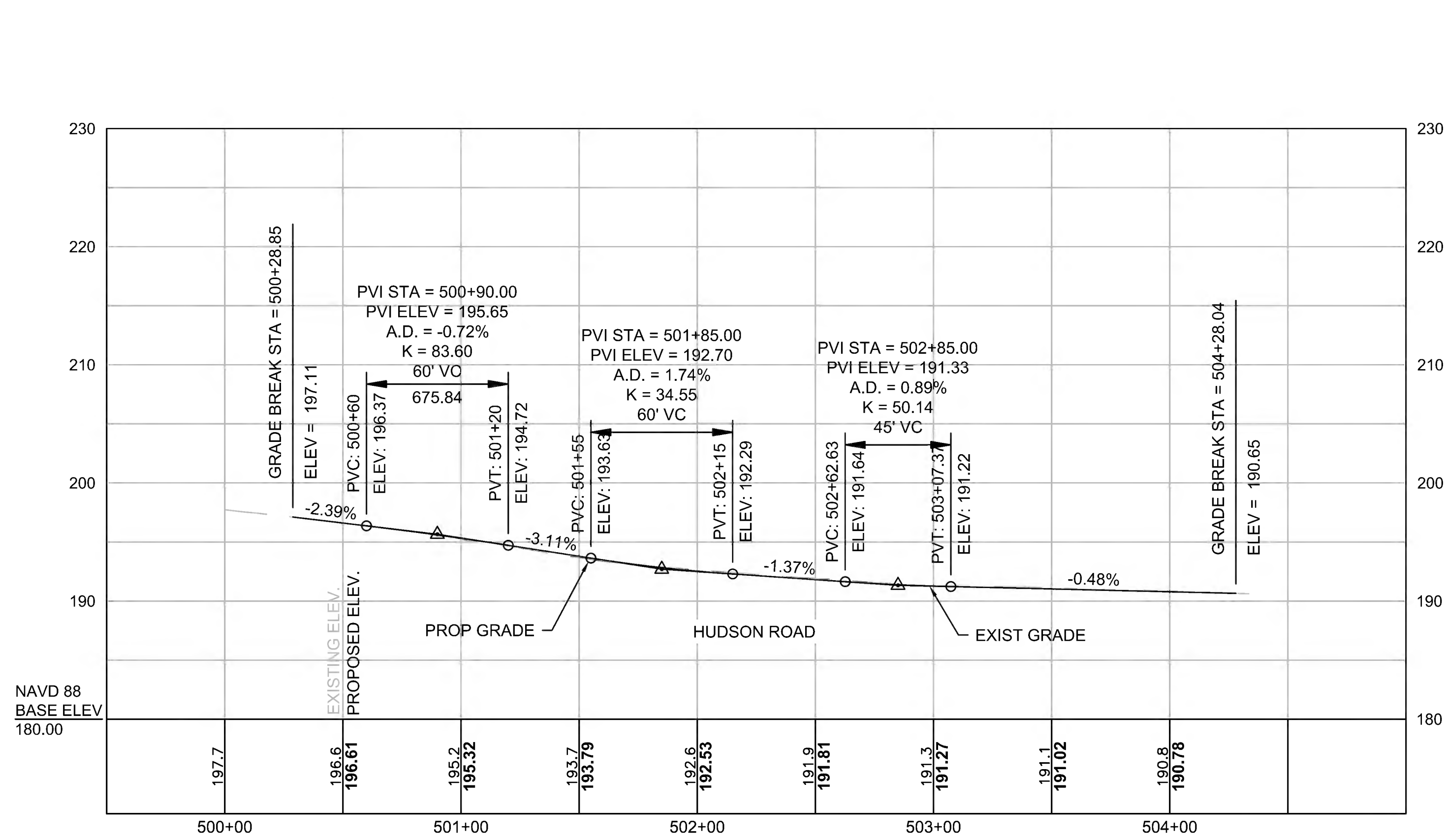
SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	58	319
PROJECT FILE NO.		608164	

**PROFILES**



FOR CONSTRUCTION PLANS SEE SHEET NO. 41 & 42



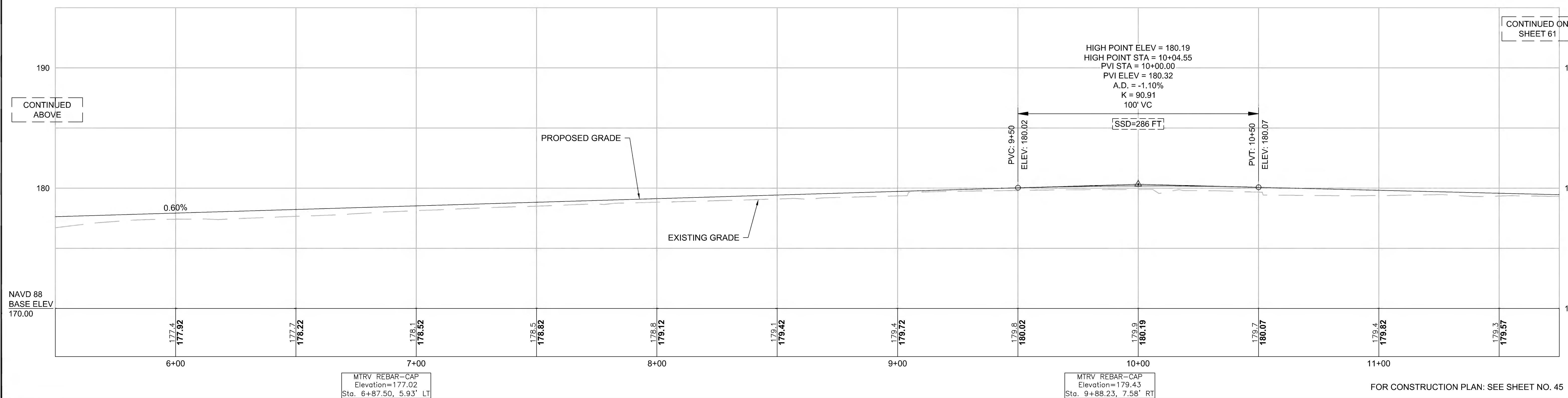
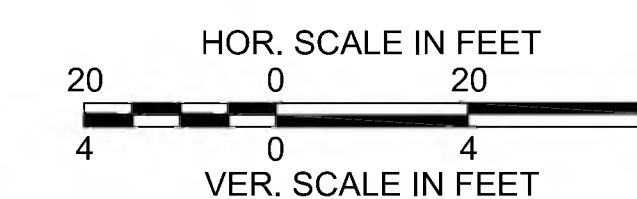
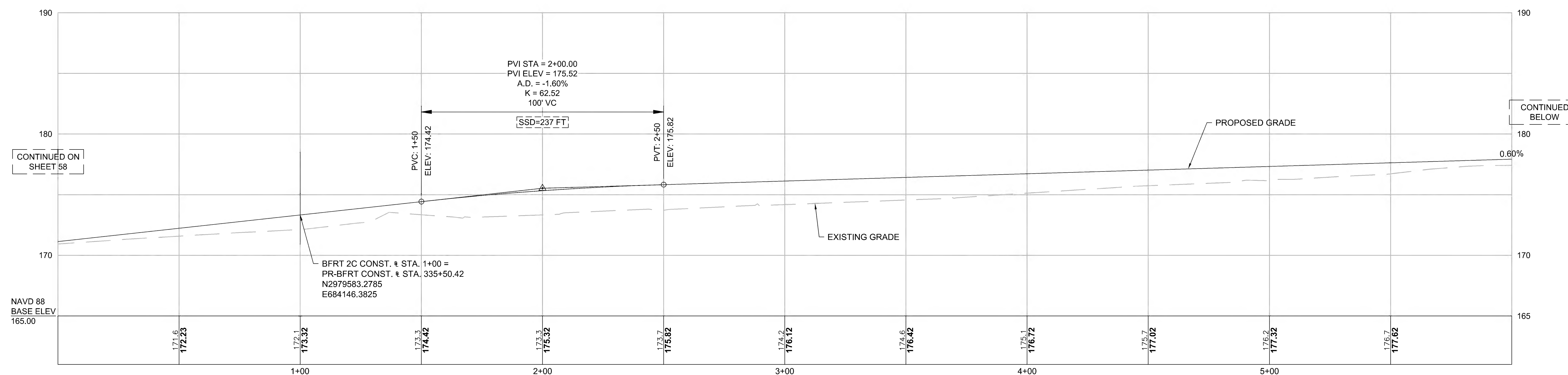




CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	60	319
PROJECT FILE NO.		608164	

CONSTRUCTION PROFILES



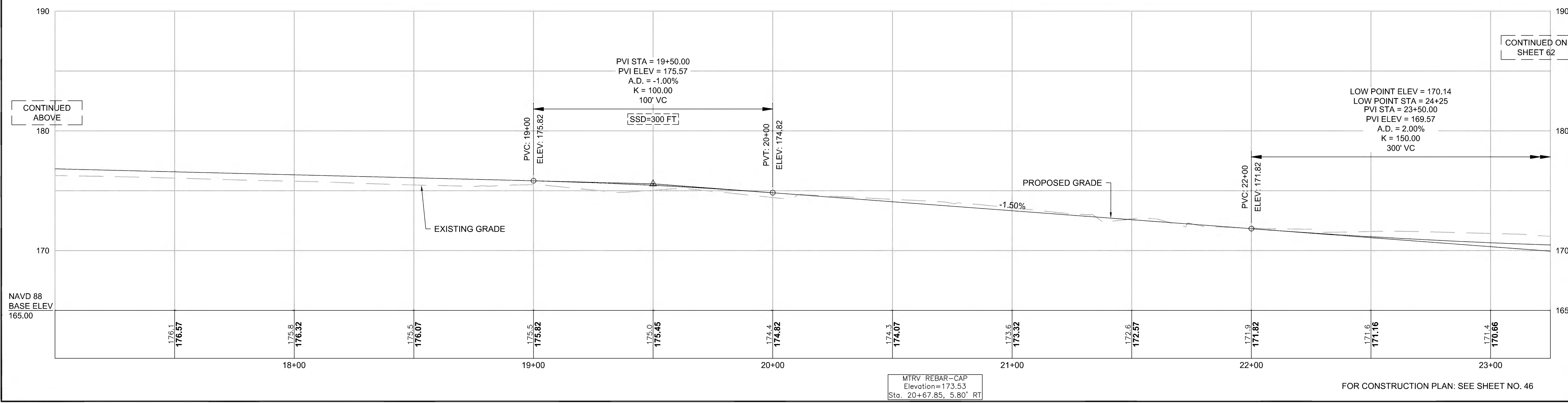
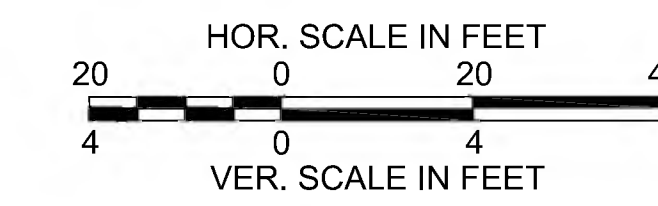
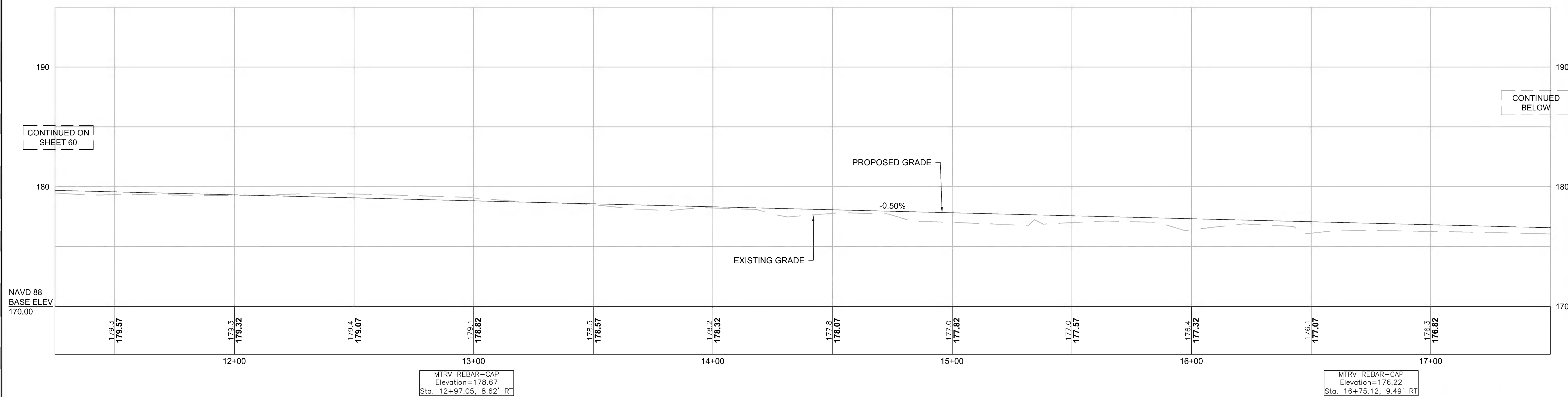
FOR CONSTRUCTION PLAN: SEE SHEET NO. 45



CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	61	319
PROJECT FILE NO.		608164	

CONSTRUCTION PROFILES



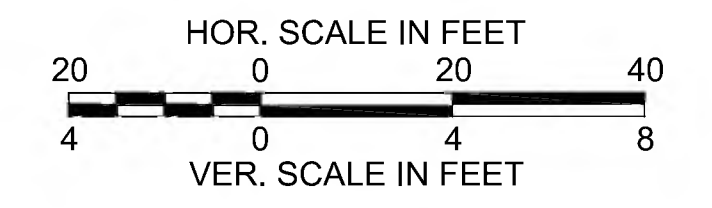
FOR CONSTRUCTION PLAN: SEE SHEET NO. 46



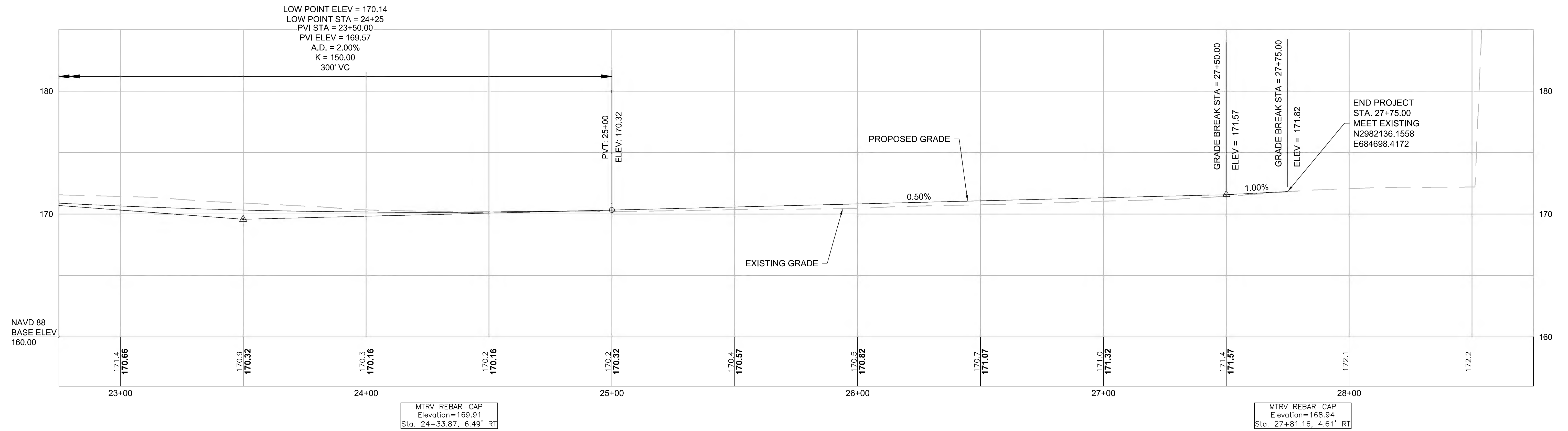
CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	62	319
PROJECT FILE NO.		608164	

CONSTRUCTION PROFILES



CONTINUED ON  
SHEET 61



FOR CONSTRUCTION PLAN: SEE SHEET NO. 47



**SURVEY NOTES**

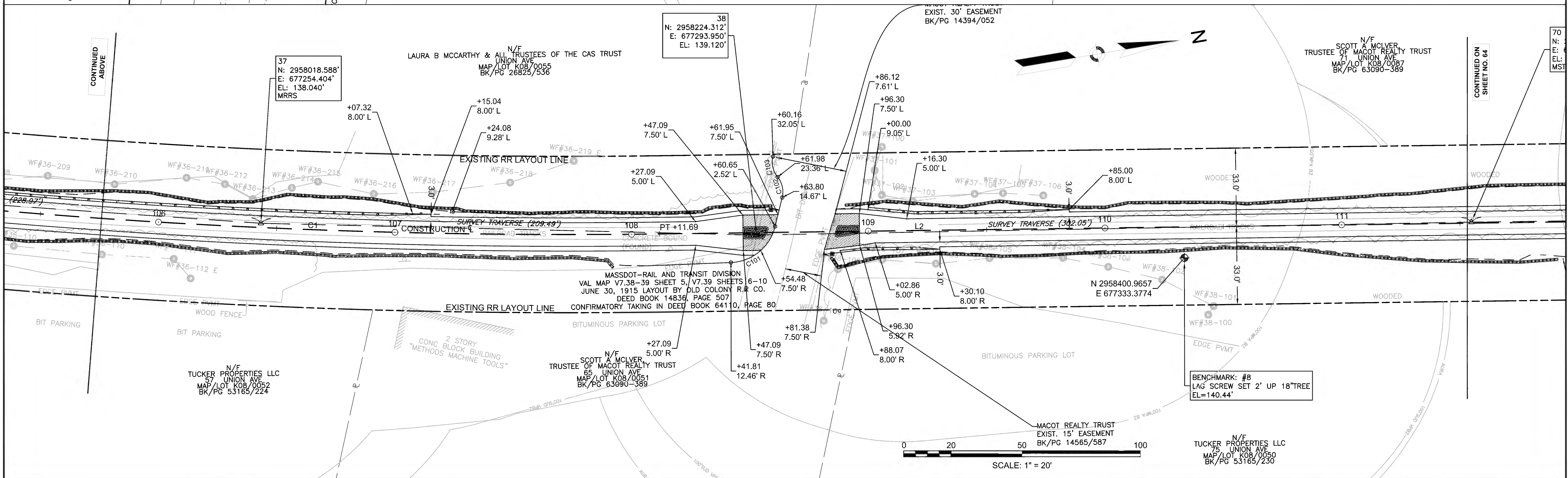
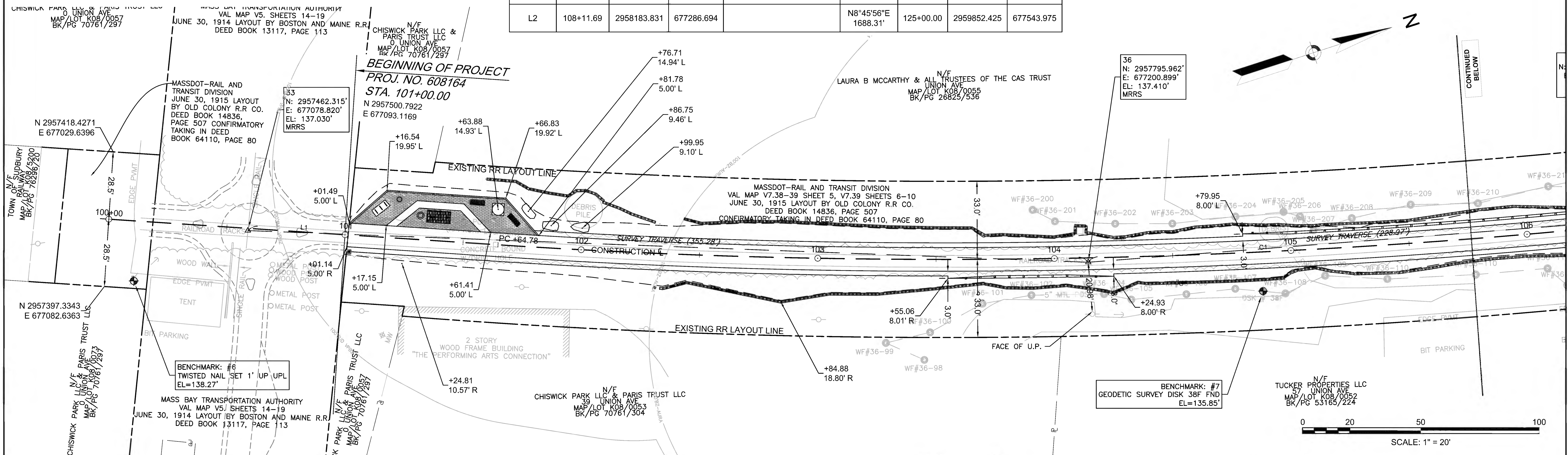
- The railroad right-of-way lines and baselines shown on this plan are based on right of way and track maps for Old Colony R.R. Co. operated by the New York New Haven and Hartford R.R. Co., dated June 30, 1915 the monuments found on this plan were field located and used to establish the right-of-way lines. The property lines of individual owners along the right-of-way are taken from mass-gis data and are not field surveyed.
- The existing conditions shown on this plan are based upon an actual field survey conducted by Vanasse Hangen Brustlin, inc. between November 2014 and June, 2016. Supplementary field survey conducted by GCG Associates from November 2020 through December 2020.
- Horizontal datum is based on MASS. grid system, NAD 1983 (2011) 2010.00 epoch. elevations shown on this plan refer to NAVD of 1988.
- The locations of existing underground utilities shown on this plan are based on field observations and information of record. They are not warranted to be exactly located nor is it warranted that all underground utilities or other structures are shown on this plan.

PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1	100+00.00	2957407.881	677056.138		N21°42'10"E 164.78'	101+64.78	2957560.979	677117.071
C1	101+64.78	2957560.979	677117.071	R=2865.00' L=646.91' Δ=12°56'14" T=324.84'		108+11.69	2958183.831	677286.694
L2	108+11.69	2958183.831	677286.694		N8°45'56"E 1688.31'	125+00.00	2959852.425	677543.975

CURVE TABLE				
CURVE NO.	LENGTH	RADIUS	DELTA	TANGENT
C101	25.83	20.00	73°59'52.19"	15.07
C102	9.20	10.00	52°42'20.45"	4.95
C103	9.20	10.00	52°42'20.45"	4.95

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	63	319
PROJECT FILE NO.		608164	

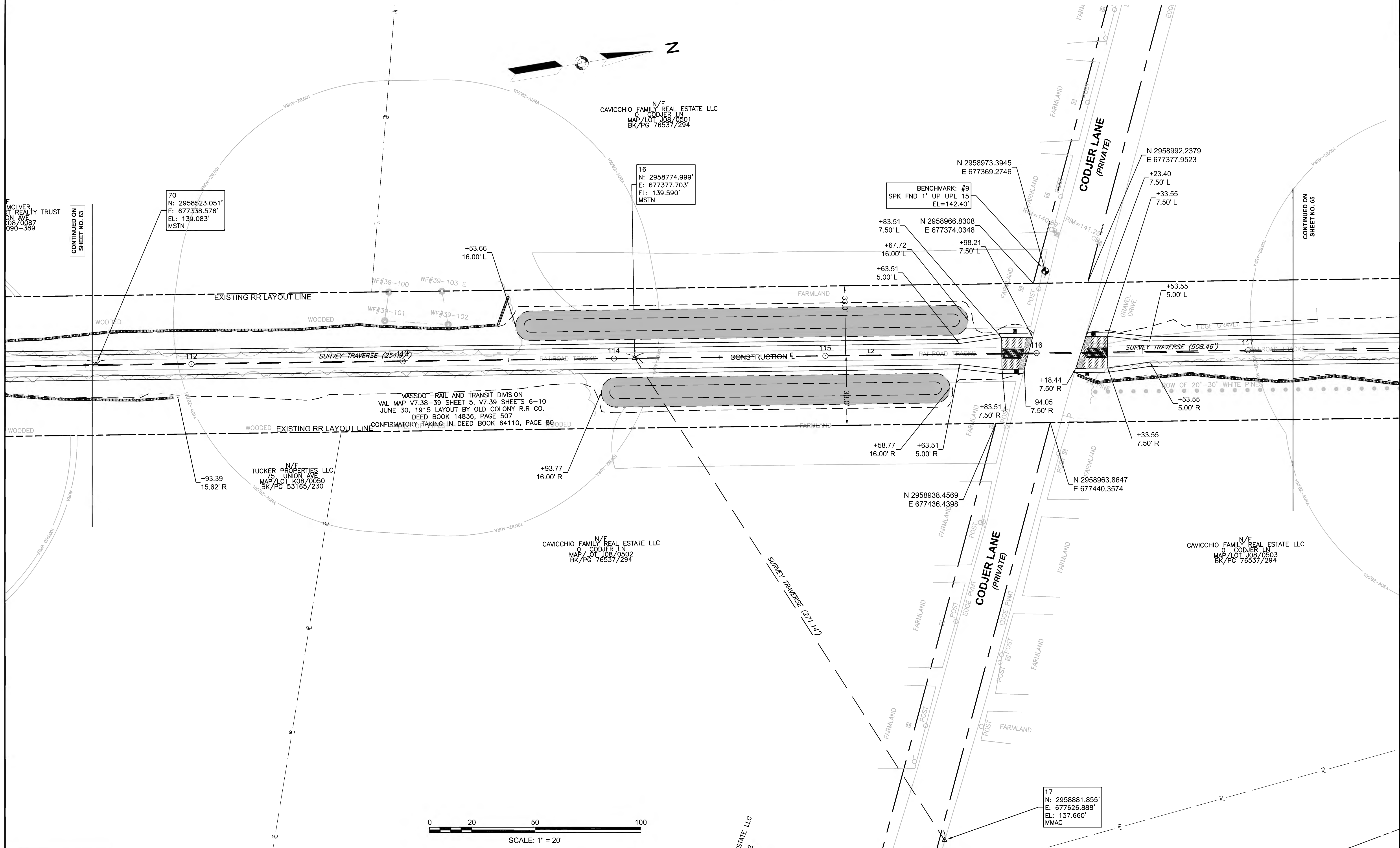
**CURB & BASELINE TIE PLANS**





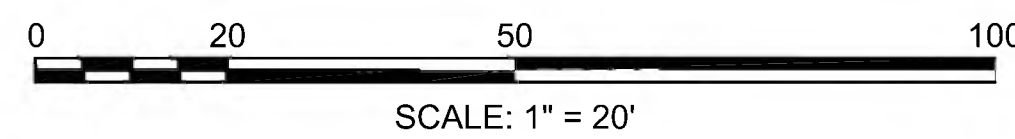
PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L2	108+11.69	2958183.831	677286.694		N8°45'56"E 1688.31'	125+00.00	2959852.425	677543.975

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	64	319
PROJECT FILE NO.		608164	
CURB & BASELINE TIE PLANS			



CONTINUED ON  
SHEET NO. 63

CONTINUED ON  
SHEET NO. 65



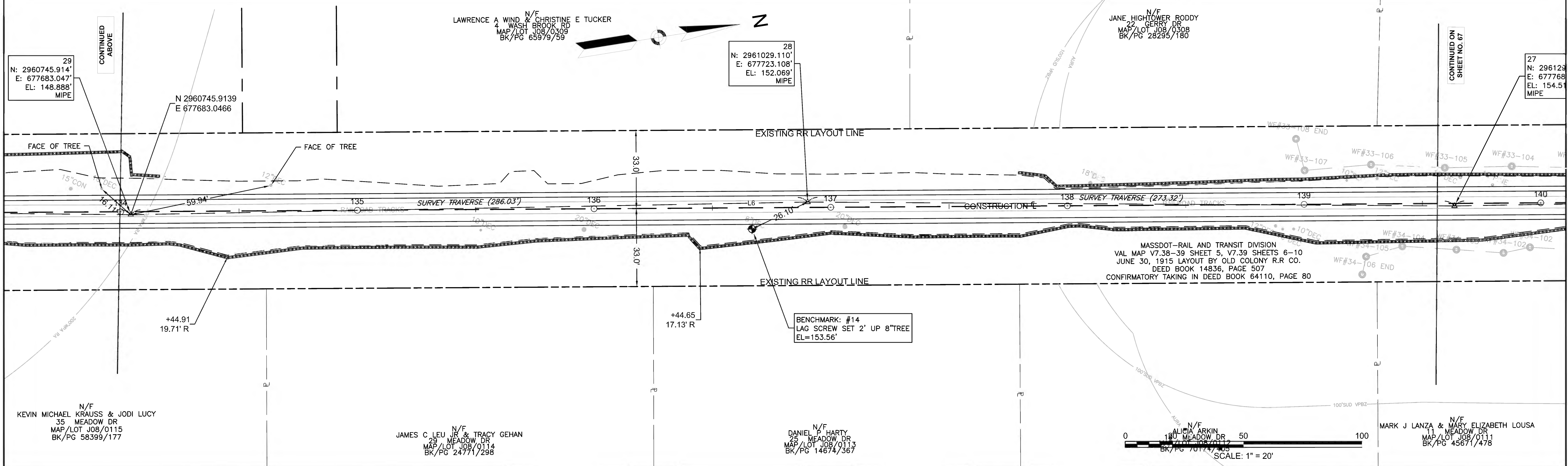
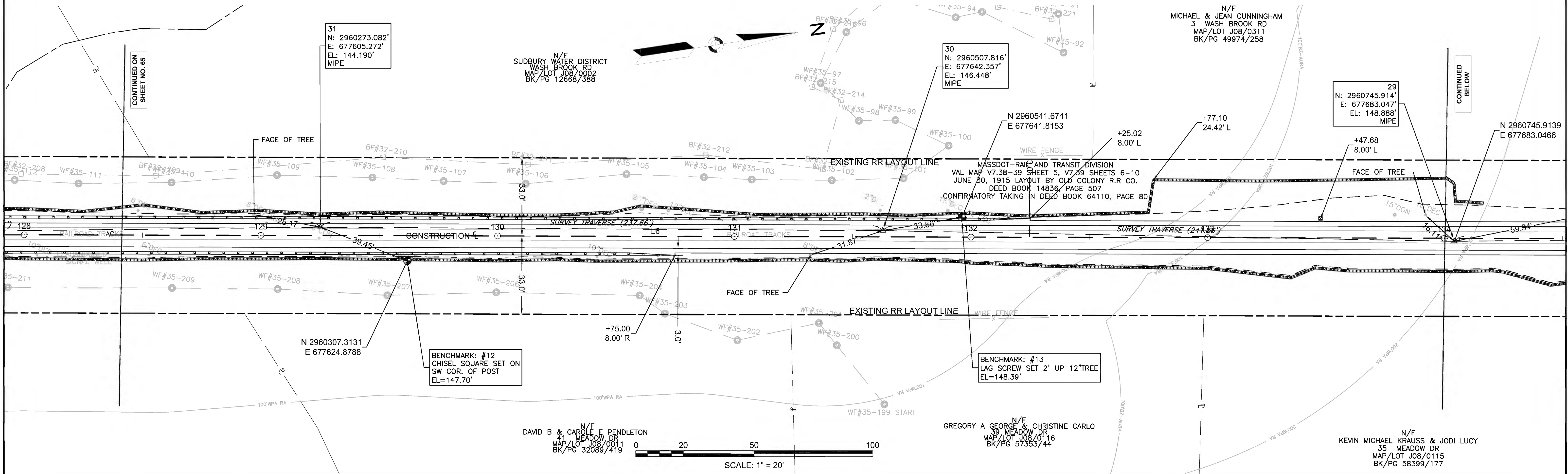






PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L6	127+19.64	2960069.485	677577.443		N8°45'56"E 1556.13'	142+75.77	2961607.441	677814.581

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	66	319
PROJECT FILE NO.		608164	
CURB & BASELINE TIE PLANS			

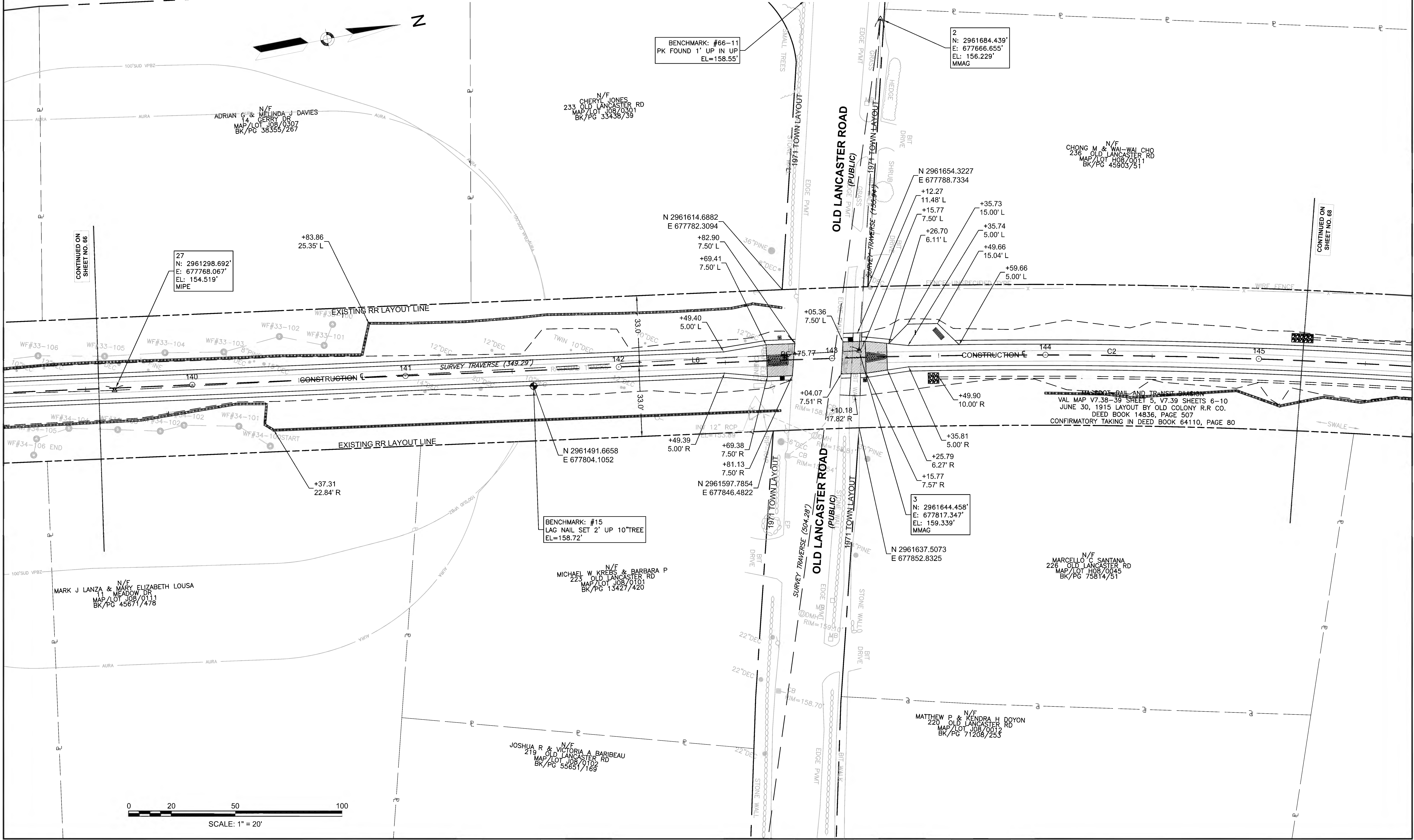


608164\_HDCURB & BASELINE TIE PLANS.DWG Plotted on 27-Jun-2022 10:03 AM



PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L6	127+19.64	2960069.485	677577.443		N8°45'56"E 1556.13'	142+75.77	2961607.441	677814.581
C2	142+75.77	2961607.441	677814.581	R=2865.00 Δ=16°09'23" L=807.88' T=406.64'		150+83.65	2962378.104	678047.899

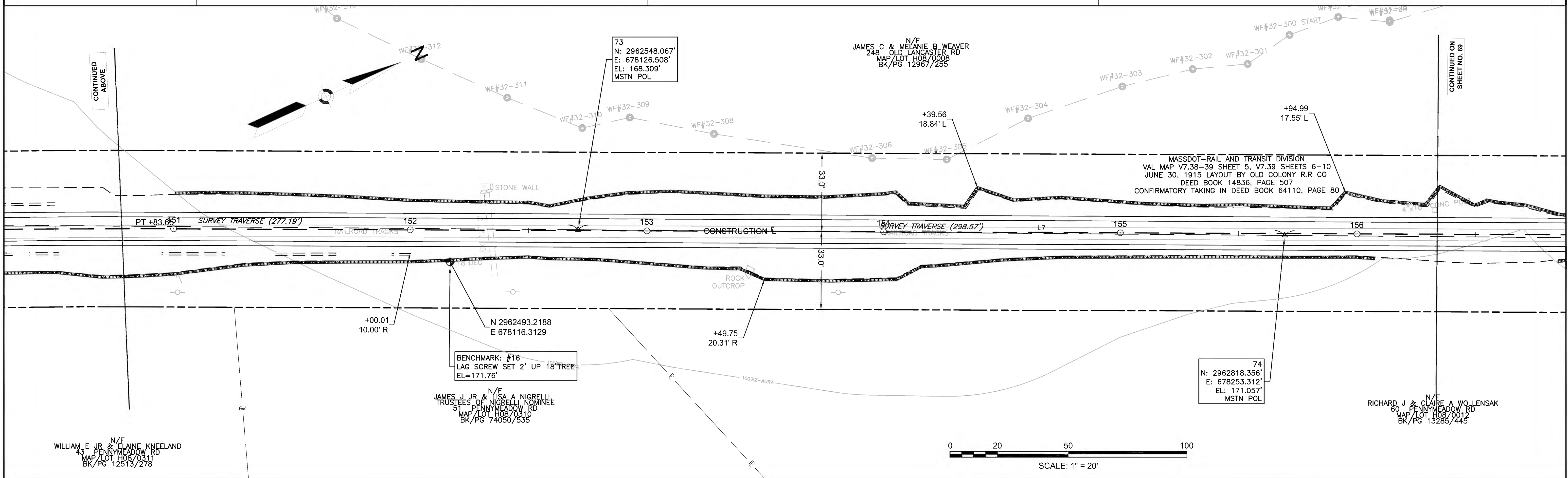
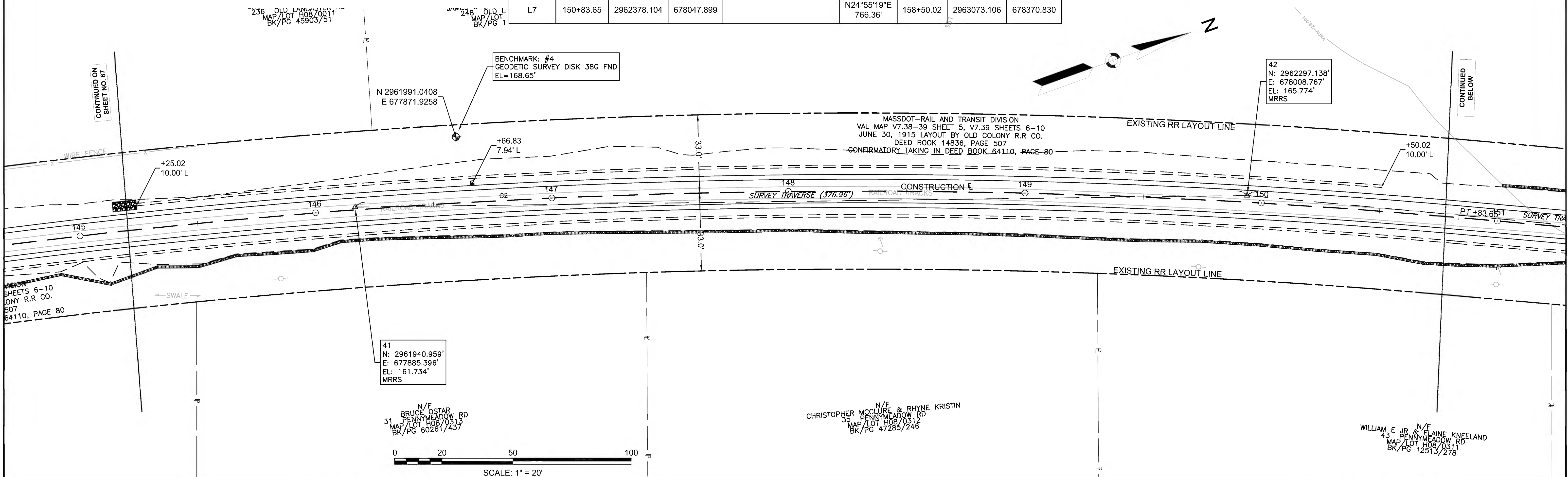
SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	67	319
PROJECT FILE NO.		608164	
CURB & BASELINE TIE PLANS			





PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C2	142+75.77	2961607.441	677814.581	R -2865.00 Δ= 16°09'23" L=807.88' T=406.64'		150+83.65	2962378.104	678047.899
L7	150+83.65	2962378.104	678047.899		N24°55'19"E 766.36'	158+50.02	2963073.106	678370.830

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	68	319
PROJECT FILE NO. 608164			
CURB & BASELINE TIE PLANS			



608164 - HD/CURB & BASELINE TIE PLANS.DWG Plotted on 27-Jun-2022 10:04 AM

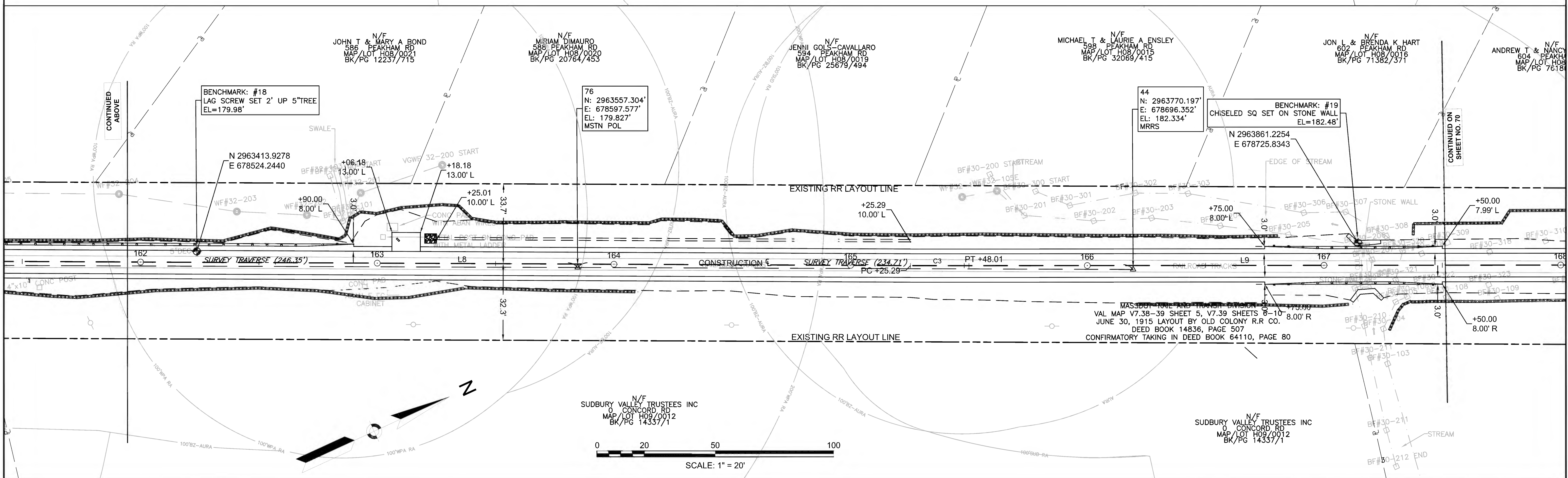
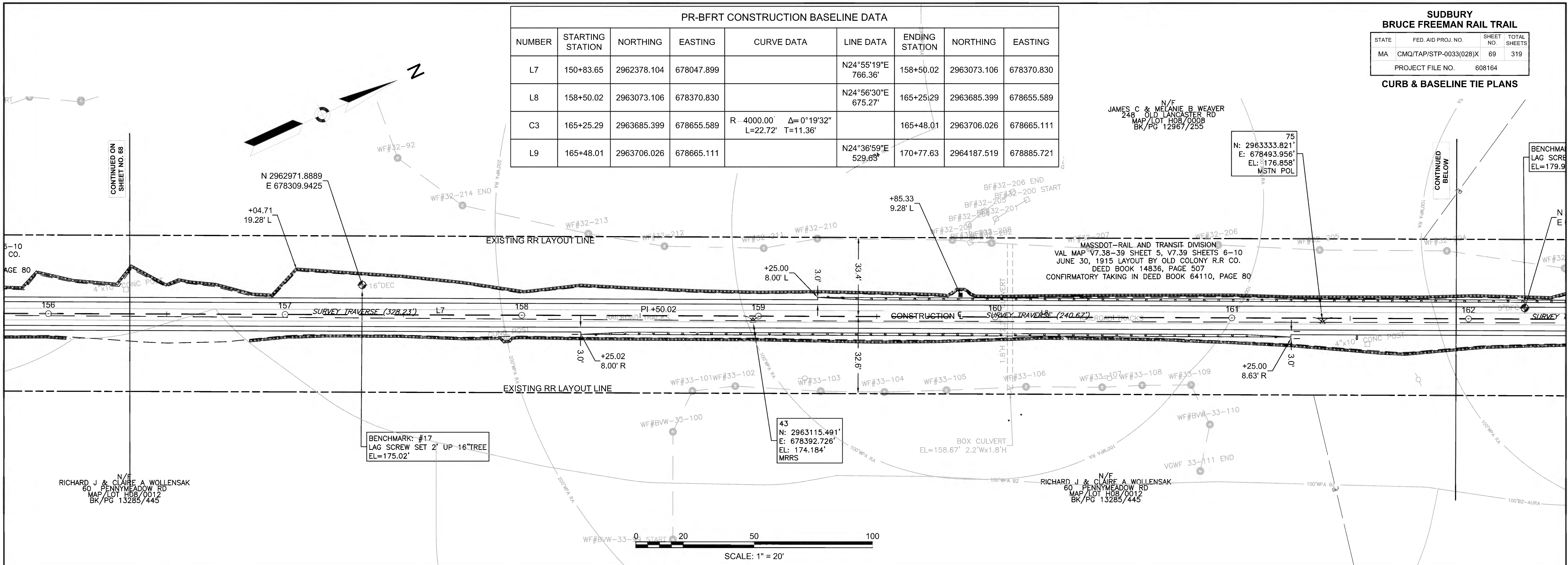


PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L7	150+83.65	2962378.104	678047.899		N24°55'19"E 766.36'	158+50.02	2963073.106	678370.830
L8	158+50.02	2963073.106	678370.830		N24°56'30"E 675.27'	165+25.29	2963685.399	678655.589
C3	165+25.29	2963685.399	678655.589	R - 4000.00 L=22.72' T=11.36'		165+48.01	2963706.026	678665.111
L9	165+48.01	2963706.026	678665.111		N24°36'59"E 529.63'	170+77.63	2964187.519	678885.721

**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	69	319
PROJECT FILE NO.		608164	

**CURB & BASELINE TIE PLANS**



608164\_HDCURB & BASELINE TIE PLANS.DWG Plotted on 27-Jun-2022 10:05 AM

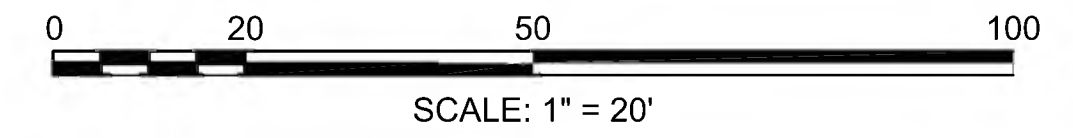
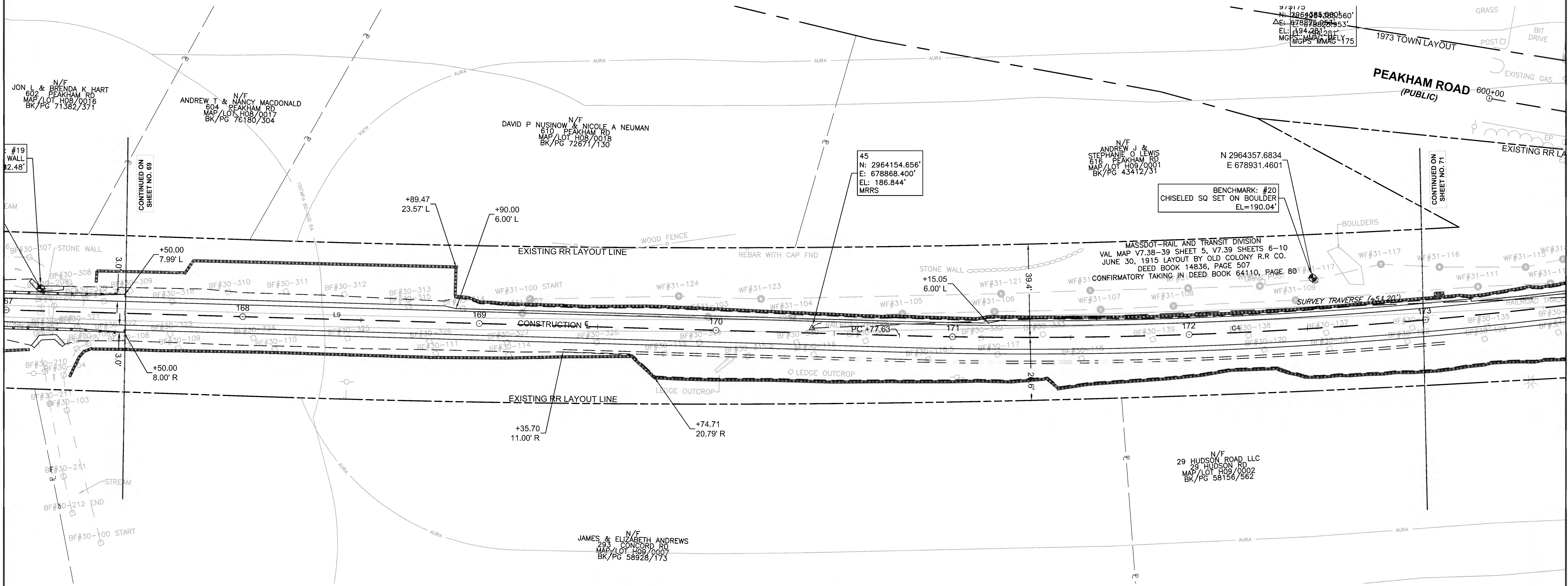
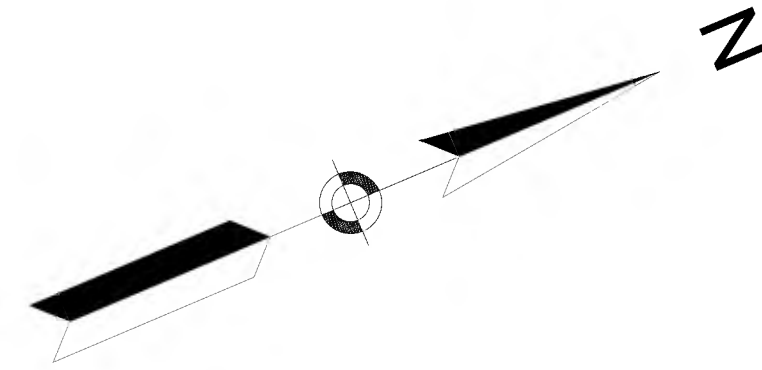


PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L9	165+48.01	2963706.026	678665.111		N24°36'59"E 529.63'	170+77.63	2964187.519	678885.721
C4	170+77.63	2964187.519	678885.721	R=1900.00' Δ=10°57'17" L=363.27' T=182.19'		174+40.91	2964530.189	679004.642

**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	70	319

PROJECT FILE NO. 608164  
**CURB & BASELINE TIE PLANS**



608164 - HD(CURB & BASELINE TIE PLANS).DWG Plotted on 27-Jun-2022 10:05 AM

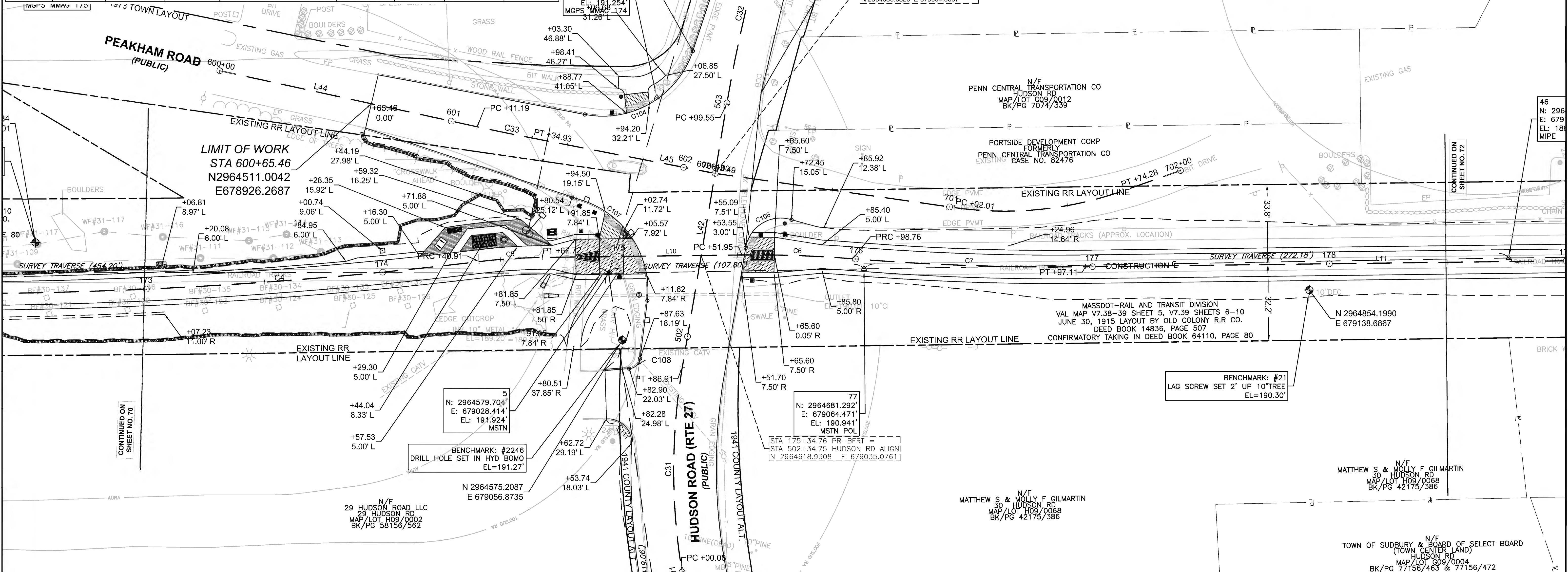


PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C4	170+77.63	2964187.519	678885.721	R=1900.00' Δ=10°57'17" L=363.27' T=182.19'		174+40.91	2964530.189	679004.642
C5	174+40.91	2964530.189	679004.642	R=250.00' Δ=6°08'42" L=26.81' T=13.42'		174+67.72	2964555.854	679012.359
L10	174+67.72	2964555.854	679012.359		N19°48'24"E 84.23'	175+51.95	2964635.105	679040.901
C6	175+51.95	2964635.105	679040.901	R=500.00' Δ=5°21'48" L=46.81' T=23.42'		175+98.76	2964678.335	679058.797
C7	175+98.76	2964678.335	679058.797	R=1050.00' Δ=5°22'01" L=98.36' T=49.21'		176+97.11	2964769.179	679096.401
L11	176+97.11	2964769.179	679096.401		N19°48'11"E 225.82'	179+22.94	2964981.648	679172.907

CURVE TABLE				
CURVE NO.	LENGTH	RADIUS	DELTA	TANGENT
C104	57.74	40.00	82°42'36.78"	35.21
C106	25.74	15.02	98°10'46.34"	17.33
C107	59.15	40.00	84°43'39.51"	36.48
C108	6.86	5.00	78°36'27.63"	4.09
C111	16.70	10.05	95°15'25.87"	11.01

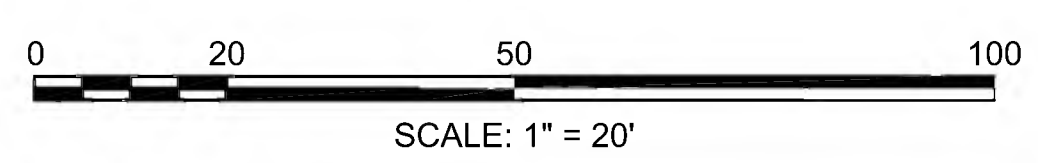
BRUCE FREEMAN RAIL TRAIL			
STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	71	319
PROJECT FILE NO. 608164			

CURB & BASELINE TIE PLANS



PEAKHAM CL CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L44	600+00.00	2964455.986	678890.793		N32°48'51"E 111.19'	601+11.19	2964549.437	678951.050
C33	601+11.19	2964549.437	678951.050	R=1000.00' Δ=1°21'36" L=23.74' T=11.87'		601+34.93	2964569.536	678963.675
L45	601+34.93	2964569.536	678963.675		N31°27'15"E 78.56'	602+13.49	2964636.552	679004.669

HUDSON RD ALIGN CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L40	500+00.00	2964547.903	679256.040		N81°35'18"W 45.35'	500+45.35	2964554.537	679211.180
C30	500+45.35	2964554.537	679211.180	R=500.00' Δ=2°41'32" L=23.49' T=11.75'		500+68.84	2964558.518	679188.029
L41	500+68.84	2964558.518	679188.029		N78°53'46"W 31.23'	501+00.08	2964564.534	679157.380
C31	501+00.08	2964564.534	679157.380	R=262.00' Δ=18°59'19" L=86.83' T=43.82'		501+86.91	2964594.942	679076.472
L42	501+86.91	2964594.942	679076.472		N59°54'27"W 112.64'	502+99.55	2964651.420	678979.012
C32	502+99.55	2964651.420	678979.012	R=600.00' Δ=7°21'27" L=77.05' T=38.58'		503+76.60	2964694.220	678915.008
L43	503+76.60	2964694.220	678915.008		N52°33'00"W 53.40'	504+30.00	2964726.692	678872.613

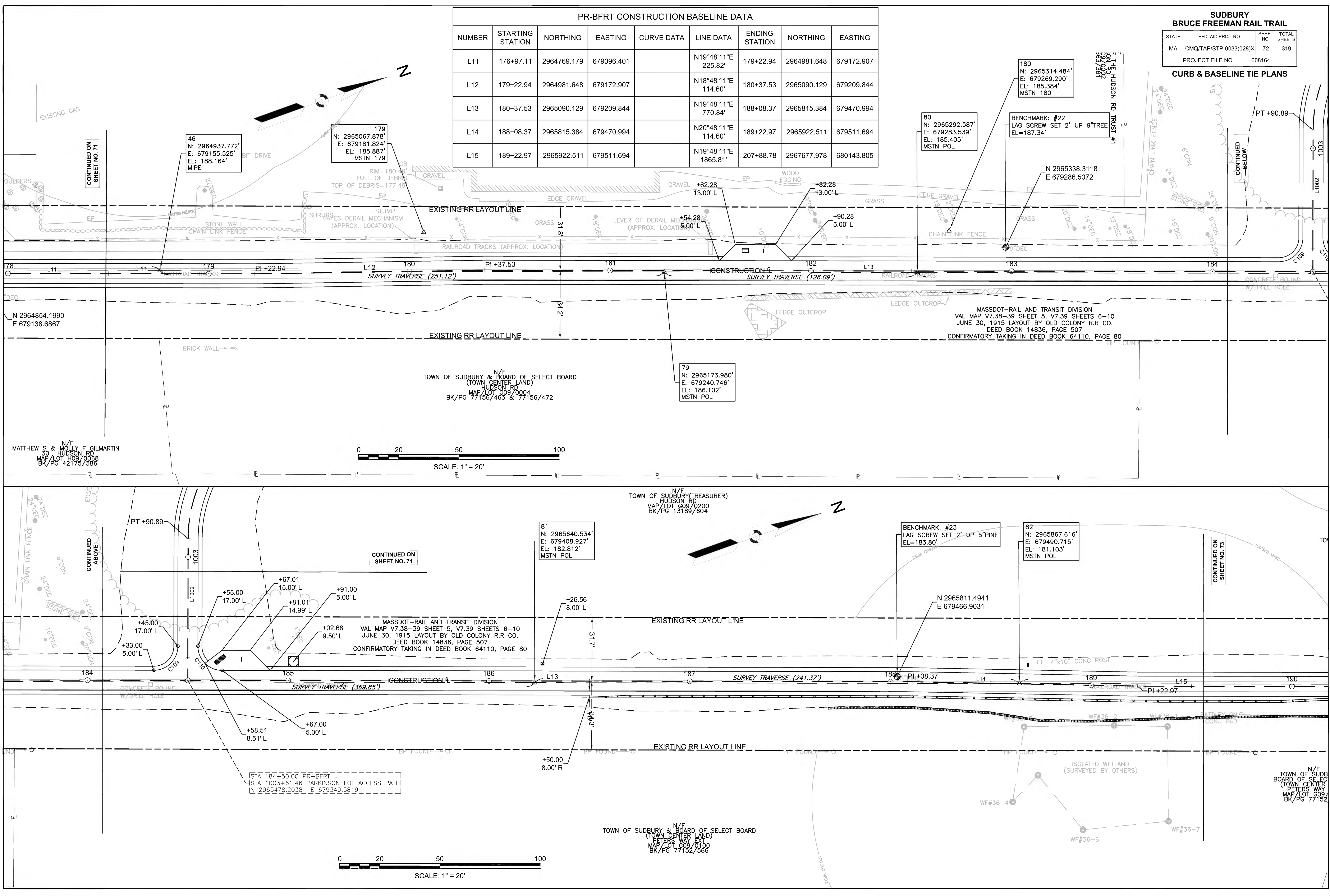




PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L11	176+97.11	2964769.179	679096.401		N19°48'11"E 225.82'	179+22.94	2964981.648	679172.907
L12	179+22.94	2964981.648	679172.907		N18°48'11"E 114.60'	180+37.53	2965090.129	679209.844
L13	180+37.53	2965090.129	679209.844		N19°48'11"E 770.84'	188+08.37	2965815.384	679470.994
L14	188+08.37	2965815.384	679470.994		N20°48'11"E 114.60'	189+22.97	2965922.511	679511.694
L15	189+22.97	2965922.511	679511.694		N19°48'11"E 1865.81'	207+88.78	2967677.978	680143.805

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	72	319
PROJECT FILE NO.		608164	

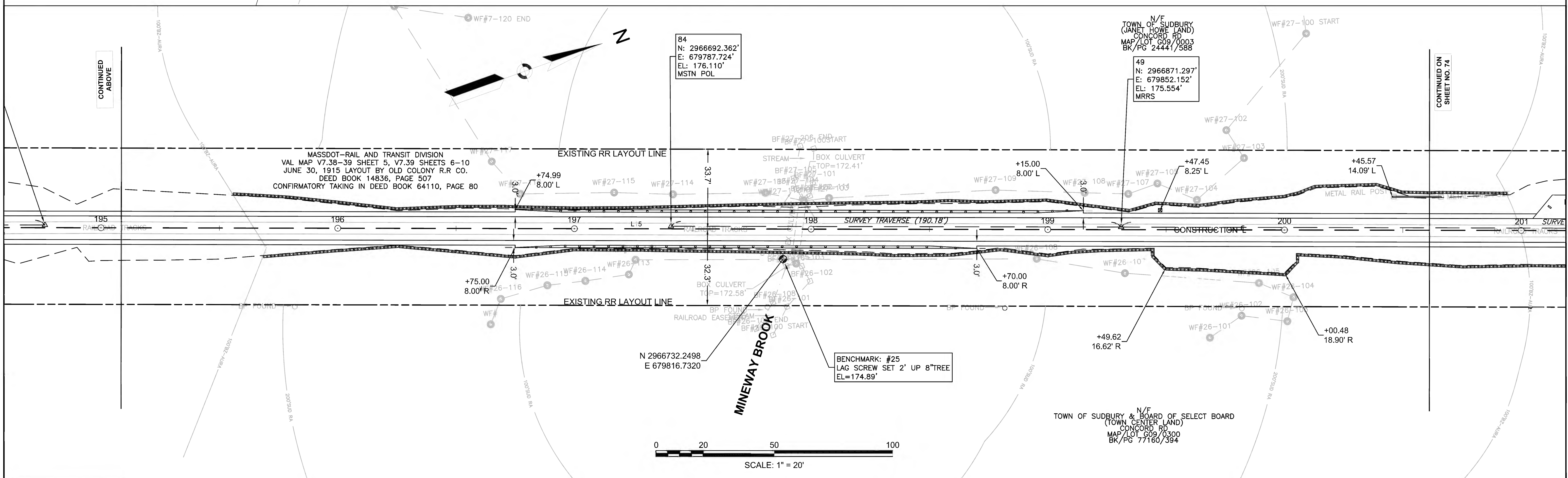
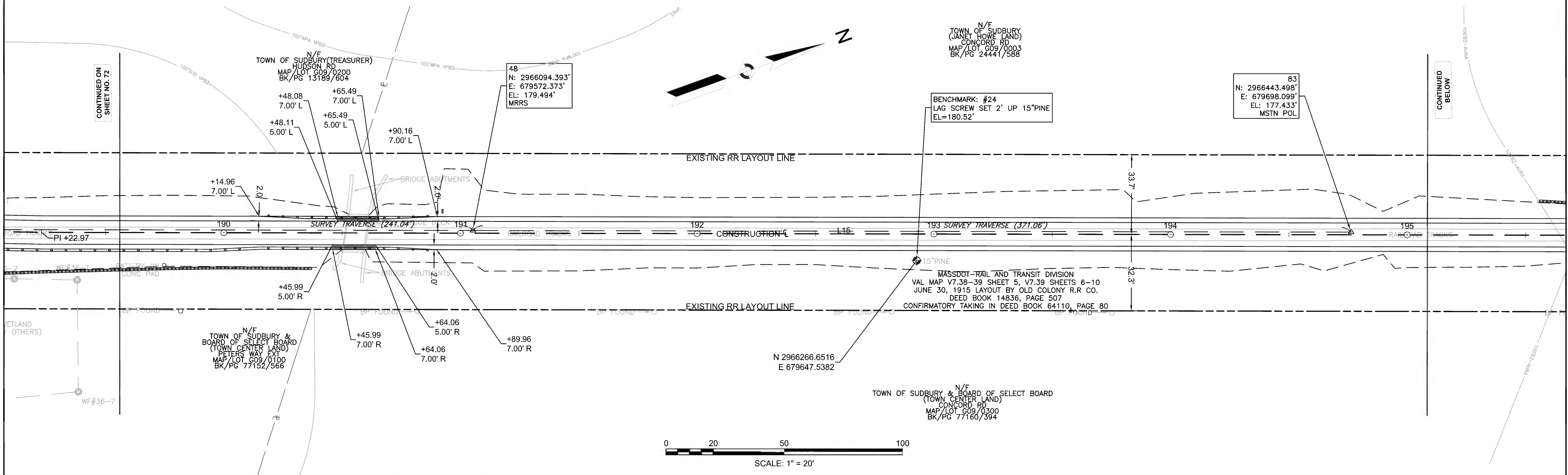
CURB & BASELINE TIE PLANS





PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L15	189+22.97	2965922.511	679511.694		N19°48'11"E 1865.81'	207+88.78	2967677.978	680143.805

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	73	319
PROJECT FILE NO.		608164	
CURB & BASELINE TIE PLANS			



608164\_HDCURB & BASELINE TIE PLANS.DWG Plotted on 27-Jun-2022 10:07 AM



PR-BFRT CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L15	189+22.97	2965922.511	679511.694		N19°48'11"E 1865.81'	207+88.78	2967677.978	680143.805
C8	207+88.78	2967677.978	680143.805	R=4000.00' Δ=0°52'18" L=60.86' T=30.43'		208+49.64	2967735.395	680163.988
L16	208+49.64	2967735.395	680163.988		N18°55'52"E 139.23'	209+88.86	2967867.089	680209.157
C9	209+88.86	2967867.089	680209.157	R=4000.00' Δ=0°52'31" L=61.11' T=30.55'		210+49.97	2967924.739	680229.423
L17	210+49.97	2967924.739	680229.423		N19°48'24"E 131.71'	211+81.68	2968048.655	680274.052

**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

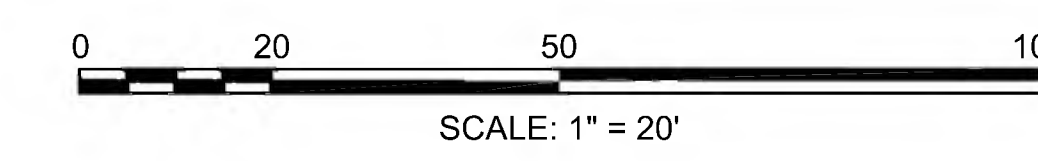
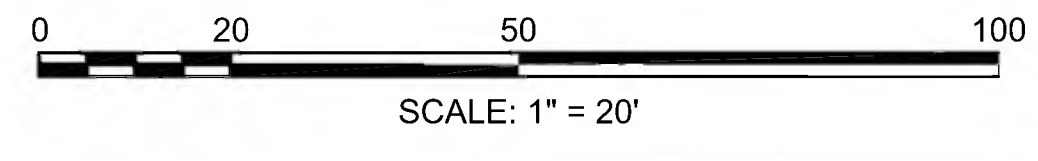
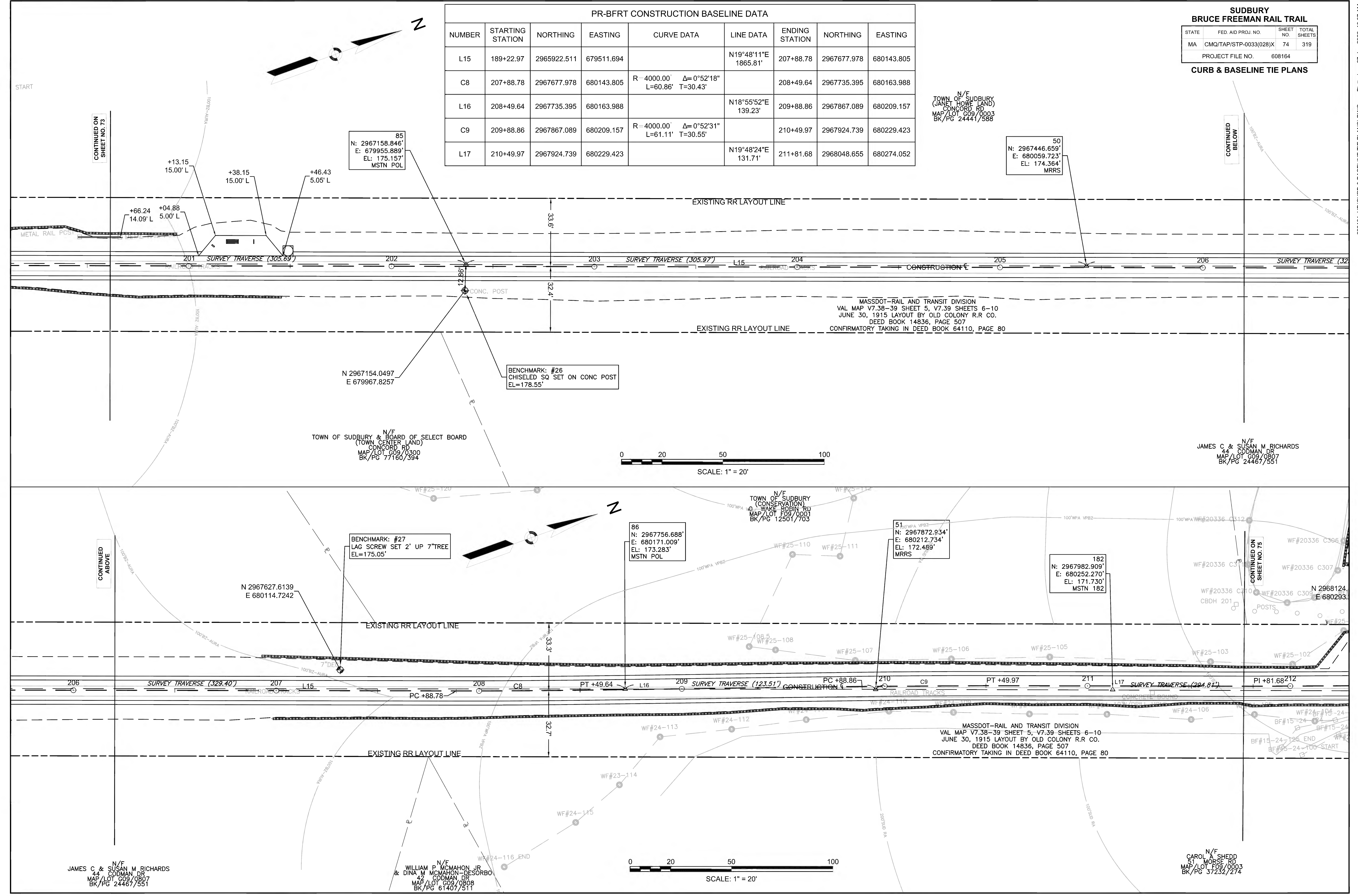
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	74	319

PROJECT FILE NO. 608164

**CURB & BASELINE TIE PLANS**

TOWN OF SUDBURY  
(JANET HOWE LAND)  
CONCORD RD  
MAP/LOT G09/0003  
BK/PG 24441/588

50  
N: 2967446.659'  
E: 680059.723'  
EL: 174.364'  
MRRS



CONTINUED ON  
SHEET NO. 73

CONTINUED  
BELOW

CONTINUED  
ABOVE

CONTINUED ON  
SHEET NO. 75

JAMES C & SUSAN M RICHARDS  
44 CODMAN DR  
MAP/LOT G09/0807  
BK/PG 24467/551

WILLIAM P MCMAHON JR  
& DINA M MCMAHON-DESORBO  
42 CODMAN DR  
MAP/LOT G09/0808  
BK/PG 61407/511

CAROL A SHEDD  
51 MORSE RD  
MAP/LOT F09/0003  
BK/PG 37232/274



PR-BFRT CONSTRUCTION BASELINE DATA

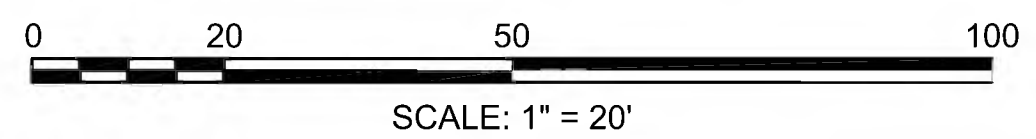
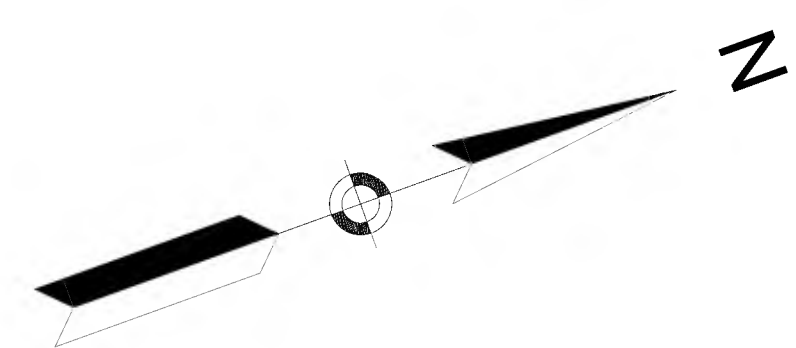
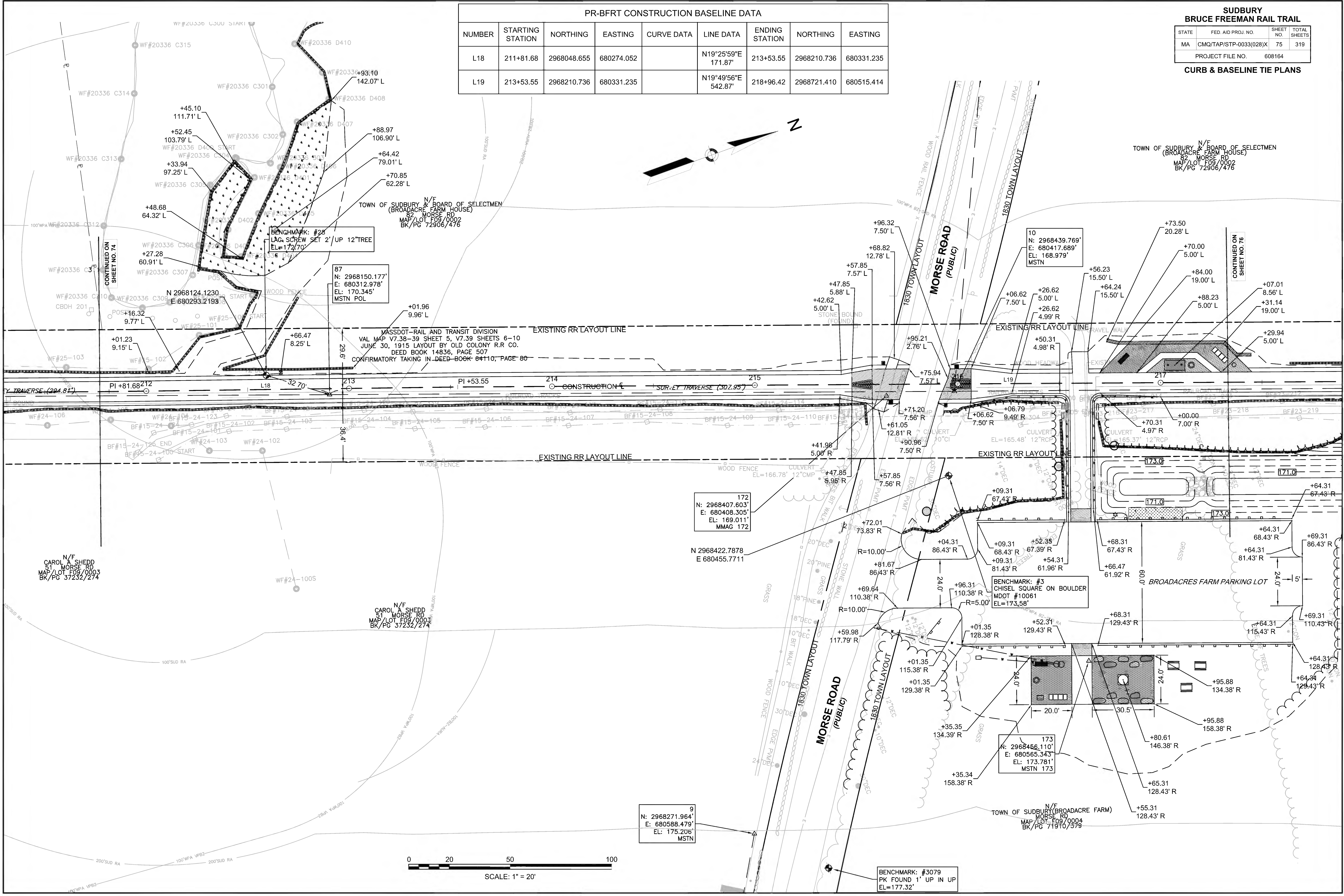
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L18	211+81.68	2968048.655	680274.052		N19°25'59"E 171.87'	213+53.55	2968210.736	680331.235
L19	213+53.55	2968210.736	680331.235		N19°49'56"E 542.87'	218+96.42	2968721.410	680515.414

SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	75	319

PROJECT FILE NO. 608164

CURB & BASELINE TIE PLANS





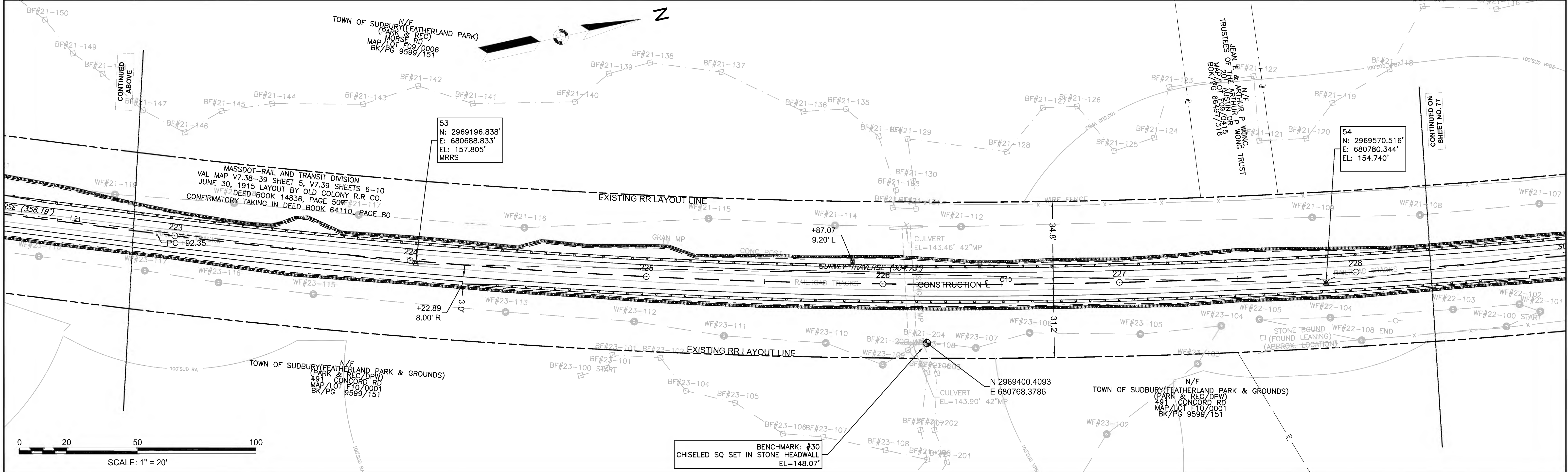
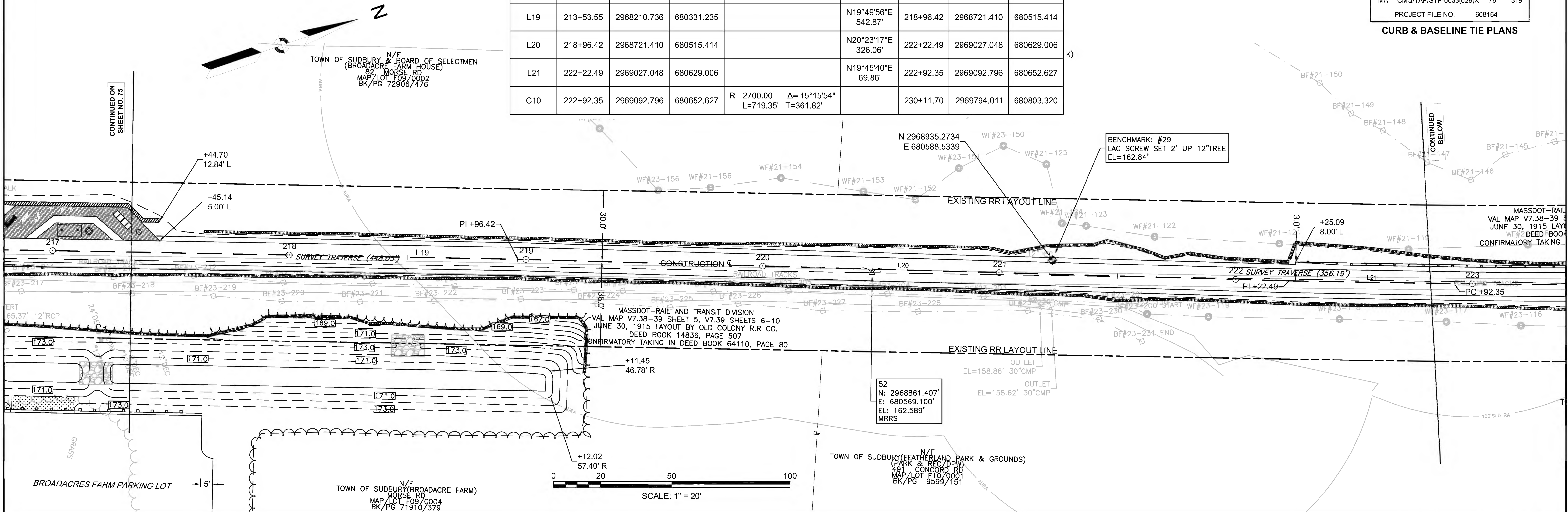
PR-BFRT CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L19	213+53.55	2968210.736	680331.235		N19°49'56"E 542.87'	218+96.42	2968721.410	680515.414
L20	218+96.42	2968721.410	680515.414		N20°23'17"E 326.06'	222+22.49	2969027.048	680629.006
L21	222+22.49	2969027.048	680629.006		N19°45'40"E 69.86'	222+92.35	2969092.796	680652.627
C10	222+92.35	2969092.796	680652.627	R=2700.00' Δ=15°15'54" L=719.35' T=361.82'		230+11.70	2969794.011	680803.320

**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	76	319
PROJECT FILE NO.		608164	

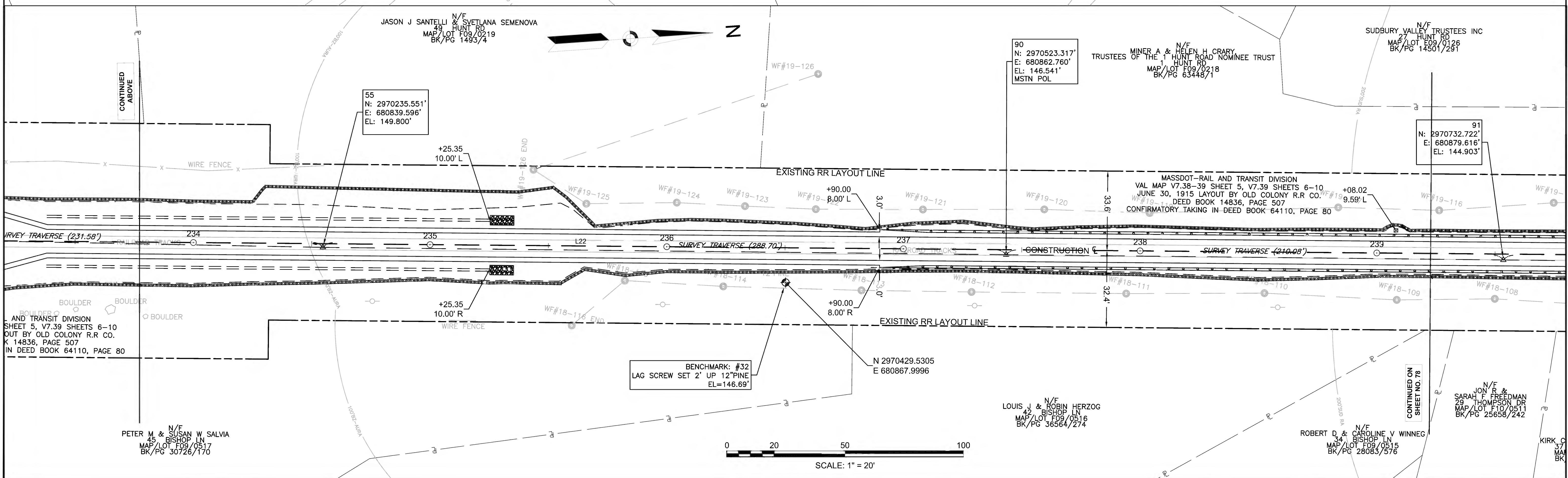
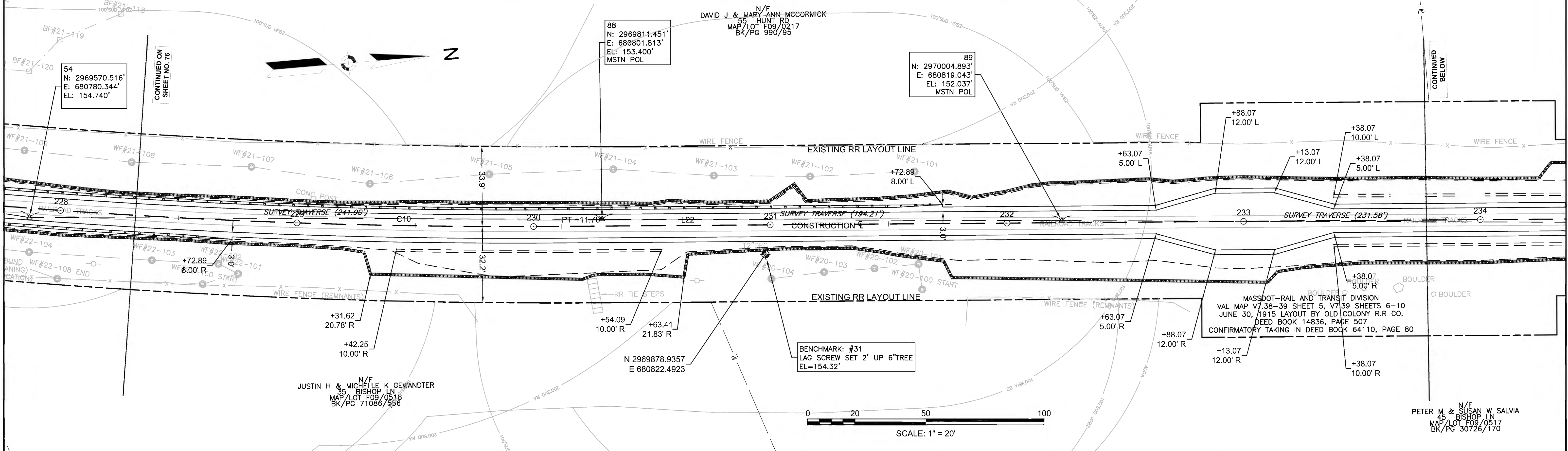
**CURB & BASELINE TIE PLANS**





PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C10	222+92.35	2969092.796	680652.627	R-2700.00 Δ=15°15'54" L=719.35' T=361.82'		230+11.70	2969794.011	680803.320
L22	230+11.70	2969794.011	680803.320		N4°29'46"E 1103.93'	241+15.63	2970894.547	680889.857

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	77	319
PROJECT FILE NO. 608164			
CURB & BASELINE TIE PLANS			



608164 - HD/CURB & BASELINE TIE PLANS.DWG Plotted on 27-Jun-2022 10:08 AM



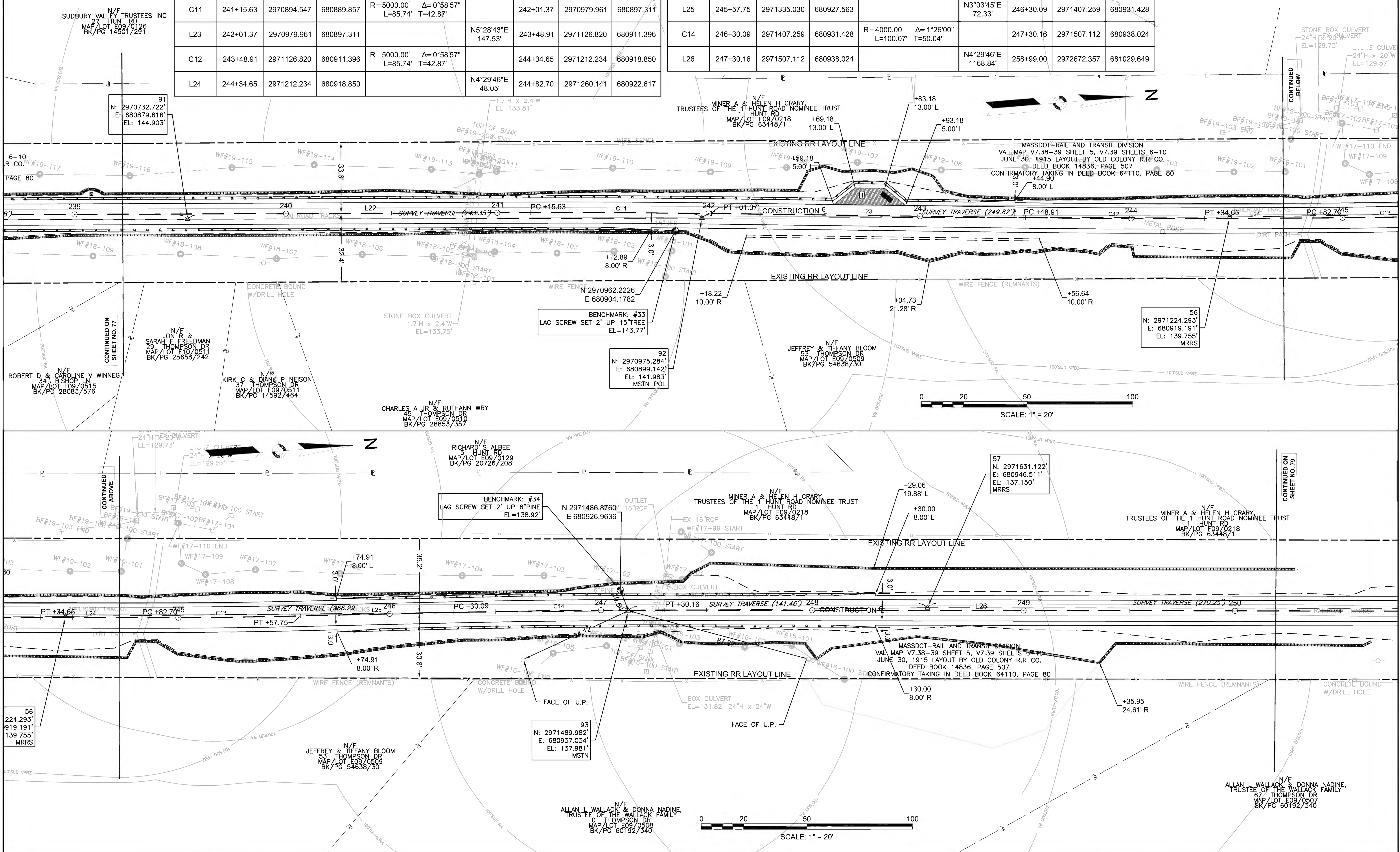
PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L22	230+11.70	2969794.011	680803.320			241+15.63	2970894.547	680889.857
C11	241+15.63	2970894.547	680889.857	R=5000.00' Δ=0°58'57" L=85.74' T=42.87'		242+01.37	2970979.961	680897.311
L23	242+01.37	2970979.961	680897.311			243+48.91	2971126.820	680911.396
C12	243+48.91	2971126.820	680911.396	R=5000.00' Δ=0°58'57" L=85.74' T=42.87'		244+34.65	2971212.234	680918.850
L24	244+34.65	2971212.234	680918.850			244+82.70	2971260.141	680922.617

PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C13	244+82.70	2971260.141	680922.617	R=3000.00' Δ=1°26'00" L=75.05' T=37.53'		245+57.75	2971335.030	680927.563
L25	245+57.75	2971335.030	680927.563			246+30.09	2971407.259	680931.428
C14	246+30.09	2971407.259	680931.428	R=4000.00' Δ=1°26'00" L=100.07' T=50.04'		247+30.16	2971507.112	680938.024
L26	247+30.16	2971507.112	680938.024			258+99.00	2972672.357	681029.649

**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	78	319
PROJECT FILE NO.		608164	

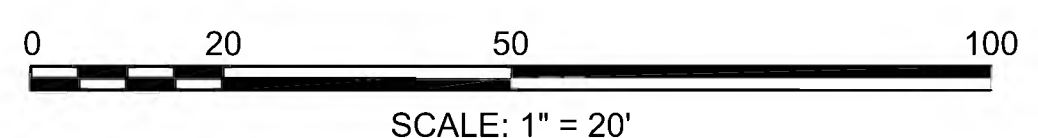
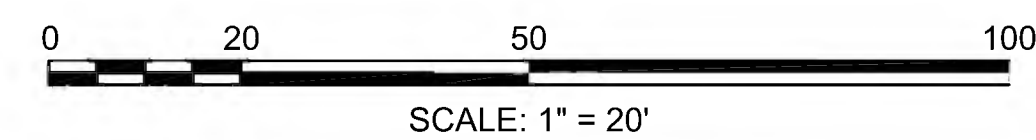
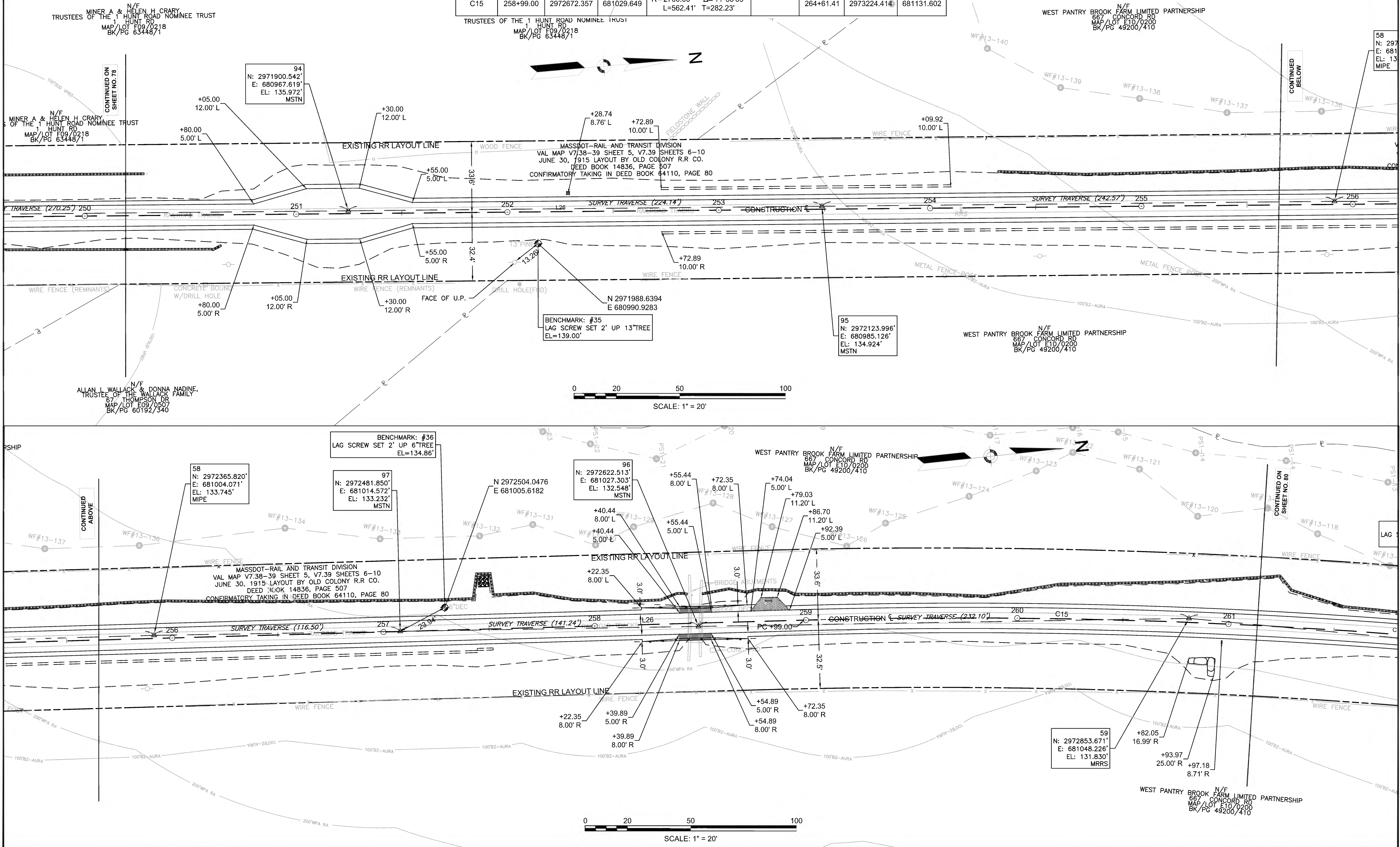
**CURB & BASELINE TIE PLANS**





PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L26	247+30.16	2971507.112	680938.024		N4°29'46"E 1168.84'	258+99.00	2972672.357	681029.649
C15	258+99.00	2972672.357	681029.649	R=2700.00' L=562.41' Δ=11°56'05" T=282.23'		264+61.41	2973224.414	681131.602

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	79	319
PROJECT FILE NO.		608164	
CURB & BASELINE TIE PLANS			

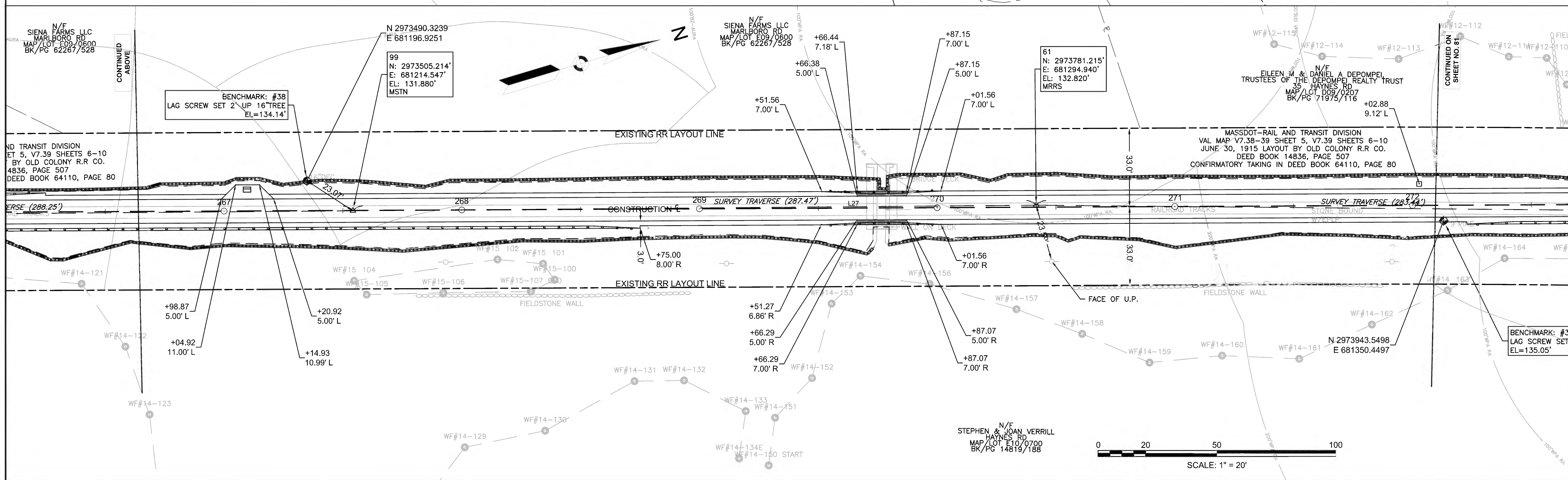
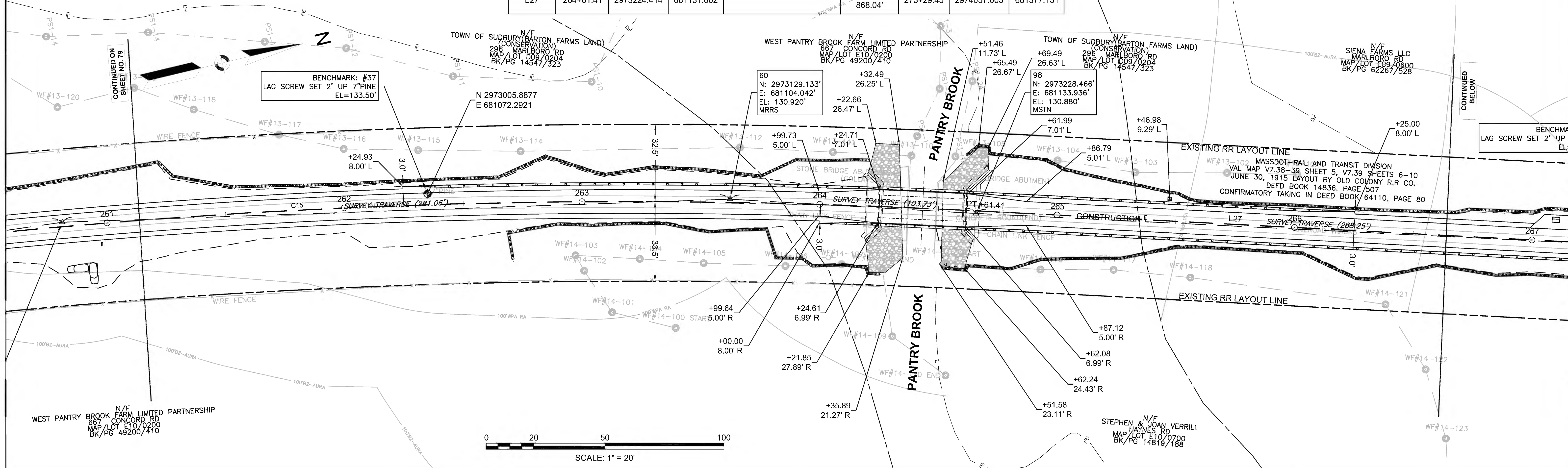


608164\_HDCURB & BASELINE TIE PLANS.DWG Plotted on 27-Jun-2022 10:09 AM



PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C15	258+99.00	2972672.357	681029.649	R=2700.00' Δ=11°56'05" L=562.41' T=282.23'		264+61.41	2973224.414	681131.602
L27	264+61.41	2973224.414	681131.602		N16°25'51"E 868.04'	273+29.45	2974057.003	681377.131

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	80	319
PROJECT FILE NO.		608164	
CURB & BASELINE TIE PLANS			



608164 - HD(CURB & BASELINE TIE PLANS).DWG Plotted on 27-Jun-2022 10:10 AM



PR-BFRT CONSTRUCTION BASELINE DATA

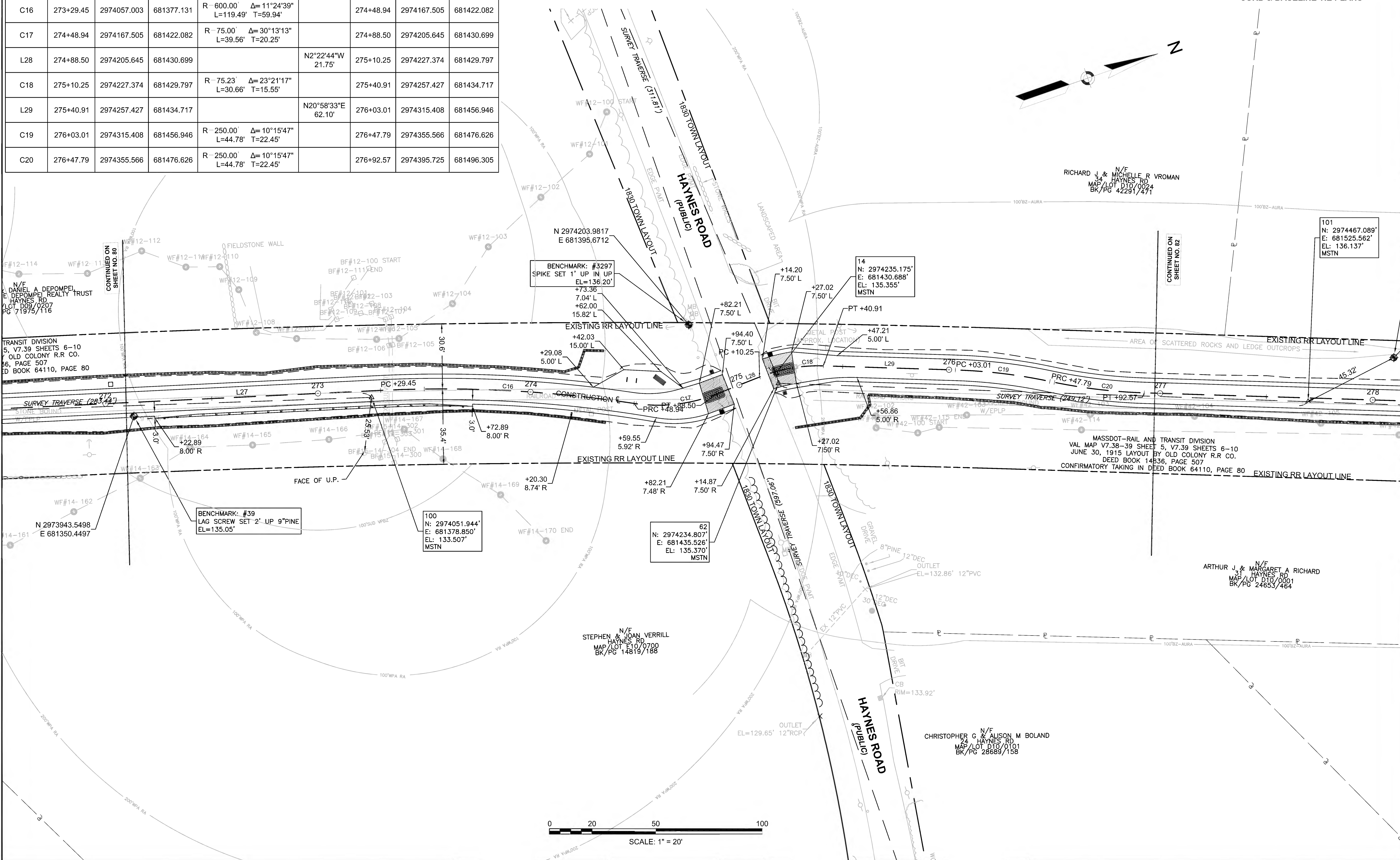
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L27	264+61.41	2973224.414	681131.602		N16°25'51"E 868.04'	273+29.45	2974057.003	681377.131
C16	273+29.45	2974057.003	681377.131	R- 600.00' Δ= 11°24'39" L=119.49' T=59.94'		274+48.94	2974167.505	681422.082
C17	274+48.94	2974167.505	681422.082	R- 75.00' Δ= 30°13'13" L=39.56' T=20.25'		274+88.50	2974205.645	681430.699
L28	274+88.50	2974205.645	681430.699		N2°22'44"W 21.75'	275+10.25	2974227.374	681429.797
C18	275+10.25	2974227.374	681429.797	R- 75.23' Δ= 23°21'17" L=30.66' T=15.55'		275+40.91	2974257.427	681434.717
L29	275+40.91	2974257.427	681434.717		N20°58'33"E 62.10'	276+03.01	2974315.408	681456.946
C19	276+03.01	2974315.408	681456.946	R- 250.00' Δ= 10°15'47" L=44.78' T=22.45'		276+47.79	2974355.566	681476.626
C20	276+47.79	2974355.566	681476.626	R- 250.00' Δ= 10°15'47" L=44.78' T=22.45'		276+92.57	2974395.725	681496.305

SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	81	319

PROJECT FILE NO. 608164

CURB & BASELINE TIE PLANS

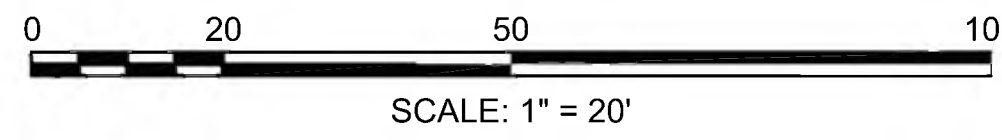
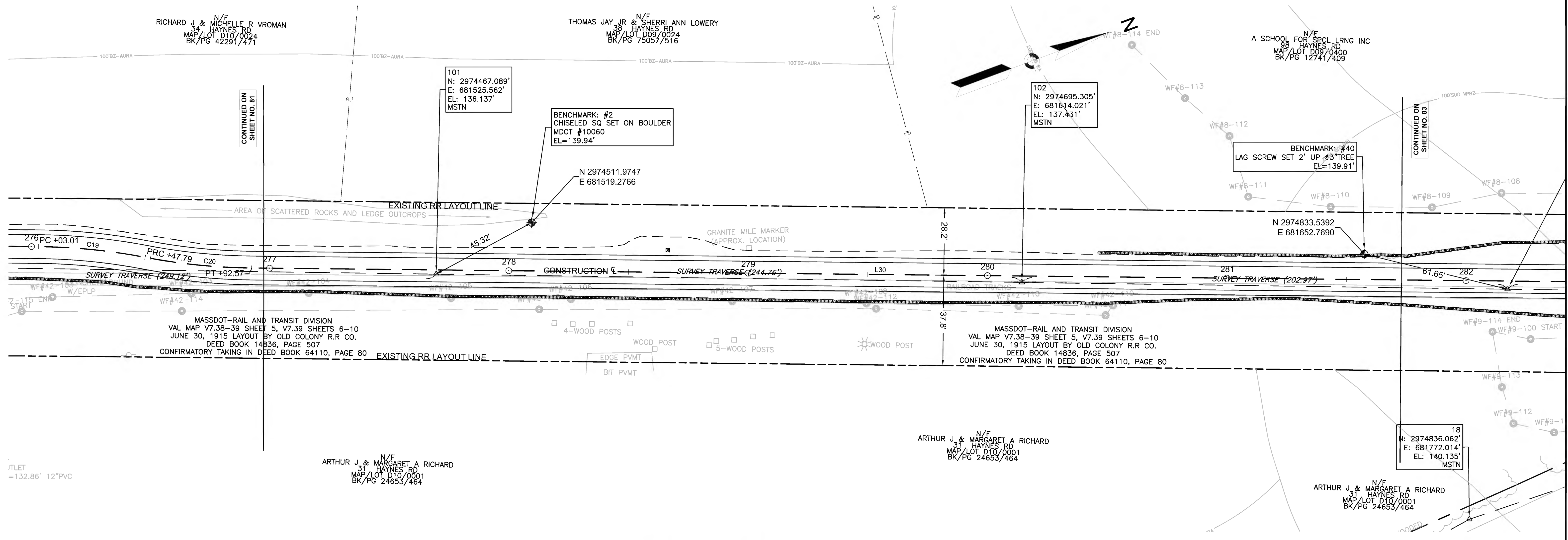


608164 - HD(CURB & BASELINE TIE PLANS).DWG Plotted on 27-Jun-2022 10:10 AM



PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L30	276+92.57	2974395.725	681496.305		N20°58'33"E 621.40'	283+13.96	2974975.941	681718.749

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	82	319
PROJECT FILE NO.		608164	
CURB & BASELINE TIE PLANS			



IT/LET  
=132.86' 12" PVC



PR-BFRT CONSTRUCTION BASELINE DATA

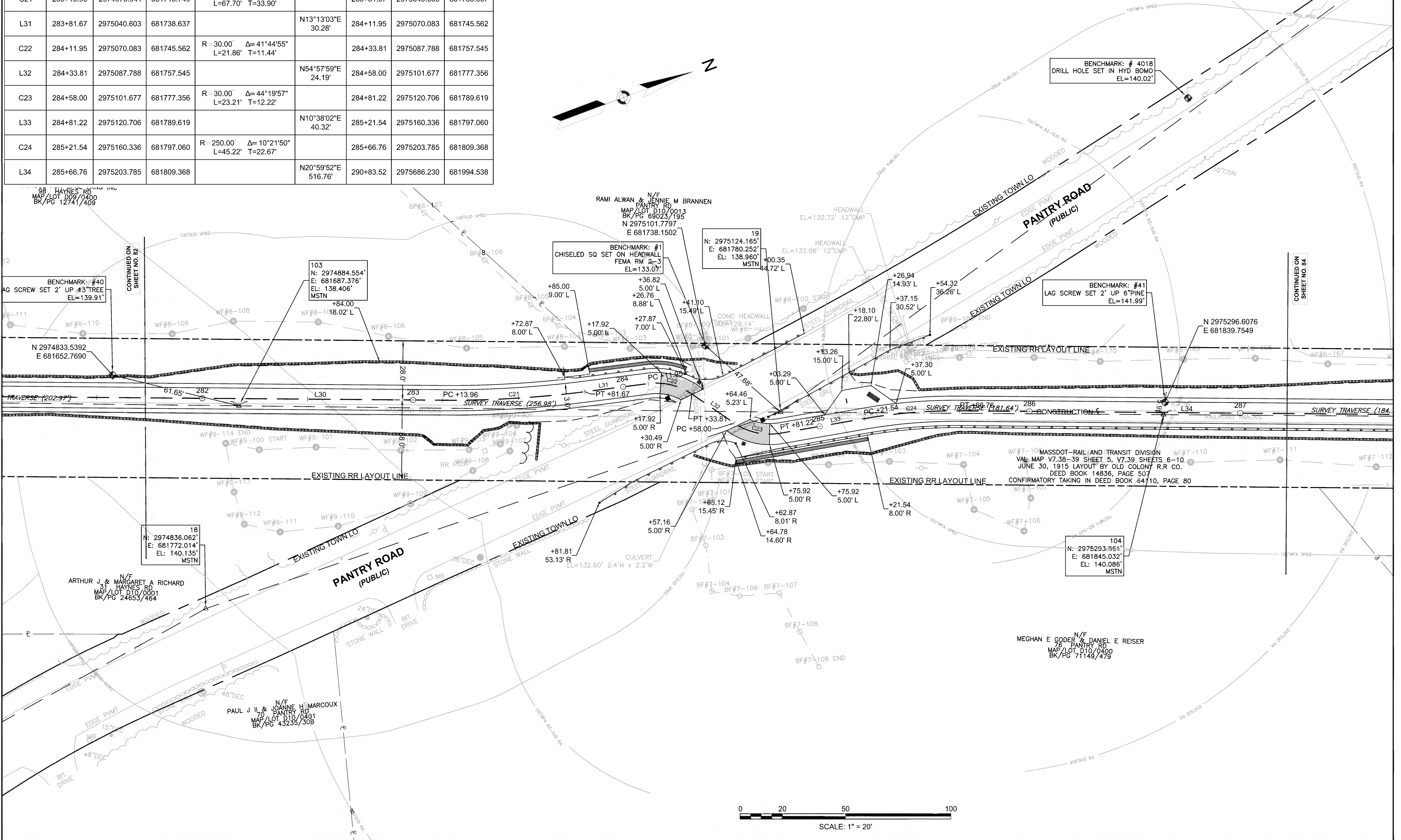
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L30	276+92.57	2974395.725	681496.305		N20°58'33"E 621.40'	283+13.96	2974975.941	681718.749
C21	283+13.96	2974975.941	681718.749	R=500.00' Δ=7°45'30" L=67.70' T=33.90'		283+81.67	2975040.603	681738.637
L31	283+81.67	2975040.603	681738.637		N13°13'03"E 30.28'	284+11.95	2975070.083	681745.562
C22	284+11.95	2975070.083	681745.562	R=30.00' Δ=41°44'55" L=21.86' T=11.44'		284+33.81	2975087.788	681757.545
L32	284+33.81	2975087.788	681757.545		N54°57'59"E 24.19'	284+58.00	2975101.677	681777.356
C23	284+58.00	2975101.677	681777.356	R=30.00' Δ=44°19'57" L=23.21' T=12.22'		284+81.22	2975120.706	681789.619
L33	284+81.22	2975120.706	681789.619		N10°38'02"E 40.32'	285+21.54	2975160.336	681797.060
C24	285+21.54	2975160.336	681797.060	R=250.00' Δ=10°21'50" L=45.22' T=22.67'		285+66.76	2975203.785	681809.368
L34	285+66.76	2975203.785	681809.368		N20°59'52"E 516.76'	290+83.52	2975686.230	681994.538

**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	83	319

PROJECT FILE NO. 608164

**CURB & BASELINE TIE PLANS**



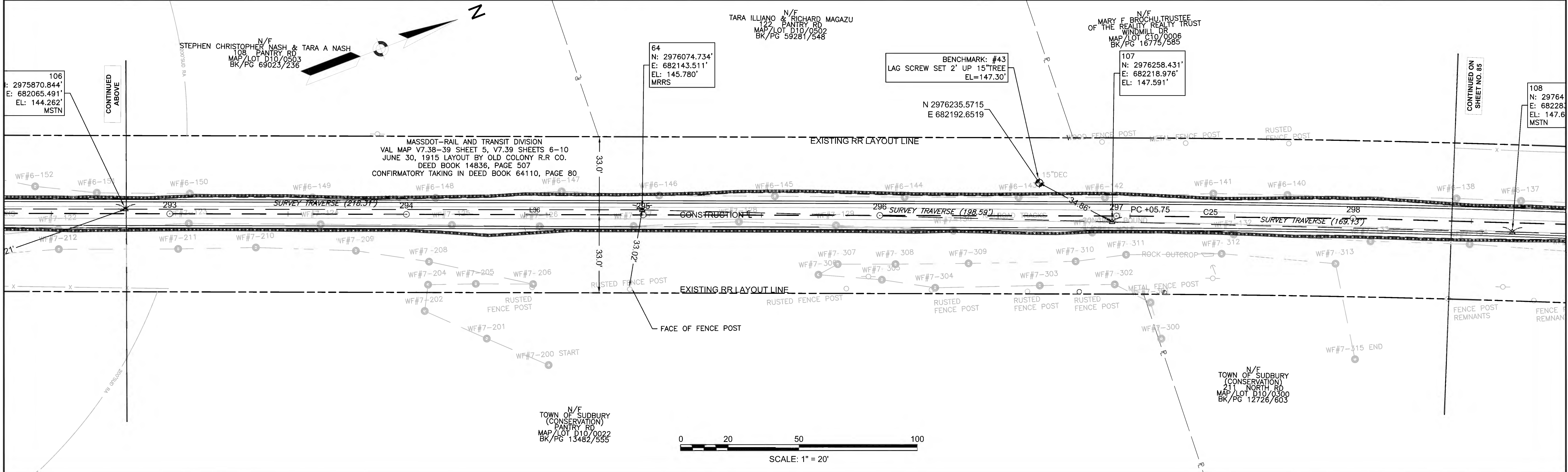
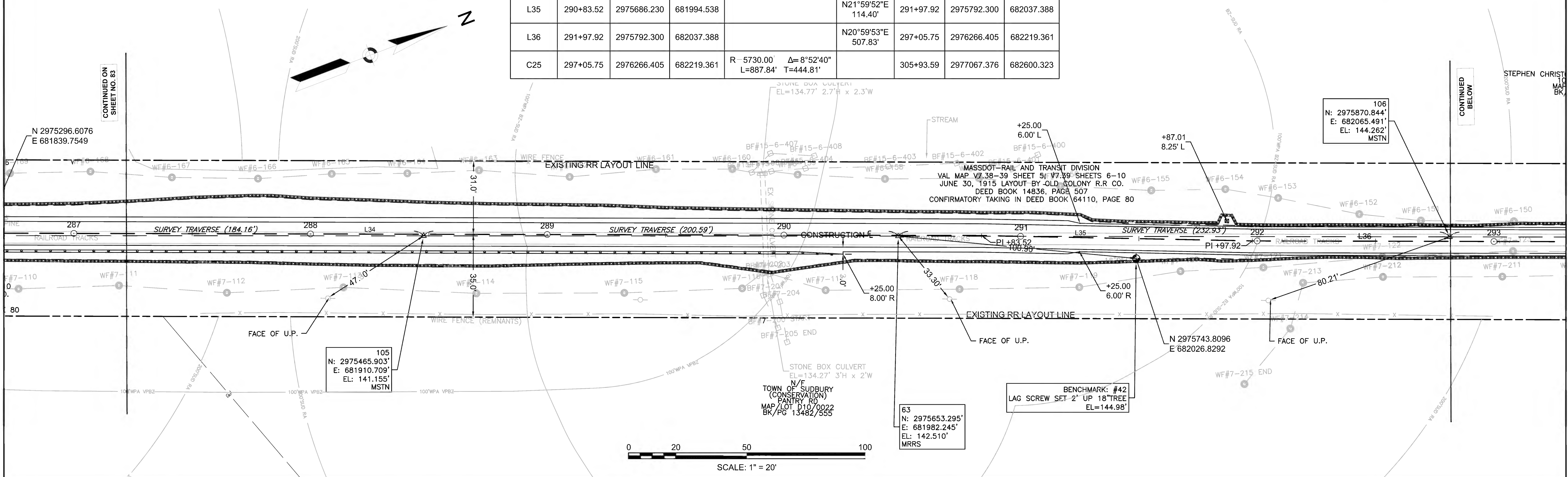


PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L34	285+66.76	2975203.785	681809.368		N20°59'52"E 516.76'	290+83.52	2975686.230	681994.538
L35	290+83.52	2975686.230	681994.538		N21°59'52"E 114.40'	291+97.92	2975792.300	682037.388
L36	291+97.92	2975792.300	682037.388		N20°59'53"E 507.83'	297+05.75	2976266.405	682219.361
C25	297+05.75	2976266.405	682219.361	R-5730.00 L=887.84' T=444.81'		305+93.59	2977067.376	682600.323

**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	84	319
PROJECT FILE NO.		608164	

**CURB & BASELINE TIE PLANS**



CONTINUED ON  
SHEET NO. 83

CONTINUED  
BELOW

CONTINUED  
ABOVE

CONTINUED ON  
SHEET NO. 85



PR-BFRT CONSTRUCTION BASELINE DATA

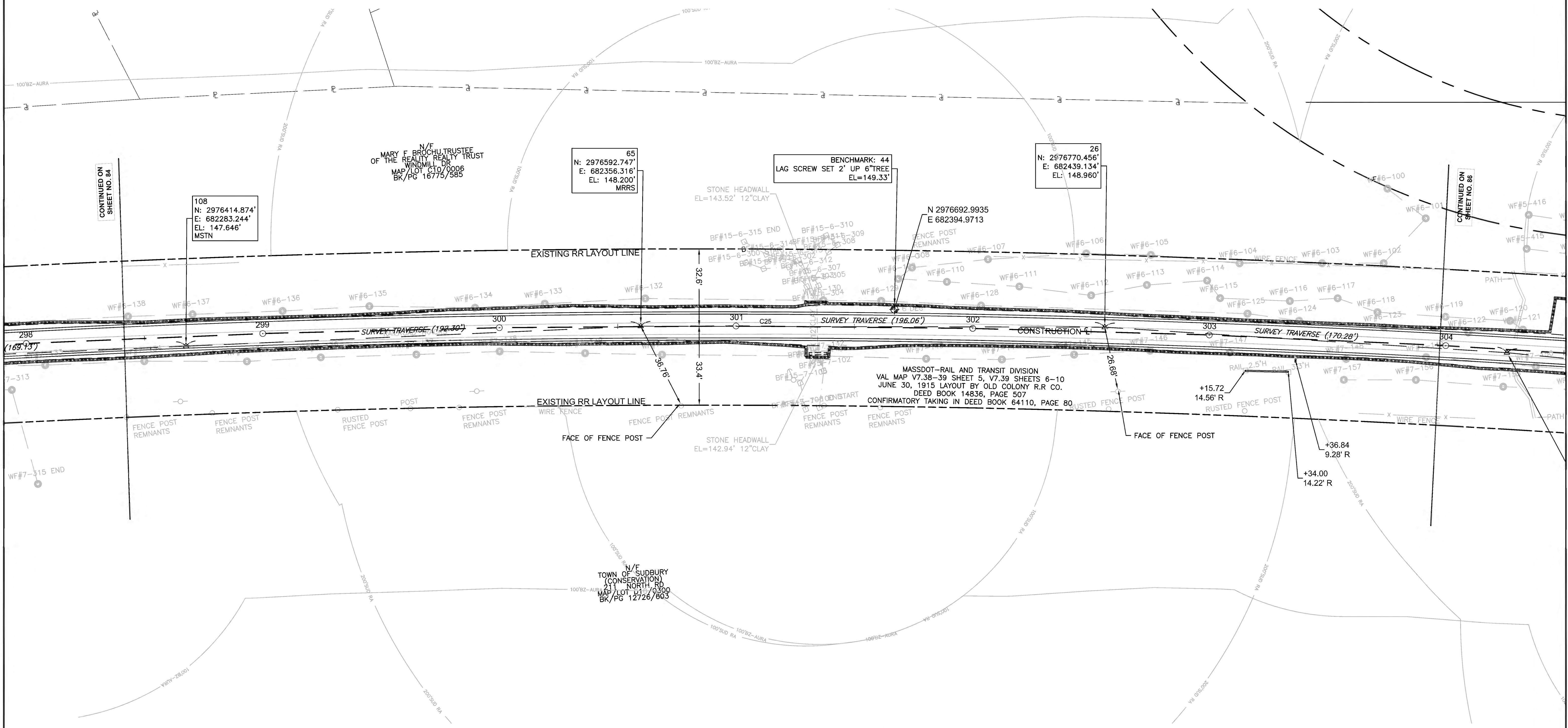
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C25	297+05.75	2976266.405	682219.361	R=5730.00' Δ=8°52'40" L=887.84' T=444.81'		305+93.59	2977067.376	682600.323

SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	85	319

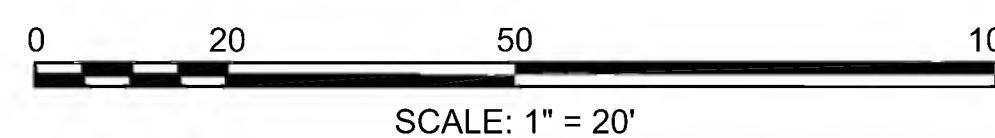
PROJECT FILE NO. 608164

CURB & BASELINE TIE PLANS



CONTINUED ON SHEET NO. 84

CONTINUED ON SHEET NO. 86





PR-BFRT CONSTRUCTION BASELINE DATA

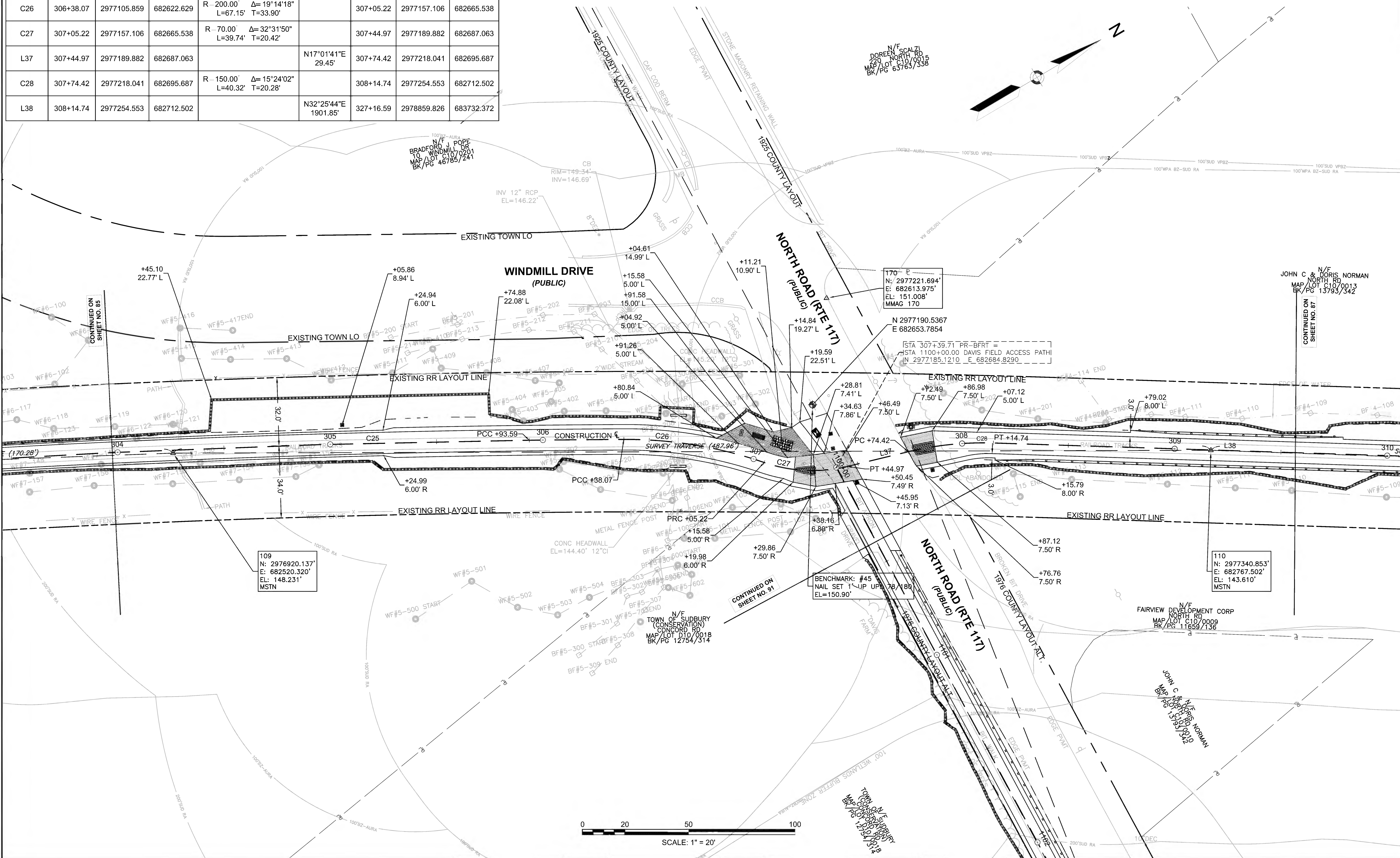
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C25	297+05.75	2976266.405	682219.361	R - 5730.00' Δ= 8°52'40" L=887.84' T=444.81'		305+93.59	2977067.376	682600.323
C26	306+38.07	2977105.859	682622.629	R - 200.00' Δ= 19°14'18" L=67.15' T=33.90'		307+05.22	2977157.106	682665.538
C27	307+05.22	2977157.106	682665.538	R - 70.00' Δ= 32°31'50" L=39.74' T=20.42'		307+44.97	2977189.882	682687.063
L37	307+44.97	2977189.882	682687.063		N17°01'41"E 29.45'	307+74.42	2977218.041	682695.687
C28	307+74.42	2977218.041	682695.687	R - 150.00' Δ= 15°24'02" L=40.32' T=20.28'		308+14.74	2977254.553	682712.502
L38	308+14.74	2977254.553	682712.502		N32°25'44"E 1901.85'	327+16.59	2978859.826	683732.372

**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	86	319

PROJECT FILE NO. 608164

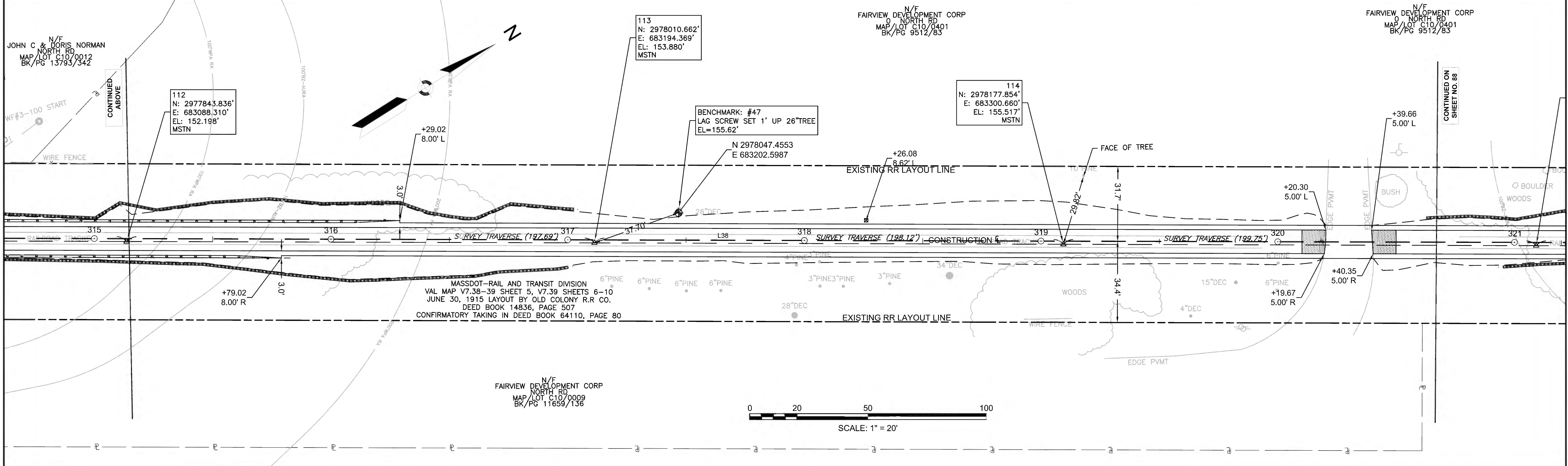
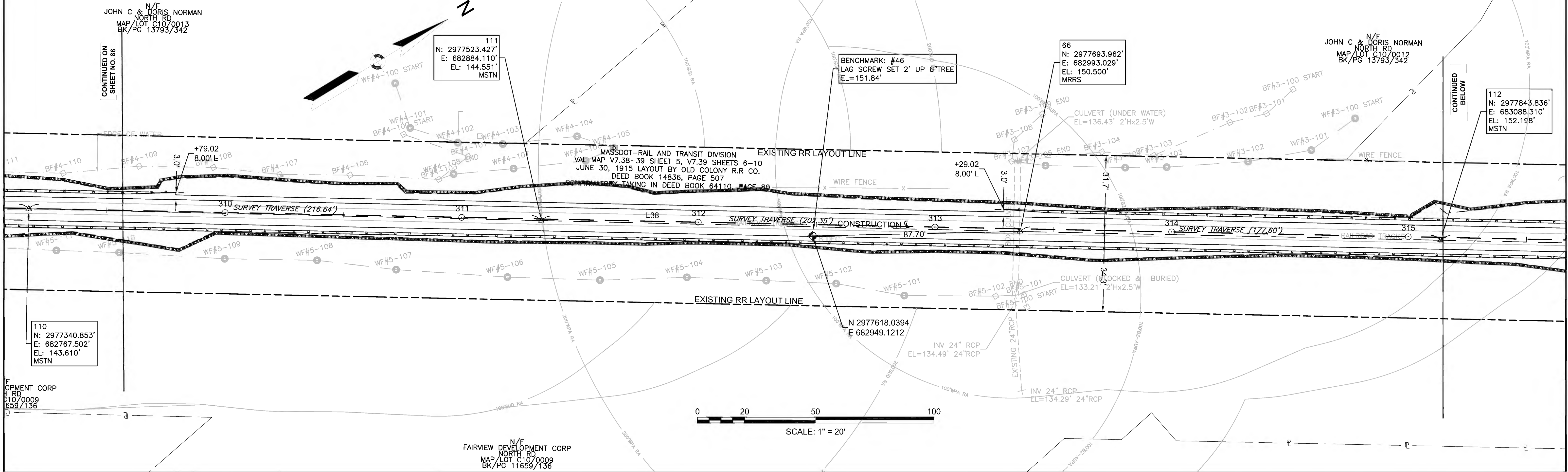
**CURB & BASELINE TIE PLANS**





PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L38	308+14.74	2977254.553	682712.502		N32°25'44"E 1901.85'	327+16.59	2978859.826	683732.372

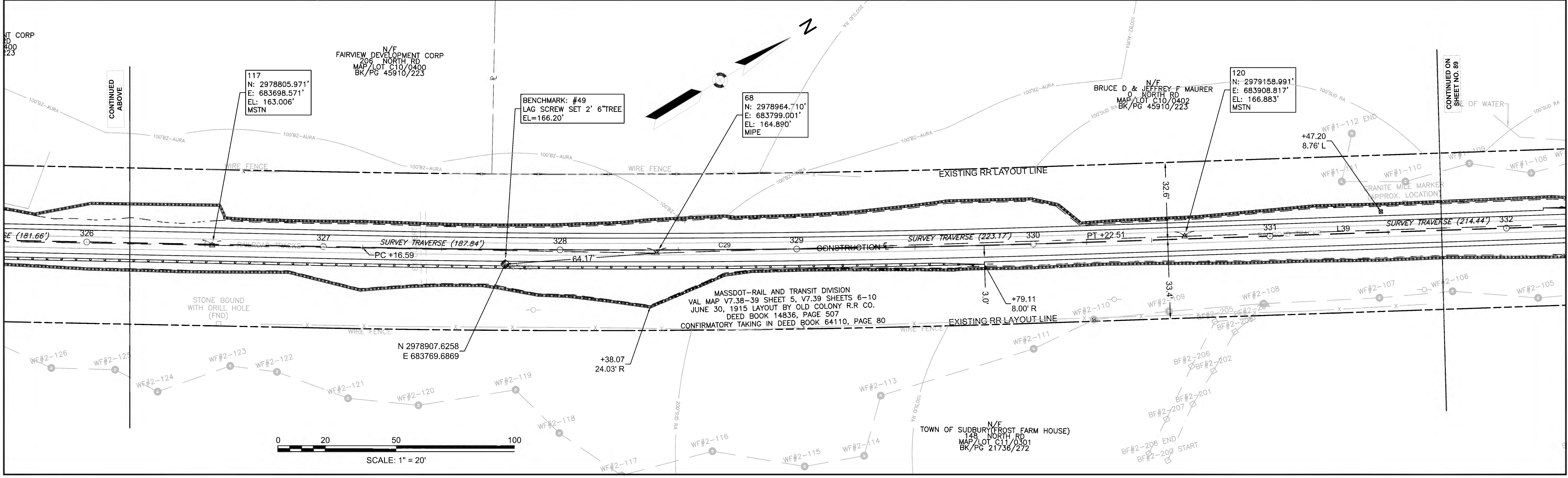
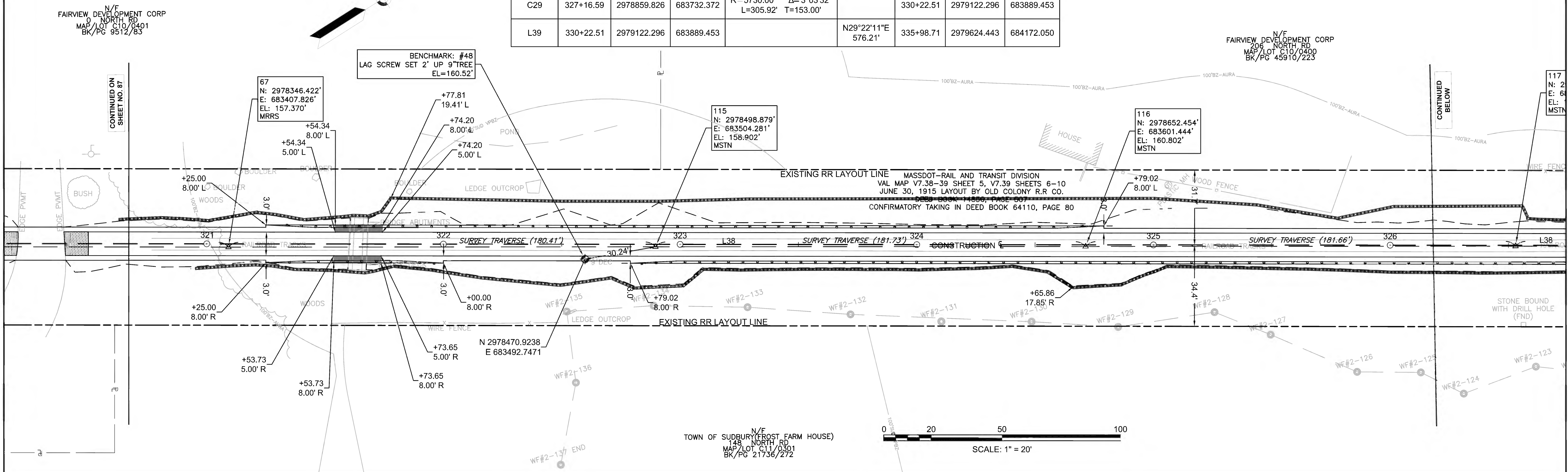
SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	87	319
PROJECT FILE NO.		608164	
CURB & BASELINE TIE PLANS			



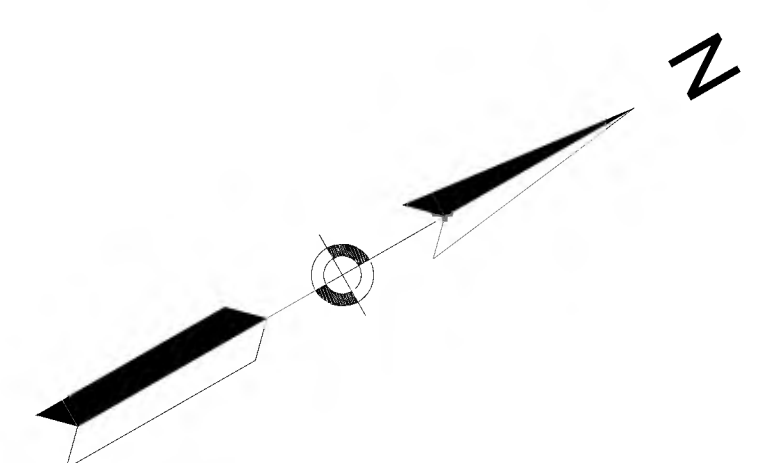
608164\_HDCURB & BASELINE TIE PLANS.DWG Plotted on 27-Jun-2022 10:12 AM



PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L38	308+14.74	2977254.553	682712.502		N32°25'44"E 1901.85'	327+16.59	2978859.826	683732.372
C29	327+16.59	2978859.826	683732.372	R=5730.00' Δ=3°03'32" L=305.92' T=153.00'		330+22.51	2979122.296	683889.453
L39	330+22.51	2979122.296	683889.453		N29°22'11"E 576.21'	335+98.71	2979624.443	684172.050

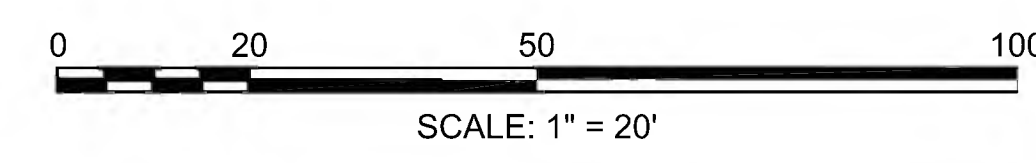
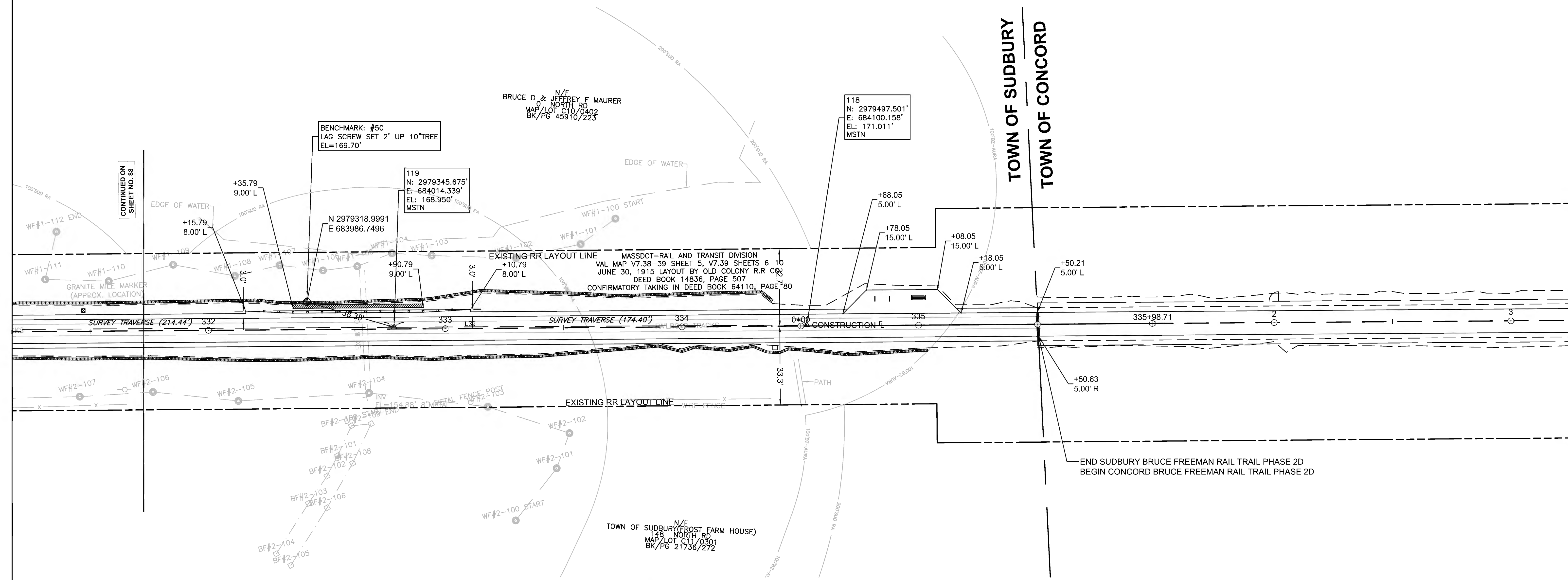






PR-BFRT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L39	330+22.51	2979122.296	683889.453		N29°22'11"E 576.21'	335+98.71	2979624.443	684172.050

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	89	319
PROJECT FILE NO.		608164	
CURB & BASELINE TIE PLANS			



CONTINUED ON  
SHEET NO. 88

TOWN OF SUDBURY  
TOWN OF CONCORD

END SUDBURY BRUCE FREEMAN RAIL TRAIL PHASE 2D  
BEGIN CONCORD BRUCE FREEMAN RAIL TRAIL PHASE 2D



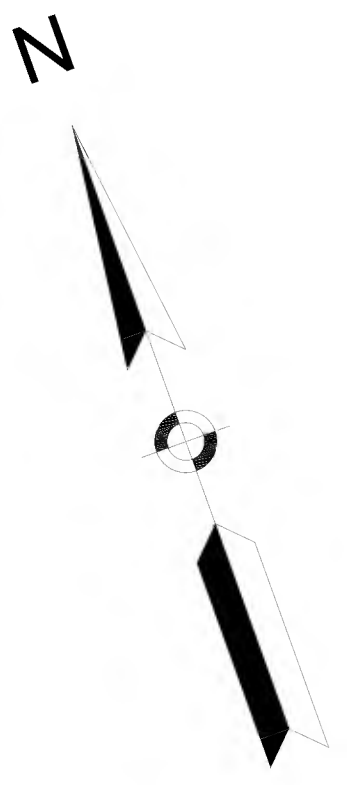
PARKINSON LOT ACCESS PATH CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1001	1000+00.00	2965485.946	679063.812		N41°30'12"E 94.96'	1000+94.96	2965557.063	679126.739
C1001	1000+94.96	2965557.063	679126.739	R -70.00' Δ= 114°20'20" L=139.69' T=108.49'		1002+34.65	2965539.324	679243.032
L1002	1002+90.89	2965502.111	679283.187		S70°11'49"E 70.57'	1003+61.46	2965478.204	679349.582

**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	90	319
PROJECT FILE NO.		608164	

**CURB & BASELINE TIE PLANS**



91  
N: 2965640.534'  
E: 679408.927'  
EL: 182.812'  
MSTN POL

MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80

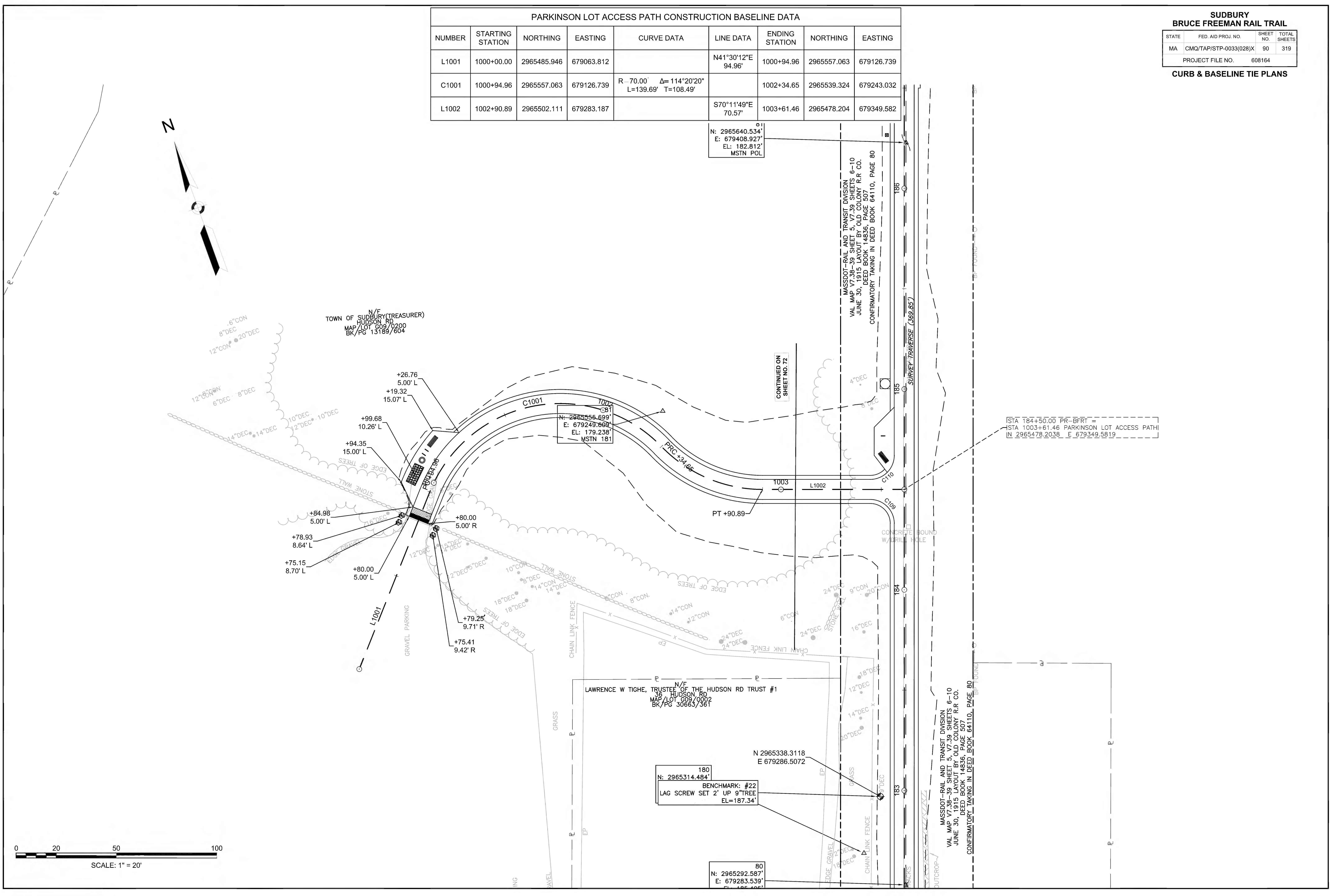
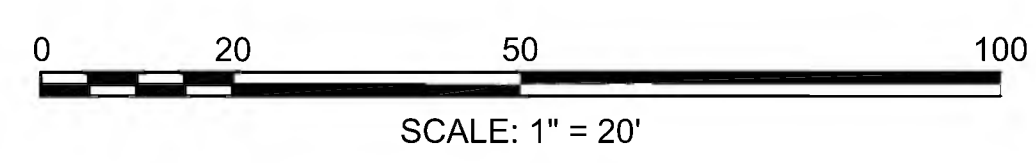
CONTINUED ON  
SHEET NO. 72

STA 184+50.00 PR-BFRT =  
STA 1003+61.46 PARKINSON LOT ACCESS PATH  
IN 2965478.2038 E 679349.5819

91  
N: 2965556.699'  
E: 679249.694'  
EL: 179.238'  
MSTN 181

180  
N: 2965314.484'  
E: 679286.5072  
BENCHMARK: #22  
LAG SCREW SET 2' UP 9" TREE  
EL=187.34'

80  
N: 2965292.587'  
E: 679283.539'  
EL: 185.405'





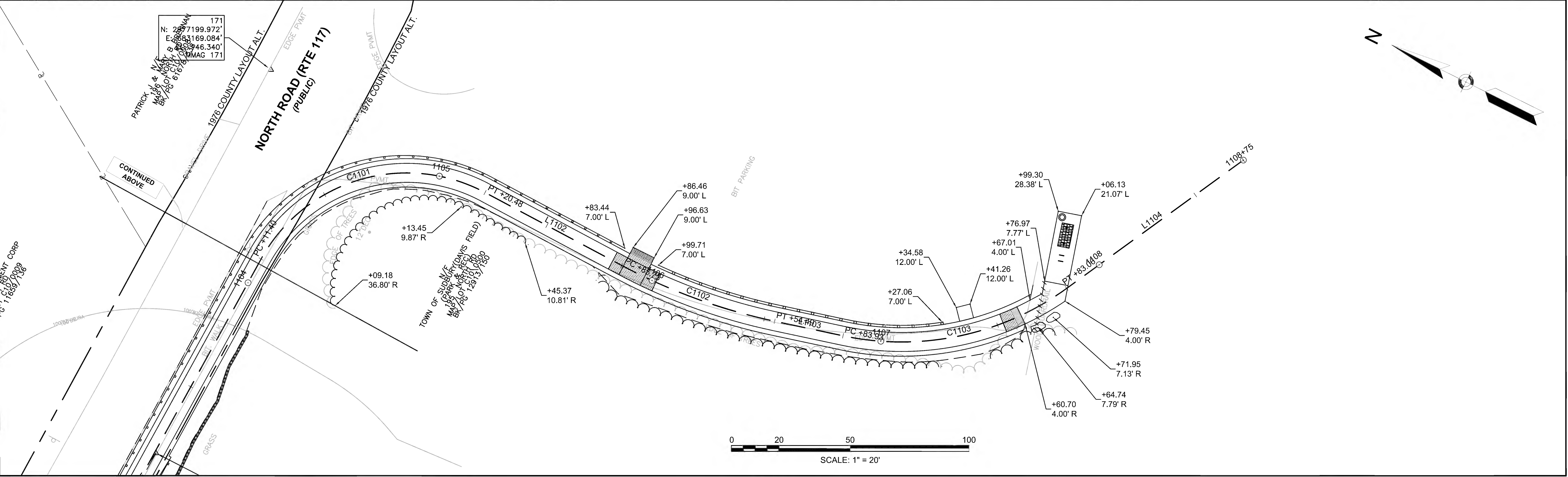
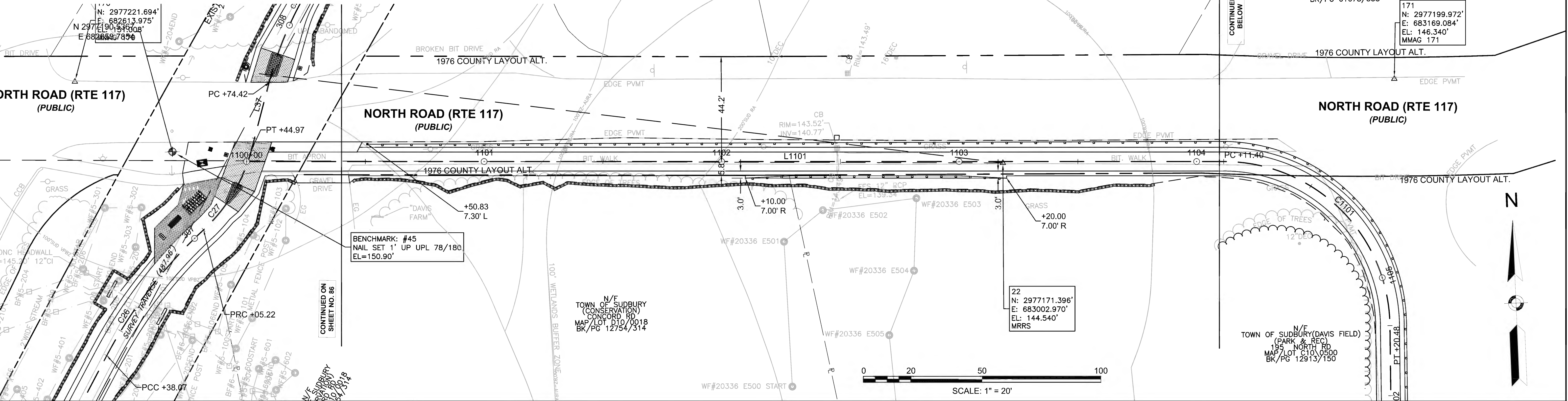
DAVIS FIELD ACCESS PATH CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1101	1100+00.00	2977185.121	682684.829		S87°38'12"E 411.40'	1104+11.40	2977168.156	683095.882
C1101	1104+11.40	2977168.156	683095.882	R=70.00' Δ=89°17'00" L=109.08' T=69.13'		1105+20.48	2977096.204	683162.966
L1102	1105+20.48	2977096.204	683162.966		S1°38'48"W 65.25'	1105+85.73	2977030.980	683161.091
C1102	1105+85.73	2977030.980	683161.091	R=245.30' Δ=16°03'34" L=68.76' T=34.60'		1106+54.49	2976962.874	683168.710

DAVIS FIELD ACCESS PATH CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1103	1106+54.49	2976962.874	683168.710		S14°24'46"E 29.44'	1106+83.93	2976934.361	683176.038
C1103	1106+83.93	2976934.361	683176.038	R=118.28' Δ=48°01'17" L=99.14' T=52.69'		1107+83.06	2976858.948	683235.860
L1104	1107+83.06	2976858.948	683235.860		S62°26'03"E 91.93'	1108+75.00	2976816.405	683317.356

**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	91	319
PROJECT FILE NO.		608164	

**CURB & BASELINE TIE PLANS**





CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	92	319
PROJECT FILE NO.		608164	

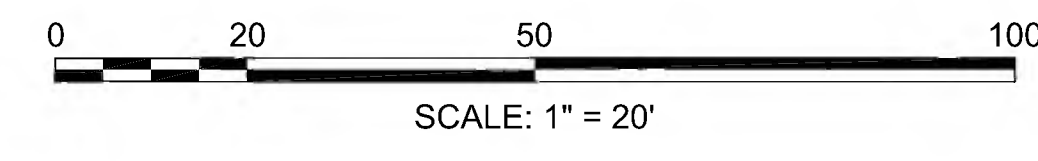
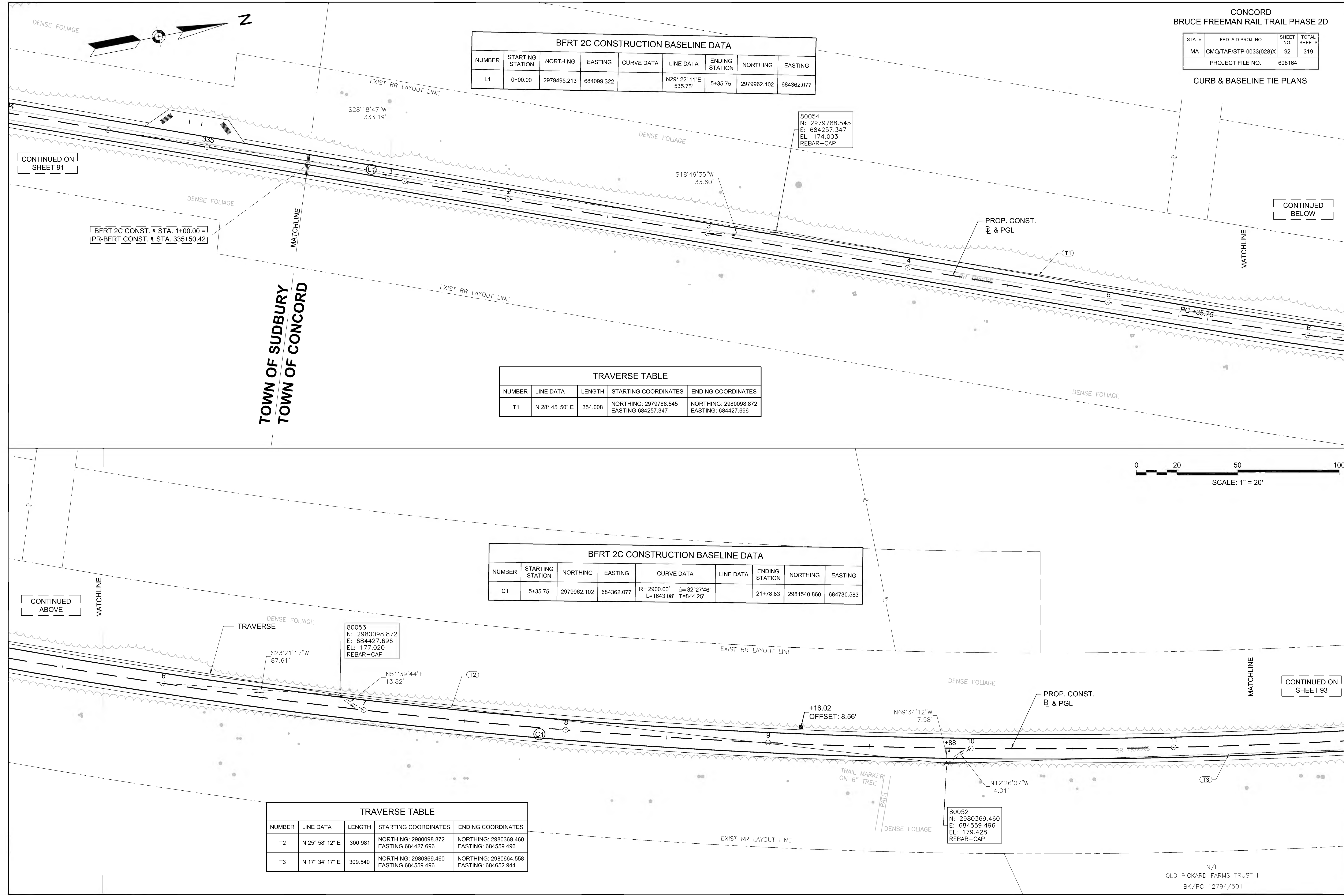
CURB & BASELINE TIE PLANS

BFRT 2C CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1	0+00.00	2979495.213	684099.322		N29° 22' 11"E 535.75'	5+35.75	2979962.102	684362.077

TRAVERSE TABLE				
NUMBER	LINE DATA	LENGTH	STARTING COORDINATES	ENDING COORDINATES
T1	N 28° 45' 50" E	354.008	NORTHING: 2979788.545 EASTING: 684257.347	NORTHING: 2980098.872 EASTING: 684427.696

BFRT 2C CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C1	5+35.75	2979962.102	684362.077	R=2900.00' Δ=32°27'46" L=1643.08' T=844.25'		21+78.83	2981540.860	684730.583

TRAVERSE TABLE				
NUMBER	LINE DATA	LENGTH	STARTING COORDINATES	ENDING COORDINATES
T2	N 25° 58' 12" E	300.981	NORTHING: 2980098.872 EASTING: 684427.696	NORTHING: 2980369.460 EASTING: 684559.496
T3	N 17° 34' 17" E	309.540	NORTHING: 2980369.460 EASTING: 684559.496	NORTHING: 2980664.558 EASTING: 684652.944



CONTINUED ON SHEET 91

BFRT 2C CONST. @ STA. 1+00.00 =  
PR-BFRT CONST. @ STA. 335+50.42

TOWN OF SUDBURY  
TOWN OF CONCORD

CONTINUED BELOW

CONTINUED ABOVE

CONTINUED ON SHEET 93

N/F  
OLD PICKARD FARMS TRUST II  
BK/PG 12794/501

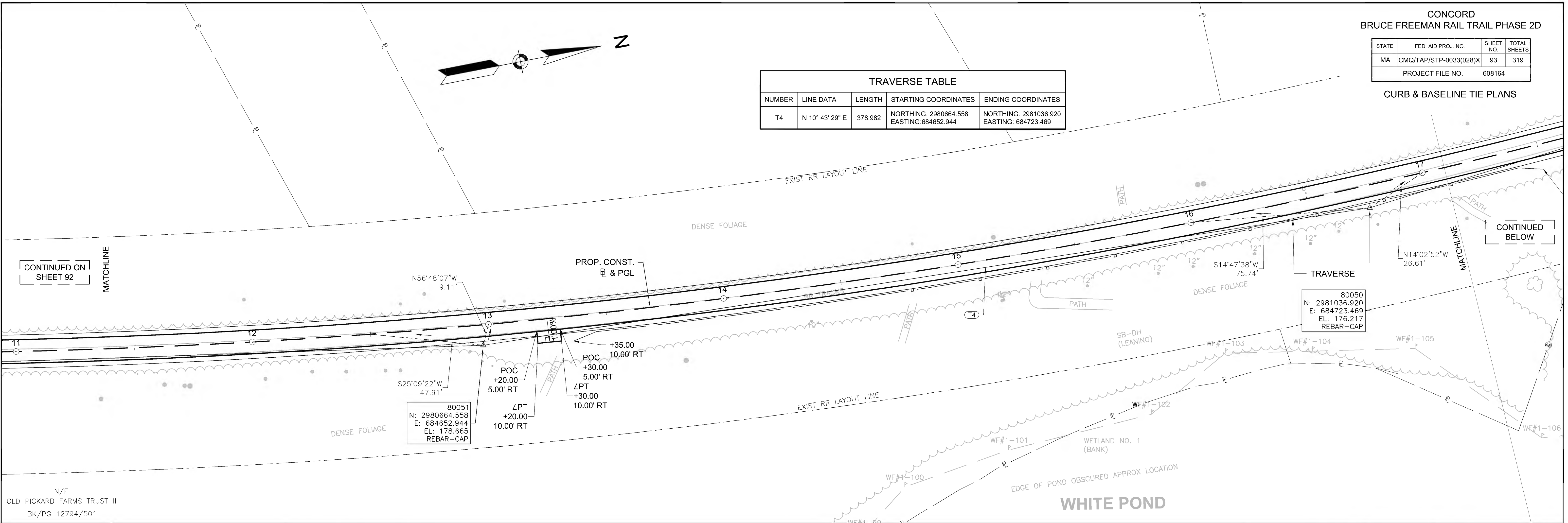


CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

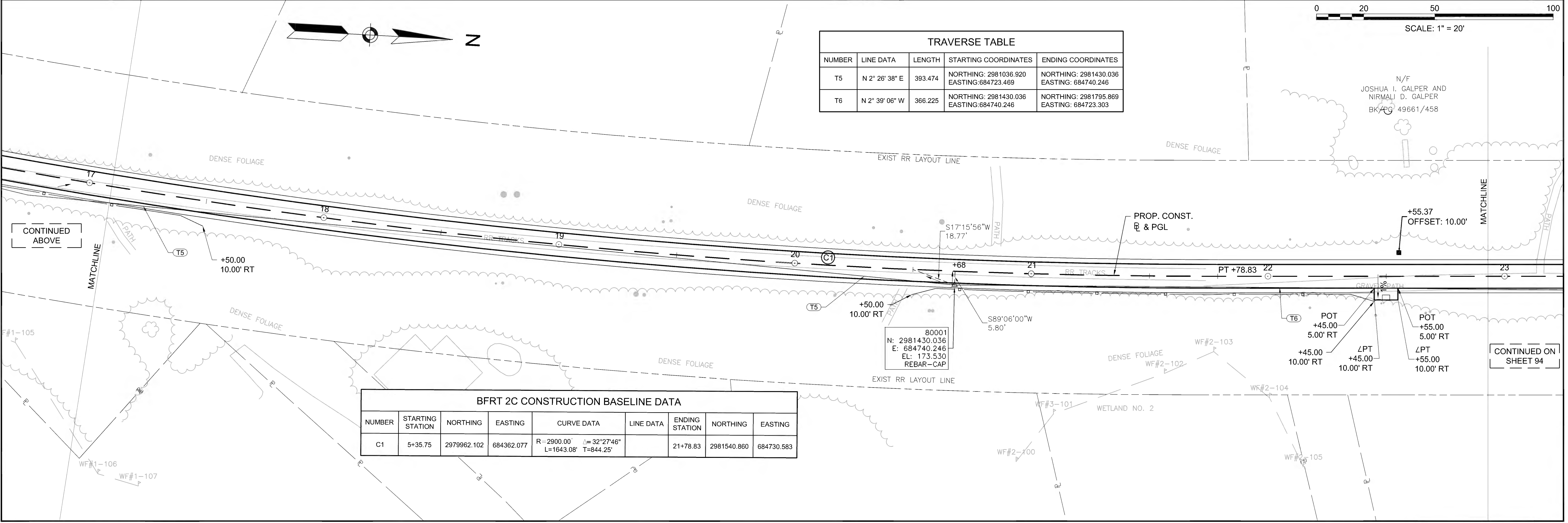
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	93	319
PROJECT FILE NO.		608164	

CURB & BASELINE TIE PLANS

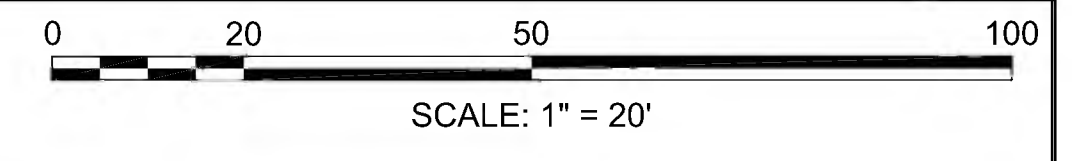
TRAVERSE TABLE				
NUMBER	LINE DATA	LENGTH	STARTING COORDINATES	ENDING COORDINATES
T4	N 10° 43' 29" E	378.982	NORTHING: 2980664.558 EASTING: 684652.944	NORTHING: 2981036.920 EASTING: 684723.469



TRAVERSE TABLE				
NUMBER	LINE DATA	LENGTH	STARTING COORDINATES	ENDING COORDINATES
T5	N 2° 26' 38" E	393.474	NORTHING: 2981036.920 EASTING: 684723.469	NORTHING: 2981430.036 EASTING: 684740.246
T6	N 2° 39' 06" W	366.225	NORTHING: 2981430.036 EASTING: 684740.246	NORTHING: 2981795.869 EASTING: 684723.303



BFRT 2C CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C1	5+35.75	2979962.102	684362.077	R=2900.00' Δ=32°27'46" L=1643.08' T=844.25'		21+78.83	2981540.860	684730.583



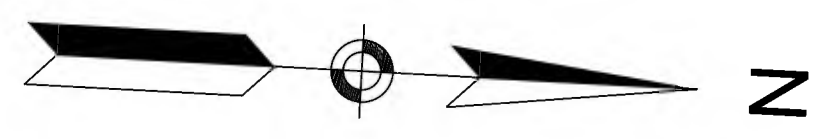


CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

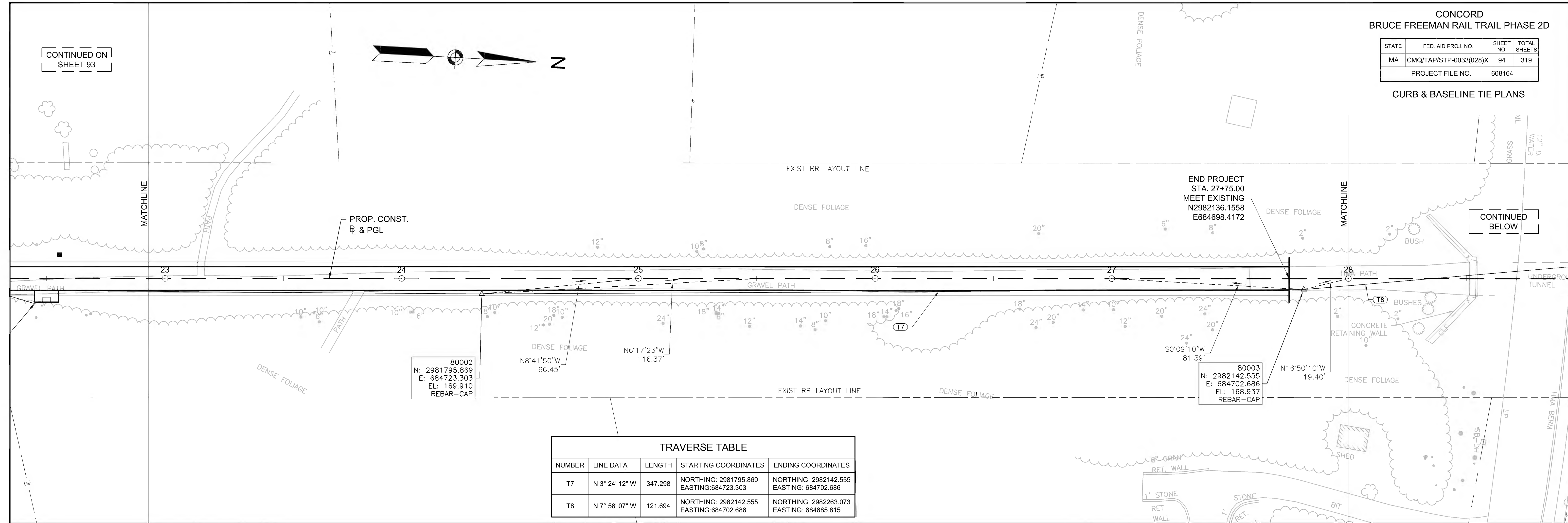
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	94	319
PROJECT FILE NO.		608164	

CURB & BASELINE TIE PLANS

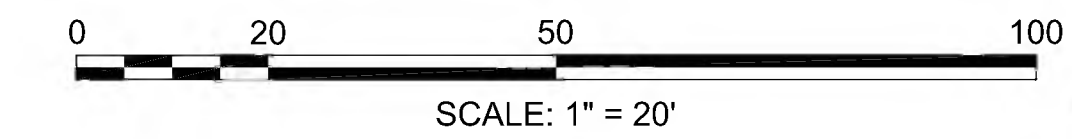
CONTINUED ON  
SHEET 93



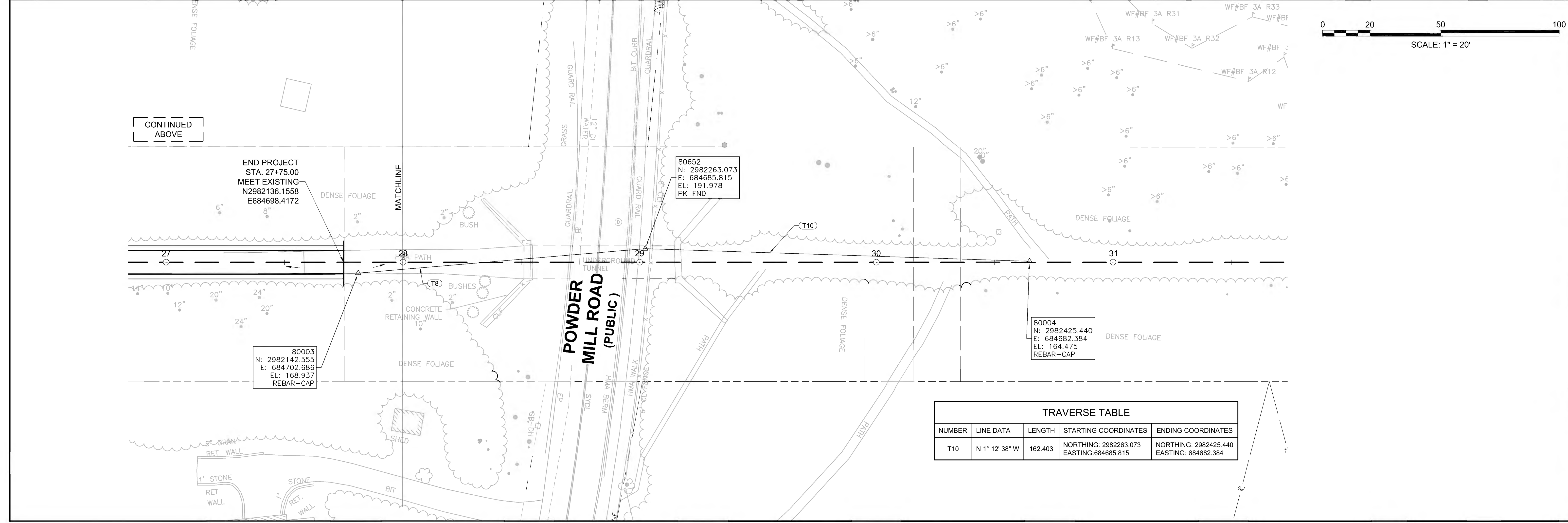
CONTINUED  
BELOW



TRAVERSE TABLE				
NUMBER	LINE DATA	LENGTH	STARTING COORDINATES	ENDING COORDINATES
T7	N 3° 24' 12" W	347.298	NORTHING: 2981795.869 EASTING: 684723.303	NORTHING: 2982142.555 EASTING: 684702.686
T8	N 7° 58' 07" W	121.694	NORTHING: 2982142.555 EASTING: 684702.686	NORTHING: 2982263.073 EASTING: 684685.815



CONTINUED  
ABOVE



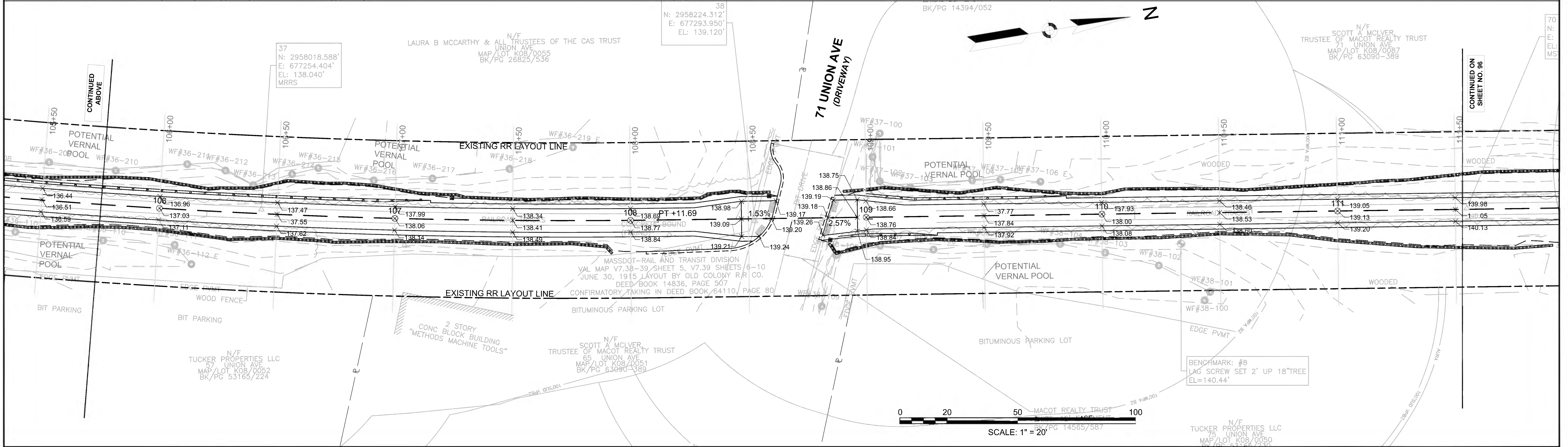
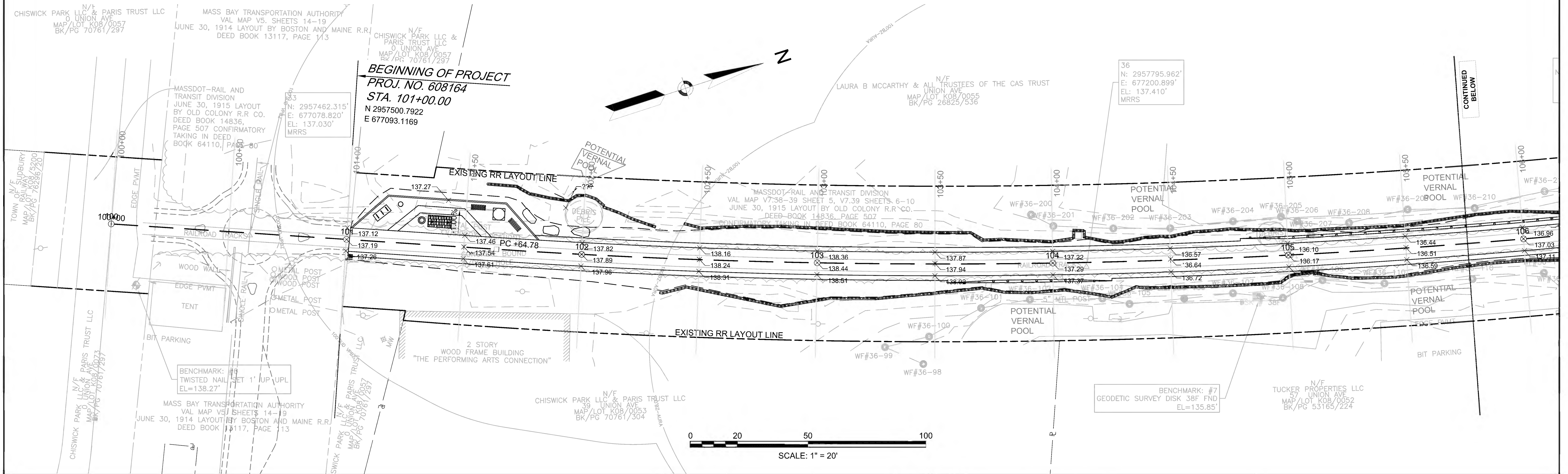
TRAVERSE TABLE				
NUMBER	LINE DATA	LENGTH	STARTING COORDINATES	ENDING COORDINATES
T10	N 1° 12' 38" W	162.403	NORTHING: 2982263.073 EASTING: 684685.815	NORTHING: 2982425.440 EASTING: 684682.384



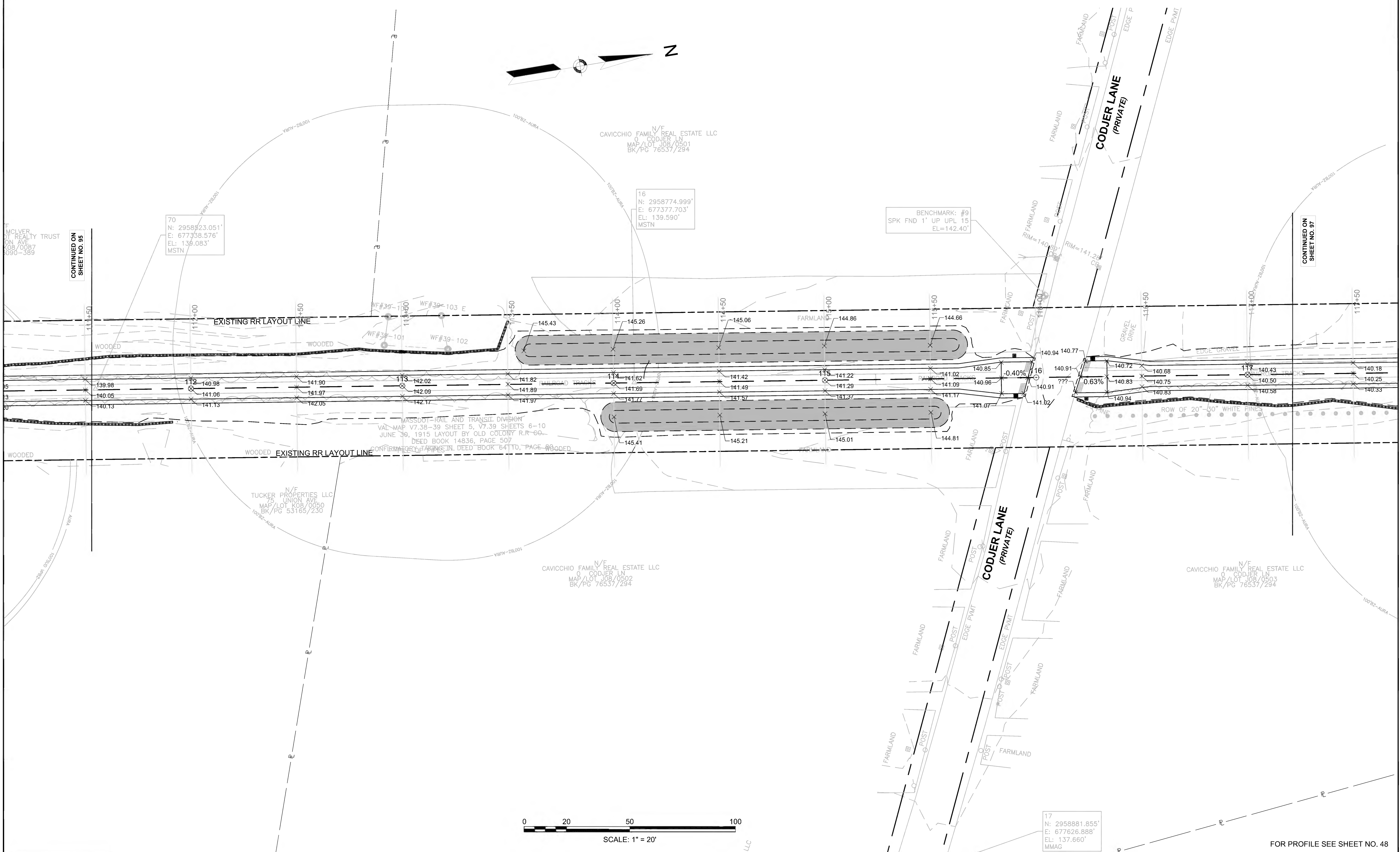
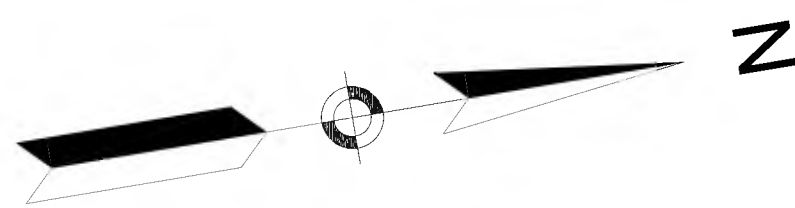
**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	95	319
PROJECT FILE NO.		608164	

**GRADING PLANS**

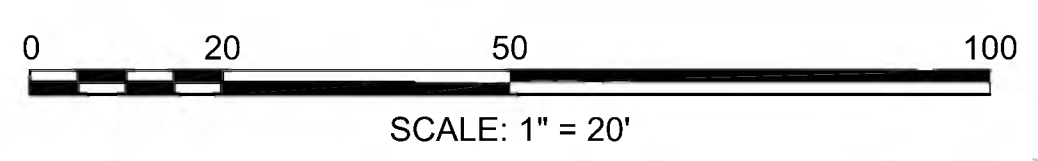






CONTINUED ON  
SHEET NO. 95

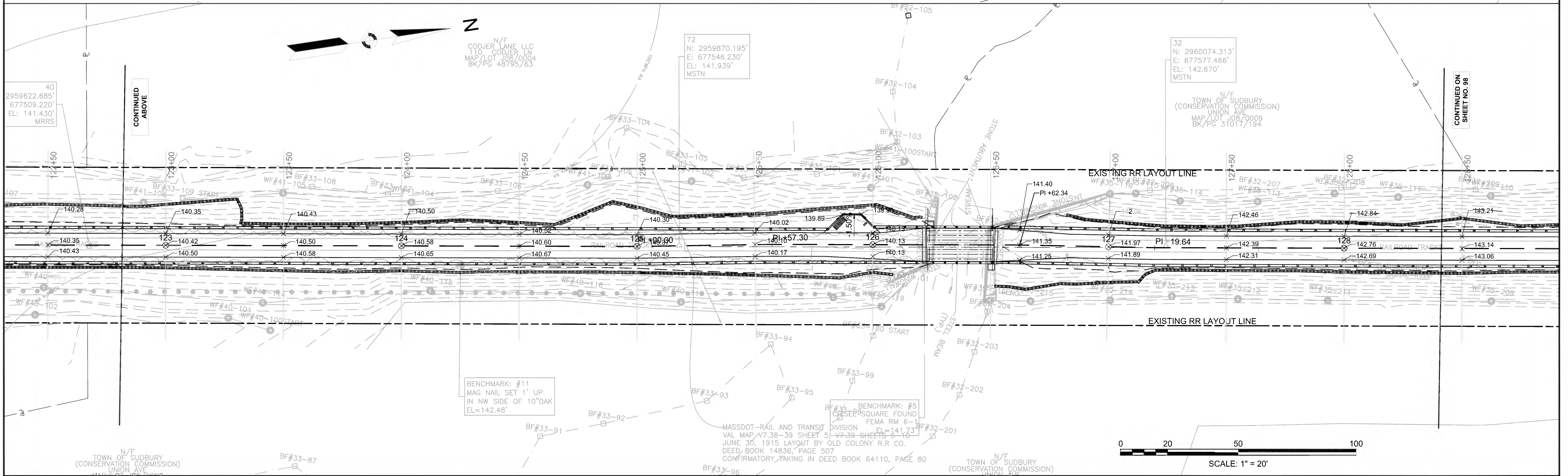
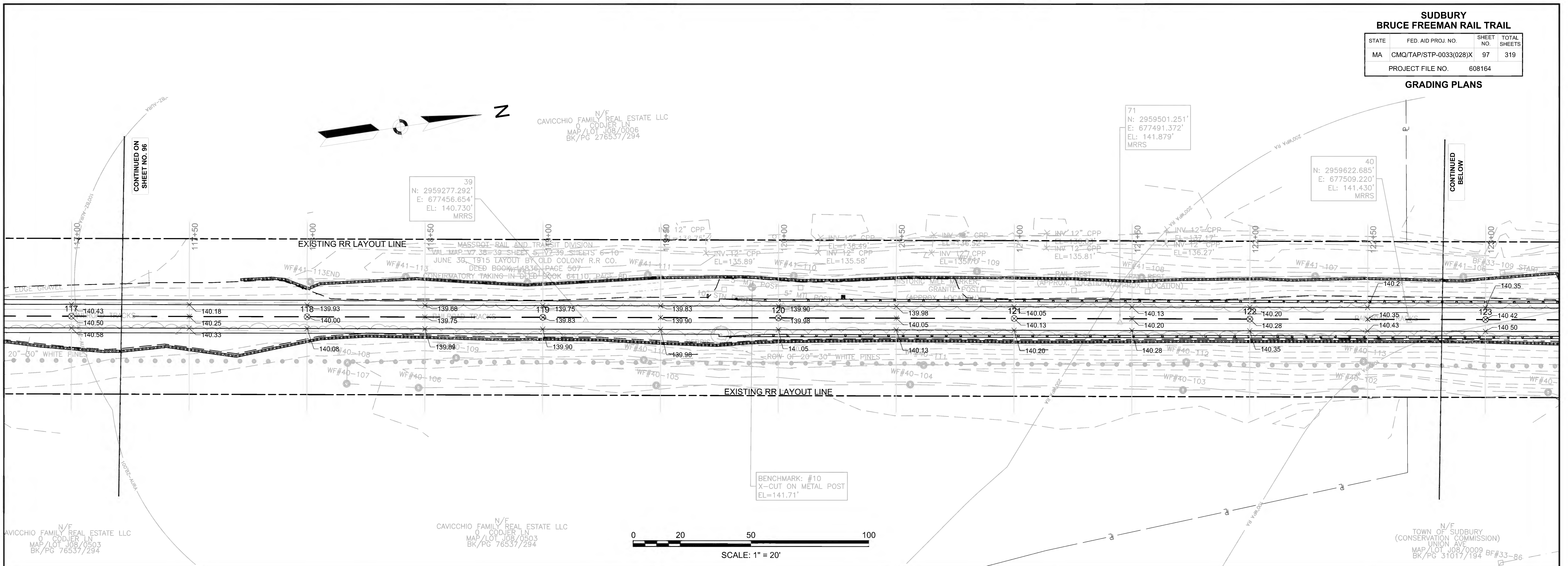
CONTINUED ON  
SHEET NO. 97



17  
N: 2958881.855'  
E: 677626.888'  
EL: 137.660'  
MMAG

FOR PROFILE SEE SHEET NO. 48



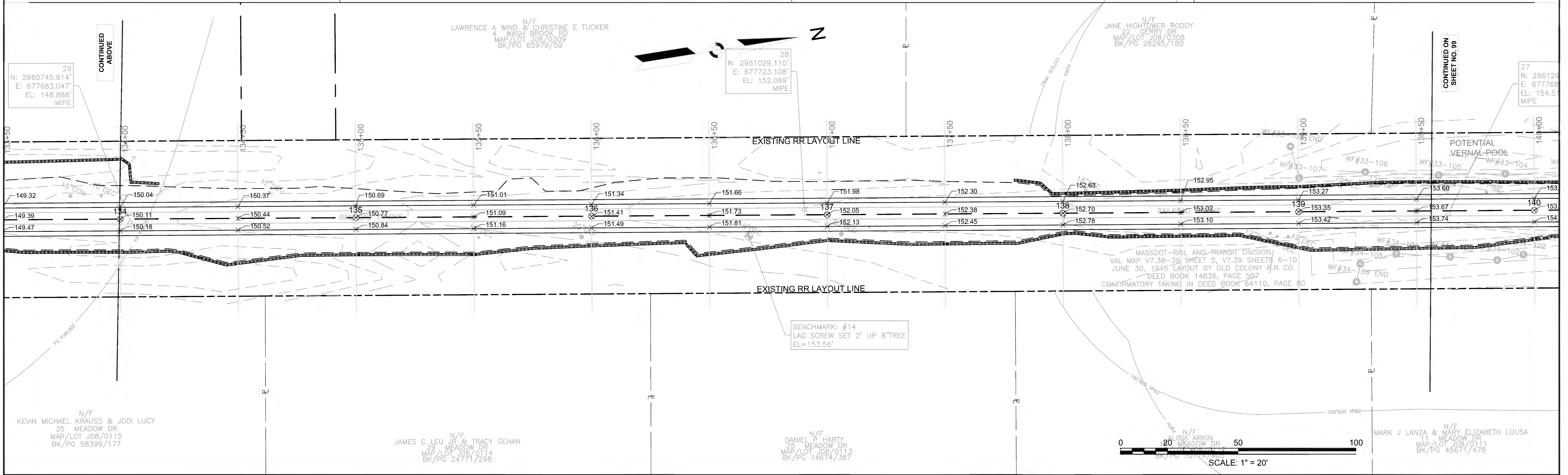
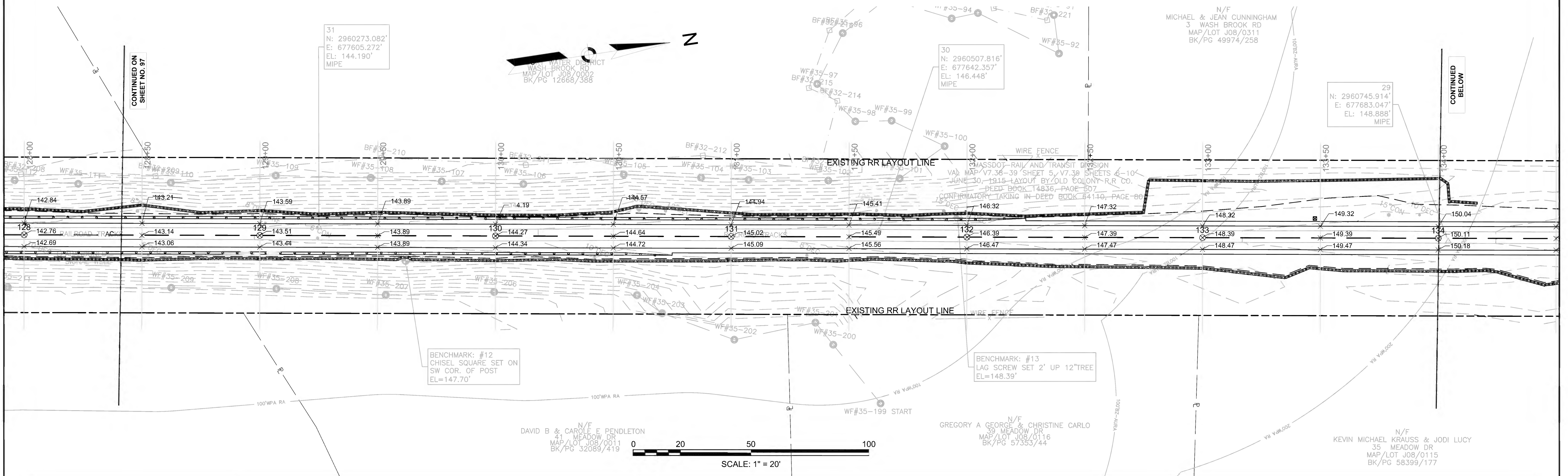




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	98	319
PROJECT FILE NO.		608164	

**GRADING PLANS**





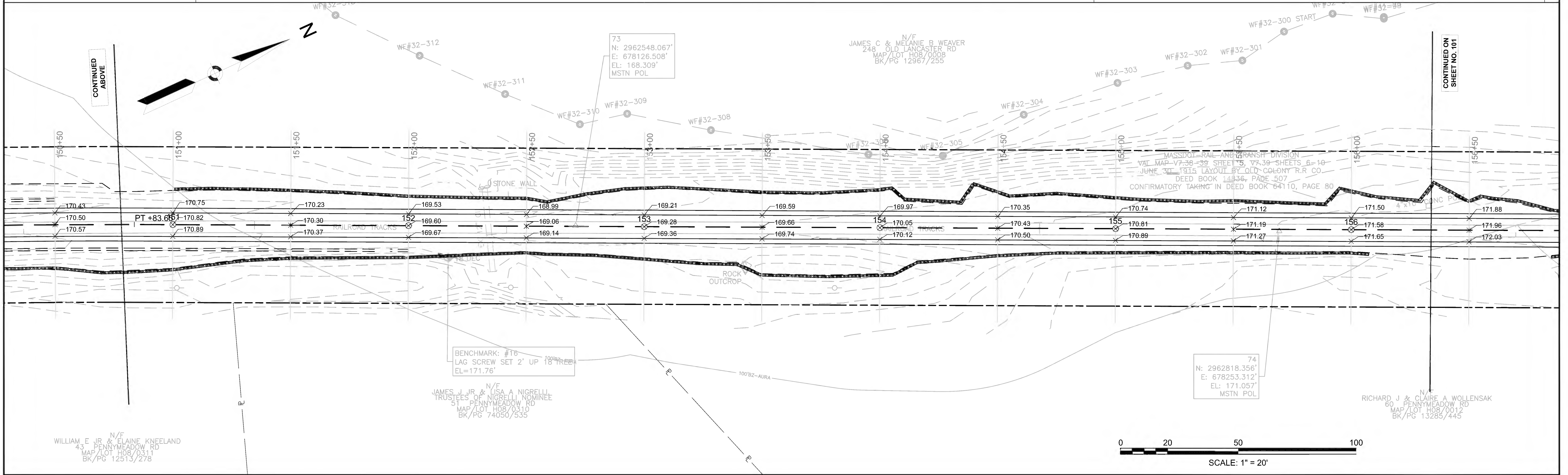
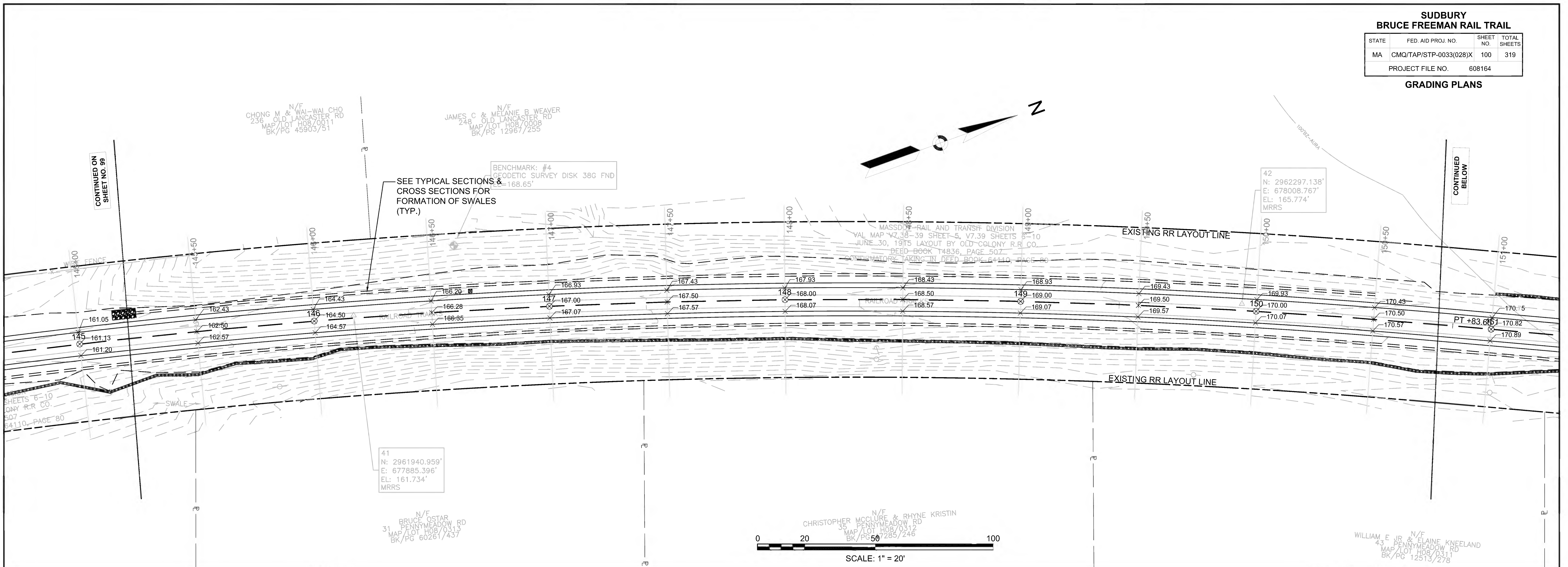




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	100	319
PROJECT FILE NO.		608164	

**GRADING PLANS**





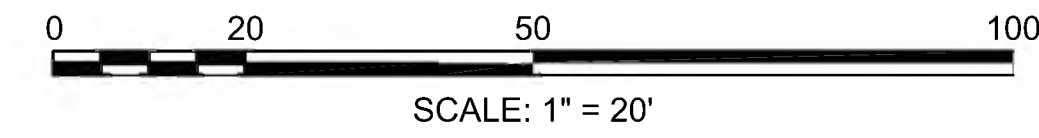
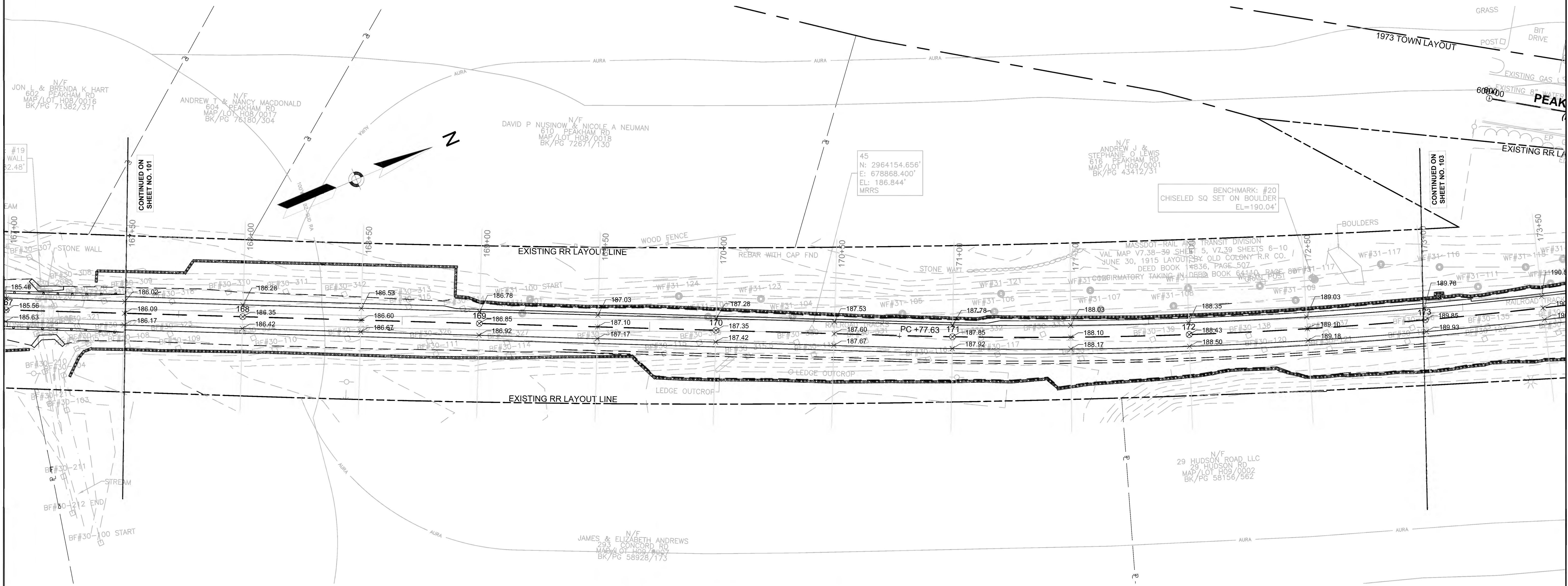




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	102	319
PROJECT FILE NO.		608164	

**GRADING PLANS**

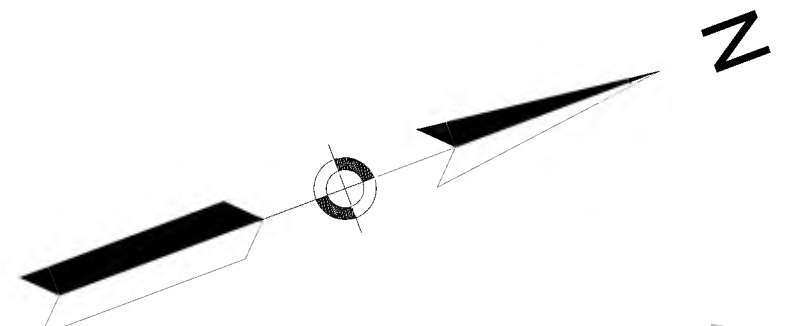
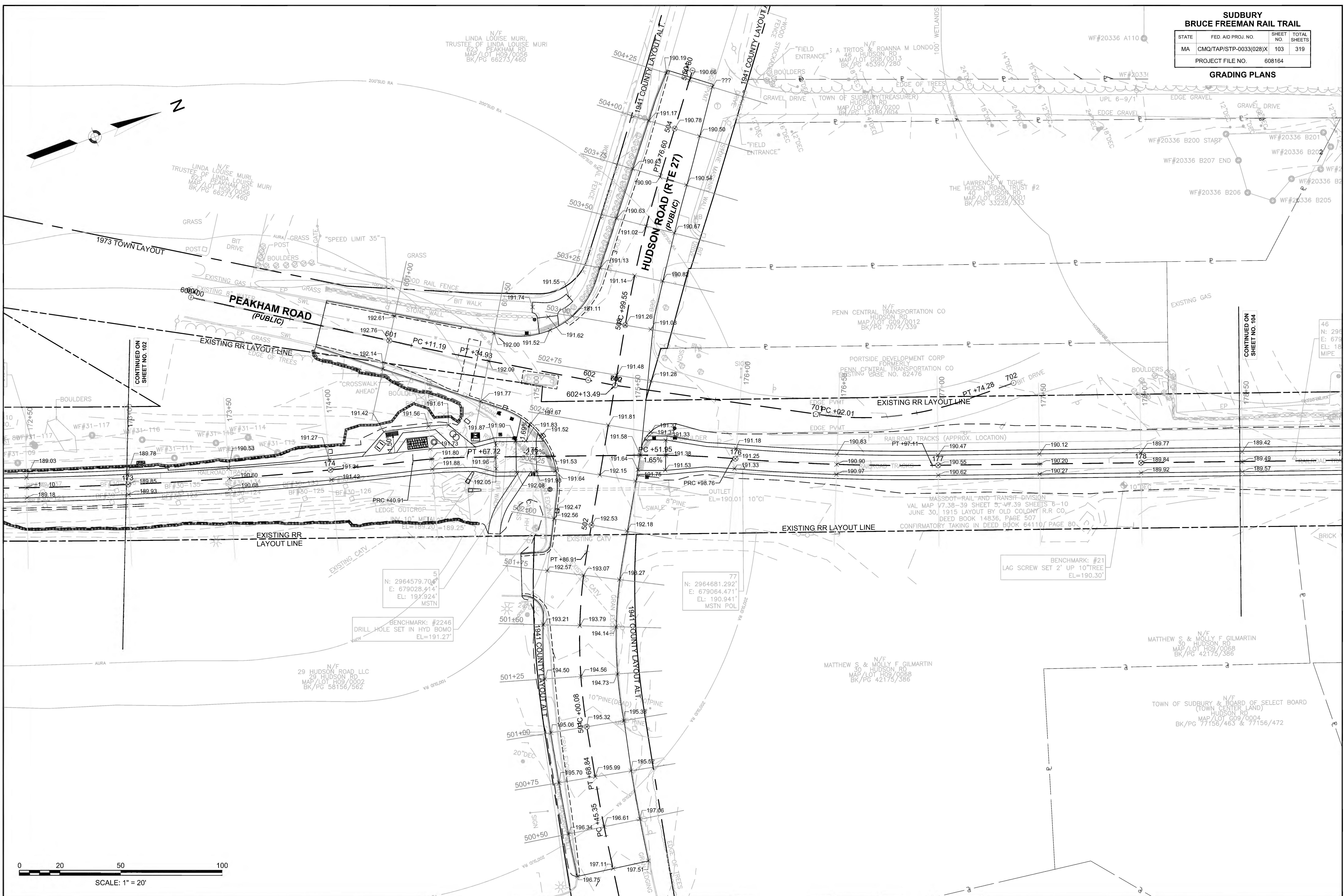




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

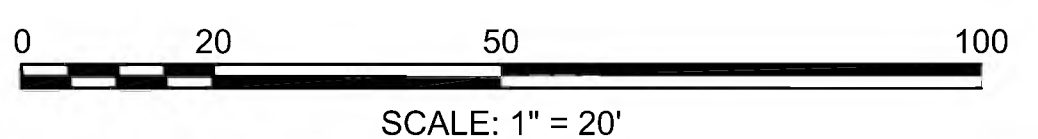
STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	103	319
PROJECT FILE NO.		608164	

**GRADING PLANS**



CONTINUED ON  
SHEET NO. 102

CONTINUED ON  
SHEET NO. 104



N/F  
LINDA LOUISE MURI,  
TRUSTEE OF LINDA LOUISE MURI  
623 PEAKHAM RD  
MAP/LOT H09/0056  
BK/PG 66273/460

N/F  
LINDA LOUISE MURI,  
TRUSTEE OF LINDA LOUISE MURI  
623 PEAKHAM RD  
MAP/LOT H09/0056  
BK/PG 66273/460

N/F  
LAWRENCE W. TIGHE,  
THE HUDSON ROAD TRUST #2  
40 HUDSON RD  
MAP/LOT G09/0001  
BK/PG 33228/333

N/F  
PENN CENTRAL TRANSPORTATION CO  
HUDSON RD  
MAP/LOT G09/0012  
BK/PG 7074/339

PORTSIDE DEVELOPMENT CORP  
FORMERLY  
PENN CENTRAL TRANSPORTATION CO  
PENDING CASE NO. 82476

MASSDOT—RAIL AND TRANSIT DIVISION  
VAL MAP V7-38-39 SHEET 5-VF-39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80

N: 2964579.704'  
E: 679028.414'  
EL: 193.924'  
MSTN

BENCHMARK: #2246  
DRILL HOLE SET IN HYD BOMO  
EL=191.27'

N: 2964681.292'  
E: 679064.471'  
EL: 190.941'  
MSTN POL

BENCHMARK: #21  
LAG SCREW SET 2' UP 10" TREE  
EL=190.30'

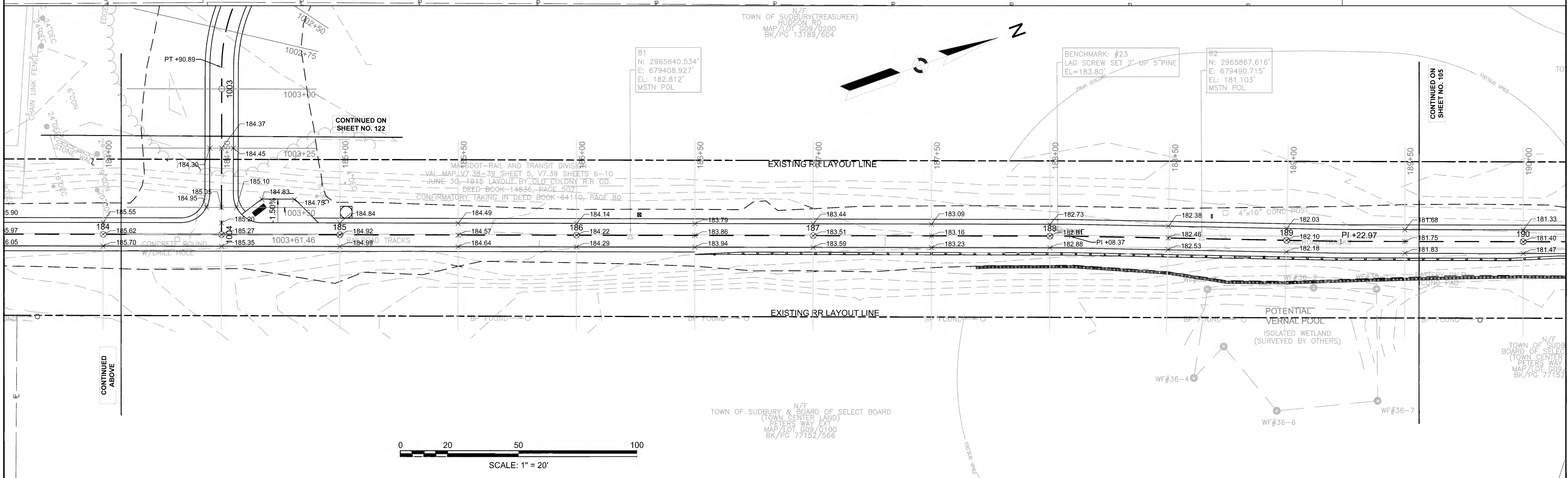
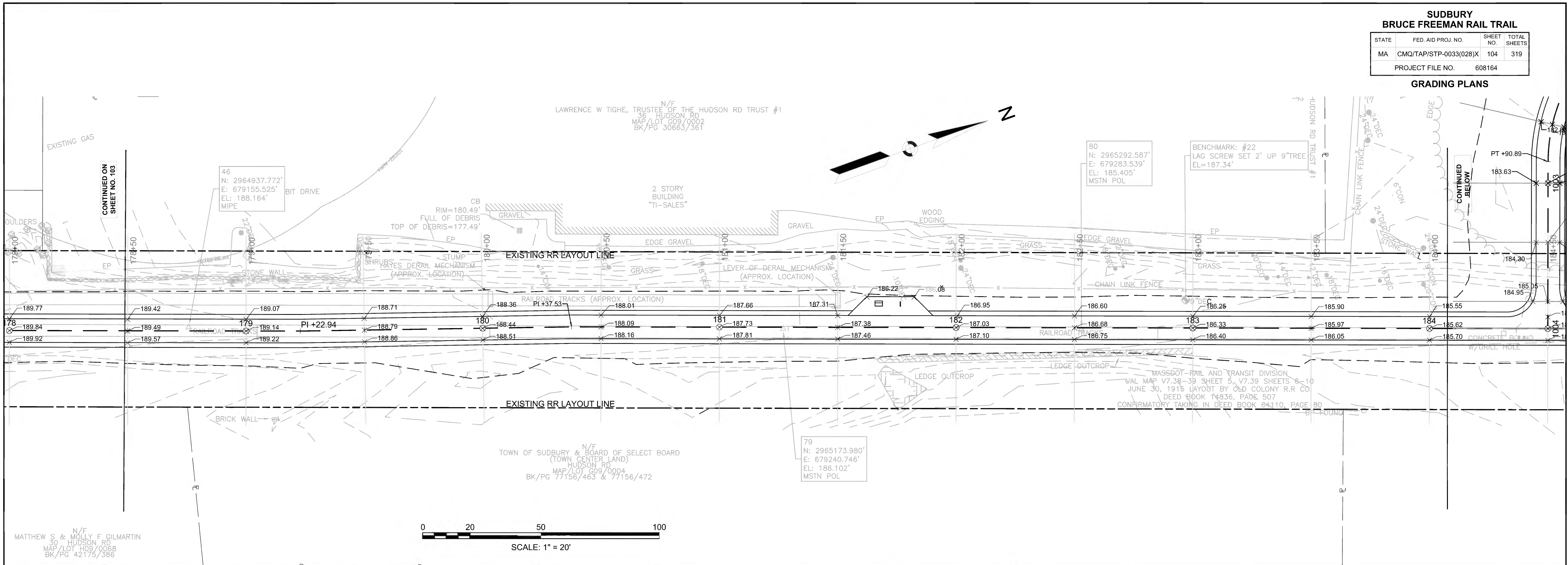
N/F  
29 HUDSON ROAD LLC  
29 HUDSON RD  
MAP/LOT H09/0002  
BK/PG 58156/562

N/F  
MATTHEW S & MOLLY F GILMARTIN  
30 HUDSON RD  
MAP/LOT H09/0068  
BK/PG 42175/386

N/F  
MATTHEW S & MOLLY F GILMARTIN  
30 HUDSON RD  
MAP/LOT H09/0068  
BK/PG 42175/386

N/F  
TOWN OF SUDBURY & BOARD OF SELECT BOARD  
(TOWN CENTER LAND)  
HUDSON RD  
MAP/LOT G09/0004  
BK/PG 77156/463 & 77156/472







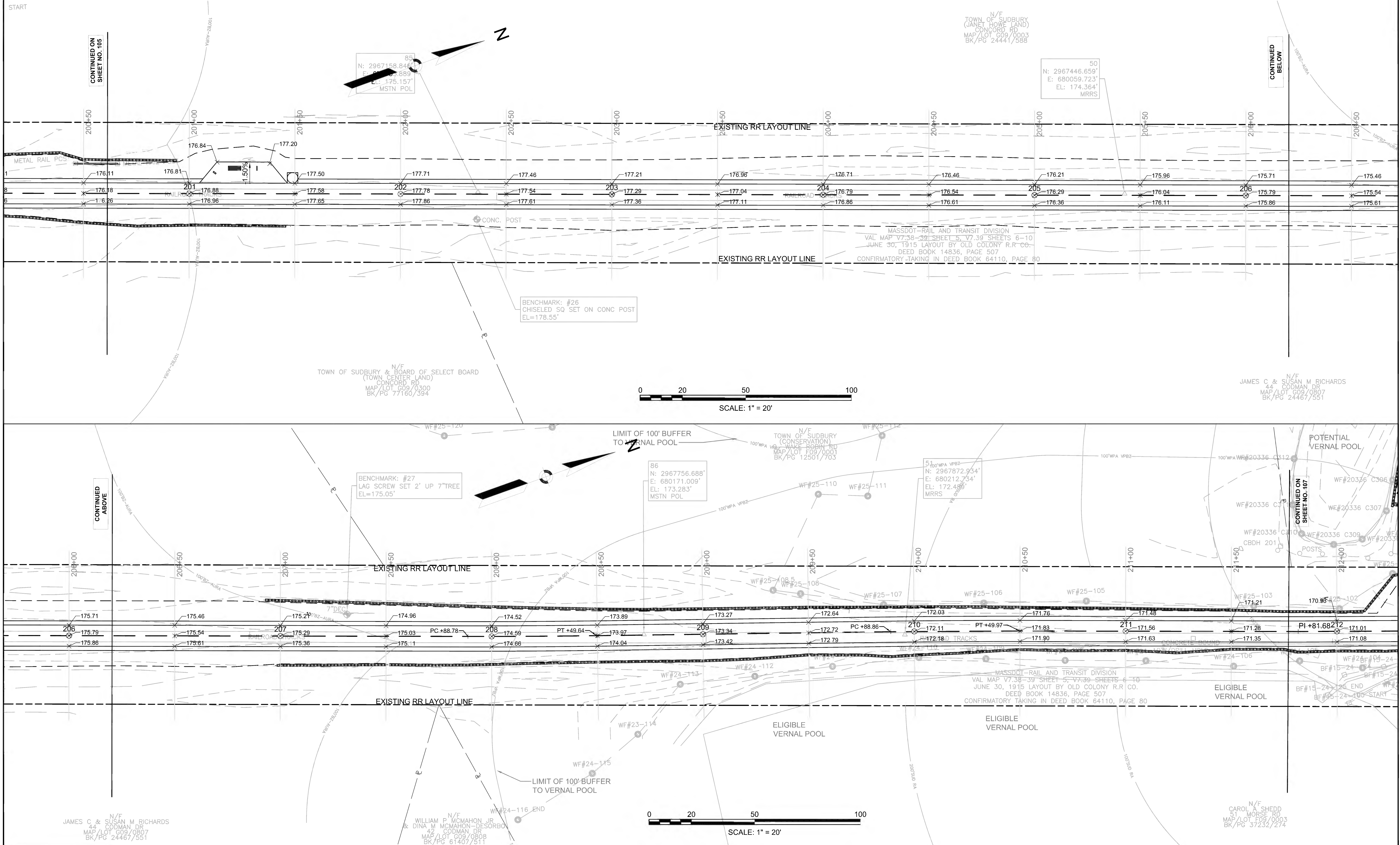




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	106	319
PROJECT FILE NO.		608164	

**GRADING PLANS**

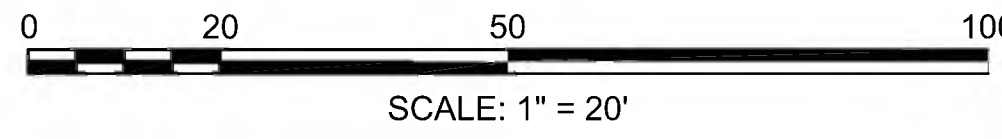
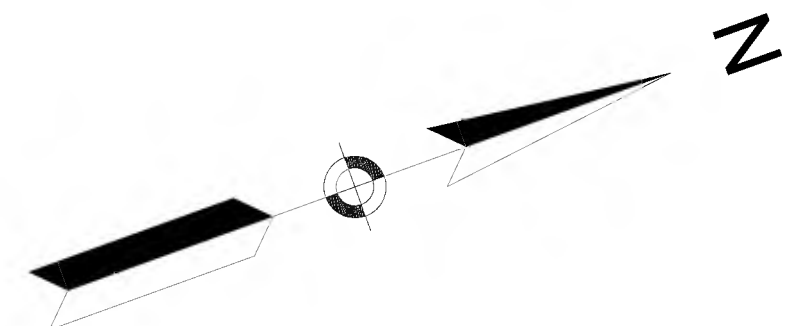




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	107	319
PROJECT FILE NO.		608164	

**GRADING PLANS**



9  
N: 2968271.964'  
E: 680588.479'  
EL: 175.208'

TOWN OF SUDBURY & BOARD OF SELECTMEN  
(BROADACRES FARM HOUSE)  
87 MORSE RD  
MAP/LOT F09/0002  
BK/PG 72906/476

10  
N: 2968439.769'  
E: 680417.689'  
EL: 168.979'  
MSTN

N/F CAROL A SHEDD  
51 MORSE RD  
MAP/LOT F09/0003  
BK/PG 37232/274

N/F CAROL A SHEDD  
51 MORSE RD  
MAP/LOT F09/0003  
BK/PG 37232/274

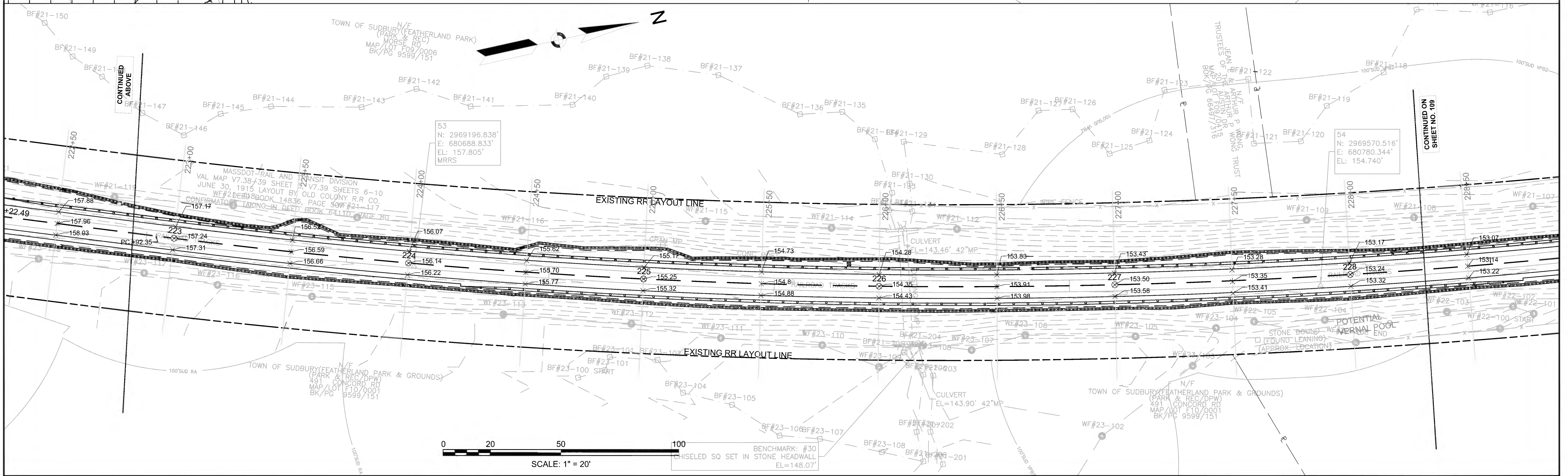
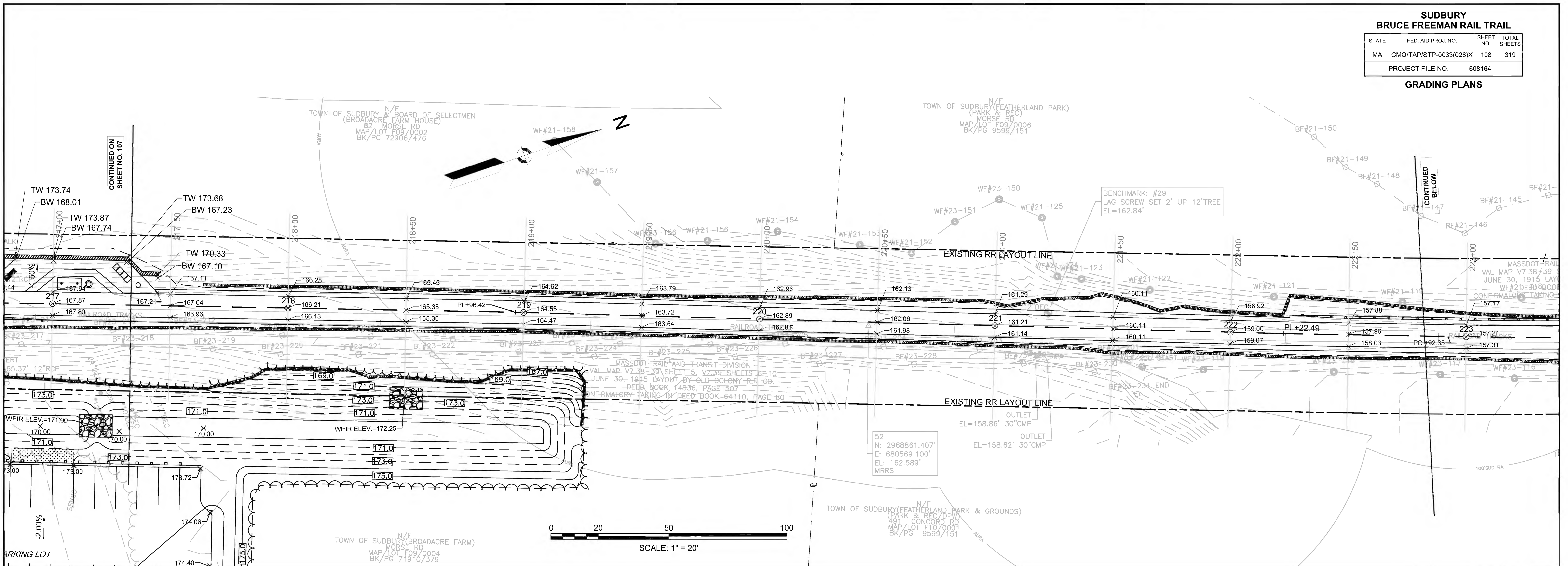
POTENTIAL  
VERNAL POOL

ELIGIBLE  
VERNAL POOL

CONTINUED ON  
SHEET NO. 108

CONTINUED ON  
SHEET NO. 106



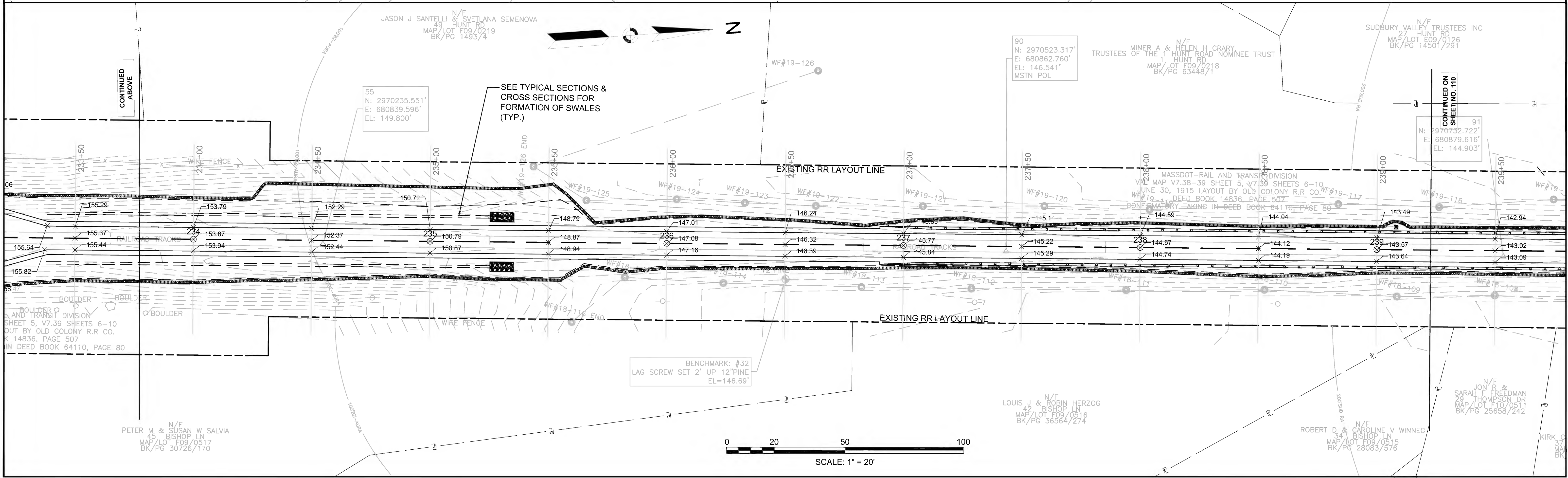
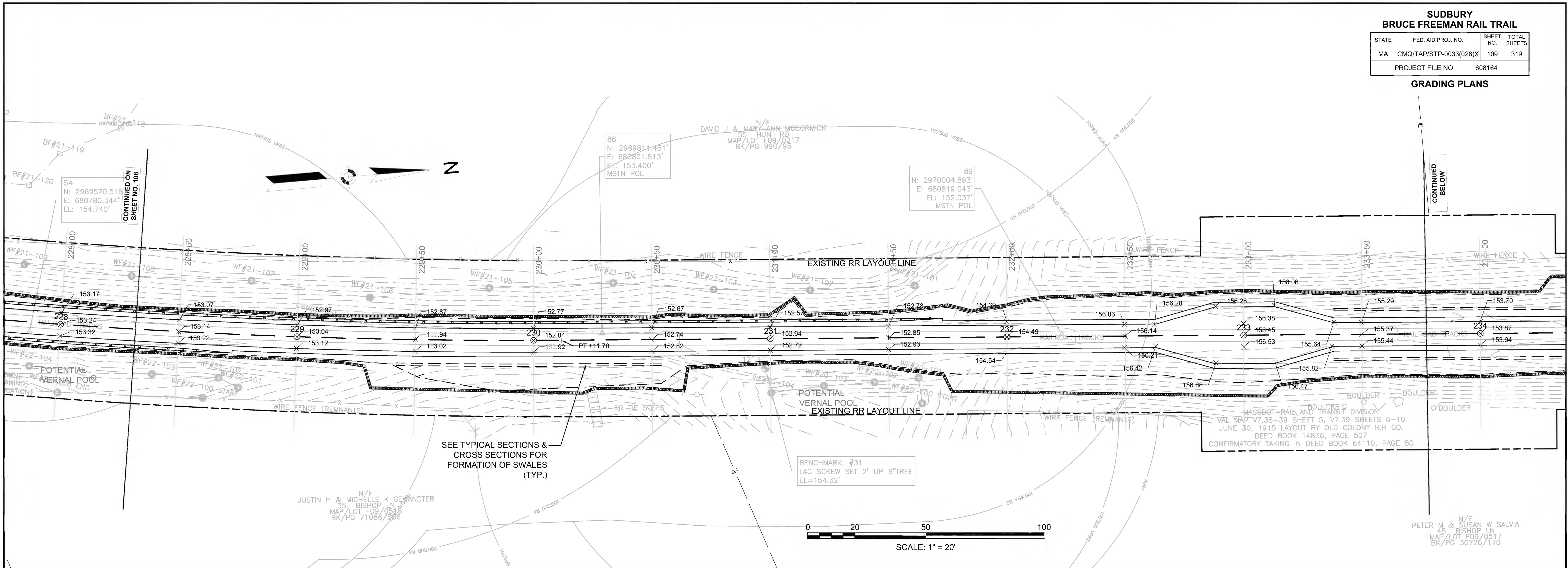




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	109	319
PROJECT FILE NO.		608164	

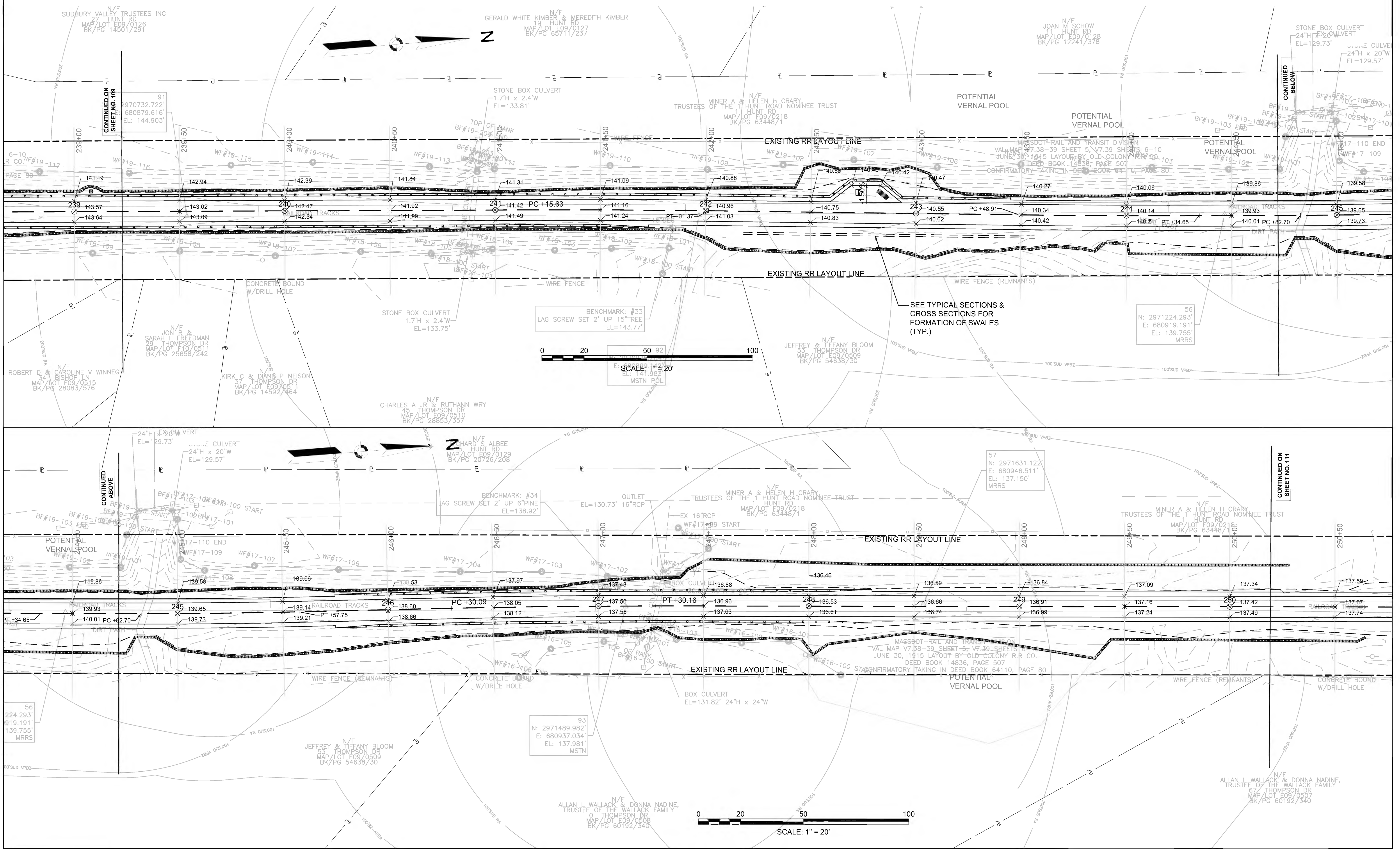
**GRADING PLANS**





SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	110	319
PROJECT FILE NO.		608164	

GRADING PLANS

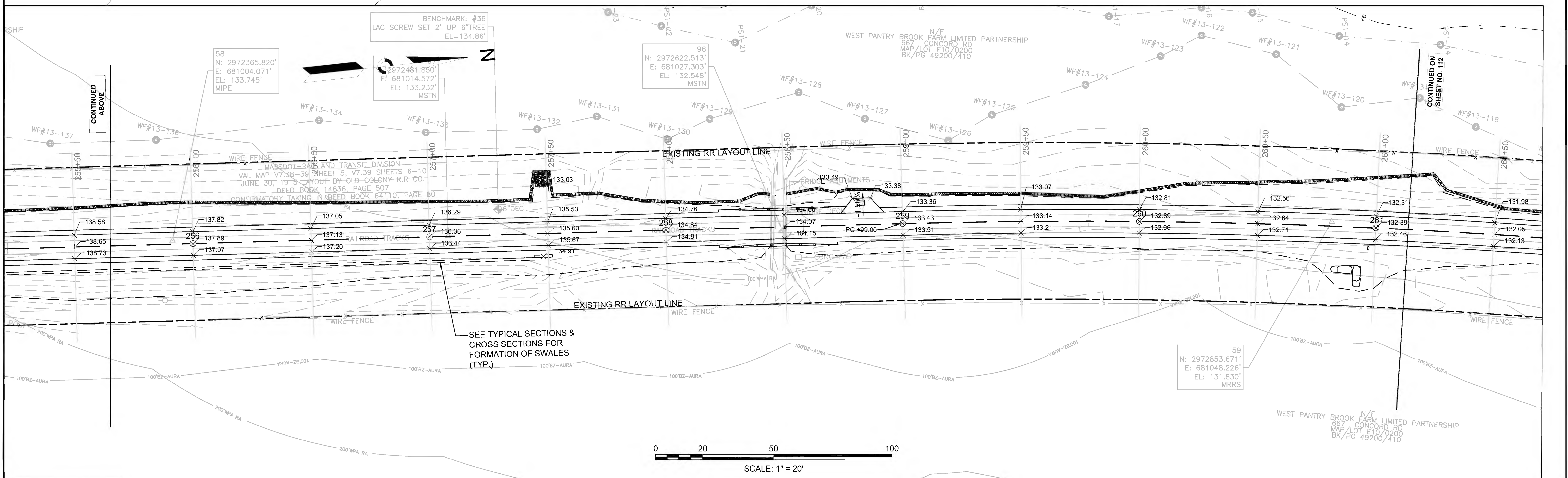
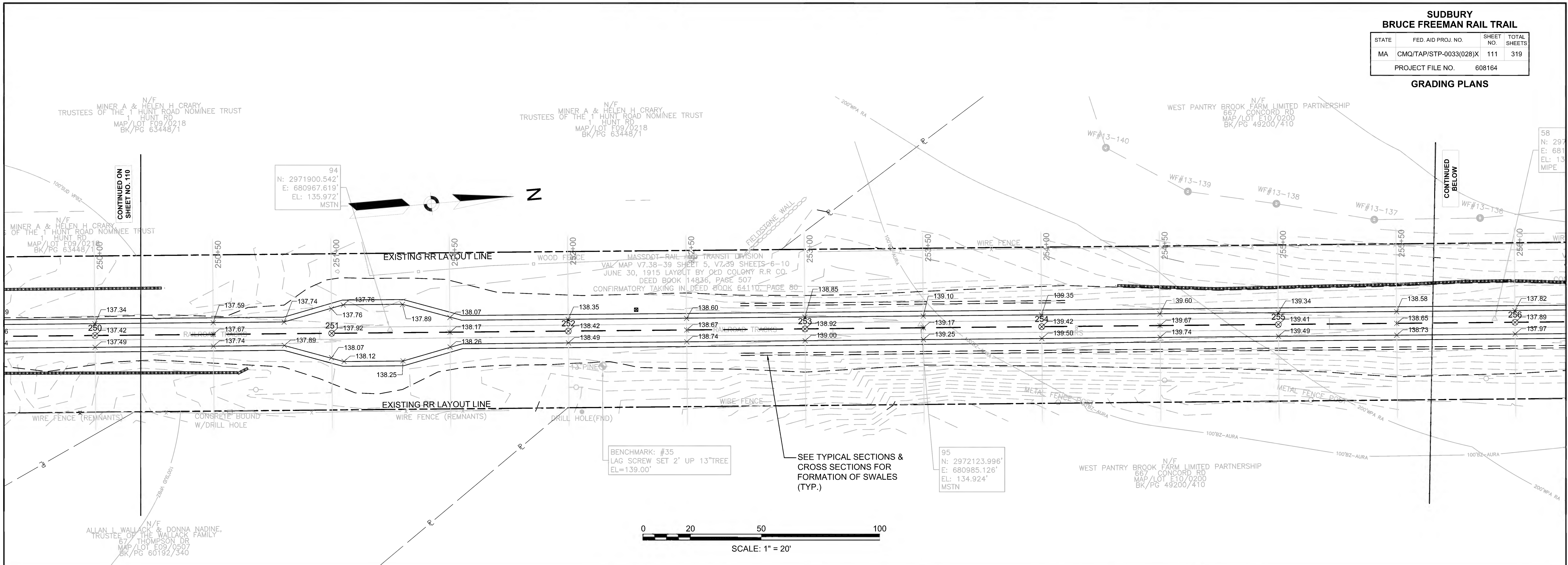




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	111	319
PROJECT FILE NO.		608164	

**GRADING PLANS**

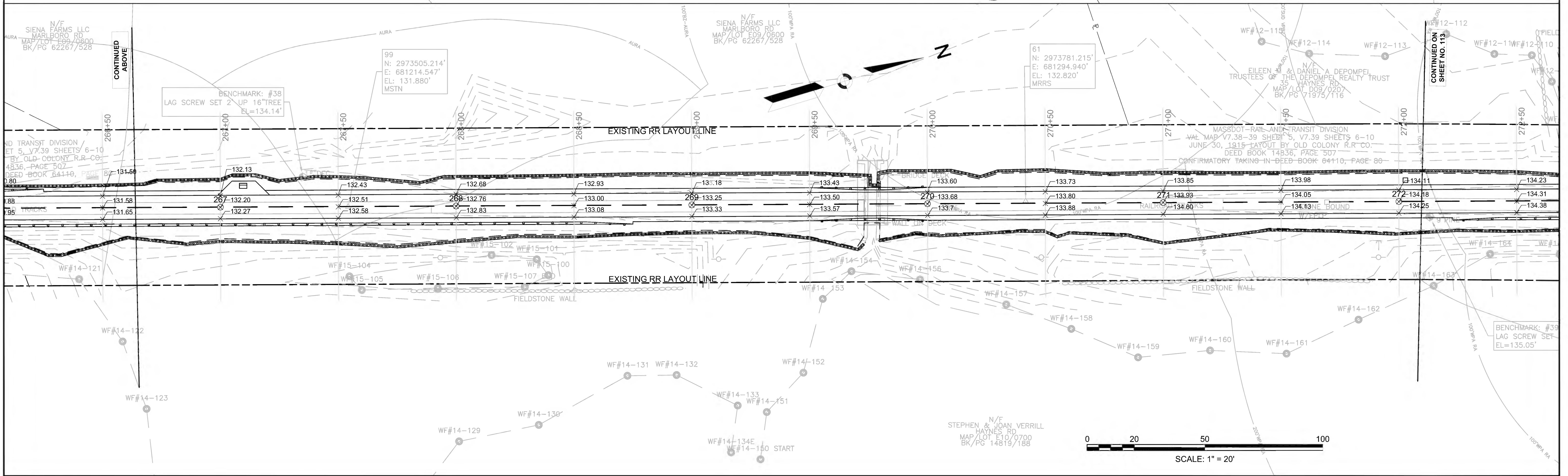
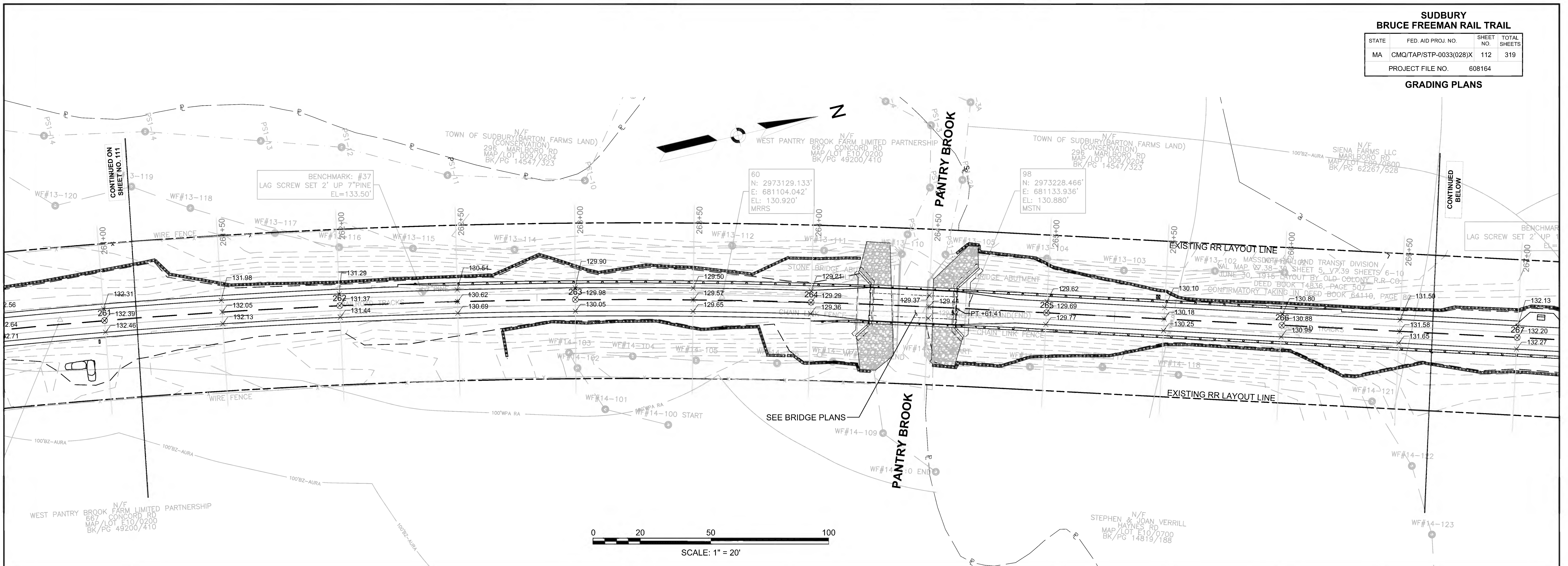




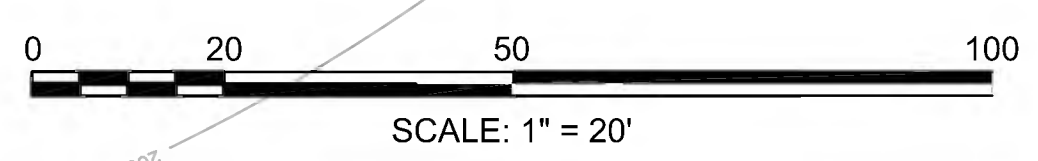
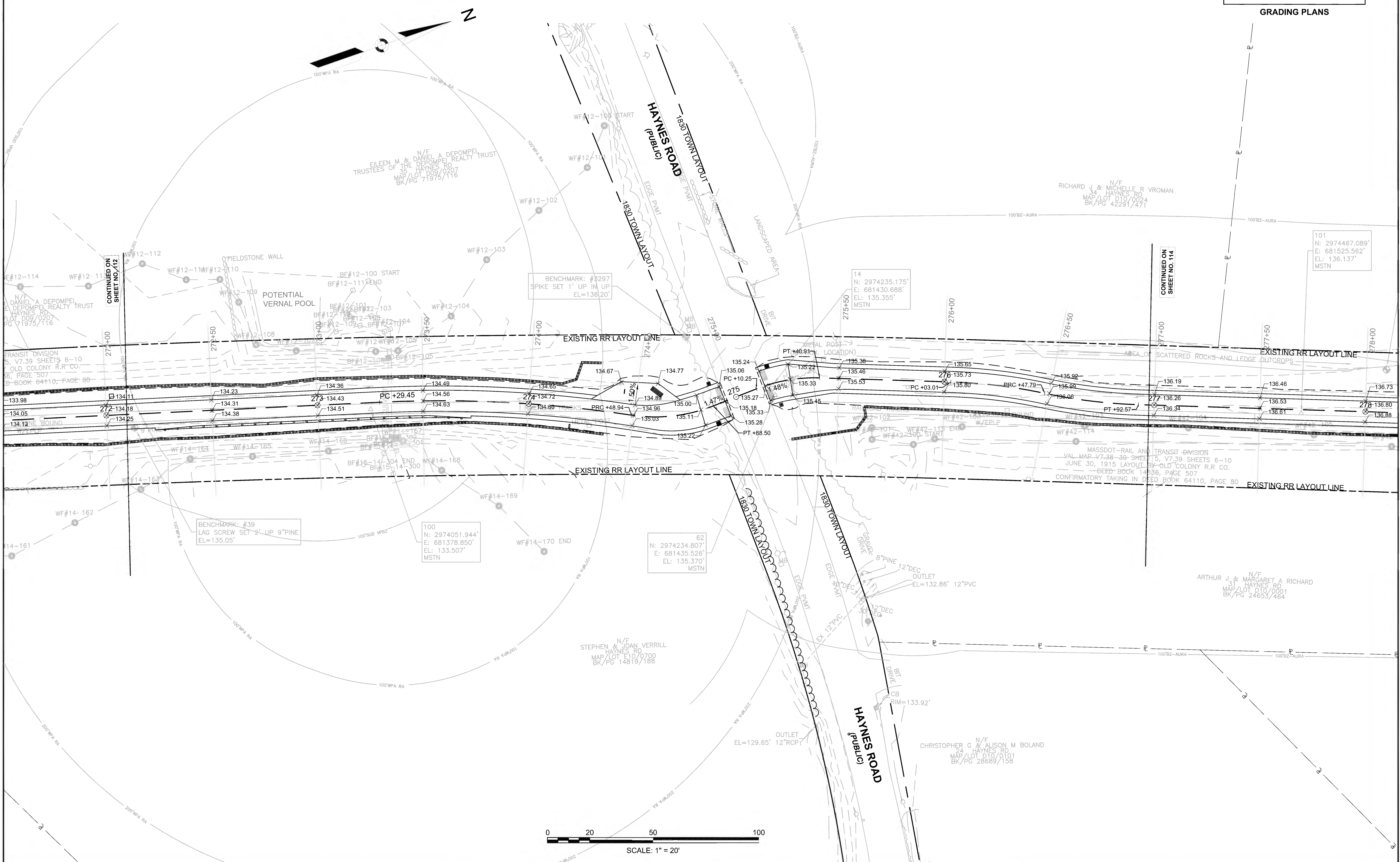
**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	112	319
PROJECT FILE NO.		608164	

**GRADING PLANS**





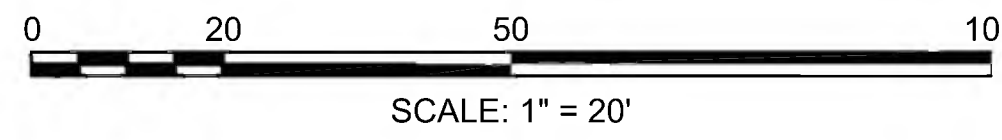
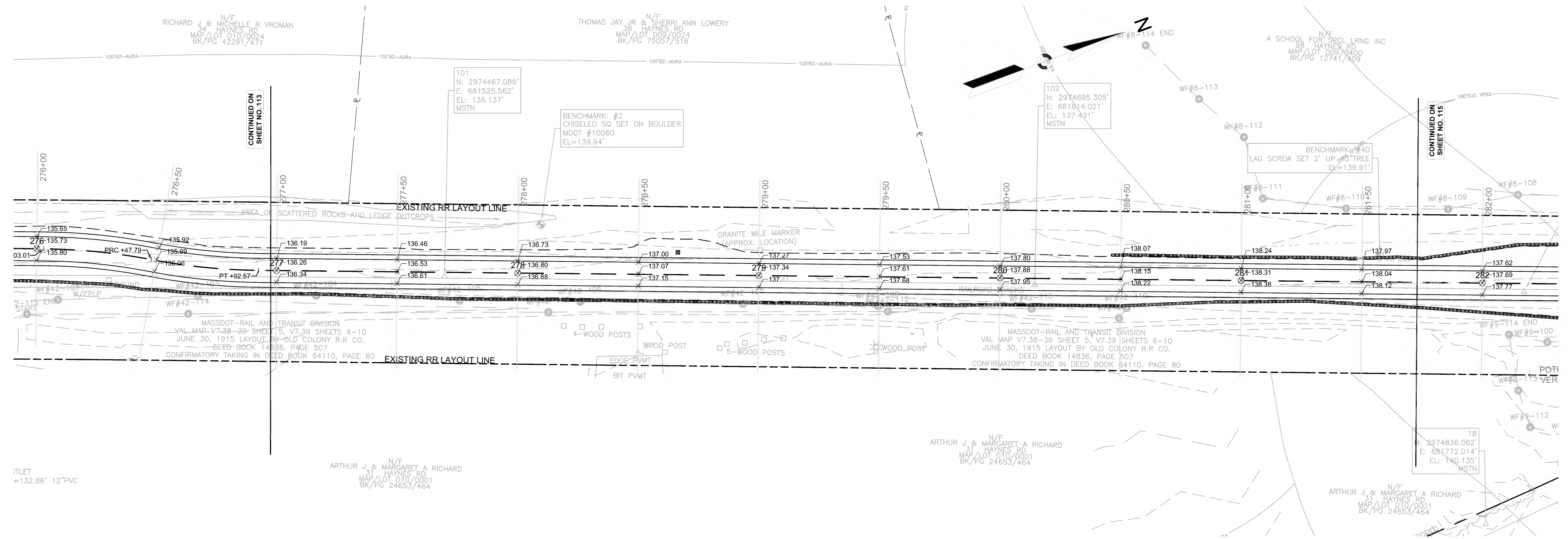




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	114	319
PROJECT FILE NO.		608164	

**GRADING PLANS**

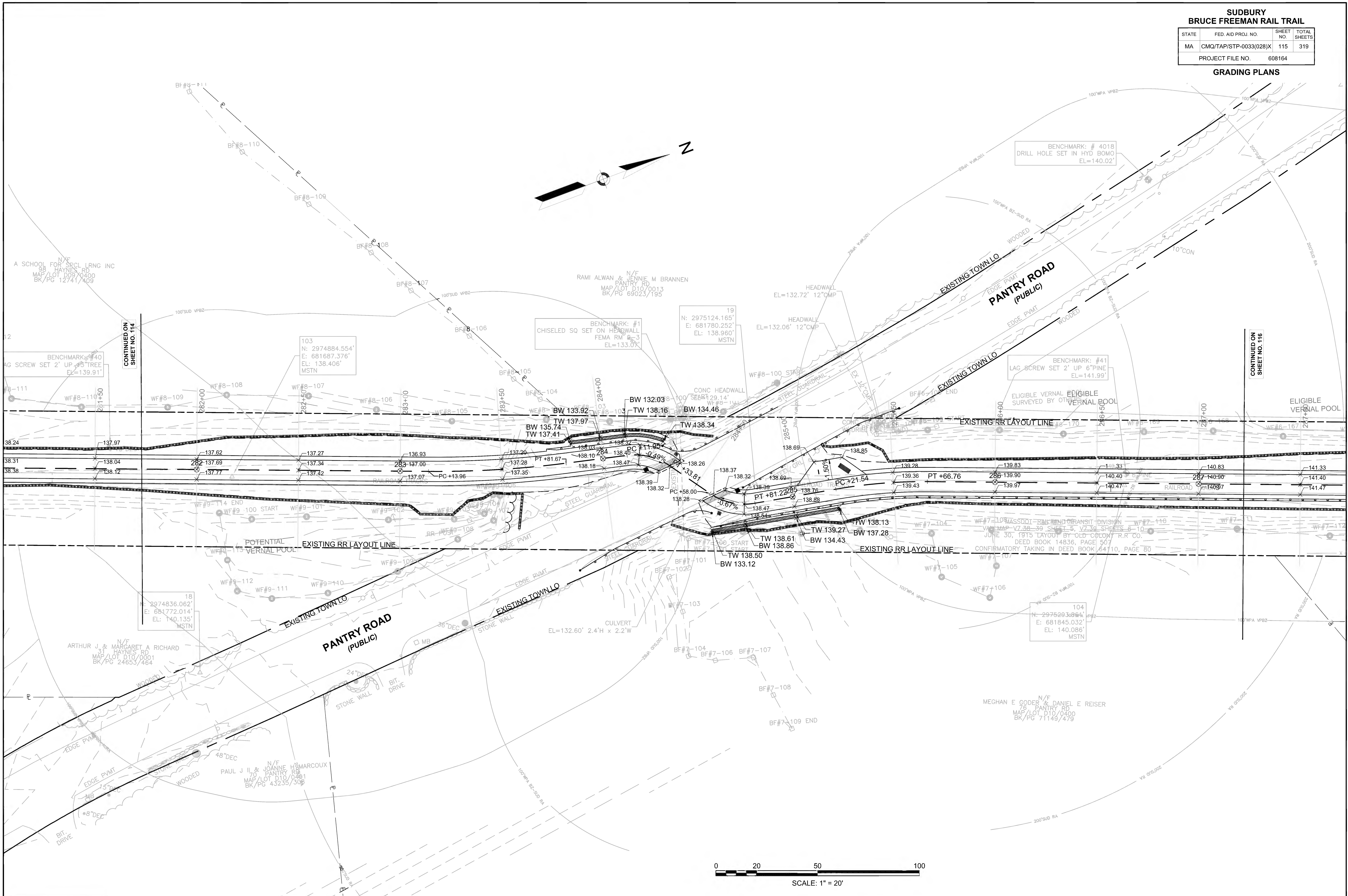




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	115	319
PROJECT FILE NO.		608164	

**GRADING PLANS**

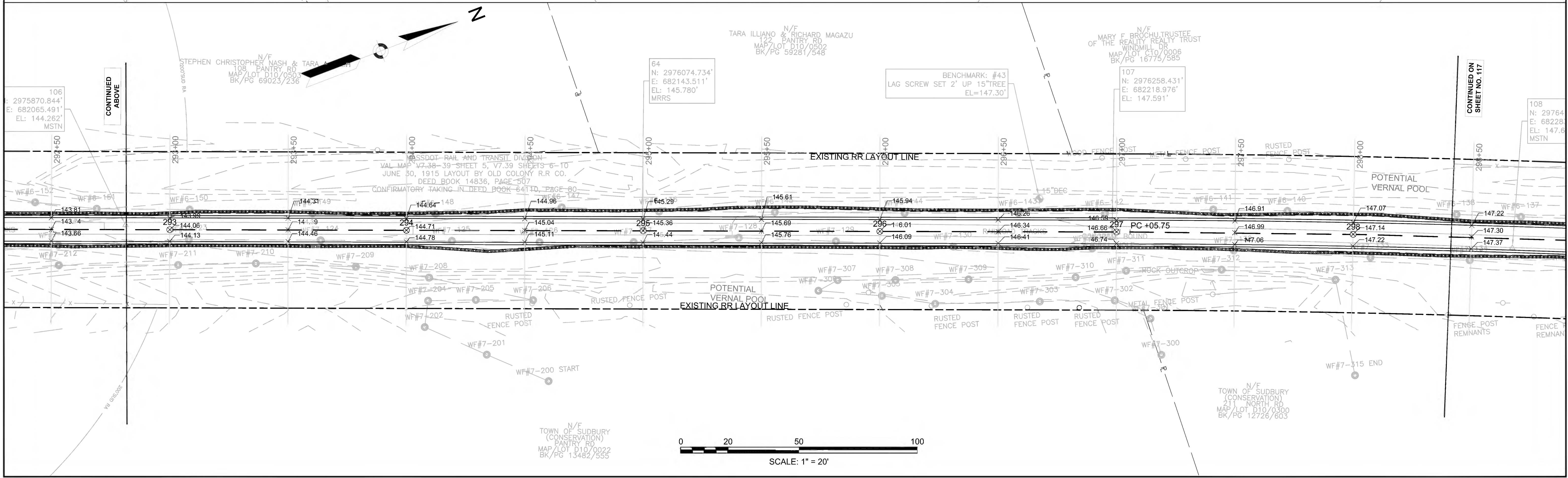
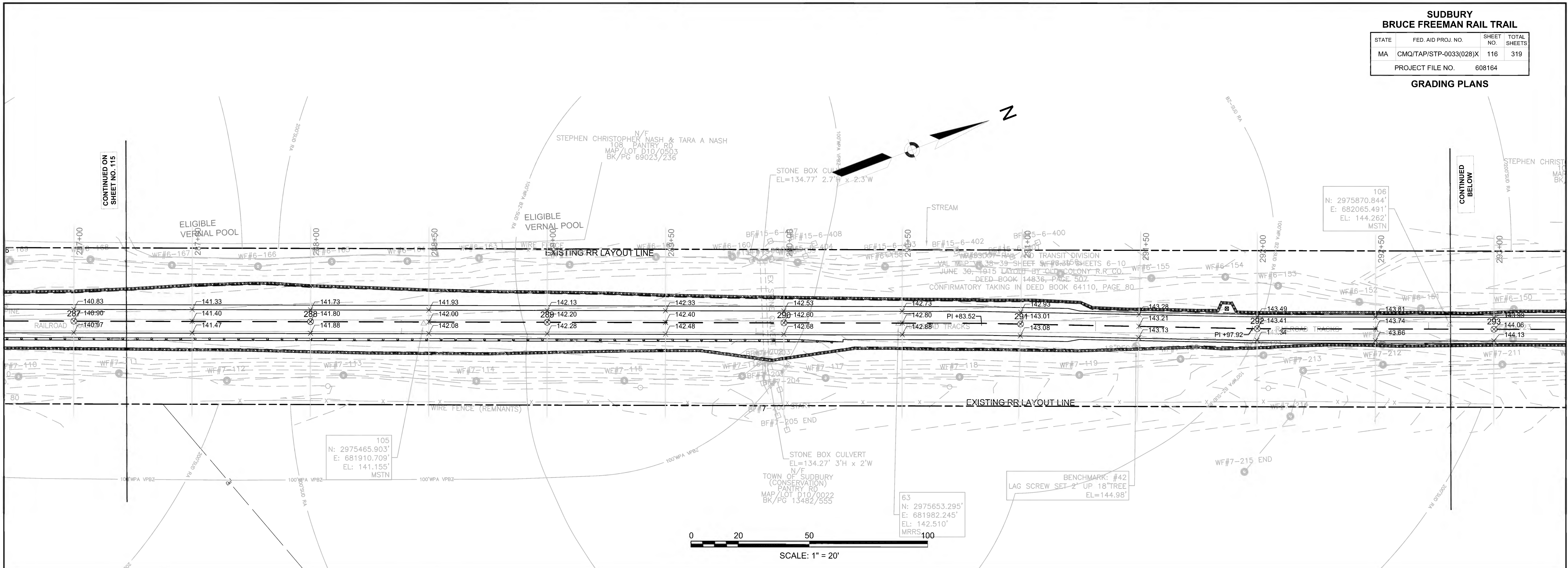




**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	116	319
PROJECT FILE NO.		608164	

**GRADING PLANS**

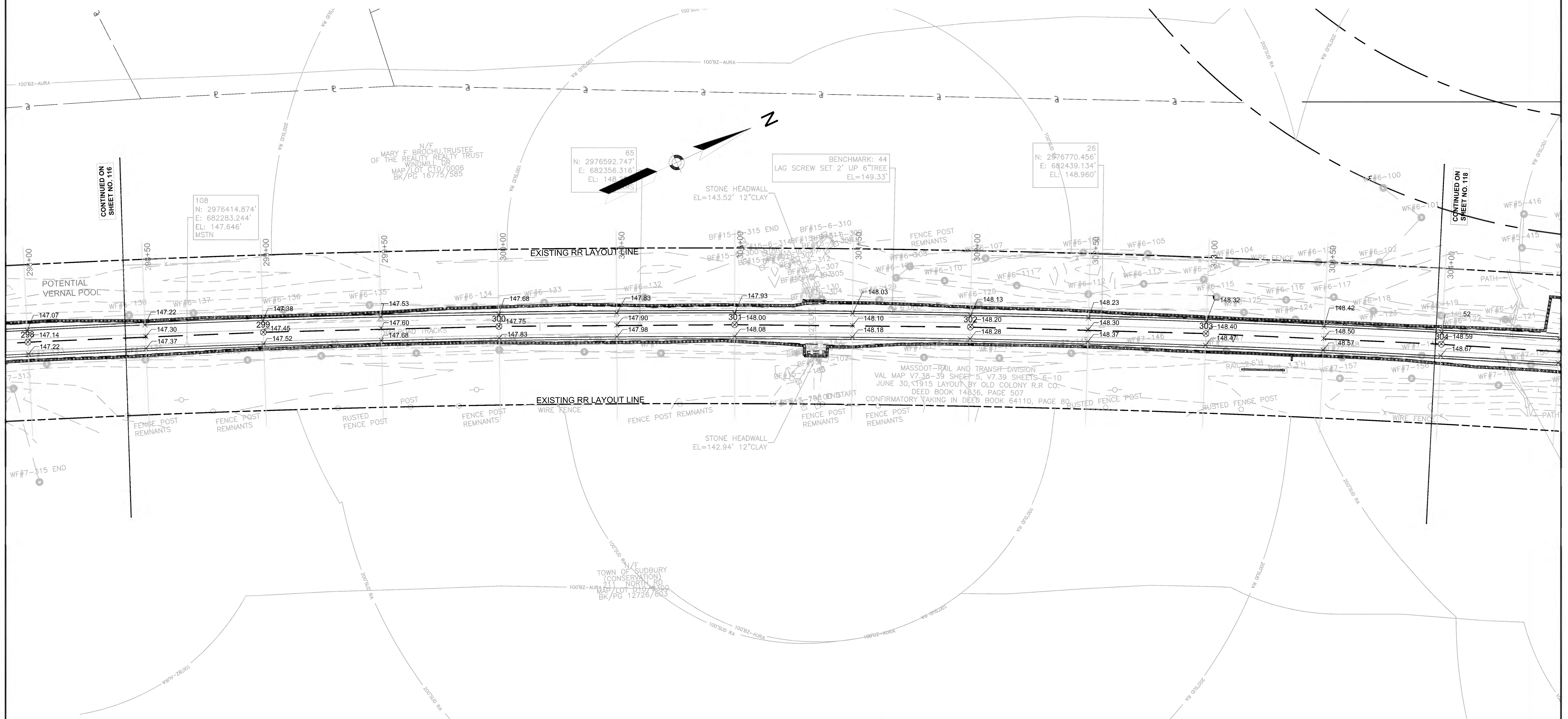




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

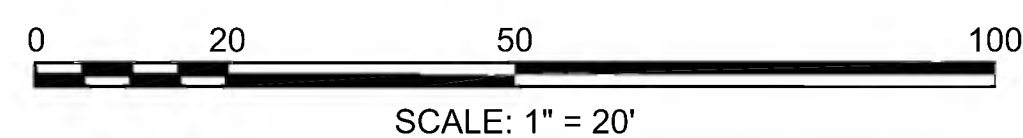
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	117	319
PROJECT FILE NO.		608164	

**GRADING PLANS**

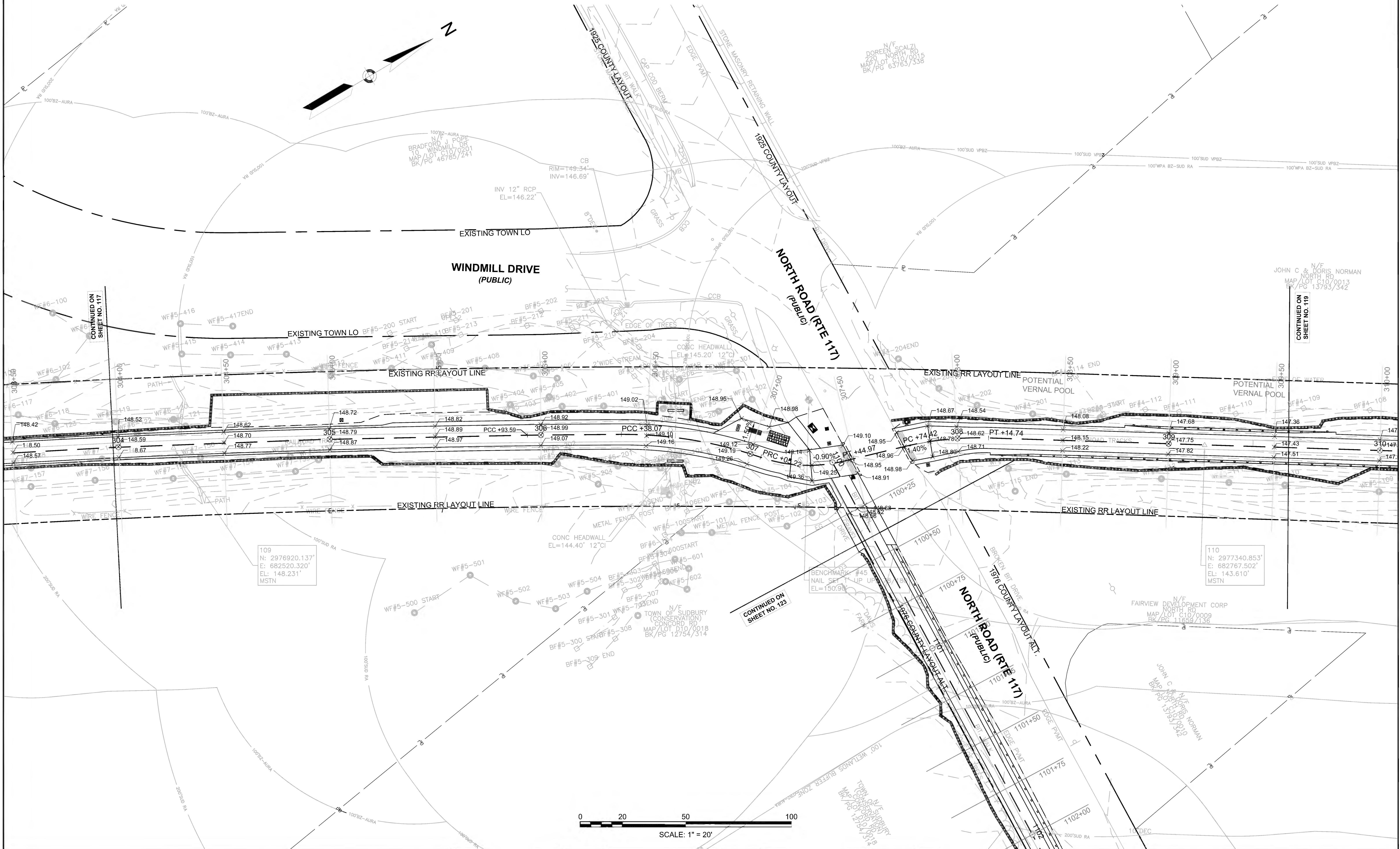


CONTINUED ON  
SHEET NO. 116

CONTINUED ON  
SHEET NO. 118

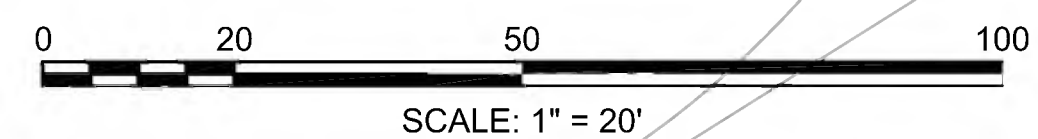






109  
N: 2976920.137'  
E: 682520.320'  
EL: 148.231'  
MSTN

110  
N: 2977340.853'  
E: 682767.502'  
EL: 143.610'  
MSTN

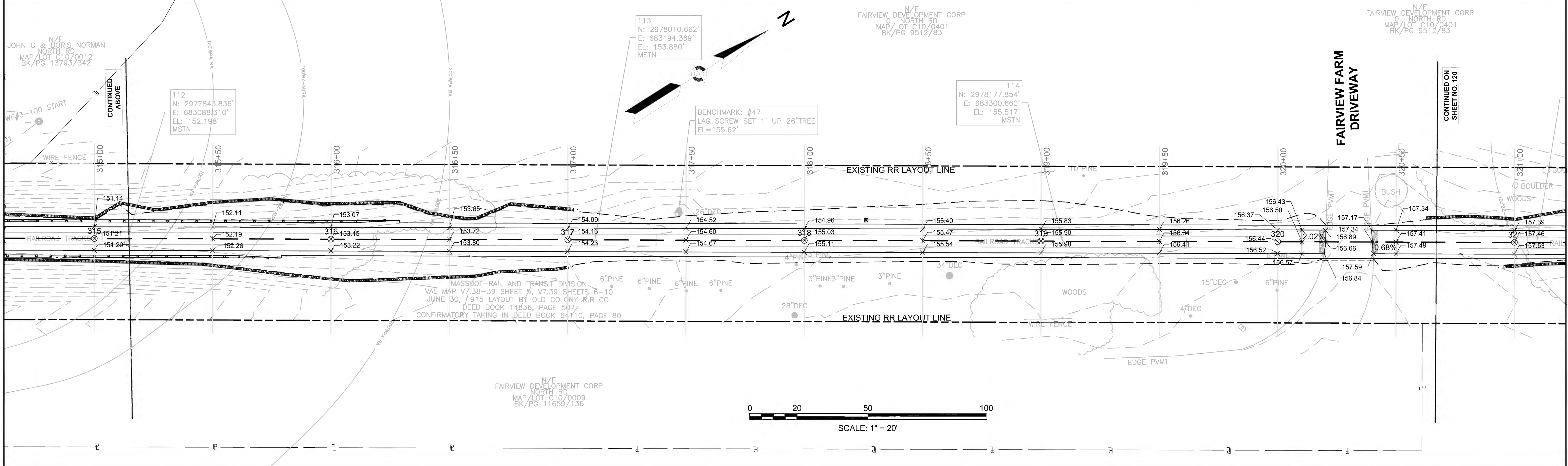
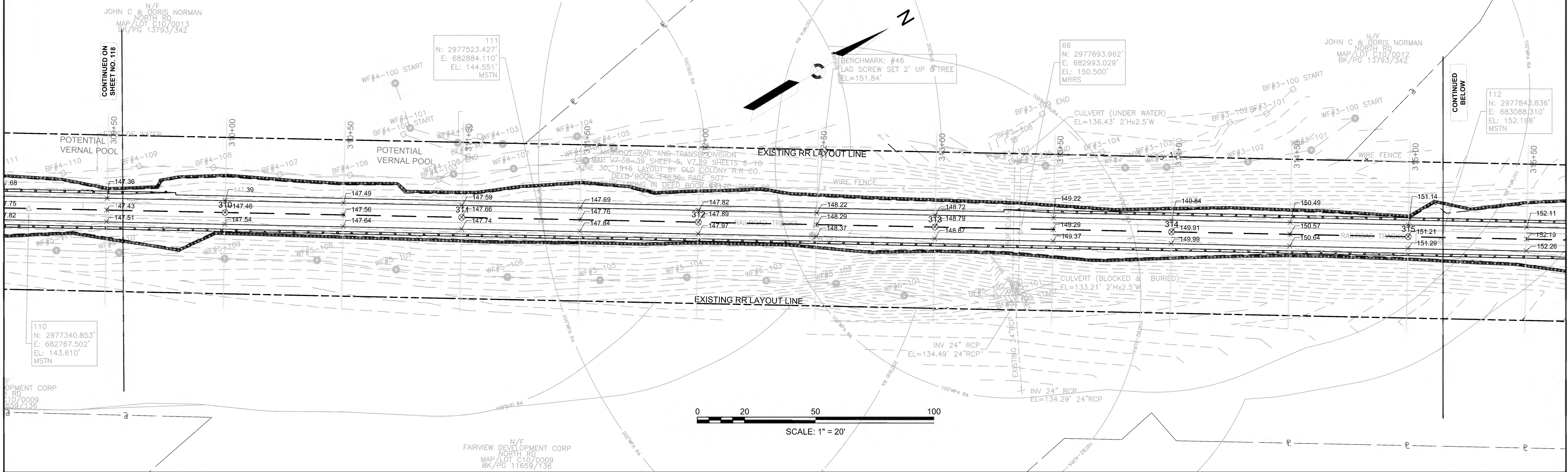




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	119	319
PROJECT FILE NO.		608164	

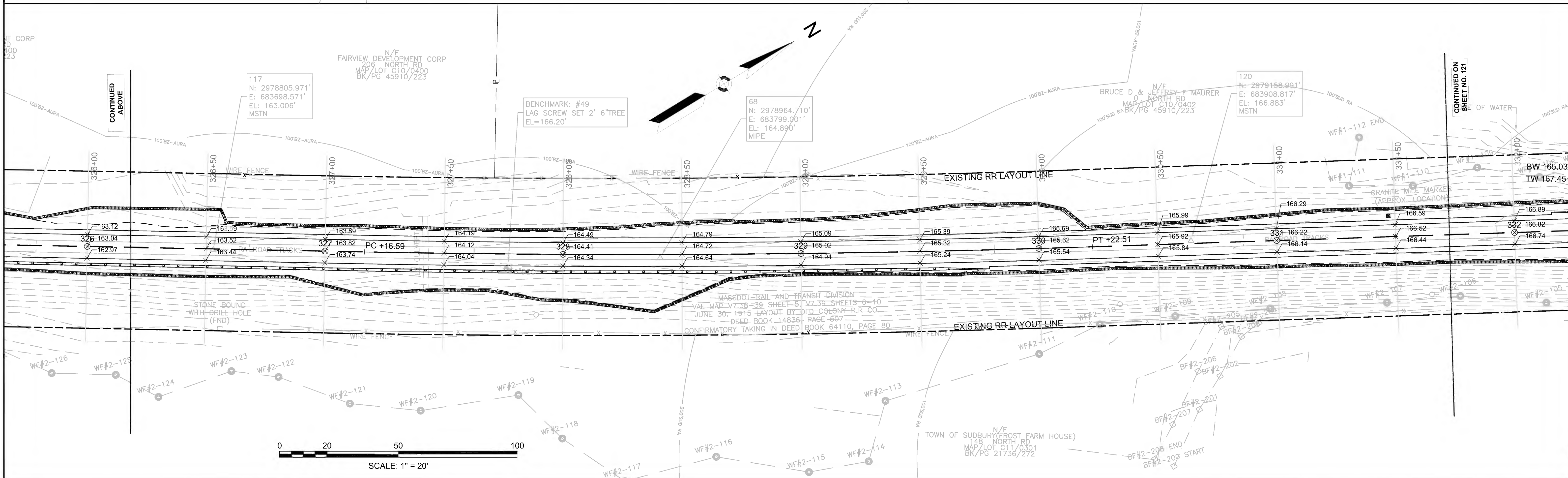
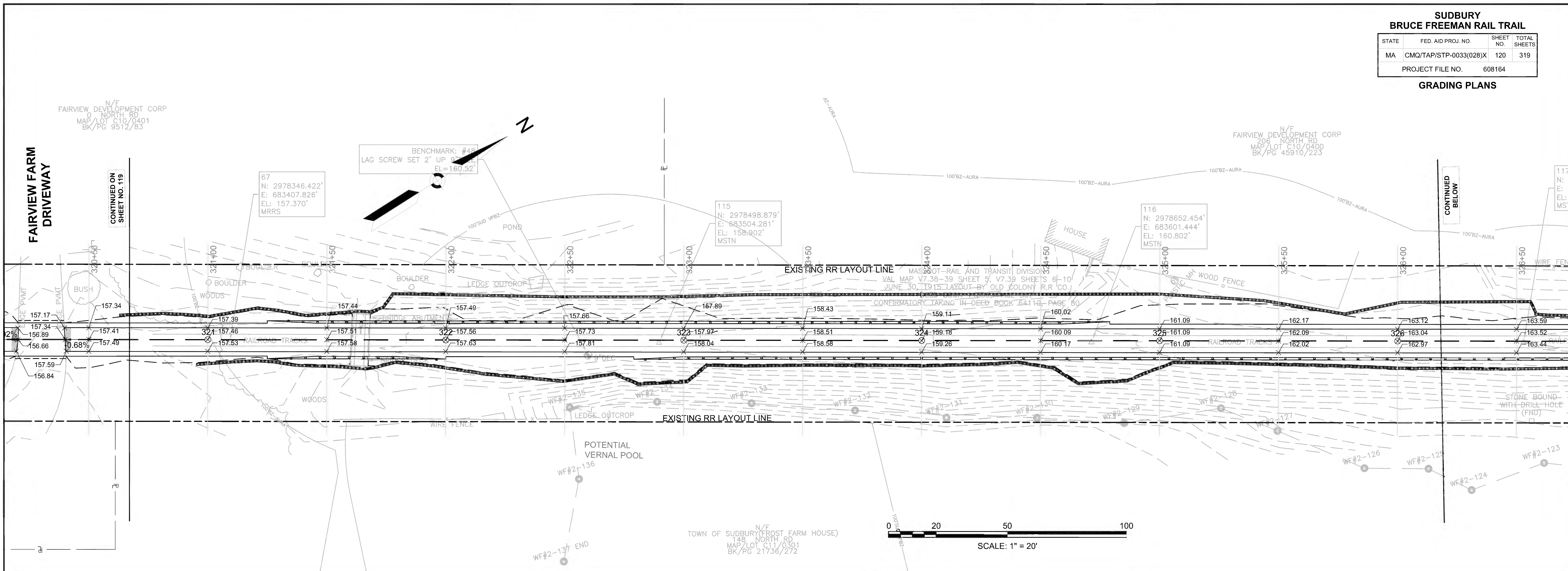
**GRADING PLANS**



608164\_HD(GRADING PLANS).DWG Plotted on 27-Jun-2022 10:35 AM

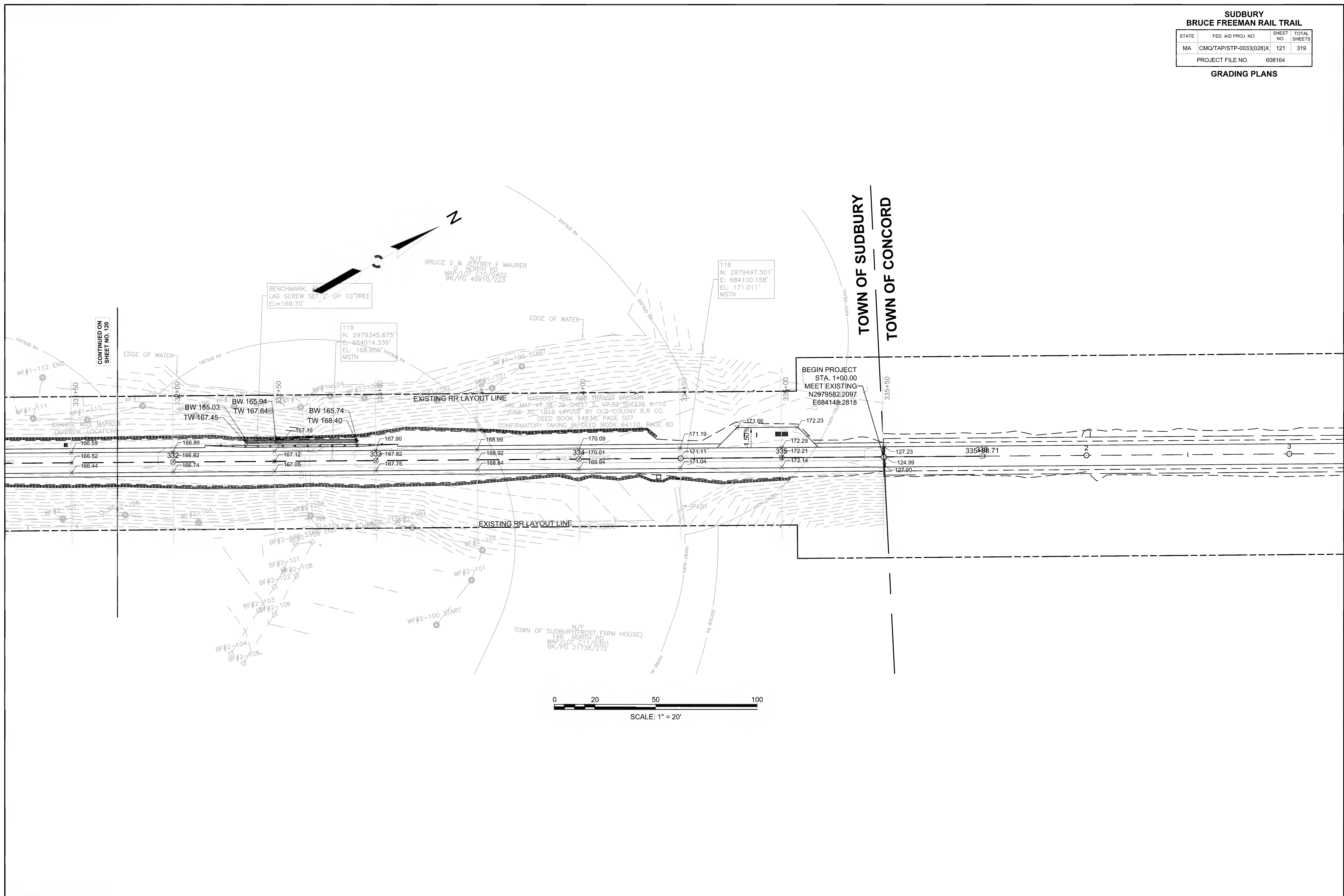


SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	120	319
PROJECT FILE NO.		608164	
GRADING PLANS			

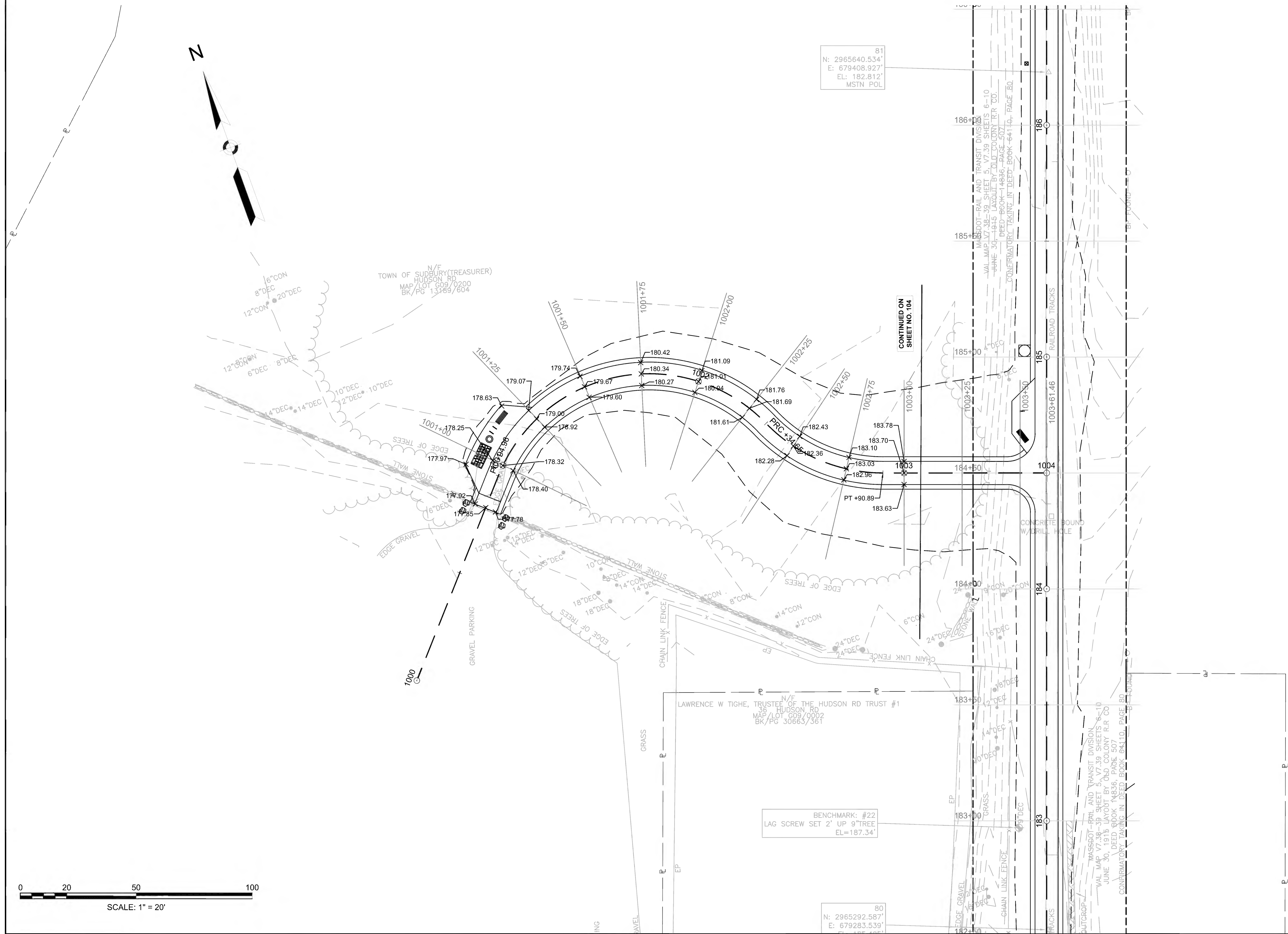




SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	121	319
PROJECT FILE NO.		608164	
GRADING PLANS			



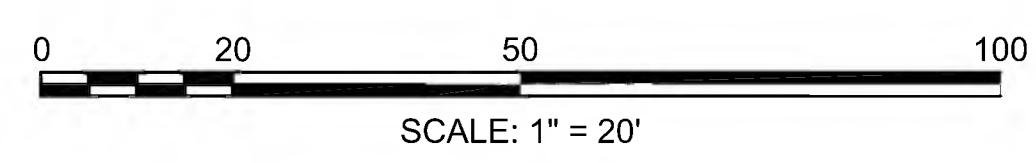




81  
 N: 2965640.534'  
 E: 679408.927'  
 EL: 182.812'  
 MSTN POL

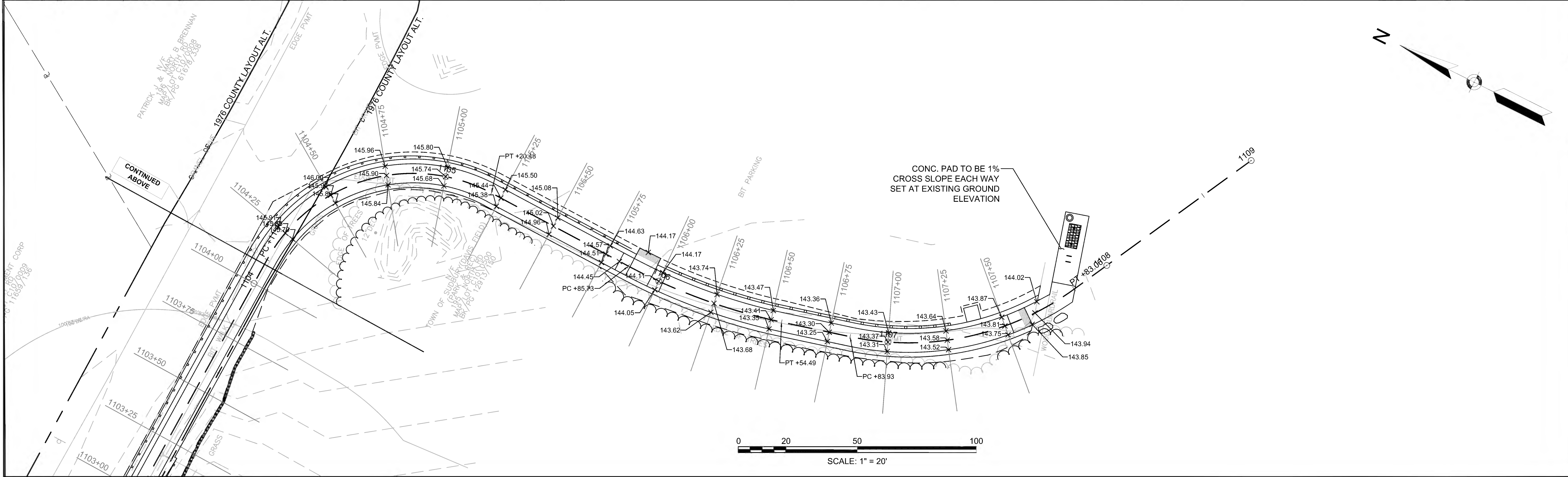
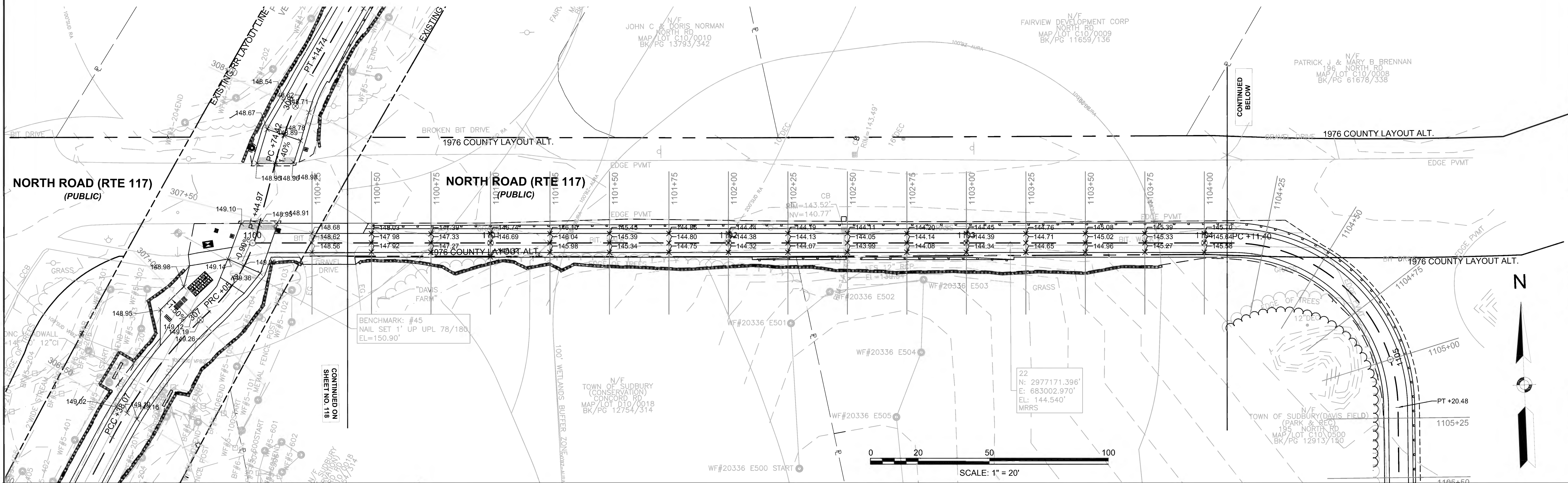
CONTINUED ON  
 SHEET NO. 104

80  
 N: 2965292.587'  
 E: 679283.539'  
 EL: 187.34'





SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003(028)X	123	319
PROJECT FILE NO.		608164	
GRADING PLANS			



608164\_HD\GRADING PLANS.DWG Plotted on 27-Jun-2022 10:36 AM



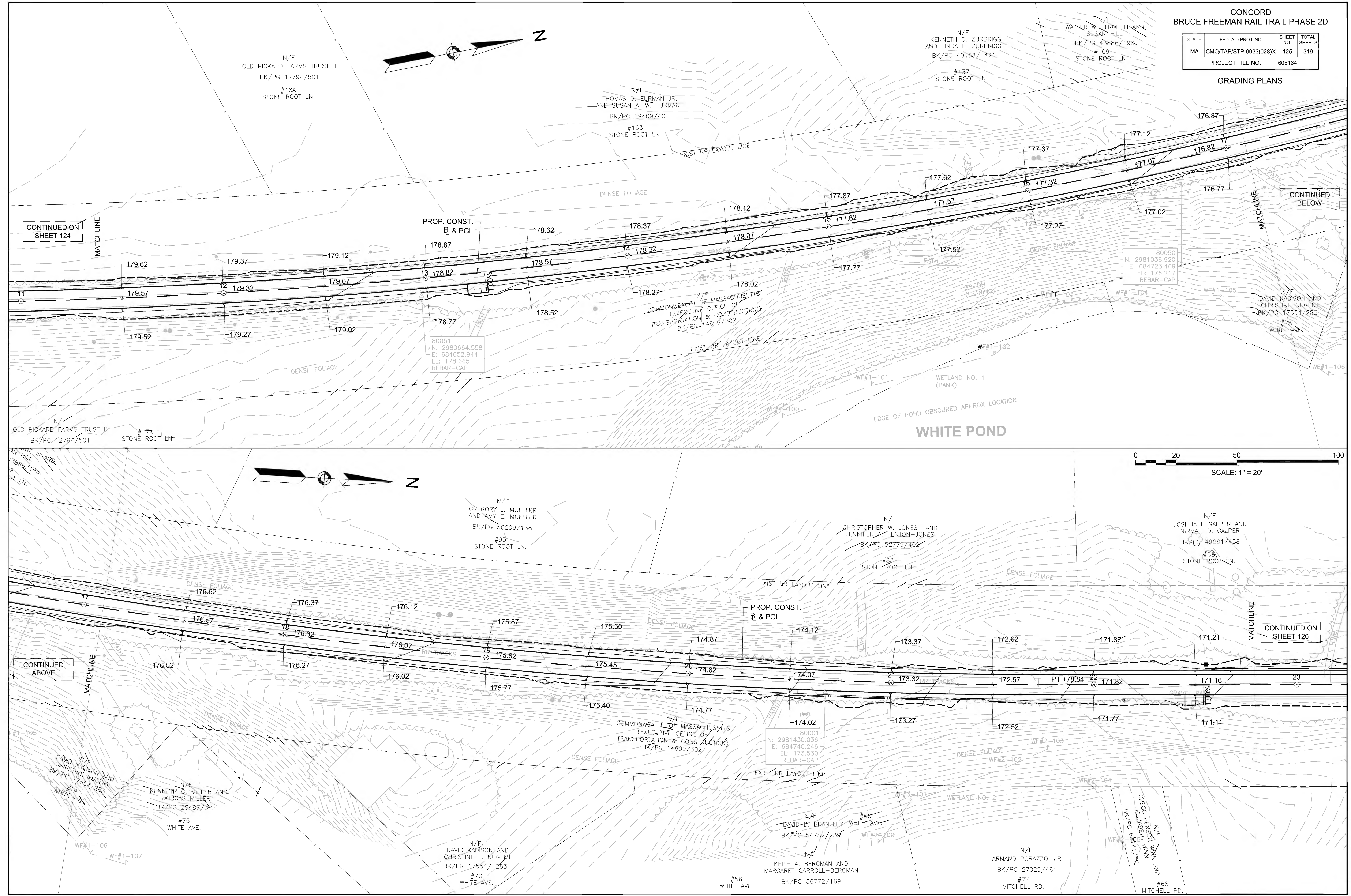




CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	125	319
PROJECT FILE NO.		608164	

GRADING PLANS

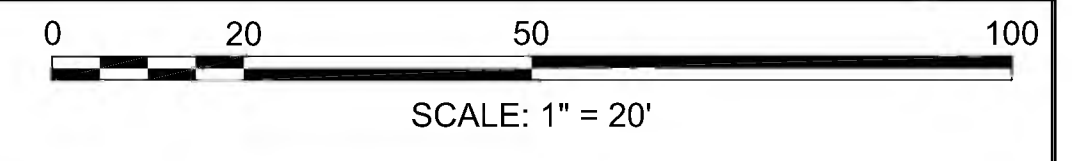
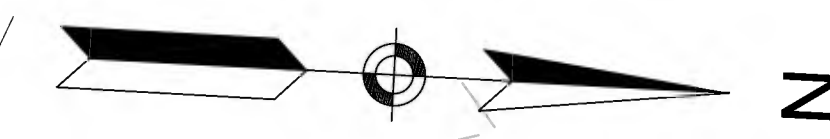
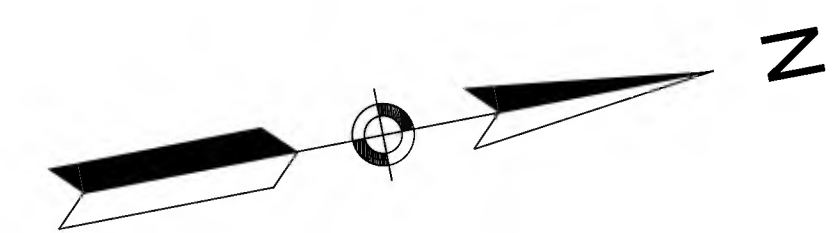


CONTINUED ON SHEET 124

CONTINUED BELOW

CONTINUED ABOVE

CONTINUED ON SHEET 126



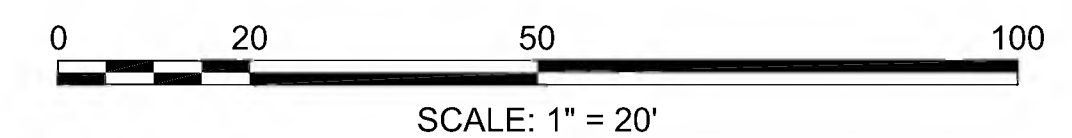
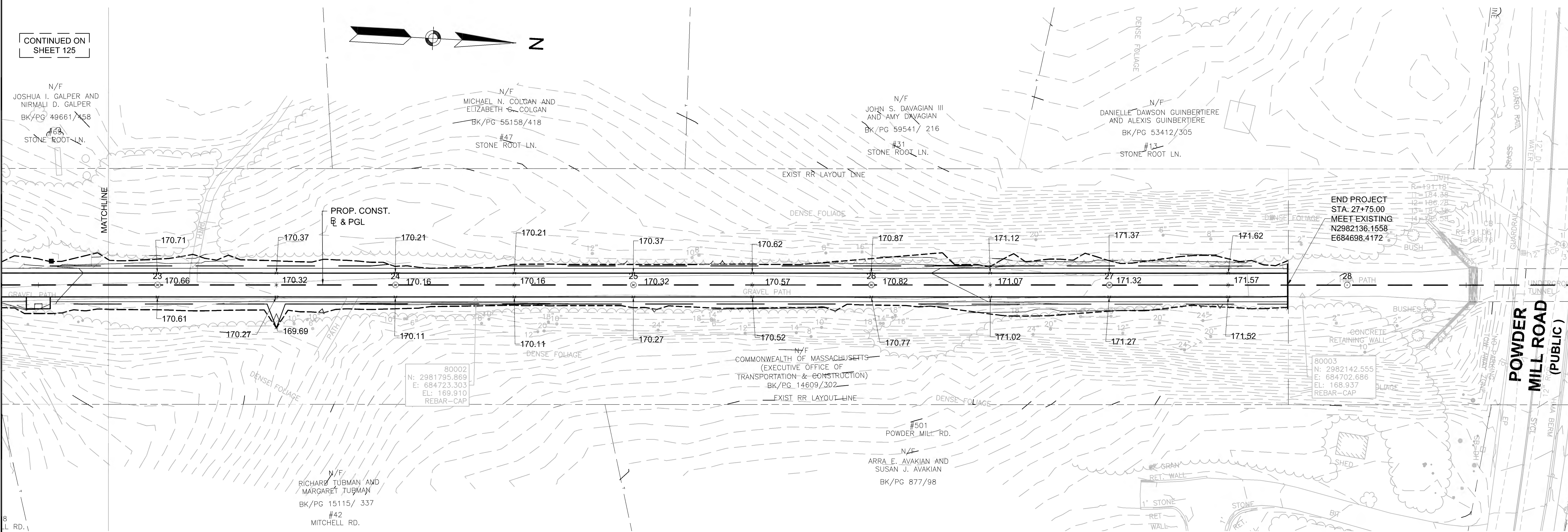
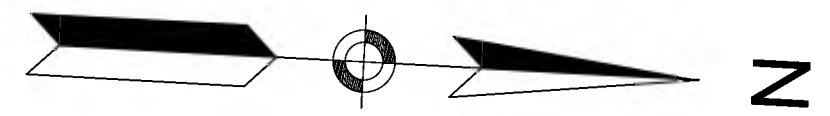


CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	126	319
PROJECT FILE NO.		608164	

GRADING PLANS

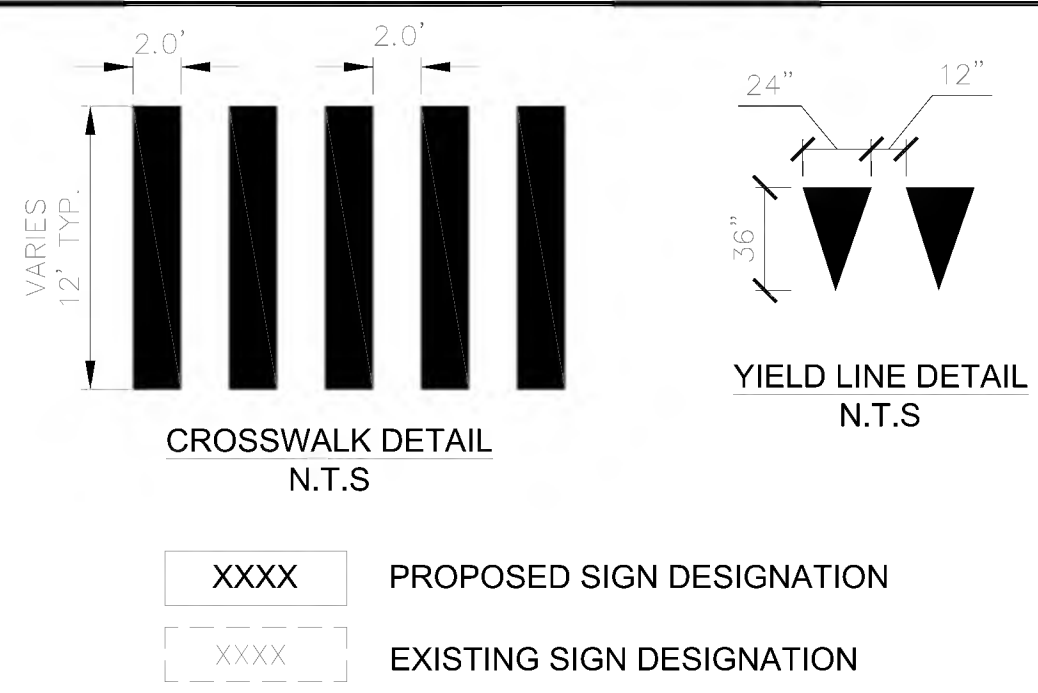
CONTINUED ON  
SHEET 125



POWDER  
MILL ROAD  
(PUBLIC)



- NOTES:
- ALL EXISTING SIGNS TO REMAIN UNLESS OTHERWISE NOTED ON PLANS.
  - ALL PAVEMENT MARKINGS ON RAIL TRAIL AND PARKING LOT SHALL BE REFLECTORIZED PAINT.
  - ALL PROPOSED PAVEMENT MARKING LINES ON ROADWAYS SHALL BE 6" WIDE, EXCEPT STOP BARS WHICH SHALL BE 12" WIDE. ALL MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC.
  - SIGN SUPPORTS FOR SHARED-USE PATH SHALL BE 4"x4" PRESSURE TREATED WOOD POSTS AND PLACED AS SHOWN ON THE "TYPICAL SIGN PLACEMENT DETAIL" IN THE CONSTRUCTION DETAILS.
  - ANY SIGN LABELED WITH AN "\*" SHALL BE MOUNTED ON A STANDARD P-5 POST AT STANDARD MUTCD HEIGHT UNLESS OTHERWISE SHOWN ON PLANS.
  - ALL P-5 POSTS SHALL BE FACTORY COATED GLOSS BLACK.
  - EXISTING PAVEMENT MARKING REMOVAL WILL BE REQUIRED TO INSTALL THE PROPOSED PAVEMENT MARKINGS IN CONFLICTING AREAS PER PLAN.
  - ALL "DS" WAYFINDING SIGNS SHALL BE MOUNTED ON TIMBER SPECIAL CANTILEVER POST. SEE CONSTRUCTION DETAILS.



MARKING LEGEND

BICYCLE DETECTOR PAVEMENT MARKING

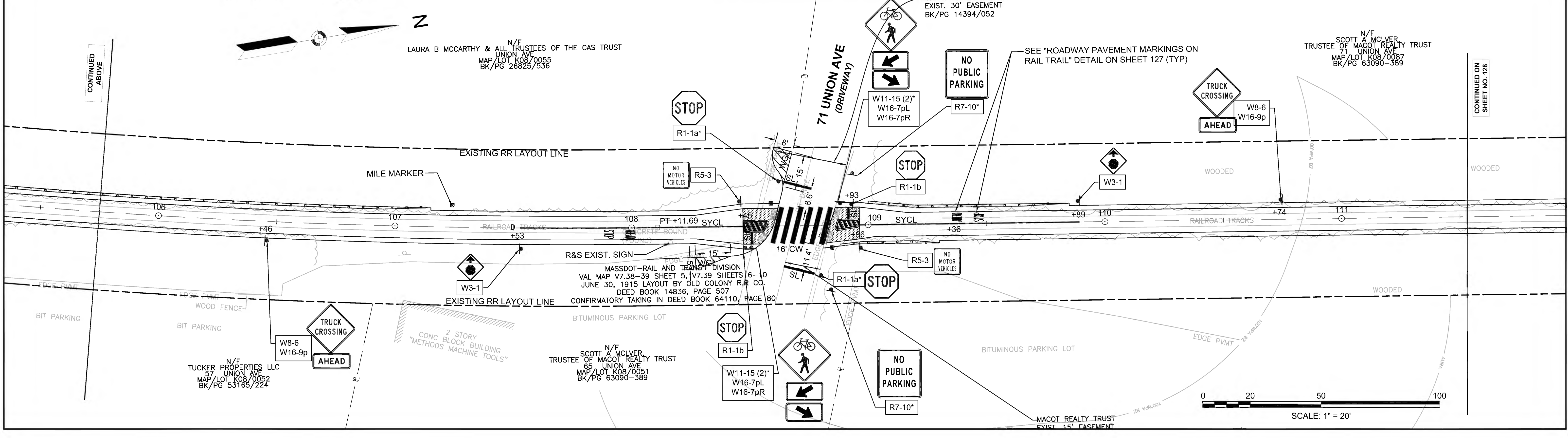
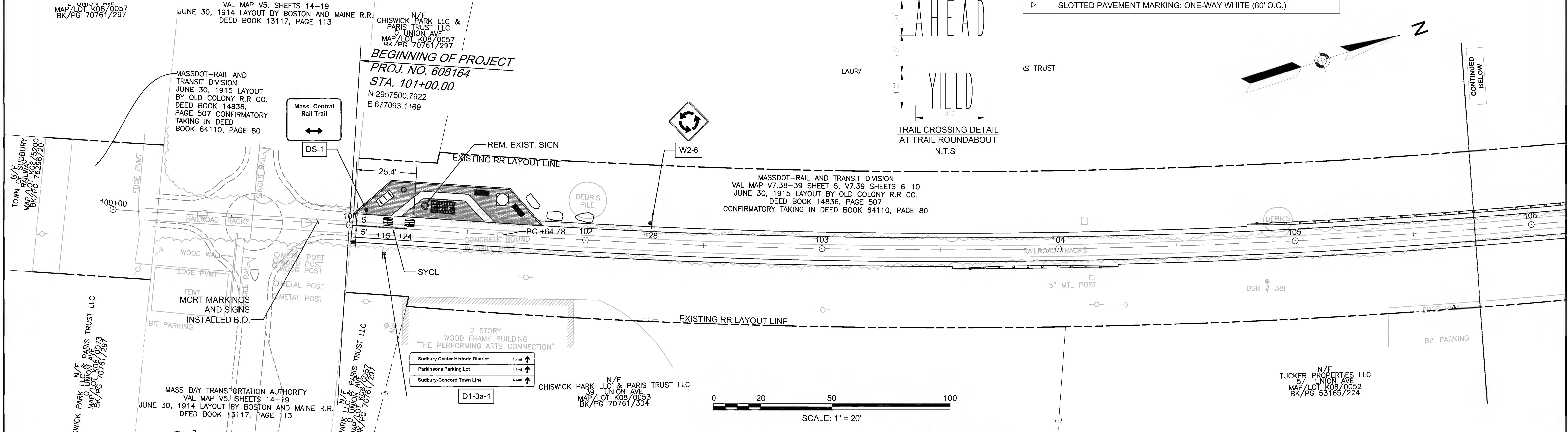
PROPOSED SIGN

SL	PROPOSED 12" WHITE STOP LINE
CW	PROPOSED 24" WHITE CROSS WALK
SWEL	PROPOSED 6" SINGLE WHITE EDGE LINE
BWLL	PROPOSED 6" SINGLE WHITE LANE LINE
SYEL	PROPOSED 6" SINGLE YELLOW EDGE LINE (10' MARK - 30' SKIP)
SYCL	PROPOSED 6" SINGLE YELLOW CENTER LINE
BYCL	PROPOSED 6" BROKEN YELLOW CENTER LINE (3' MARK - 9' SKIP)
DYCL	PROPOSED 6" DOUBLE YELLOW CENTER LINE
DWLEx	PROPOSED 6" DOTTED WHITE LANE EXTENSION LINE (2' MARK - 6' SKIP)
SWCHL	PROPOSED 6" SOLID WHITE CHANNEL LINE
WGL	WHITE GORE LINE - 12" SOLID WHITE LINE
▶	SLOTTED PAVEMENT MARKING: TWO-WAY YELLOW (40' O.C.)
▶	SLOTTED PAVEMENT MARKING: ONE-WAY WHITE (80' O.C.)

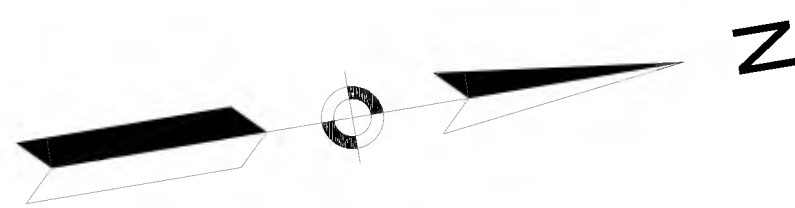
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	127	319
PROJECT FILE NO.		608164	

PAVEMENT MARKING & SIGNING PLANS





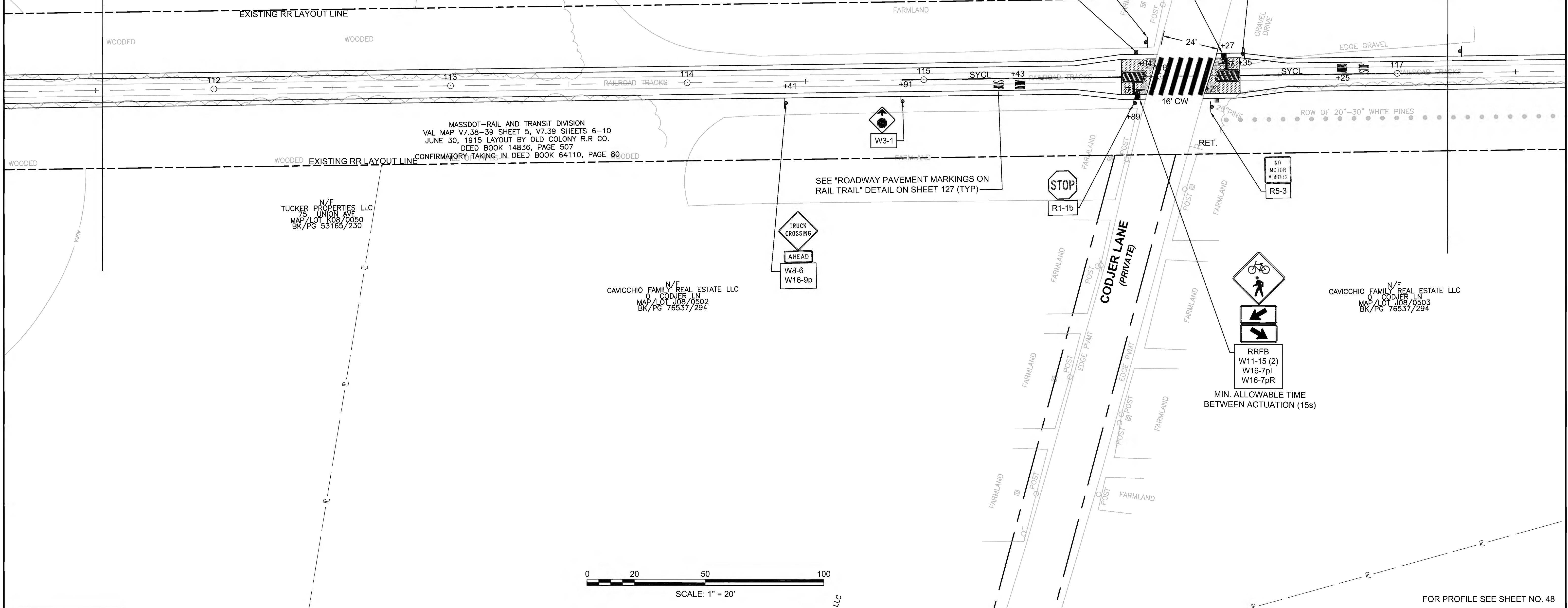


N/E  
CAVICCHIO FAMILY REAL ESTATE LLC  
0 CODJER LN  
MAP/LOT JOB/0501  
BK/PG 76537/294

MCLVER  
OT REALTY TRUST  
ION AVE  
KOB/0087  
090-389

CONTINUED ON  
SHEET NO. 127

CONTINUED ON  
SHEET NO. 129

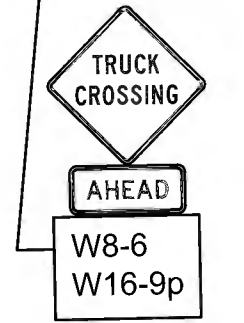


MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING JN DEED BOOK 64110, PAGE 80

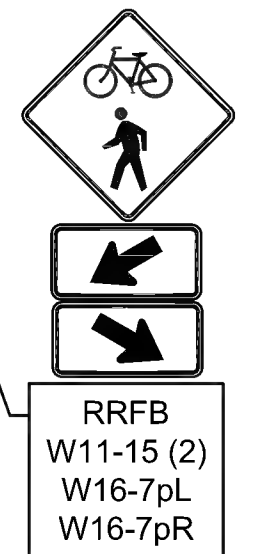
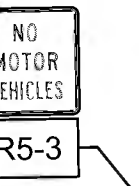
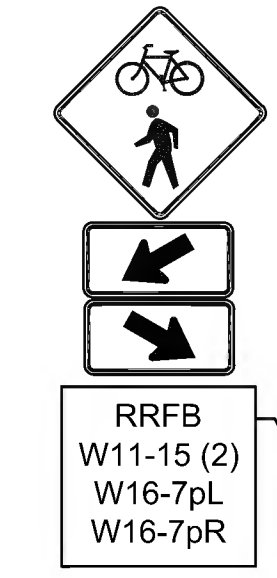
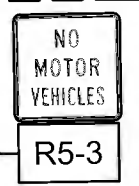
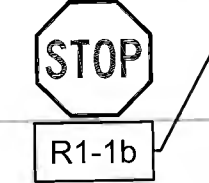
N/E  
TUCKER PROPERTIES LLC  
75 UNION AVE  
MAP/LOT JOB/0050  
BK/PG 53165/230

N/E  
CAVICCHIO FAMILY REAL ESTATE LLC  
0 CODJER LN  
MAP/LOT JOB/0502  
BK/PG 76537/294

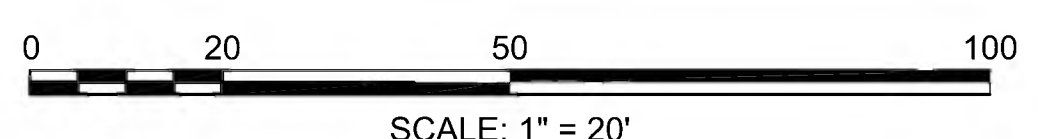
N/E  
CAVICCHIO FAMILY REAL ESTATE LLC  
0 CODJER LN  
MAP/LOT JOB/0503  
BK/PG 76537/294



SEE "ROADWAY PAVEMENT MARKINGS ON  
RAIL TRAIL" DETAIL ON SHEET 127 (TYP)



MIN. ALLOWABLE TIME  
BETWEEN ACTUATION (15s)



FOR PROFILE SEE SHEET NO. 48

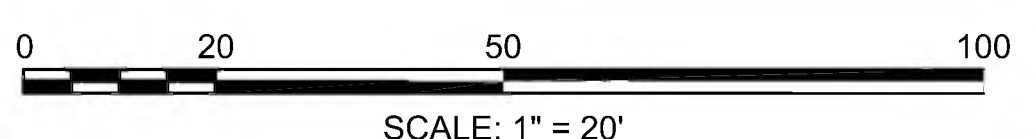
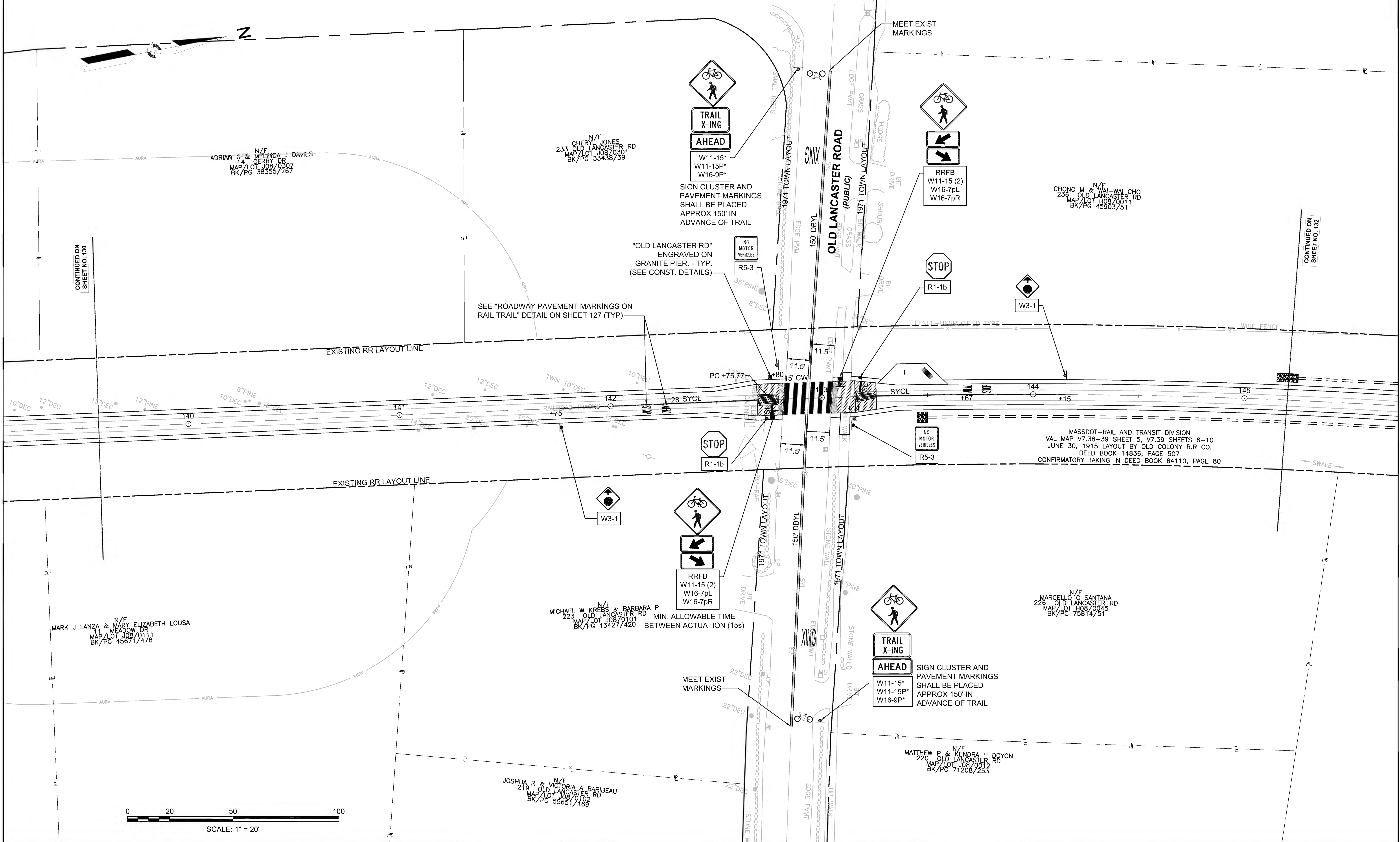
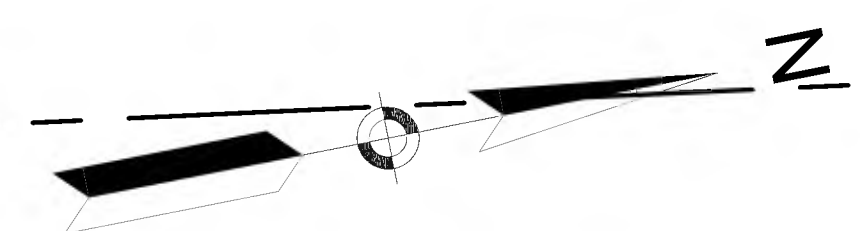












CONTINUED ON SHEET NO. 130

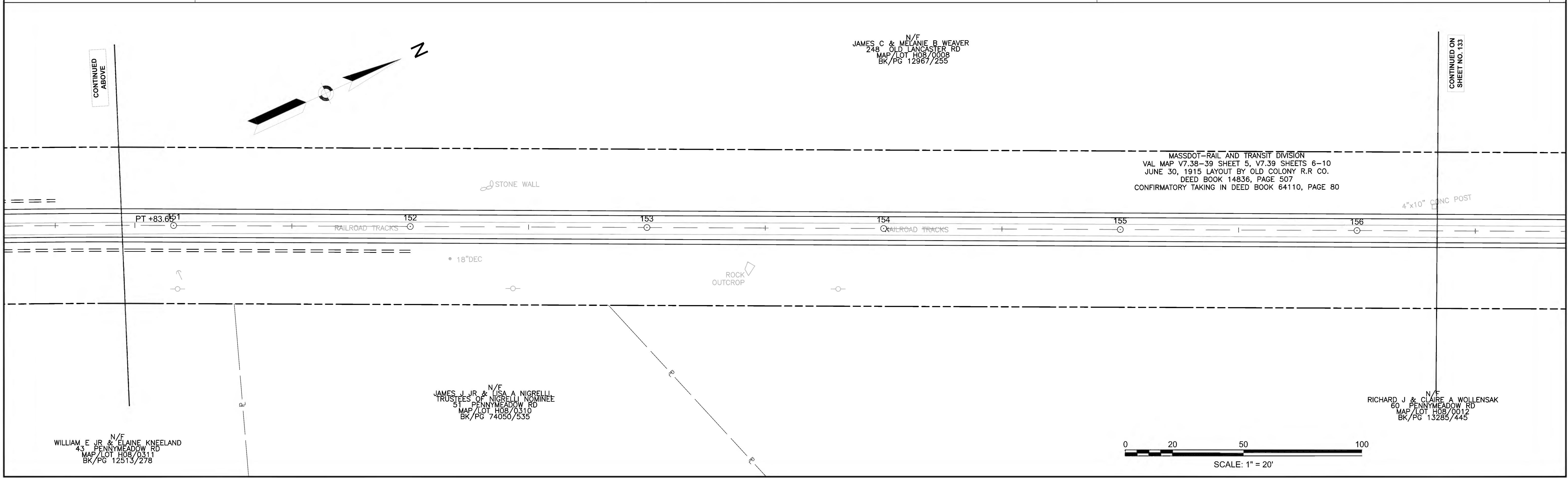
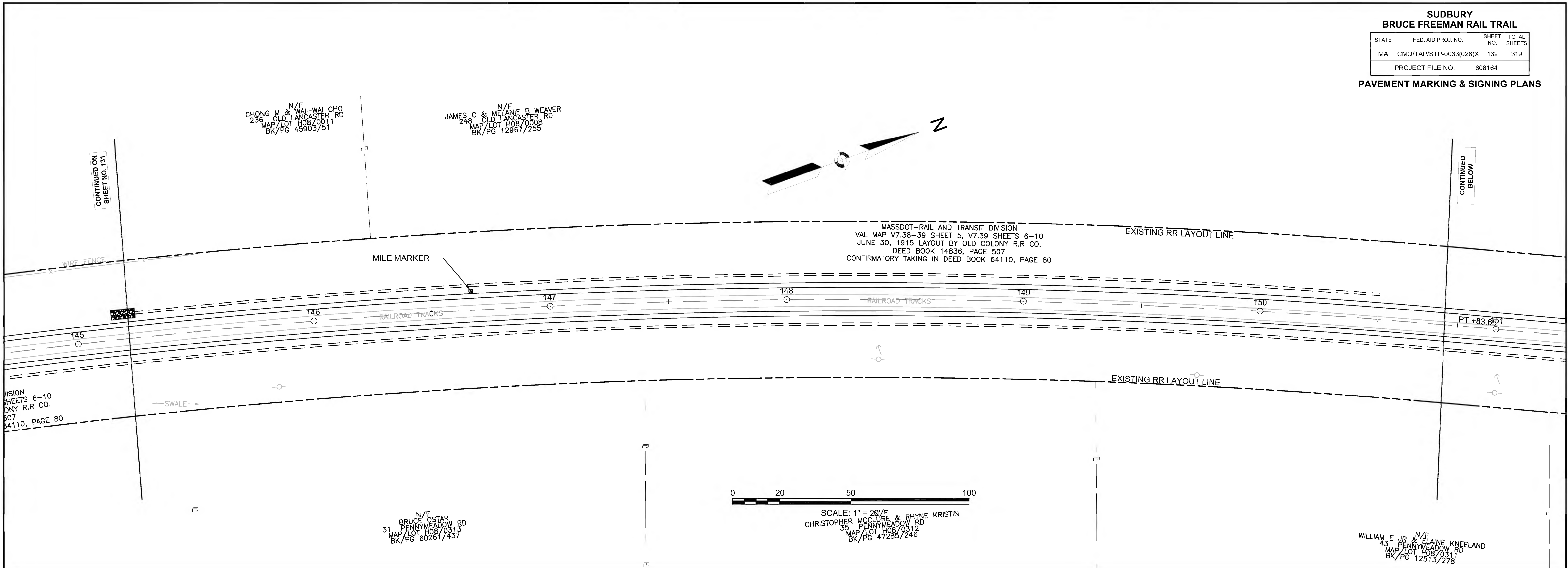
CONTINUED ON SHEET NO. 132



**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	132	319
PROJECT FILE NO.		608164	

**PAVEMENT MARKING & SIGNING PLANS**





**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

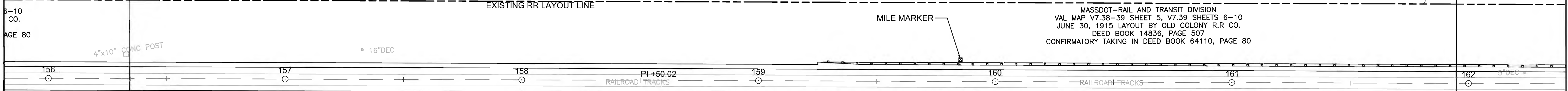
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	133	319
PROJECT FILE NO.		608164	

**PAVEMENT MARKING & SIGNING PLANS**

N/F  
JAMES C & MELANIE B WEAVER  
248 OLD LANCASTER RD  
MAP/LOT H08/0008  
BK/PG 12967/255

CONTINUED ON  
SHEET NO. 132

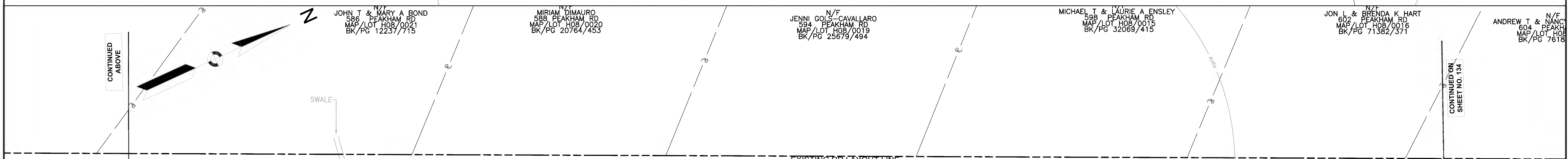
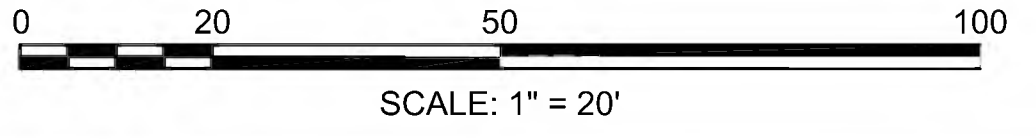
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BELOW



MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80

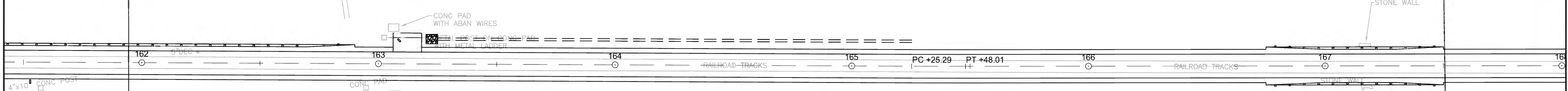
N/F  
RICHARD J & CLAIRE A WOLLENSAK  
60 PENNYMEADOW RD  
MAP/LOT H08/0012  
BK/PG 13285/445

N/F  
RICHARD J & CLAIRE A WOLLENSAK  
60 PENNYMEADOW RD  
MAP/LOT H08/0012  
BK/PG 13285/445



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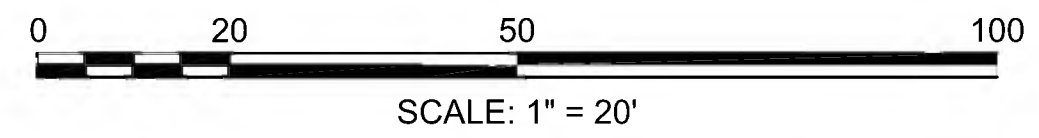
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SHEET NO. 134



MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80

N/F  
SUDBURY VALLEY TRUSTEES INC  
0 CONCORD RD  
MAP/LOT H09/0012  
BK/PG 14337/1

N/F  
SUDBURY VALLEY TRUSTEES INC  
0 CONCORD RD  
MAP/LOT H09/0012  
BK/PG 14337/1

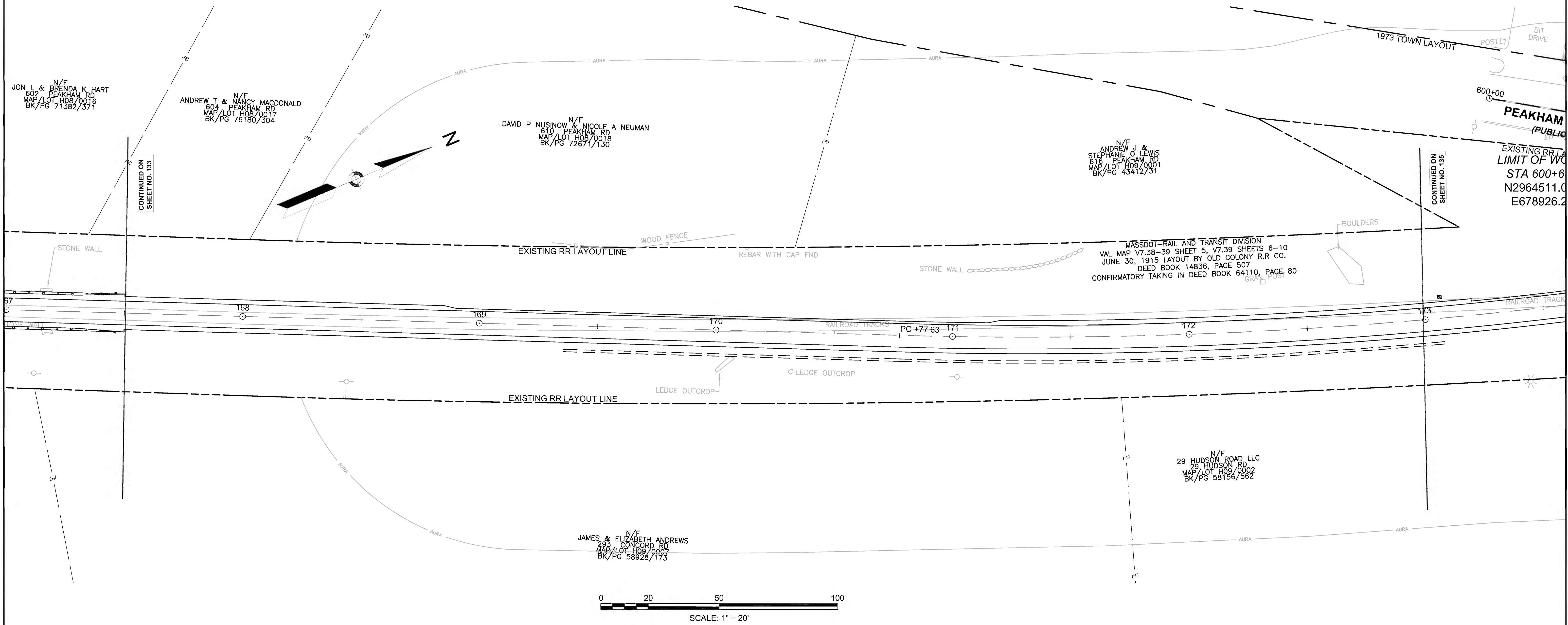




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	134	319
PROJECT FILE NO.		608164	

**PAVEMENT MARKING & SIGNING PLANS**



608164\_HD(PAVEMENT MARKING & SIGNING PLANS).DWG Plotted on 27-Jun-2022 11:00 AM

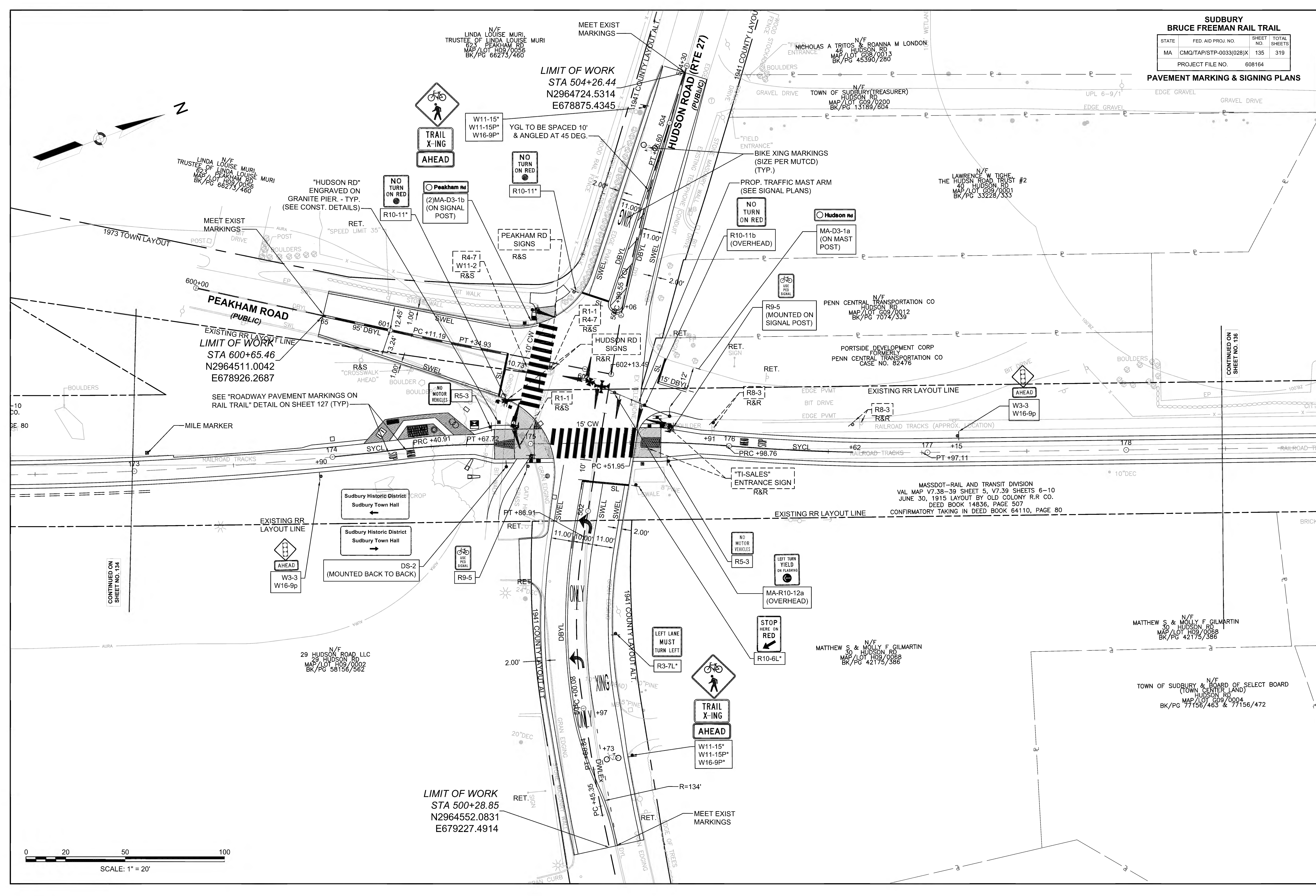
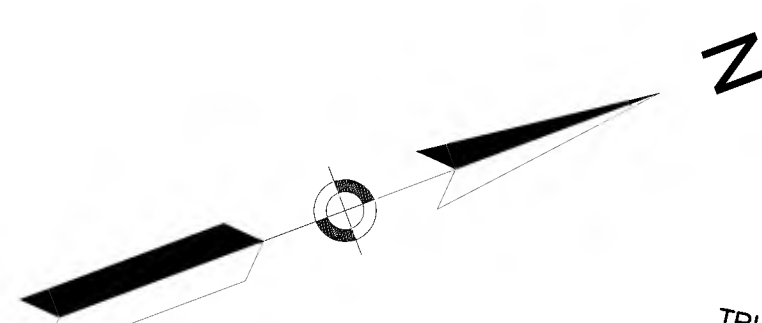
**PEAKHAM**  
(PUBLIC)  
EXISTING RR L  
LIMIT OF WC  
STA 600+6  
N2964511.0  
E678926.2

MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80

CONTINUED ON  
SHEET NO. 133

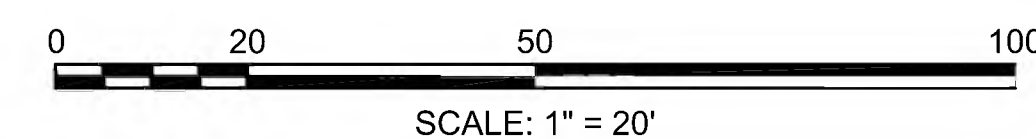
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SHEET NO. 135





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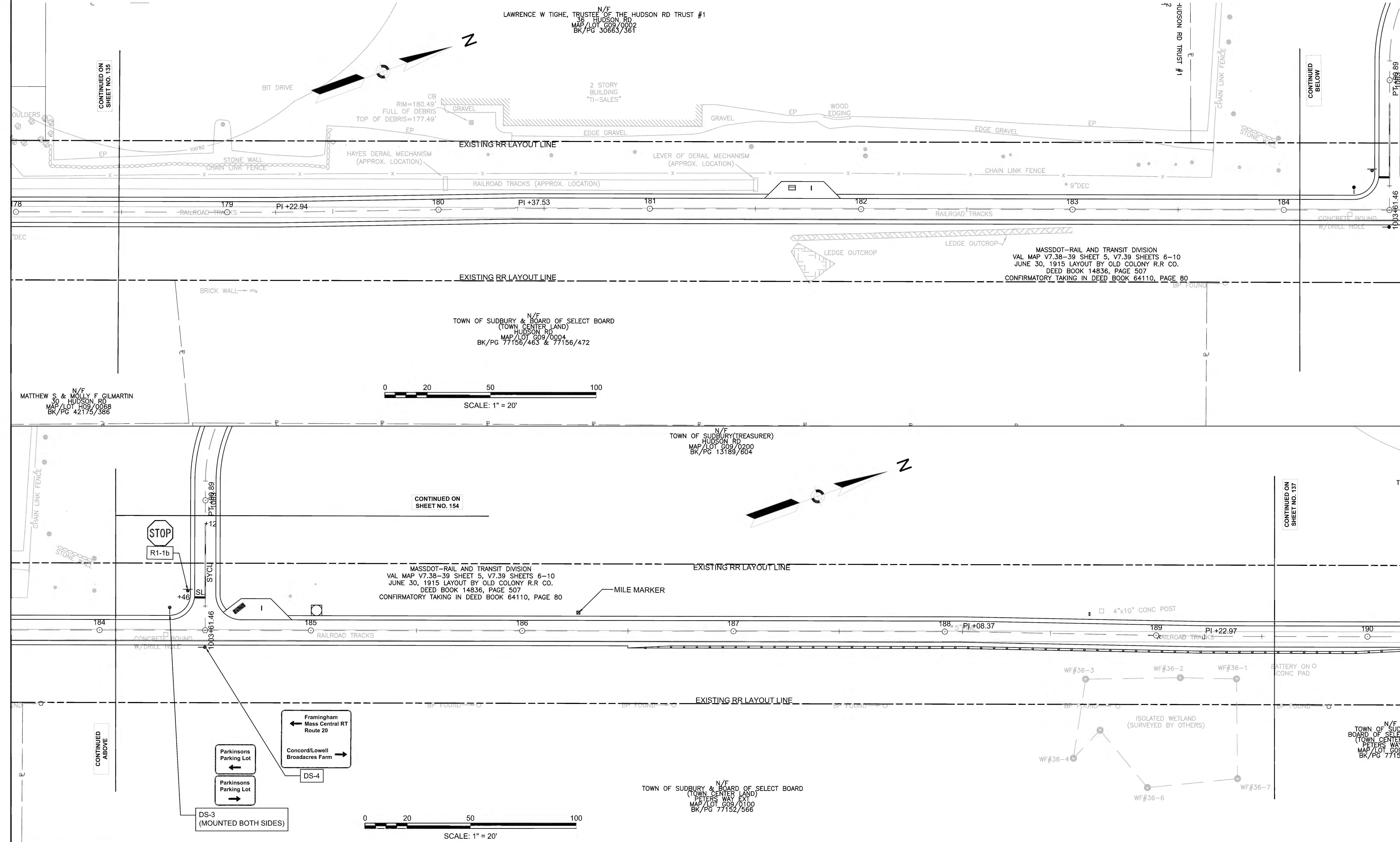




**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	136	319
PROJECT FILE NO.		608164	

**PAVEMENT MARKING & SIGNING PLANS**



CONTINUED ON SHEET NO. 135

CONTINUED BELOW

CONTINUED ON SHEET NO. 154

CONTINUED ON SHEET NO. 137

CONTINUED ABOVE

CONTINUED ON SHEET NO. 137



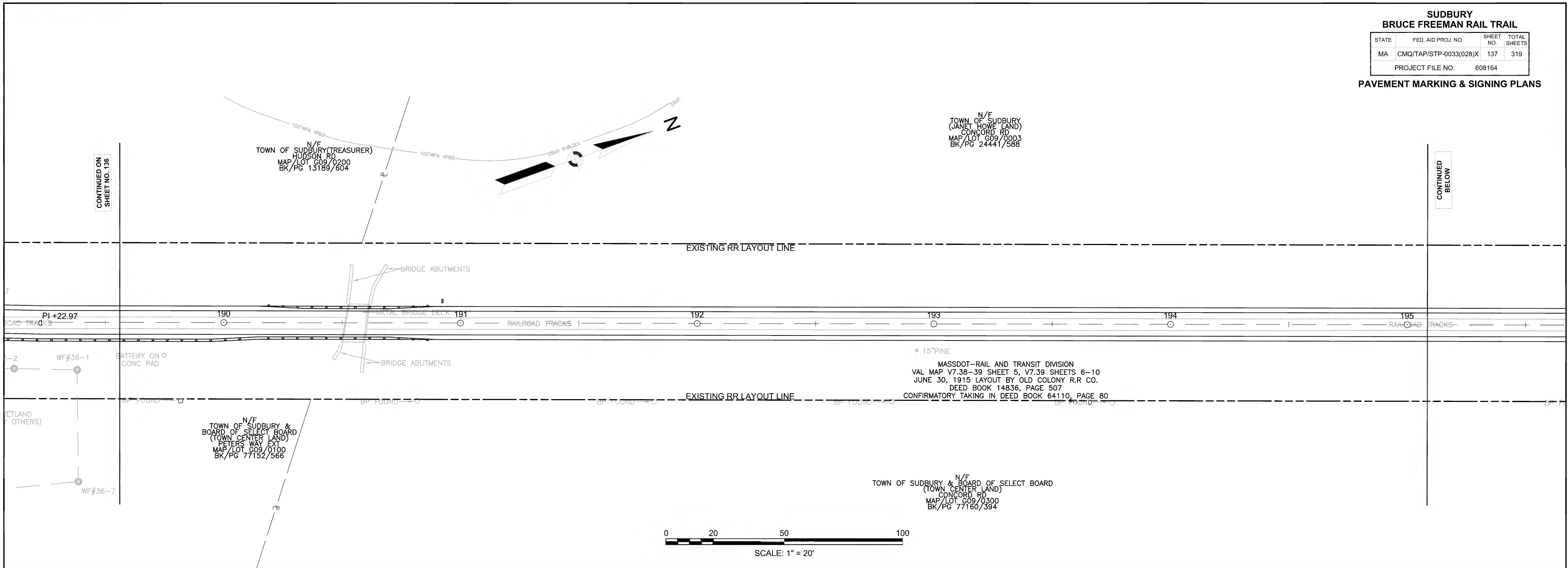
**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	137	319
PROJECT FILE NO.		608164	

**PAVEMENT MARKING & SIGNING PLANS**

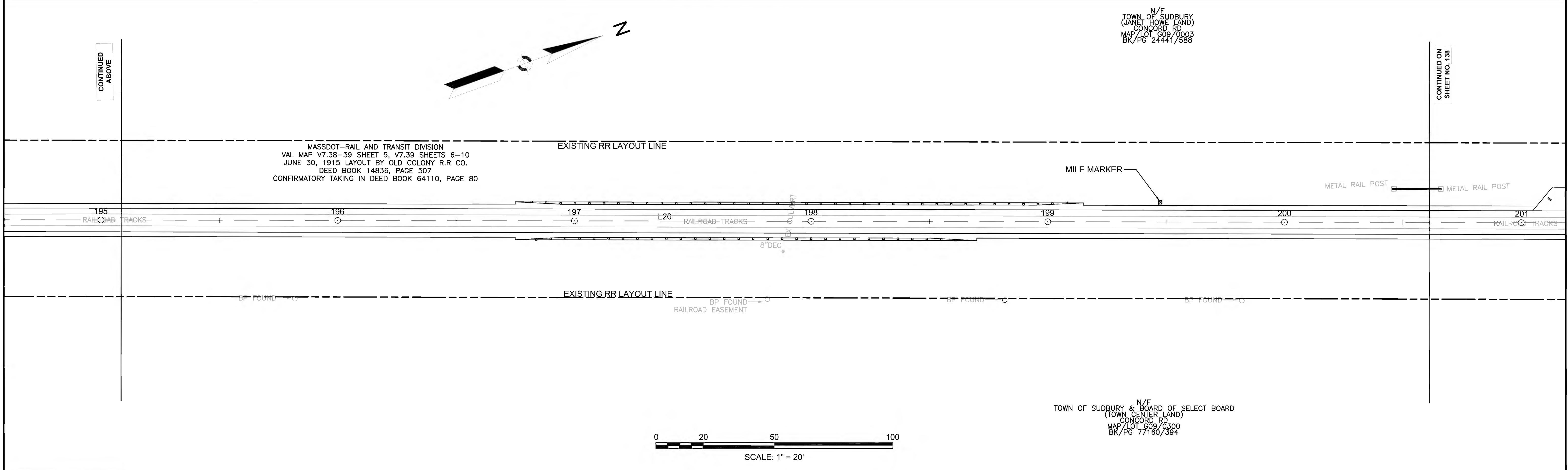
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SHEET NO. 136

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BELOW



CONTINUED  
ABOVE

CONTINUED ON  
SHEET NO. 138





**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

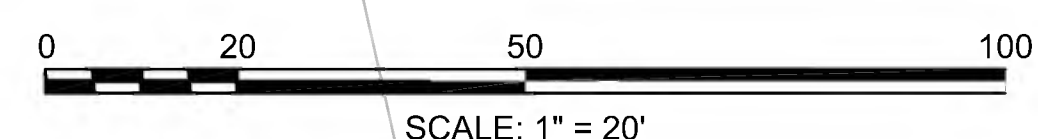
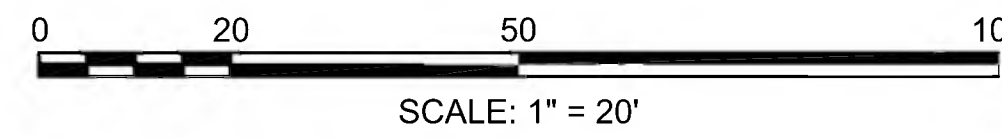
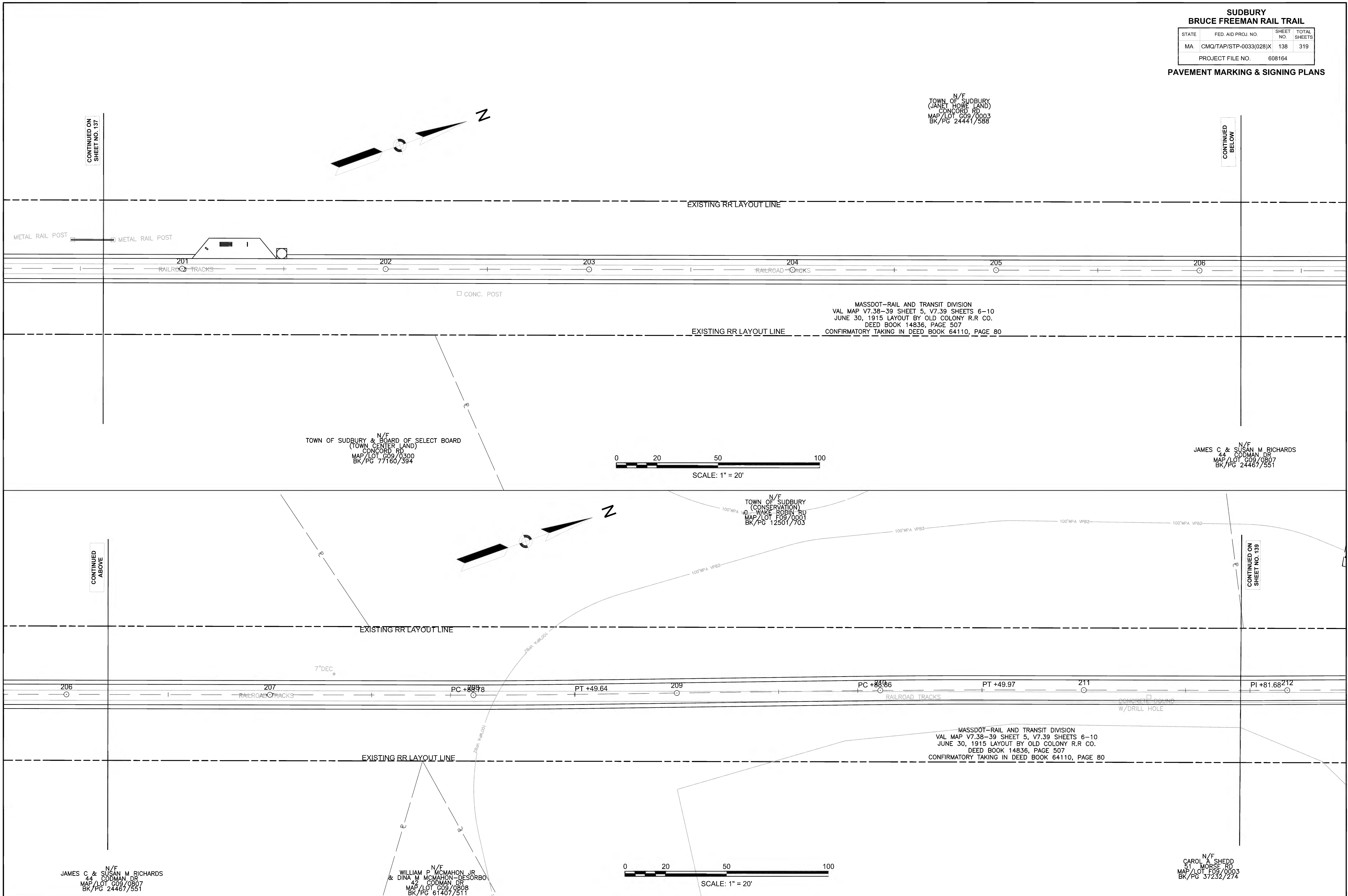
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	138	319
PROJECT FILE NO.		608164	

**PAVEMENT MARKING & SIGNING PLANS**

N/F  
TOWN OF SUDBURY  
(JANET HOWE LAND)  
CONCORD RD  
MAP/LOT G09/0003  
BK/PG 24441/588

CONTINUED ON  
SHEET NO. 137

CONTINUED  
BELOW



CONTINUED  
ABOVE

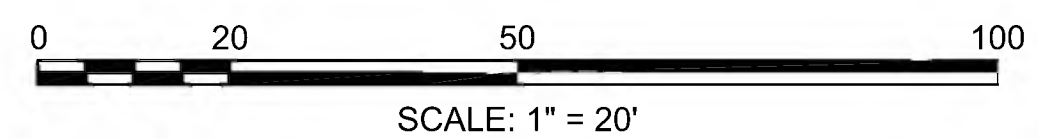
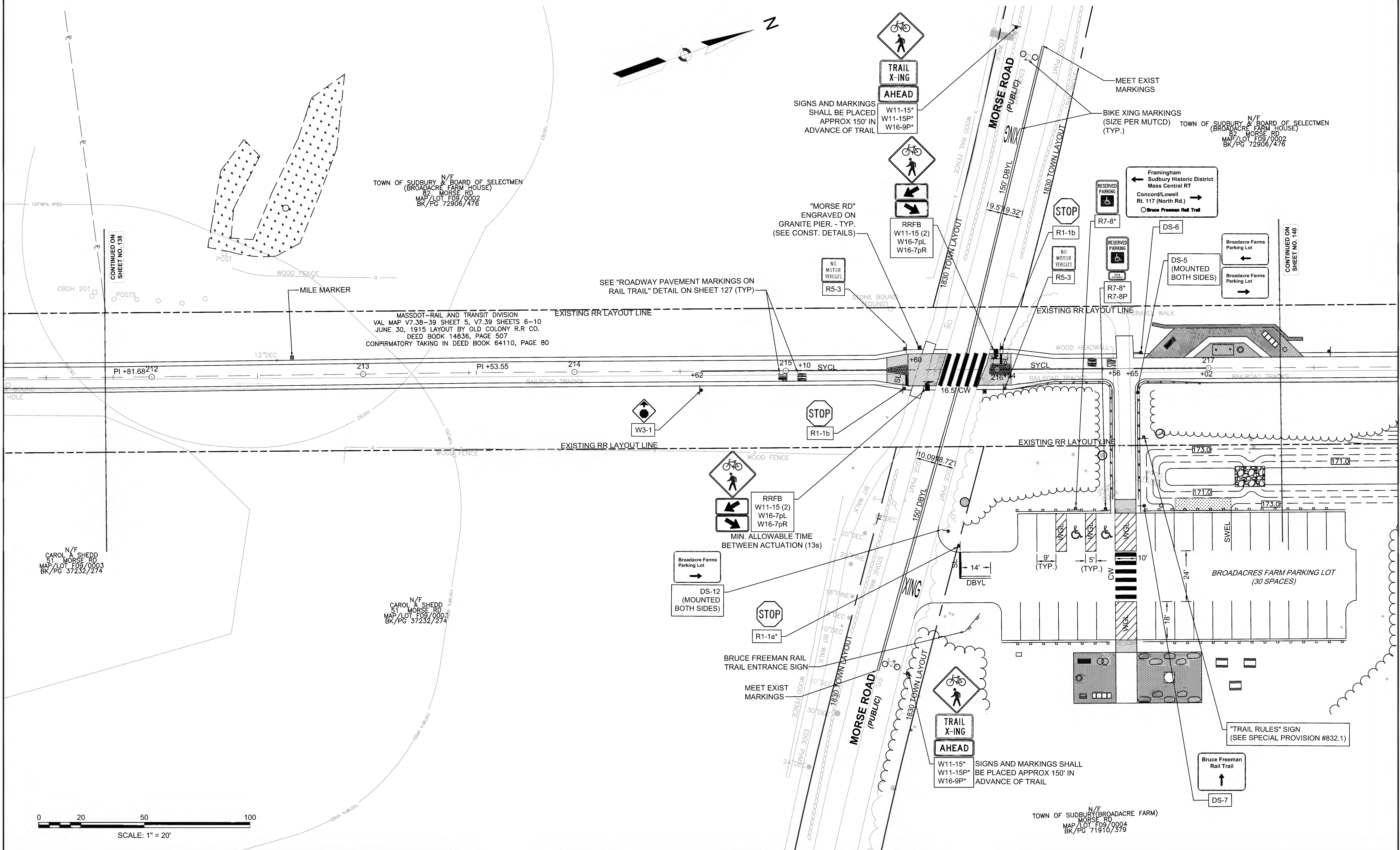
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SHEET NO. 139

N/F  
JAMES C & SUSAN M RICHARDS  
44 CODMAN DR  
MAP/LOT G09/0807  
BK/PG 24467/551

N/F  
WILLIAM P MCMAHON JR  
& DINA M MCMAHON-DESORBO  
42 CODMAN DR  
MAP/LOT G09/0808  
BK/PG 61407/511

N/F  
CAROL A SHEDD  
51 MORSE RD  
MAP/LOT F09/0003  
BK/PG 37232/274



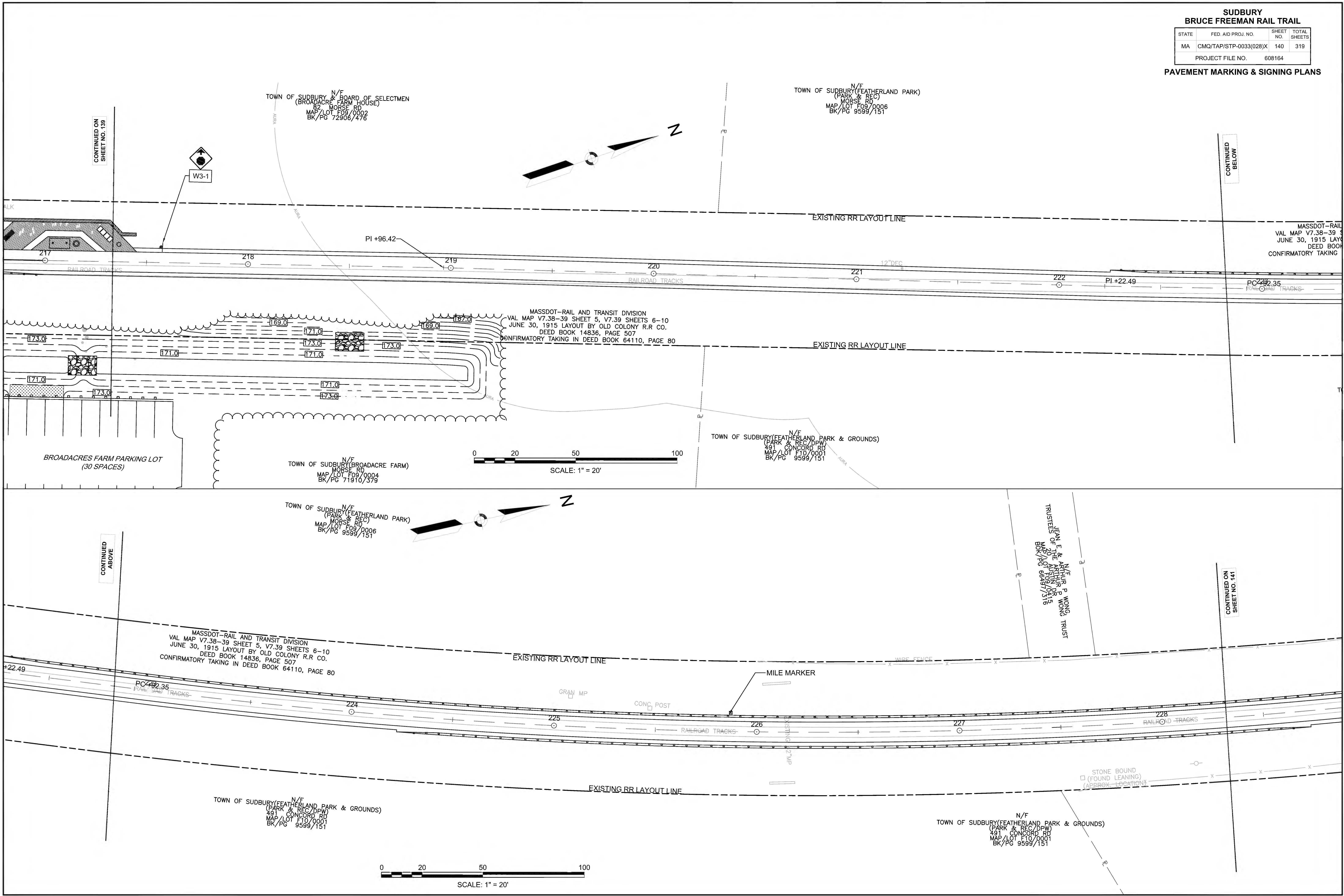




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	140	319
PROJECT FILE NO.		608164	

**PAVEMENT MARKING & SIGNING PLANS**



CONTINUED ON SHEET NO. 139

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CONTINUED ABOVE

CONTINUED ON SHEET NO. 141

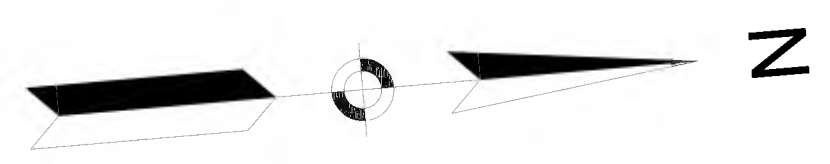


**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	141	319
PROJECT FILE NO.		608164	

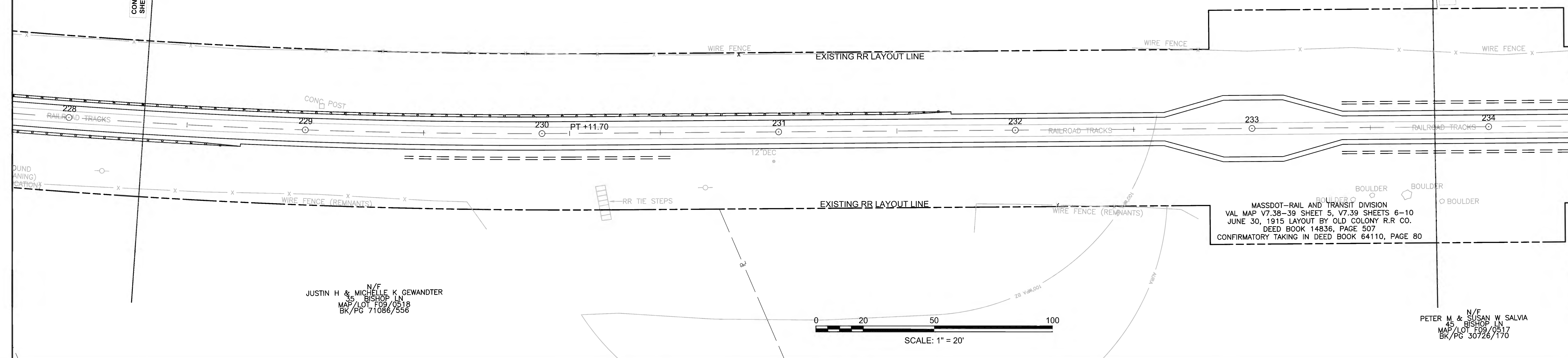
**PAVEMENT MARKING & SIGNING PLANS**

DAVID J & MARY ANN MCCORMICK  
55 HUNT RD  
MAP/LOT F09/0217  
BK/PG 990/95



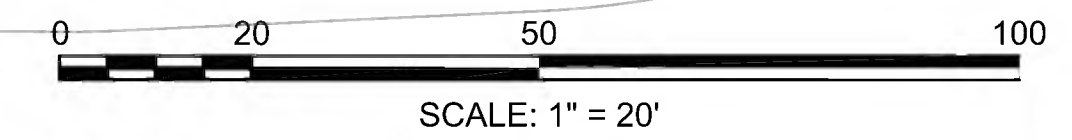
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SHEET NO. 140

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BELOW

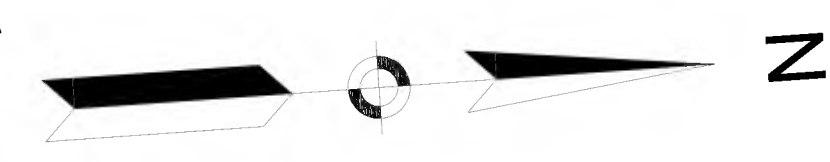


JUSTIN H & MICHELLE K GEWANDTER  
35 BISHOP LN  
MAP/LOT F09/0518  
BK/PG 71086/556

PETER M & SUSAN W SALVIA  
45 BISHOP LN  
MAP/LOT F09/0517  
BK/PG 30726/170

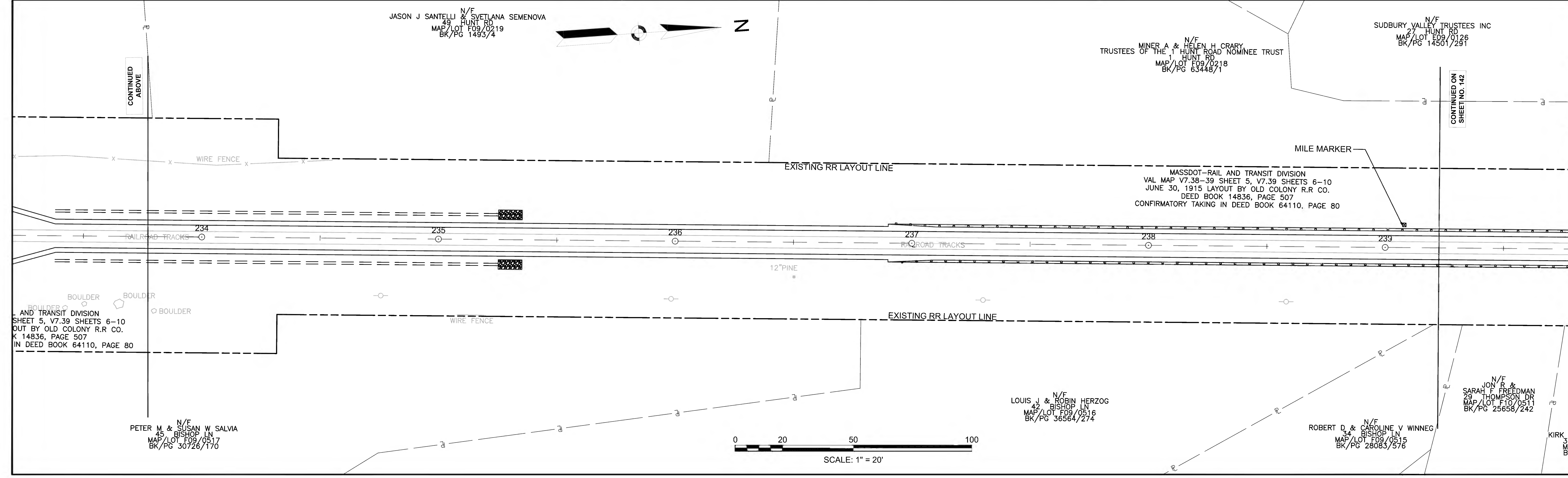


JASON J SANTELLI & SVETLANA SEMENOVA  
49 HUNT RD  
MAP/LOT F09/0219  
BK/PG 1493/4



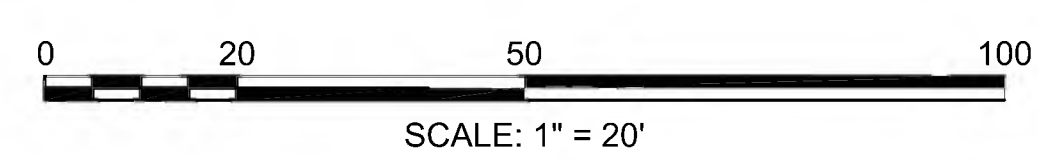
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CONTINUED ON  
SHEET NO. 142



MASSDOT-RAIL AND TRANSIT DIVISION  
SHEET 5, V7.39 SHEETS 6-10  
OUT BY OLD COLONY R.R. CO.  
K 14836, PAGE 507  
IN DEED BOOK 64110, PAGE 80

MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80



PETER M & SUSAN W SALVIA  
45 BISHOP LN  
MAP/LOT F09/0517  
BK/PG 30726/170

LOUIS J & ROBIN HERZOG  
42 BISHOP LN  
MAP/LOT F09/0516  
BK/PG 36564/274

ROBERT D & CAROLINE V WINNEG  
34 BISHOP LN  
MAP/LOT F09/0515  
BK/PG 28083/576

JOHN R & SARAH F FREDMAN  
29 THOMSON DR  
MAP/LOT F10/0511  
BK/PG 25658/242

N/F  
SUDBURY VALLEY TRUSTEES INC  
27 HUNT RD  
MAP/LOT E09/0126  
BK/PG 14501/291

N/F  
GERALD WHITE KIMBER & MEREDITH KIMBER  
19 HUNT RD  
MAP/LOT E09/0127  
BK/PG 65711/237

N/F  
JOAN M. SCHOW  
11 HUNT RD  
MAP/LOT E09/0128  
BK/PG 12241/378

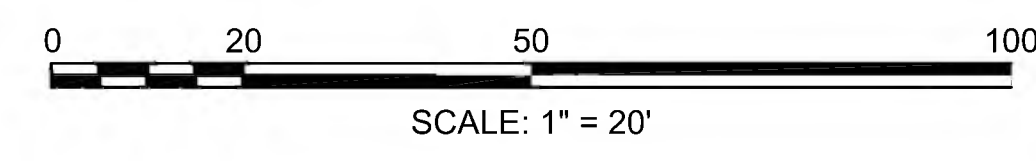
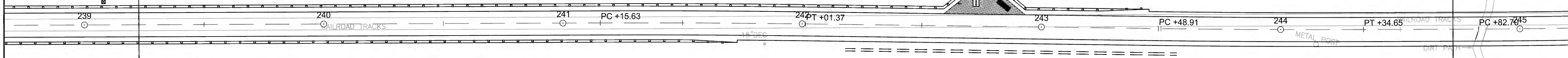
N/F  
MINER A & HELEN H. CRARY  
TRUSTEES OF THE 1 HUNT ROAD NOMINEE TRUST  
1 HUNT RD  
MAP/LOT E09/0218  
BK/PG 63448/1

MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80

6-10  
R. CO.  
PAGE 80

CONTINUED ON  
SHEET NO. 141

CONTINUED  
BELOW



N/F  
ROBERT D. & CAROLINE V WINNEG  
34 BISHOP LN  
MAP/LOT F09/0515  
BK/PG 28083/576

N/F  
JON R. & SARAH F. FREEDMAN  
29 THOMPSON DR  
MAP/LOT F10/0511  
BK/PG 25658/242

N/F  
KIRK C. & DIANE P. NEISON  
37 THOMPSON DR  
MAP/LOT E09/0511  
BK/PG 14592/464

N/F  
CHARLES A. JR. & RUTHANN WRY  
45 THOMPSON DR  
MAP/LOT E09/0510  
BK/PG 28853/357

N/F  
JEFFREY & TIFFANY BLOOM  
53 THOMPSON DR  
MAP/LOT E09/0509  
BK/PG 54636/30

N/F  
RICHARD S. ALBEE  
5 HUNT RD  
MAP/LOT E09/0129  
BK/PG 20726/208

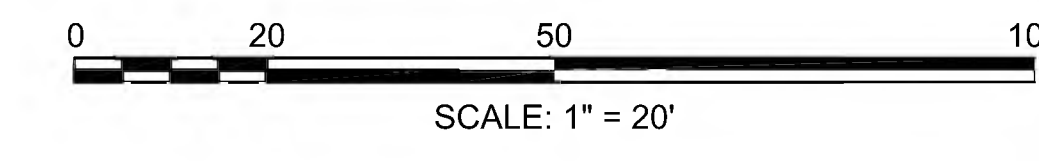
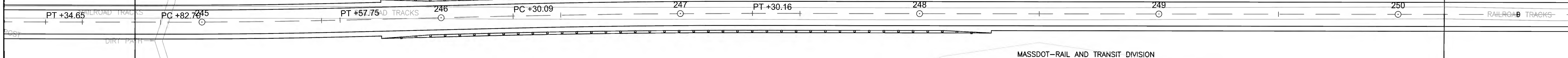
N/F  
MINER A & HELEN H. CRARY  
TRUSTEES OF THE 1 HUNT ROAD NOMINEE TRUST  
1 HUNT RD  
MAP/LOT E09/0218  
BK/PG 63448/1

N/F  
MINER A & HELEN H. CRARY  
TRUSTEES OF THE 1 HUNT ROAD NOMINEE TRUST  
1 HUNT RD  
MAP/LOT E09/0218  
BK/PG 63448/1

30

CONTINUED  
ABOVE

CONTINUED  
ON  
SHEET NO. 143



N/F  
JEFFREY & TIFFANY BLOOM  
53 THOMPSON DR  
MAP/LOT E09/0509  
BK/PG 54636/30

N/F  
ALLAN L. WALLACK & DONNA NADINE,  
TRUSTEE OF THE WALLACK FAMILY  
0 THOMPSON DR  
MAP/LOT E09/0509  
BK/PG 60192/340

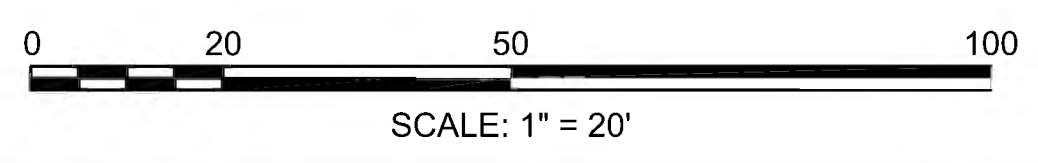
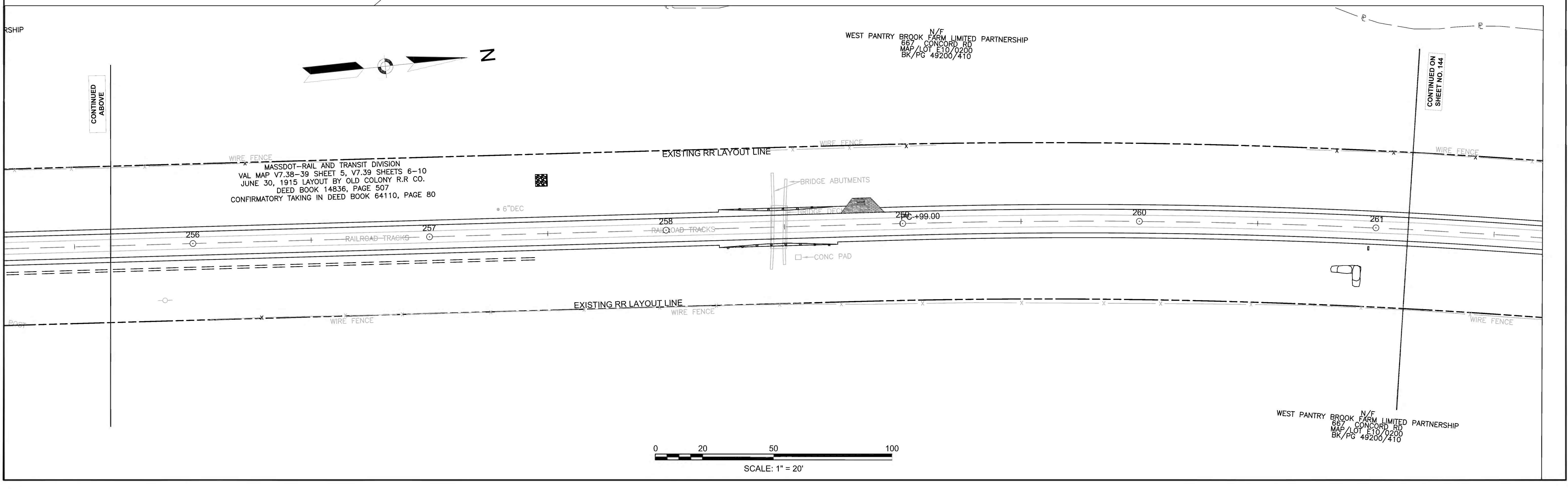
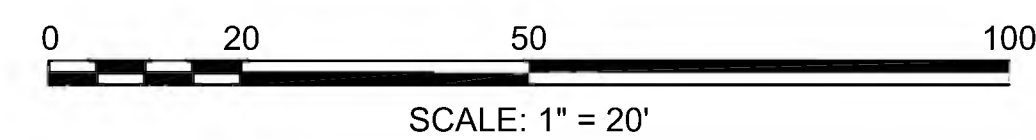
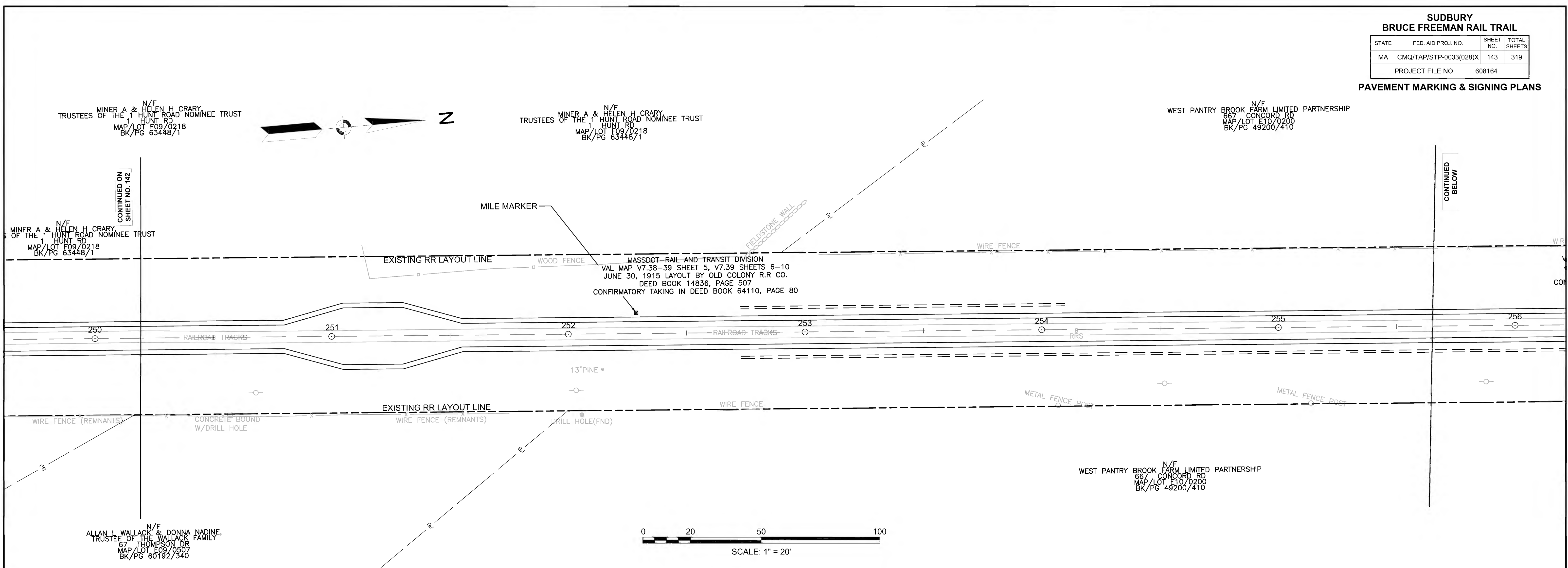
N/F  
ALLAN L. WALLACK & DONNA NADINE,  
TRUSTEE OF THE WALLACK FAMILY  
87 THOMPSON DR  
MAP/LOT E09/0509  
BK/PG 60192/340



**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	143	319
PROJECT FILE NO.		608164	

**PAVEMENT MARKING & SIGNING PLANS**

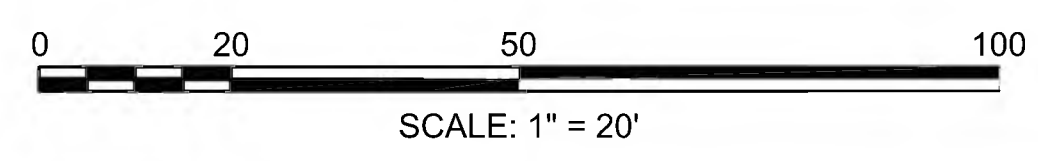
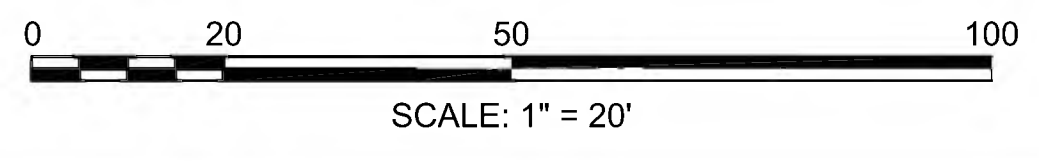
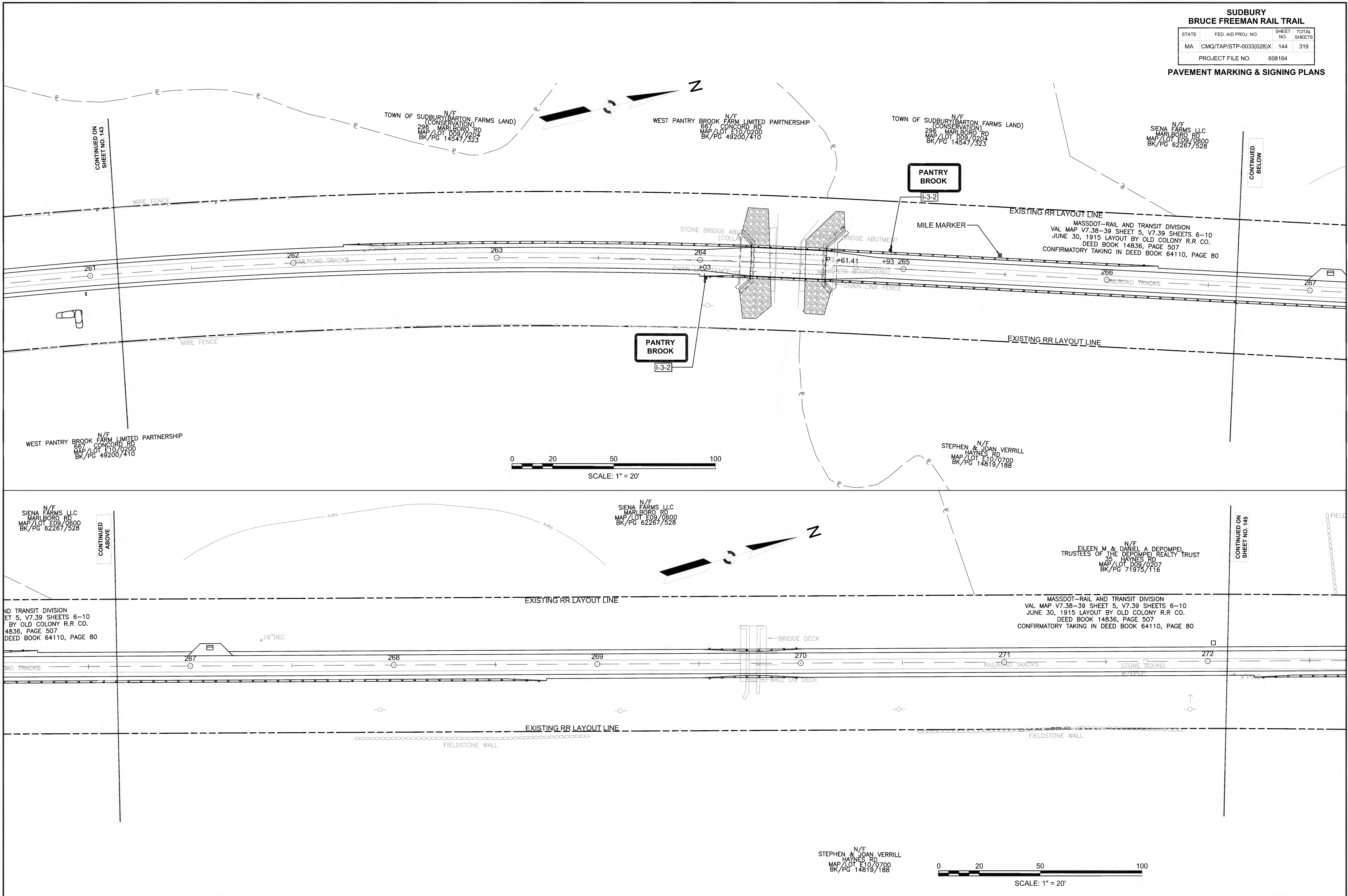


608164\_HD(PAVEMENT MARKING & SIGNING PLANS).DWG Plotted on 27-Jun-2022 11:07 AM

**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	144	319
PROJECT FILE NO.		608164	

**PAVEMENT MARKING & SIGNING PLANS**



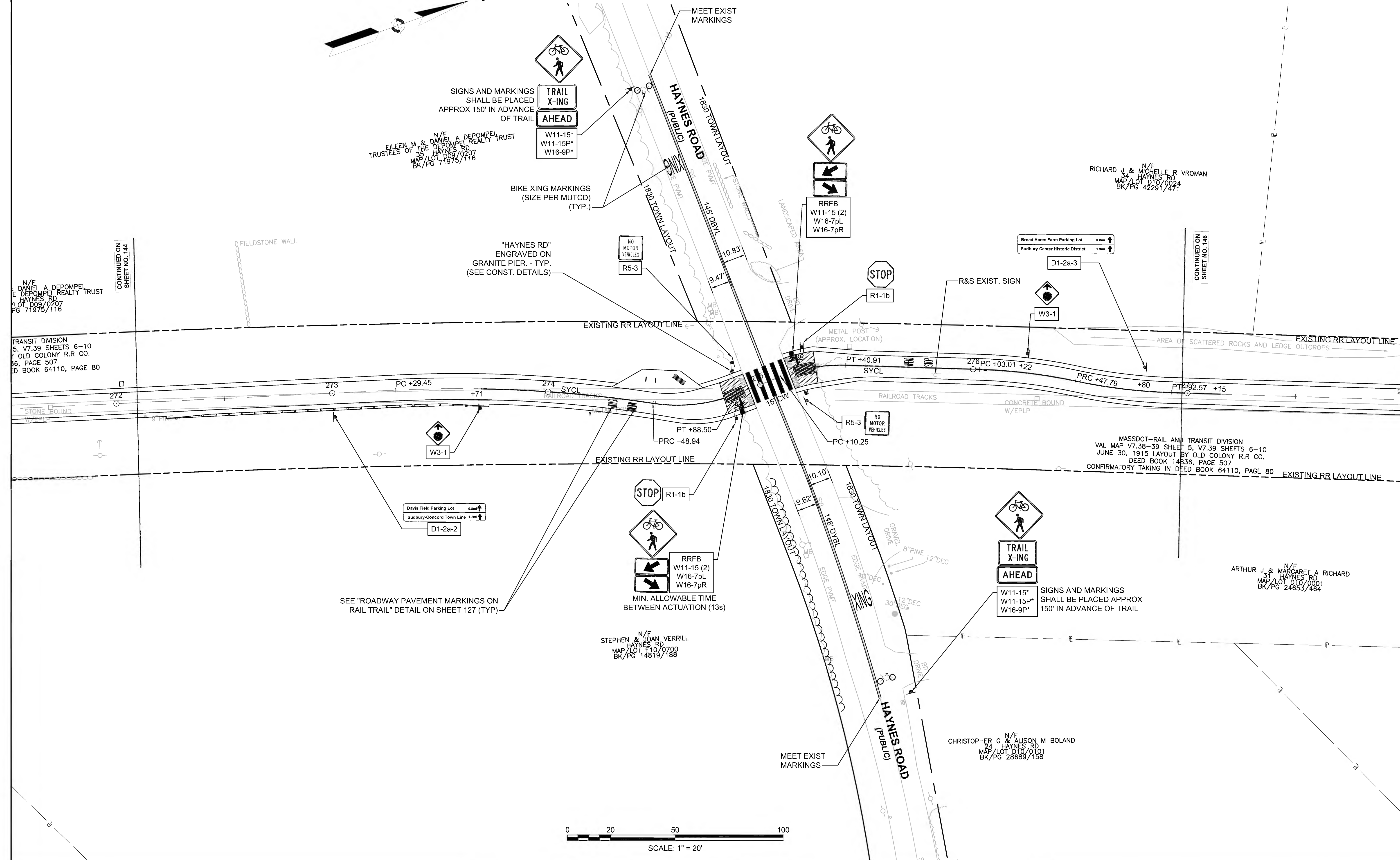
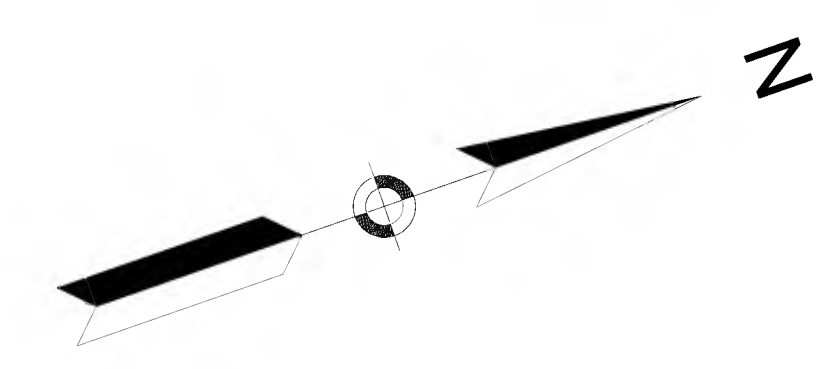
CONTINUED ON  
SHEET NO. 143

CONTINUED  
BELOW

CONTINUED ABOVE

CONTINUED ON  
SHEET NO. 145





N/E DANIEL A DEPOMPEL  
E DEPOMPEL REALTY TRUST  
HAYNES RD  
MAP/LOT D09/0207  
BK/PG 71975/116

N/E EILEEN M & DANIEL A DEPOMPEL  
TRUSTEES OF THE DEPOMPEL REALTY TRUST  
HAYNES RD  
MAP/LOT D09/0207  
BK/PG 71975/116

N/F RICHARD J & MICHELLE R VROMAN  
34 HAYNES RD  
MAP/LOT D10/0024  
BK/PG 42291/271

MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80

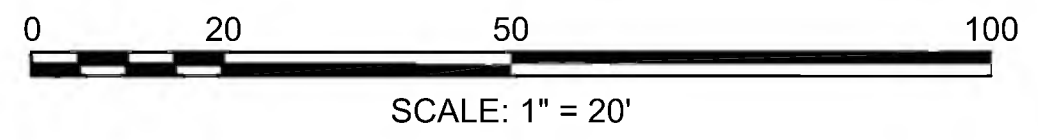
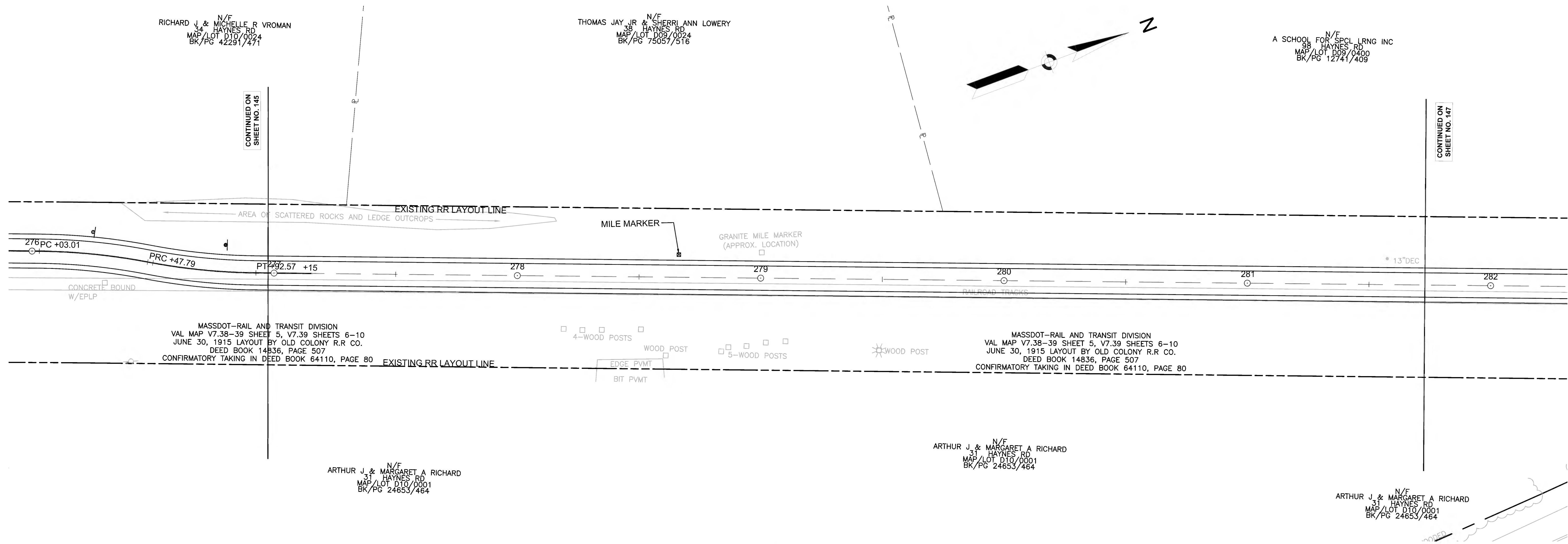
N/F ARTHUR J. & MARGARET A RICHARD  
31 HAYNES RD  
MAP/LOT D10/0001  
BK/PG 24653/464

N/E STEPHEN & JOAN VERRILL  
HAYNES RD  
MAP/LOT E10/0700  
BK/PG 14819/188

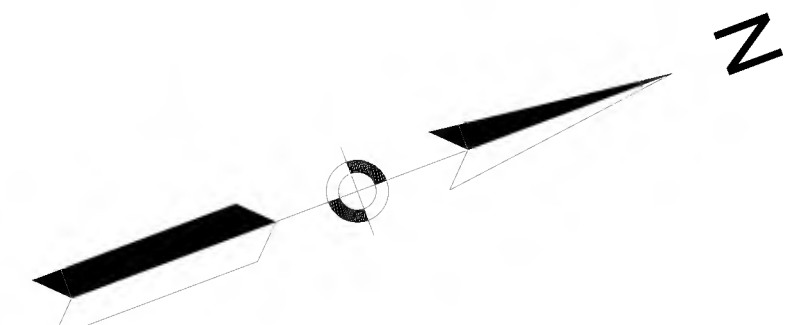
N/F CHRISTOPHER G & ALISON M BOLAND  
24 HAYNES RD  
MAP/LOT D18/0101  
BK/PG 28689/158

CONTINUED ON  
SHEET NO. 144

CONTINUED ON  
SHEET NO. 146







Broad Acres Farm Lot	1.3mi	↑
Parkinsons Lot	1.9mi	↑
Sudbury Center Historic District	2.1mi	↑
Mass. Central Rail Trail	3.5mi	↑

A SCHOOL FOR SPCL LRNG INC  
98 HAYNES RD  
MAP/LOT D10/0400  
BK/PG 12741/409

RAMI ALWAN & JENNIE M BRANNEN  
PANTRY RD  
MAP/LOT D10/0013  
BK/PG 69023/195

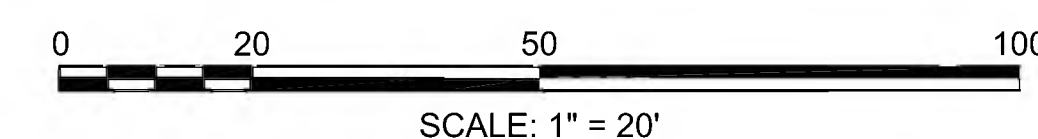
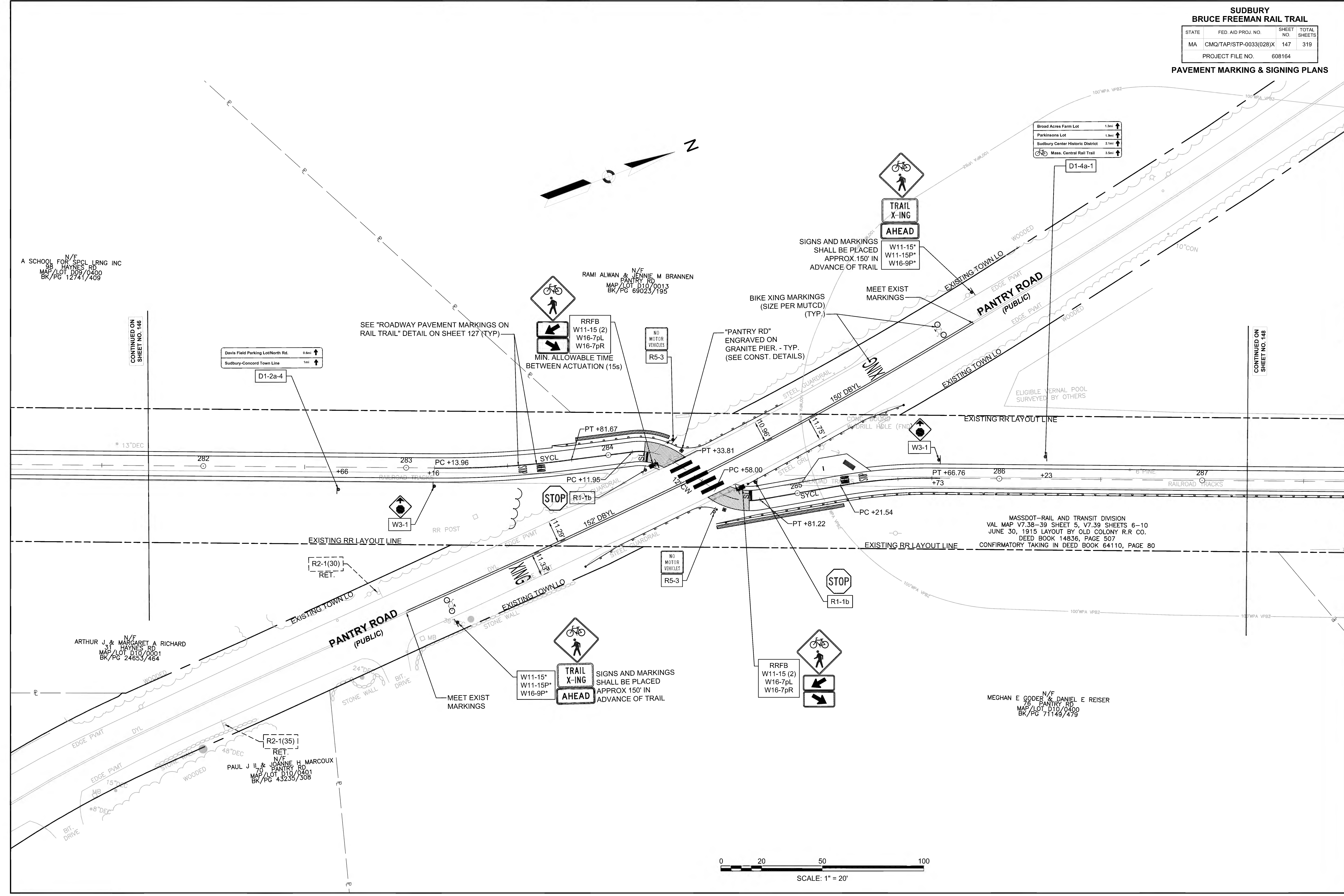
ARTHUR J & MARGARET A RICHARD  
31 HAYNES RD  
MAP/LOT D10/0001  
BK/PG 24653/464

PAUL J II & JOANNE H MARCOUX  
70 PANTRY RD  
MAP/LOT D10/0401  
BK/PG 43235/308

MEGHAN E GODER & DANIEL E REISER  
76 PANTRY RD  
MAP/LOT D10/0400  
BK/PG 71149/479

CONTINUED ON  
SHEET NO. 146

CONTINUED ON  
SHEET NO. 148



MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80

**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	148	319
PROJECT FILE NO.		608164	

**PAVEMENT MARKING & SIGNING PLANS**

CONTINUED ON  
SHEET NO. 147

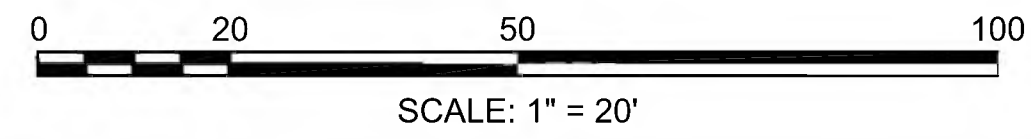
CONTINUED  
BELOW

N/F  
STEPHEN CHRISTOPHER NASH & TARA A NASH  
108 PANTRY RD  
MAP/LOT D10/0503  
BK/PG 69023/236

STEPHEN CHRISTOPHER NASH & TARA A NASH  
108 PANTRY RD  
MAP/LOT D10/0503  
BK/PG 69023/236

MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80

N/F  
TOWN OF SUDBURY  
(CONSERVATION)  
PANTRY RD  
MAP/LOT D10/0022  
BK/PG 13482/555



N/F  
STEPHEN CHRISTOPHER NASH & TARA A NASH  
108 PANTRY RD  
MAP/LOT D10/0503  
BK/PG 69023/236

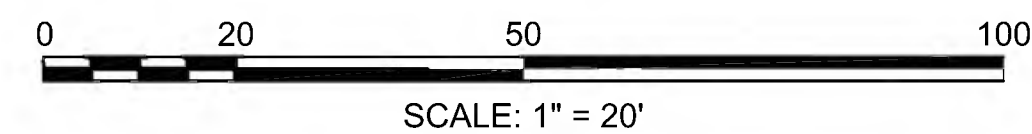
N/F  
TARA ILLIANO & RICHARD MAGAZU  
122 PANTRY RD  
MAP/LOT D10/0502  
BK/PG 5928/548

N/F  
MARY F BROCHU TRUSTEE  
OF THE REALTY TRUST  
WINDMILL DR  
MAP/LOT D10/0006  
BK/PG 16775/585

MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80

N/F  
TOWN OF SUDBURY  
(CONSERVATION)  
PANTRY RD  
MAP/LOT D10/0022  
BK/PG 13482/555

N/F  
TOWN OF SUDBURY  
(CONSERVATION)  
211 NORTH RD  
MAP/LOT D10/0300  
BK/PG 12726/603

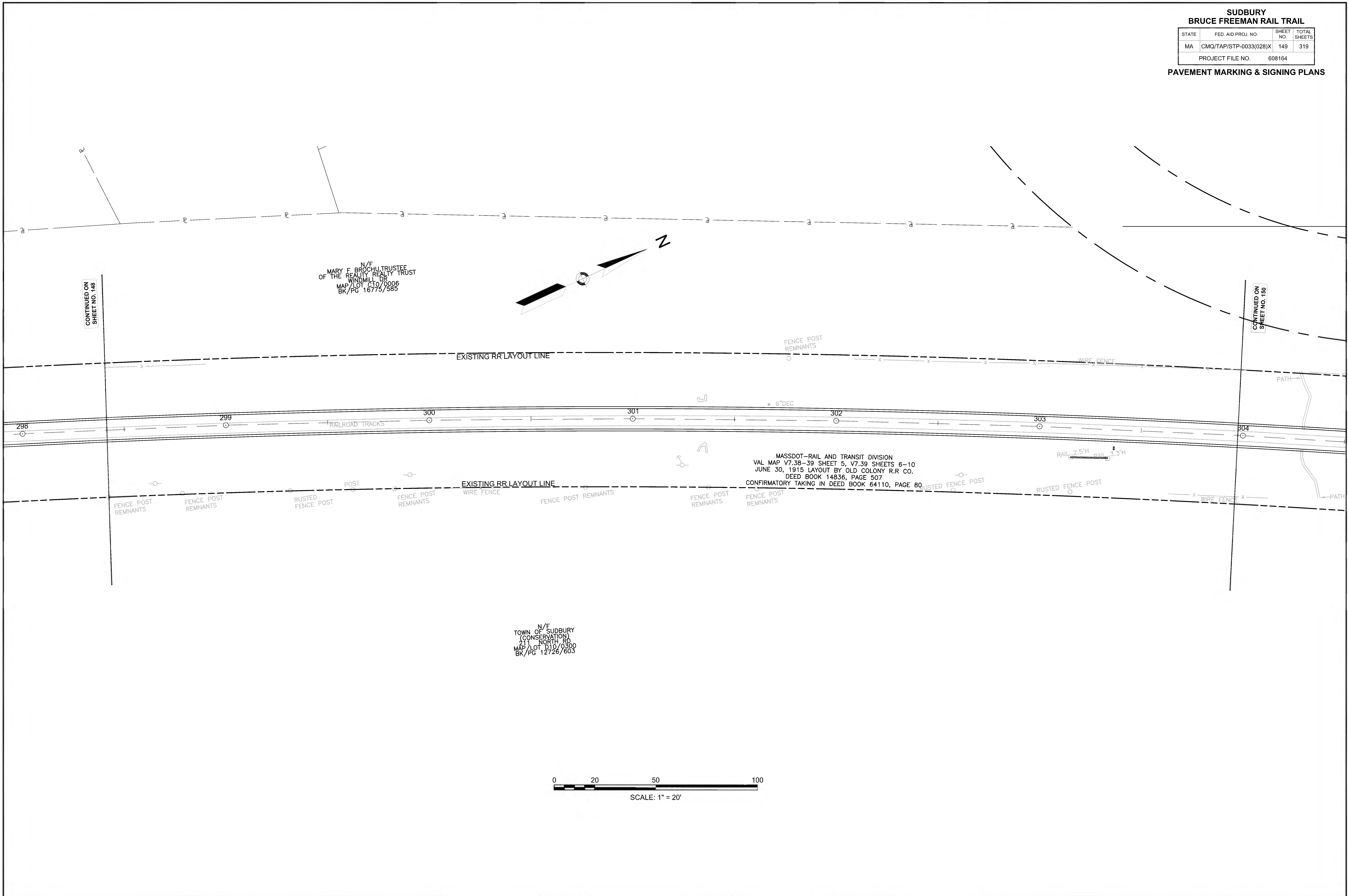




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	149	319
PROJECT FILE NO.		608164	

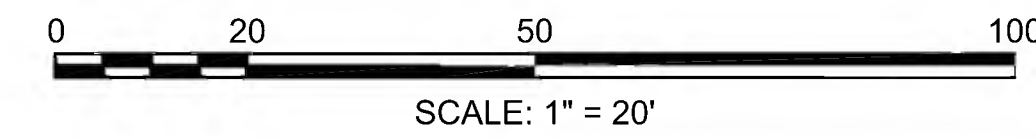
**PAVEMENT MARKING & SIGNING PLANS**

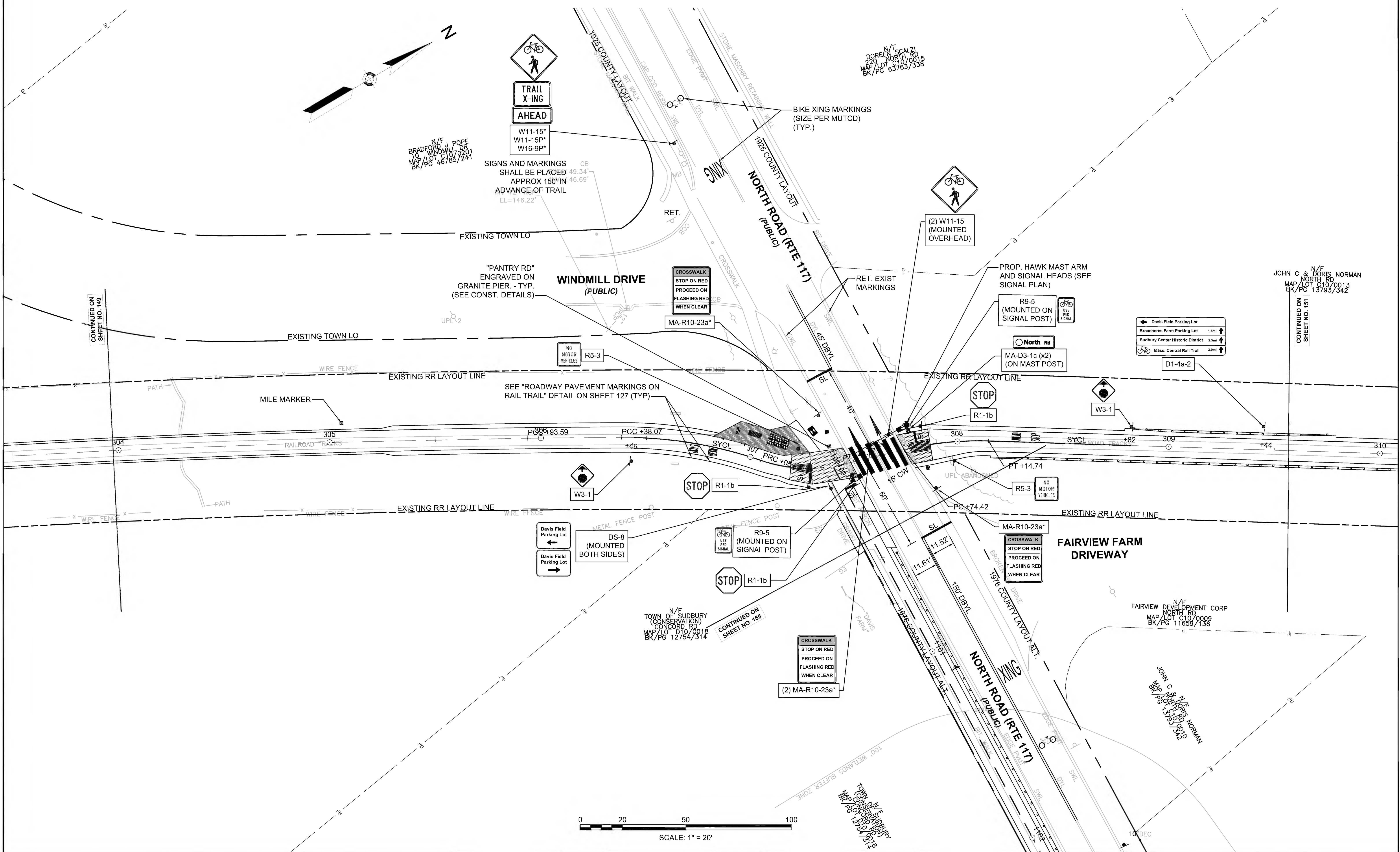


N/E  
MARY F BROCHU TRUSTEE  
OF THE REALTY TRUST  
WINDMILL DR  
MAP LOT C10/0006  
BK/PG 16775/585

MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80

N/E  
TOWN OF SUDBURY  
(CONSERVATION)  
211 NORTH RD  
MAP LOT D10/0300  
BK/PG 12726/603





CONTINUED ON SHEET NO. 149

CONTINUED ON SHEET NO. 151

CONTINUED ON SHEET NO. 155

0 20 50 100  
 SCALE: 1" = 20'



**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

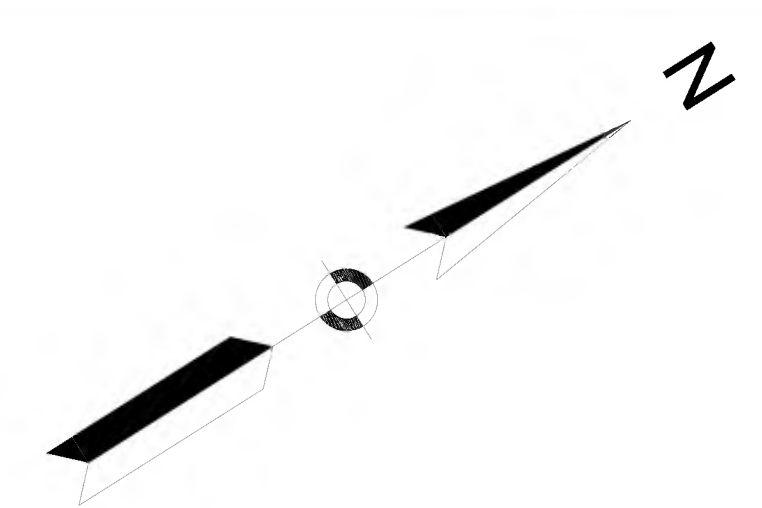
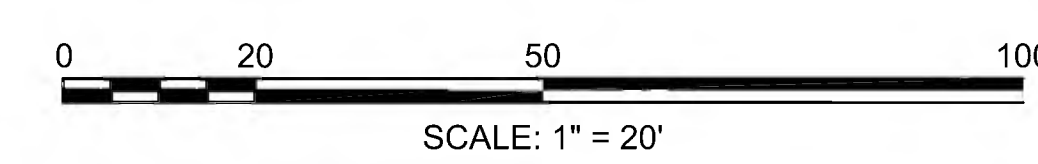
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	151	319
PROJECT FILE NO.		608164	

**PAVEMENT MARKING & SIGNING PLANS**

JOHN C & DORIS NORMAN  
NORTH RD  
MAP/LOT C10/0013  
BK/PG 13793/342

JOHN C & DORIS NORMAN  
NORTH RD  
MAP/LOT C10/0012  
BK/PG 13793/342

MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80



FAIRVIEW DEVELOPMENT CORP  
NORTH RD  
MAP/LOT C10/0009  
BK/PG 11659/136

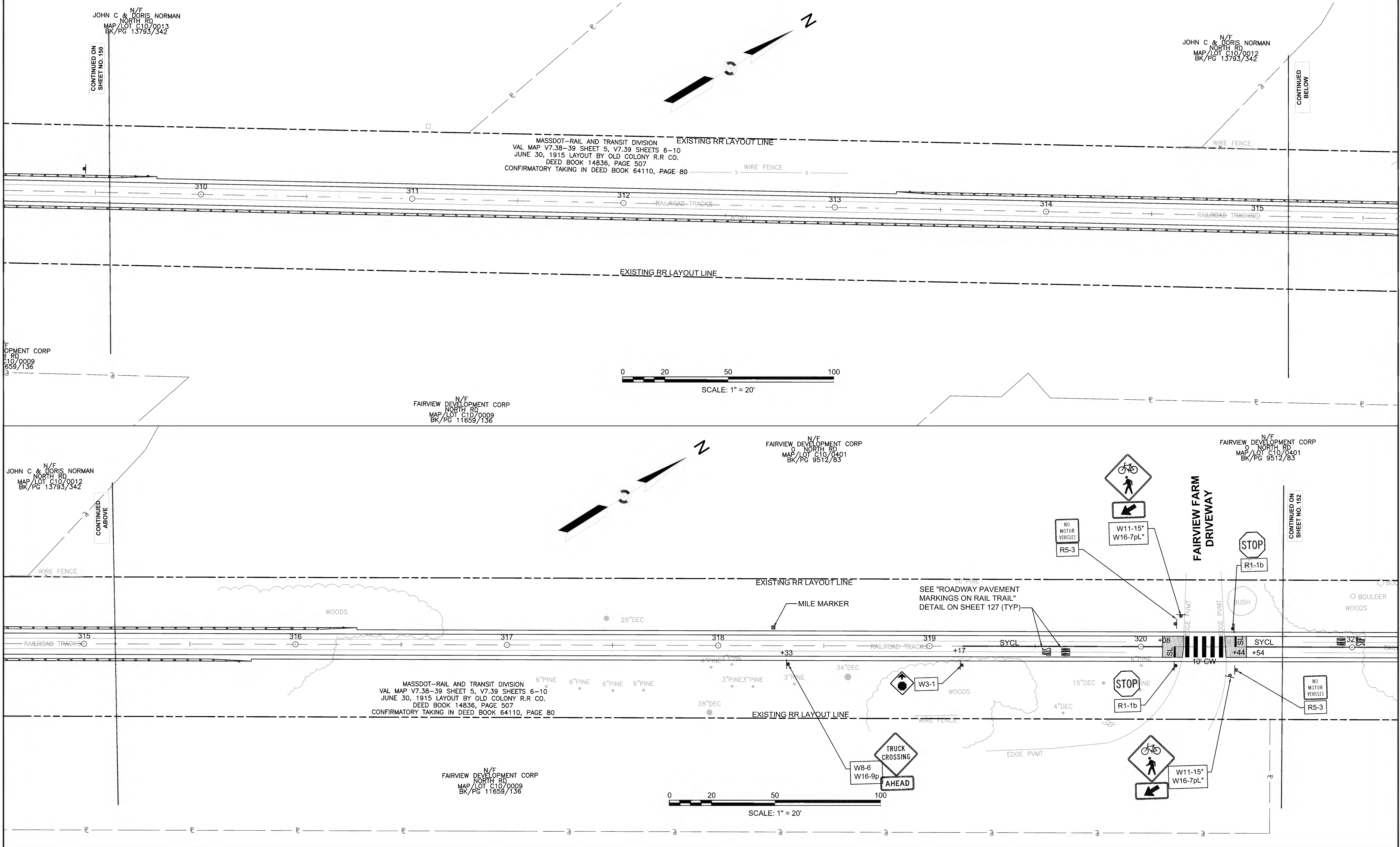
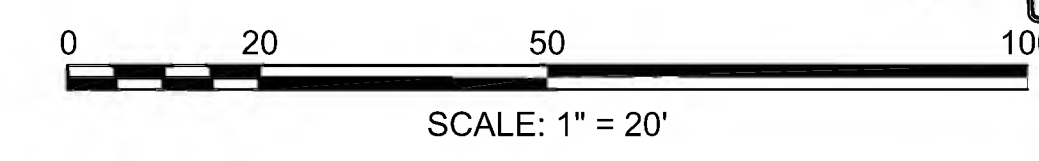
FAIRVIEW DEVELOPMENT CORP  
NORTH RD  
MAP/LOT C10/0401  
BK/PG 9512/83

FAIRVIEW DEVELOPMENT CORP  
NORTH RD  
MAP/LOT C10/0401  
BK/PG 9512/83

JOHN C & DORIS NORMAN  
NORTH RD  
MAP/LOT C10/0012  
BK/PG 13793/342

MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80

FAIRVIEW DEVELOPMENT CORP  
NORTH RD  
MAP/LOT C10/0009  
BK/PG 11659/136



CONTINUED ON SHEET NO. 150

CONTINUED BELOW

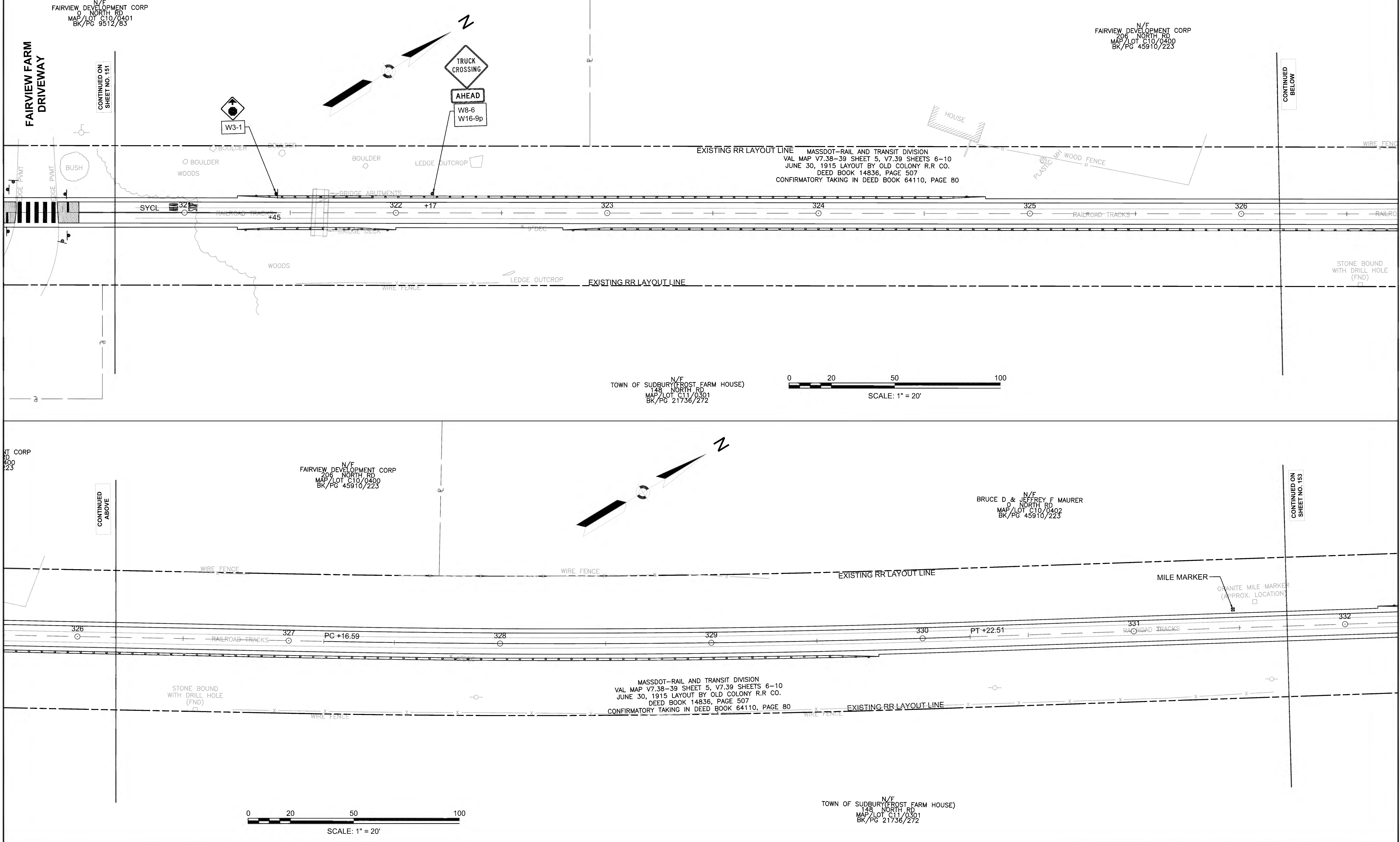
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CONTINUED ON SHEET NO. 152

**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	152	319
PROJECT FILE NO.		608164	

**PAVEMENT MARKING & SIGNING PLANS**



FAIRVIEW FARM DRIVEWAY

CONTINUED BELOW

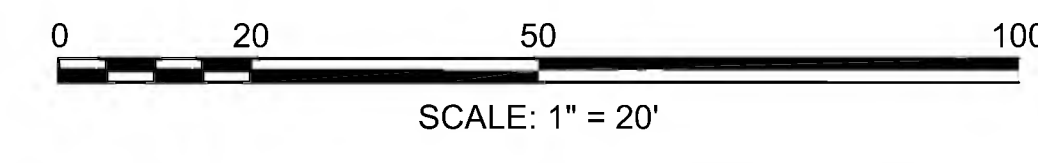
CONTINUED ON SHEET NO. 151

FAIRVIEW DEVELOPMENT CORP  
206 NORTH RD  
MAP/LOT C10/0401  
BK/PG 9512/83

FAIRVIEW DEVELOPMENT CORP  
206 NORTH RD  
MAP/LOT C10/0400  
BK/PG 45910/223

EXISTING RR LAYOUT LINE MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80

TOWN OF SUDBURY (FROST FARM HOUSE)  
148 NORTH RD  
MAP/LOT C11/0301  
BK/PG 21736/272



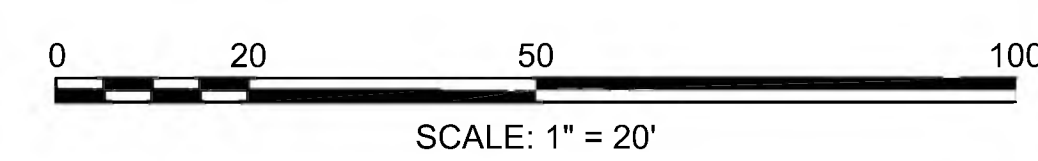
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CONTINUED ON SHEET NO. 153

FAIRVIEW DEVELOPMENT CORP  
206 NORTH RD  
MAP/LOT C10/0400  
BK/PG 45910/223

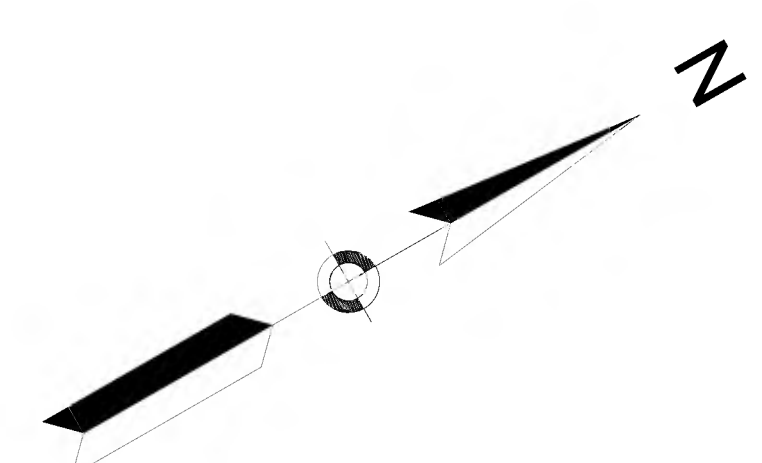
BRUCE D & JEFFREY F MAURER  
148 NORTH RD  
MAP/LOT C10/0402  
BK/PG 45910/223

MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80



TOWN OF SUDBURY (FROST FARM HOUSE)  
148 NORTH RD  
MAP/LOT C11/0301  
BK/PG 21736/272





BRUCE D & JEFFREY F MAURER  
NORTH RD  
MAP/LOT C10/0402  
BK/PG 45910/223

Sudbury Center Historic District 3mi ↑  
Mass. Central Rail Trail 4mi ↑

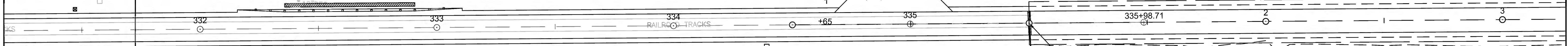
D1-2a-5

**TOWN OF SUDBURY**  
**TOWN OF CONCORD**

CONTINUED ON  
SHEET NO. 152

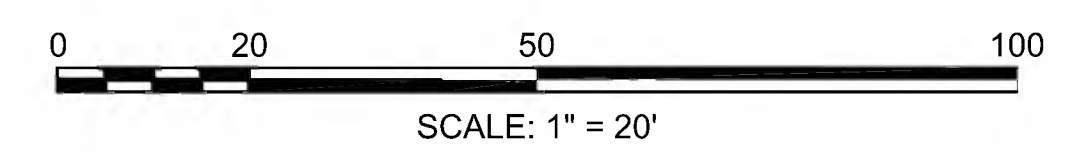
GRANITE MILE MARKER  
(APPROX. LOCATION)

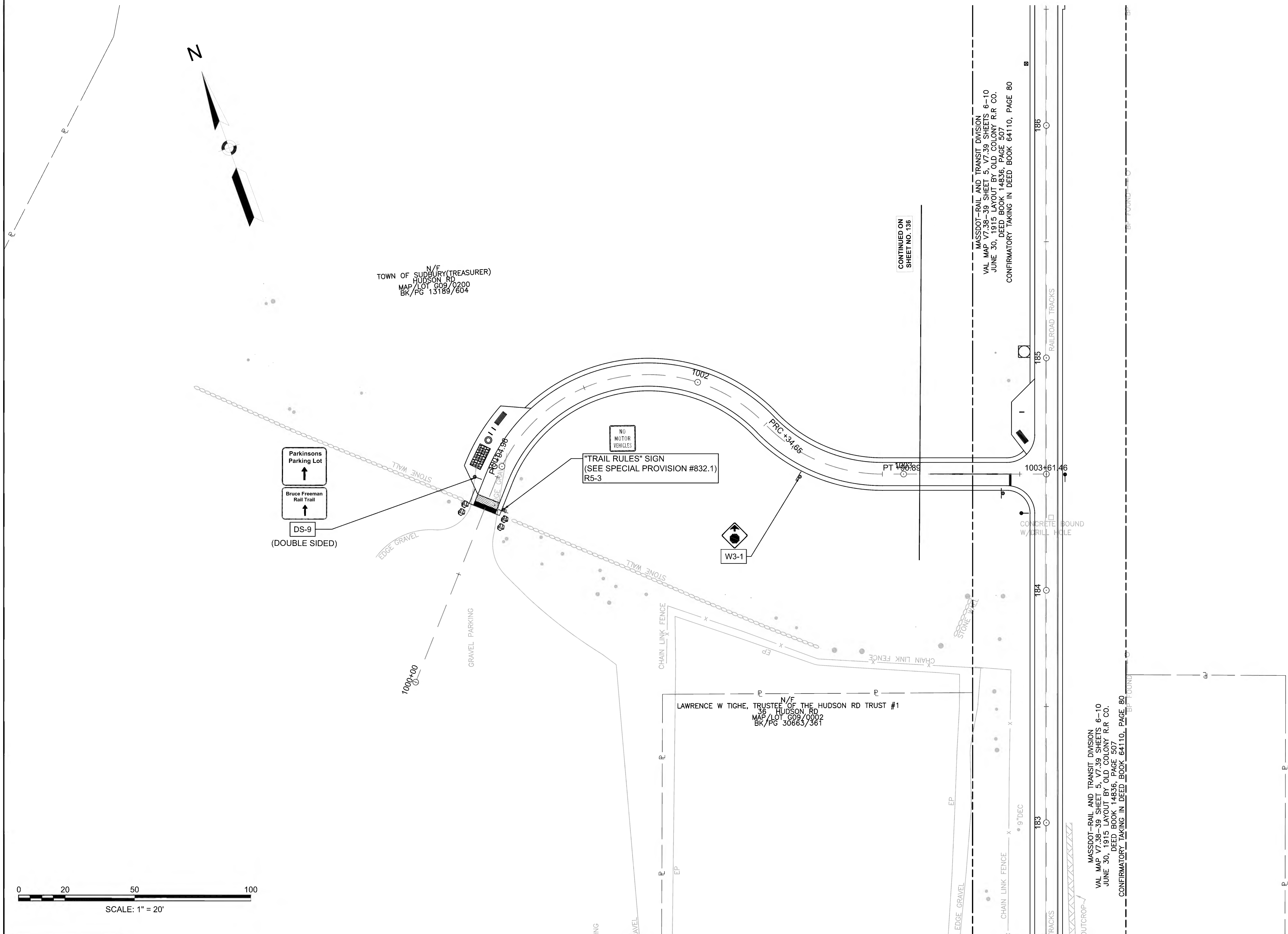
EXISTING RR LAYOUT LINE MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80



END SUDBURY BRUCE FREEMAN RAIL TRAIL PHASE 2D  
BEGIN CONCORD BRUCE FREEMAN RAIL TRAIL PHASE 2D

TOWN OF SUDBURY (FROST FARM HOUSE)  
NORTH RD  
MAP/LOT C11/0301  
BK/PG 21736/272





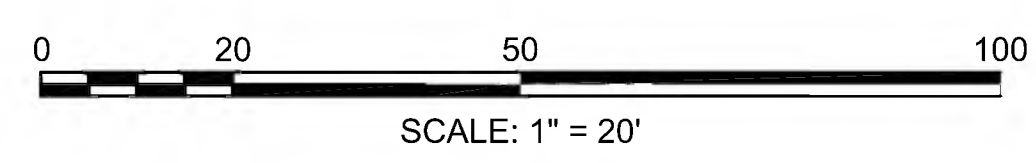
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SHEET NO. 136

MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80

N/E  
TOWN OF SUDBURY (TREASURER)  
HUDSON RD  
MAP/LOT 609/0200  
BK/PG 13189/604

N/E  
LAWRENCE W TIGHE, TRUSTEE OF THE HUDSON RD TRUST #1  
38 HUDSON RD  
MAP/LOT 609/0002  
BK/PG 30663/361

MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80





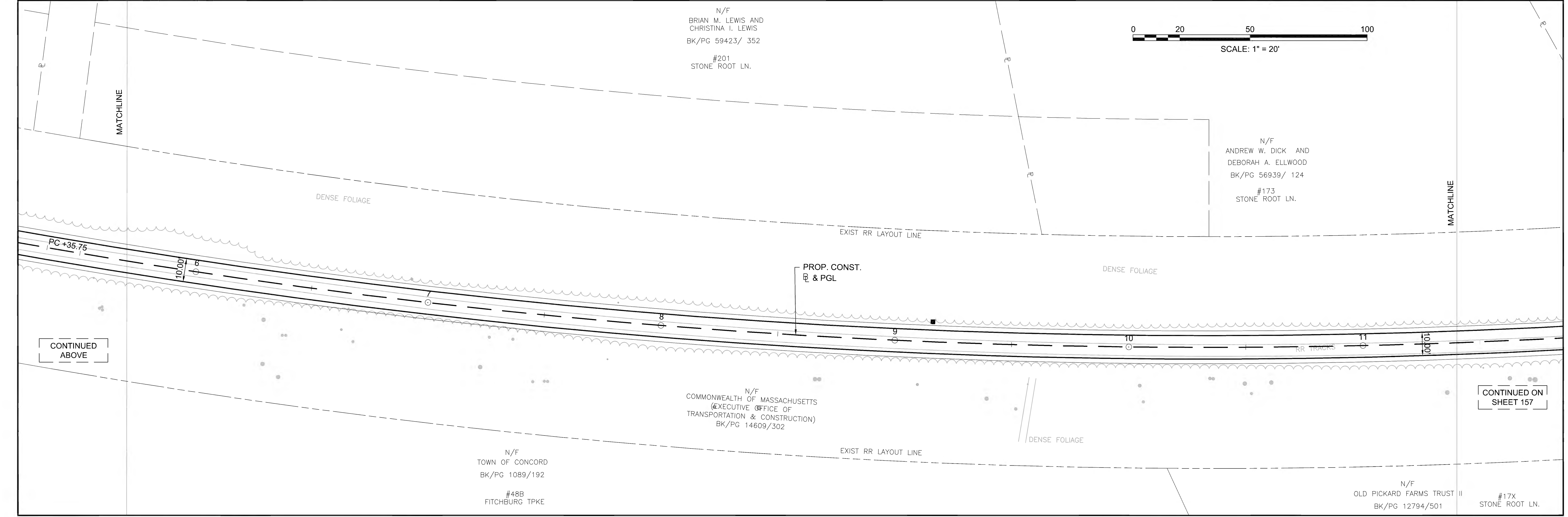
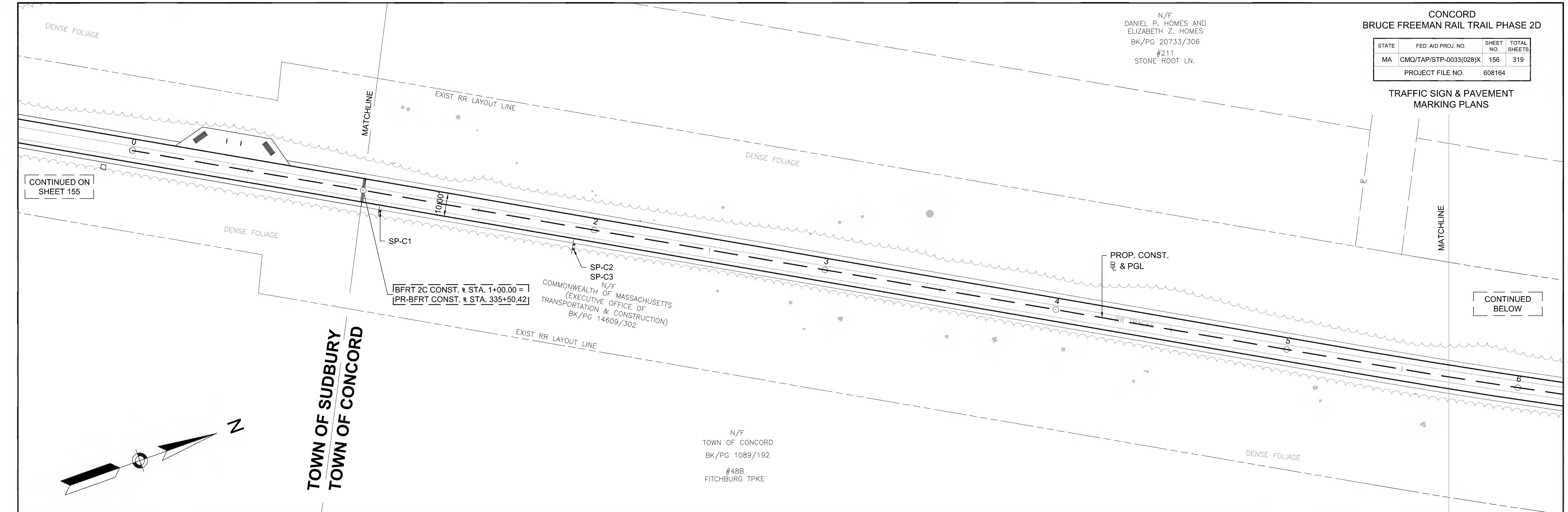


CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	156	319
PROJECT FILE NO.		608164	

TRAFFIC SIGN & PAVEMENT MARKING PLANS

N/F  
DANIEL P. HOMES AND  
ELIZABETH Z. HOMES  
BK/PG 20733/306  
#211  
STONE ROOT LN.

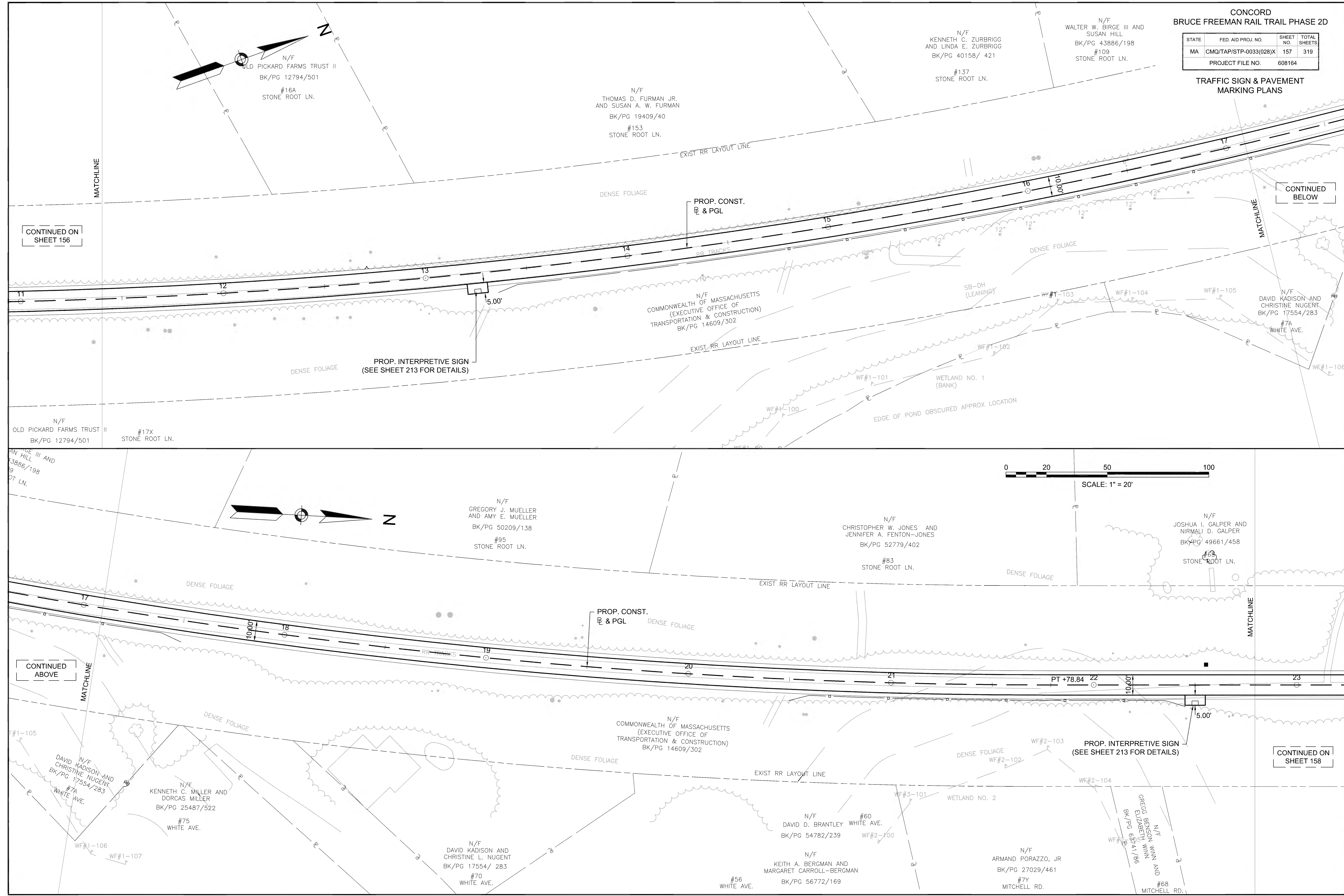




CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	157	319
PROJECT FILE NO.		608164	

TRAFFIC SIGN & PAVEMENT MARKING PLANS

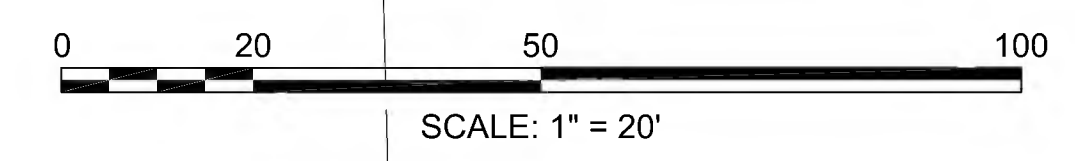


CONTINUED ON SHEET 156

CONTINUED BELOW

CONTINUED ABOVE

CONTINUED ON SHEET 158

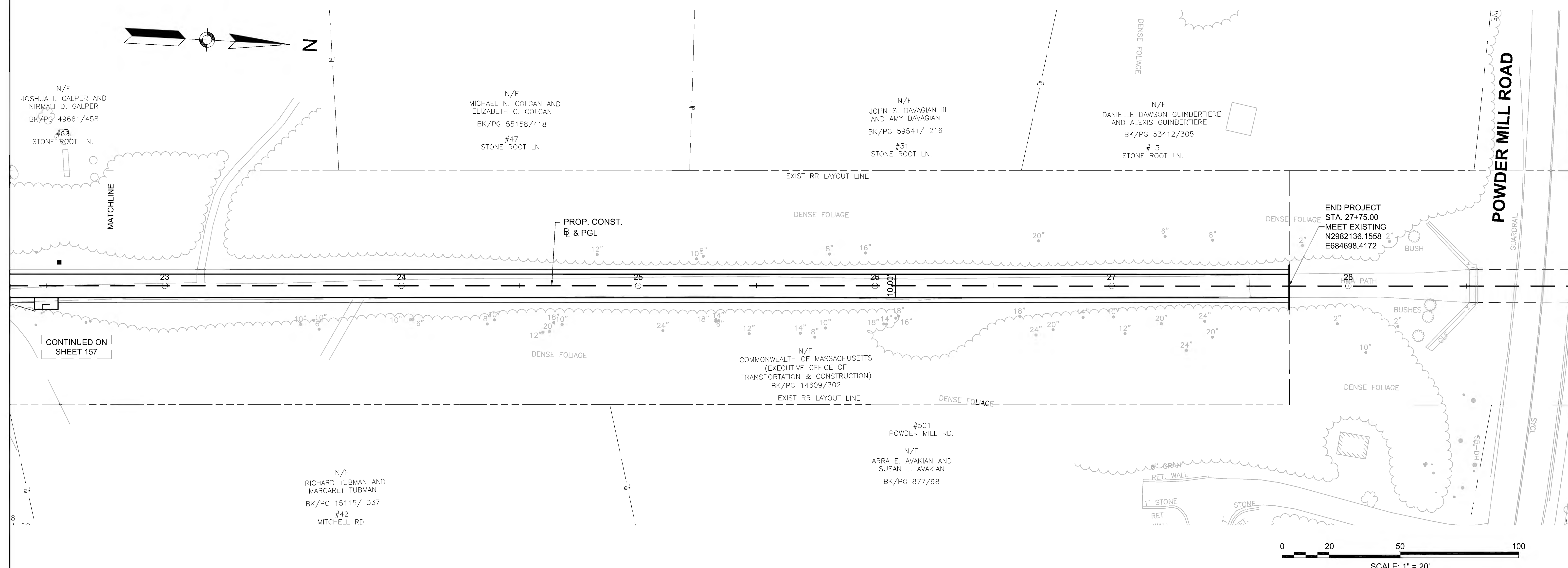


CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	158	319
PROJECT FILE NO.		608164	

TRAFFIC SIGN & PAVEMENT  
MARKING PLANS

605189\_HD(FMS)DWG Plotted on 22-Jun-2022 1:54 PM





NOTES:  
 HIGH INTENSITY ENCAPSULATED LENS REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. THE 2009 "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", THE 1990 MDPW "STANDARD DRAWINGS FOR SIGNS AND SUPPORTS", AND ALL AMENDMENTS WILL GOVERN.

ALL P5 SIGN POSTS SHALL BE 2" SQUARE POSTS FACTORY COATED GLOSS BLACK UNLESS OTHERWISE NOTED (PBS) = PAINTED BOTH SIDES

ALL TIMBER SIGN POSTS SHALL BE 8' TALL PRESSURE TREATED WHITE PINE 4"x4".

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	159	319
PROJECT FILE NO.		608164	
TRAFFIC SIGN SUMMARY			

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (in)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	SIGN FACE AREA (S.F.)	TOTAL AREA (S.F.)	IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (in)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	SIGN FACE AREA (S.F.)	TOTAL AREA (S.F.)
	WIDTH (IN)	HEIGHT (IN)		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER					LETTER HEIGHT	VERTICAL SPACING		ARROW RTE. MKR.	BACK-GROUND	LEGEND		BORDER	WIDTH (IN)	HEIGHT (IN)			
R1-1a	30	30		SEE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (INCLUDING LATEST REVISION)			3	RED	WHITE	WHITE	WOOD POST 3 REQ'D	6.25	18.75	W11-15	30	30		SEE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (INCLUDING LATEST REVISION)			18	YELLOW	BLACK	BLACK	P-5 18 REQ'D 2 O'HEAD	6.25	112.50
R1-1b	18	18					18	RED	WHITE	WHITE	WOOD POST 18 REQ'D	2.25	40.50	W11-15p	24	18					12	YELLOW	BLACK	BLACK	12 MOUNTED WITH W11-15	3.00	36.00
R3-7L	30	30					1	WHITE	BLACK	BLACK	P-5 1 REQ'D	6.25	6.25	W16-7pL	24	12					4	YELLOW	BLACK	BLACK	4 MOUNTED W/ W11-15	2.00	8.00
R5-3	24	24					20	WHITE	BLACK	BLACK	P-5 20 REQ'D	4.00	80.00	W16-7pR	24	12					2	YELLOW	BLACK	BLACK	2 MOUNTED W/ W11-15	2.00	4.00
R7-8	12	18					2	WHITE	GREEN	GREEN	WOOD POST 2 REQ'D	1.50	3.00	W16-9p	24	12					20	YELLOW	BLACK	BLACK	12 MOUNTED W/ W11-15 2 MOUNTED W/ W3-3 6 MOUNTED W/ W8-6	2.00	40.00
R7-8P	18	9					1	WHITE	GREEN	GREEN	MOUNTED WITH R7-8 SEE PLANS	1.13	1.13	MA-D3-1a	36	12		6D/4D	3 3.25	N/A	1	GREEN	WHITE	WHITE	MOUNTED ON SIGNAL POST	-	EACH
R7-10	18	12					2	WHITE	BLACK	BLACK	2 MOUNTED WITH SP-1	1.50	3.00	MA-D3-1b	36	12		6D/4D	3 3.25	N/A	2	GREEN	WHITE	WHITE	MOUNTED ON SIGNAL POST	-	EACH
R9-5	12	18					4	WHITE	BLACK	BLACK	WOOD POST 4 REQ'D 3 MOUNTED ON SIGNAL POST	1.50	6.00	MA-D3-1c	36	12		6D/4D	3 3.25	N/A	2	GREEN	WHITE	WHITE	MOUNTED ON SIGNAL POST	-	EACH
R10-6L	24	36					1	WHITE	BLACK	BLACK	P-5 1 REQ'D	6.00	6.00	I-3-1	24	18		SEE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (INCLUDING LATEST REVISION)			2	WHITE	BLACK	BLACK	WOOD POST 2 REQ'D	3.00	6.00
R10-11	24	30					2	WHITE	BLACK	BLACK	P-5 2 REQ'D	5.00	10.00	I-3-2	24	18					2	WHITE	BLACK	BLACK	WOOD POST 2 REQ'D	3.00	6.00
R10-11b	24	24					1	WHITE	BLACK	BLACK	O'HEAD MOUNT	4.00	4.00														
MA-R10-12a	30	36		MASSDOT STANDARD			1	WHITE	BLACK/YELLOW	BLACK	O'HEAD MOUNT	7.50	7.50														
MA-R10-23a	30	36					4	YELLOW/WHITE	BLACK	BLACK	P-5 4 REQ'D 2 O'HEAD MOUNT	7.50	30.00														
W2-6	18	18		SEE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (INCLUDING LATEST REVISION)			1	YELLOW	BLACK	BLACK	WOOD POST 1 REQ'D	2.25	2.25														
W3-1	18	18					18	YELLOW	BLACK	BLACK	WOOD POST 18 REQ'D	2.25	40.50														
W3-3	18	18					2	YELLOW	BLACK	BLACK	WOOD POST 2 REQ'D	2.25	4.50														
W8-6	18	18					6	YELLOW	BLACK	BLACK	WOOD POST 6 REQ'D	2.25	13.50														

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (in)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	SIGN FACE AREA (S.F.)	TOTAL AREA (S.F.)
	WIDTH (IN)	HEIGHT (IN)		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER			
SP-C4	24	18	TRAIL RULES SIGN (REF. SPEC 832.1)				3	WHITE	BLACK	BLACK	P-5 2 REQ'D 1 MOUNTED WITH R5-3	PAY UNDER ITEM 832.1	
DS-1	(SEE CONST. DETAILS)			(SEE SPECIAL PROVISION #832.2)			1	(SEE SPECIAL PROVISION #832.2)				-	EACH
DS-2	(SEE CONST. DETAILS)		 				1					-	EACH
DS-3	(SEE CONST. DETAILS)		 				1					-	EACH
DS-4	(SEE CONST. DETAILS)		 				1					-	EACH
DS-5	(SEE CONST. DETAILS)		 				1					-	EACH
DS-6	(SEE CONST. DETAILS)		 				1					-	EACH
DS-7	(SEE CONST. DETAILS)						1					-	EACH
DS-8	(SEE CONST. DETAILS)		 				1					-	EACH
DS-9	(SEE CONST. DETAILS)		 				1					-	EACH
DS-10	(SEE CONST. DETAILS)						1					-	EACH
DS-11	(SEE CONST. DETAILS)						1					-	EACH
DS-11	(SEE CONST. DETAILS)						1					-	EACH

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (in)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	SIGN FACE AREA (S.F.)	TOTAL AREA (S.F.)
	WIDTH (IN)	HEIGHT (IN)		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER			
D1-2a-1	36	16	 Boston Post Road / US 20 0.3mi	4D/3D	3 2 3	4x3 @ 90° & 4x6 4x3 @ 90°	1	GREEN	WHITE	WHITE	WOOD POST 1 REQ'D	4.00	4.00
D1-2a-2	36	16	 Sudbury-Concord Town Line 1.2mi	4D/3D	3 2 3	4x3 @ 90° 4x3 @ 90°	1	GREEN	WHITE	WHITE	WOOD POST 1 REQ'D	4.00	4.00
D1-2a-3	36	16	 Sudbury Center Historic District 1.9mi	4D/3D	3 2 3	4x3 @ 90° 4x3 @ 90°	1	GREEN	WHITE	WHITE	WOOD POST 1 REQ'D	4.00	4.00
D1-2a-4	36	16	 Sudbury-Concord Town Line 1mi	4D/3D	3 2 3	4x3 @ 90° 4x3 @ 90°	1	GREEN	WHITE	WHITE	WOOD POST 1 REQ'D	4.00	4.00
D1-2a-5	36	16	 Mass. Central Rail Trail 4.4mi	4D/3D	3 2 3	4x3 @ 90° 4x3 @ 90°	1	GREEN	WHITE	WHITE	WOOD POST 1 REQ'D	4.00	4.00
D1-3a-1	36	22	 Parkinsons Parking Lot 1.6mi Sudbury-Concord Town Line 4.4mi	4D/3D	3 2 3	4x3 @ 90° 4x3 @ 90° 4x3 @ 90°	1	GREEN	WHITE	WHITE	WOOD POST 1 REQ'D	5.50	5.50
D1-4a-1	36	26	 Parkinsons Lot 1.9mi Sudbury Center Historic District 2.1mi Mass. Central Rail Trail 3.5mi	4D/3D	3 2 2 3	4x3 @ 90° 4x3 @ 90° 4x3 @ 90° 4x3 @ 90°	1	GREEN	WHITE	WHITE	WOOD POST 1 REQ'D	6.50	6.50
D1-4a-2	36	26	 Broadacres Farm Parking Lot 1.8mi Sudbury Center Historic District 2.5mi Mass. Central Rail Trail 3.9mi	4D/3D	3 2 2 3	4x3 @ 180° 4x3 @ 90° 4x3 @ 90° 4x3 @ 90°	1	GREEN	WHITE	WHITE	WOOD POST 1 REQ'D	6.50	6.50



CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	161	319
PROJECT FILE NO.		608164	

TRAFFIC SIGN SUMMARY SHEET

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)		NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA IN SQUARE FEET	AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING		BACK-GROUND	LEGEND	BORDER			
SP-C1	30"	24"	ENTERING SENSITIVE WILDLIFE AREA	4"B 4"B 4"B	3" 3" 3"	1	WHITE	BLACK	BLACK	P5 (1 REQ'D)	5.00	5.00
SP-C2	30"	24"	BRUCE FREEMAN RAIL TRAIL	4"B 4"B 4"B	3" 3" 3"	1	BROWN	WHITE	WHITE	2-P5 (1 REQ'D)	5.00	5.00
SP-C3	24"	36"	TRAIL RULES SIGN (REF. SPEC 832.1)			1	WHITE	BLACK	BLACK	MNT w/SP-C2	PAY UNDER ITEM 832.1	

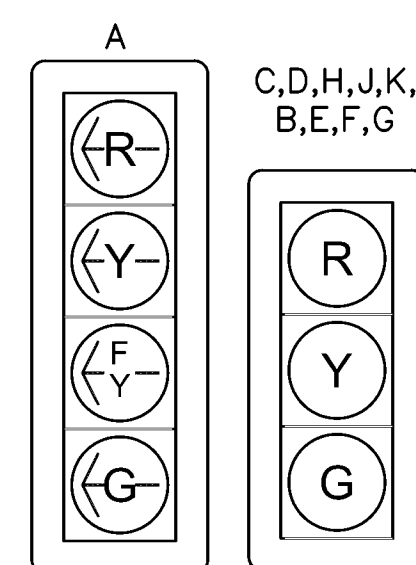
NOTES:

- ALL WARNING, REGULATORY AND ROUTE MARKERS SHALL BE FABRICATED WITH HIGH INTENSITY ENCAPSULATED LENS REFLECTIVE SHEETING (SEE SECTION M9.30.0) TYPE III OR IV.
- ALL SIGNS NOTED AS "(R&R)" SHALL BE MOUNTED ON NEW P5 POSTS OR AS OTHERWISE INDICATED.
- ALL P5 POSTS SHALL BE TELESCOPIC SQUARE TYPE POSTS.
- QUANTITIES OF SIGNS AND POSTS SHOWN ON THIS SHEET MAY DIFFER FROM THE TRAFFIC SIGN & PAVEMENT MARKING PLANS. WHERE DIFFERENCES OCCUR, THE TRAFFIC SIGN & PAVEMENT MARKING PLANS SHALL PREVAIL.
- ALL STOP AND YIELD SIGNS PROPOSED IN THIS CONTRACT ARE SUBJECT TO FIELD INVESTIGATION BY THE DISTRICT OFFICE OF THE MASSACHUSETTS HIGHWAY DEPARTMENT TO JUSTIFY WARRANTS BEFORE INSTALLATION.
- NUMERICAL LIMITS AND JUSTIFICATION FOR THE LIMITS AND JUSTIFICATION FOR THE SPEED AND ADVISORY EXIT SPEED AND ADVISORY EXIT SPEED SIGNS SHALL BE OBTAINED FROM THE SPEED ZONING UNIT OF THE TRAFFIC DEPARTMENT BEFORE FABRICATION AND/OR ERECTION.

**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	162	319
PROJECT FILE NO.		608164	

**TRAFFIC SIGNAL PLANS  
HUDSON RD & PEAKHAM RD  
LOCATION NO. 1**



**PROPOSED SIGNAL INDICATIONS**

ALL SIGNAL HEADS SHALL BE RIGID MOUNTED & EQUIPPED WITH ±5" NON-LOUVERED BACKPLATES WITH 3" YELLOW RETROREFLECTIVE TAPE BORDERS.

\*\*\*\*ALL PROPOSED SIGNAL POSTS, BASES, BACKPLATES, SIGNAL HOUSINGS, AND BRACKETS SHALL BE FACTORY BLACK\*\*\*\*

**VIDEO DETECTION**

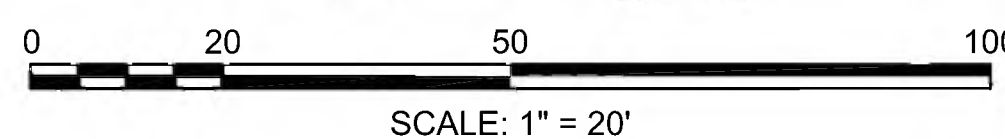
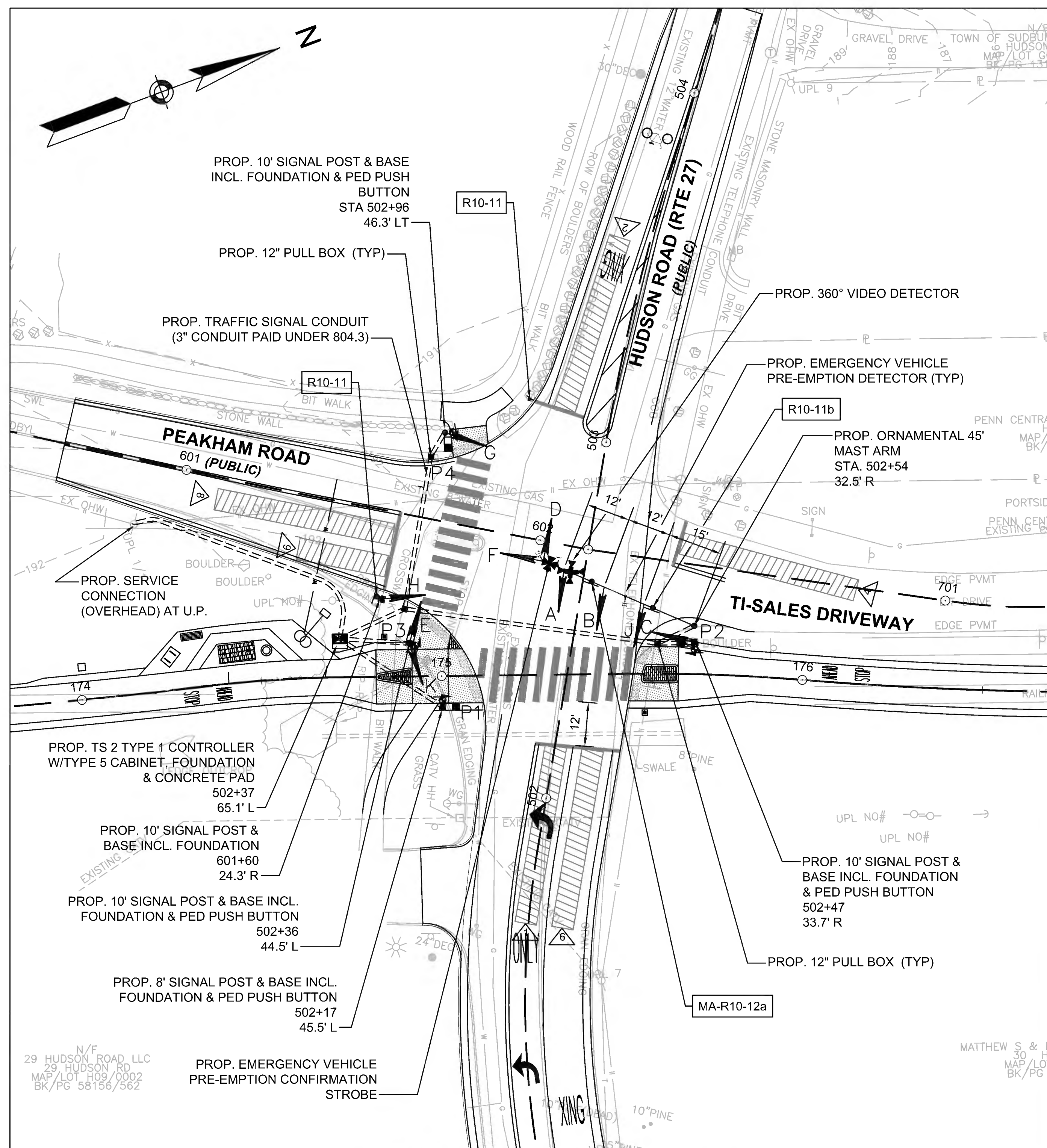
KEY	OPERATION	DELAY	PHASE
1	PRESENCE	0 SEC.	1
2	PRESENCE	0 SEC.	2
4	PRESENCE	0 SEC.	4
6	PRESENCE	0 SEC.	6
8	PRESENCE	0 SEC.	8
9	PRESENCE	5 SEC.	8

**LEGEND**

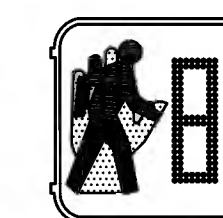
- PROPOSED MAST ARM & POLE
- PROPOSED SIGNAL POST
- ▲ PROPOSED SIGNAL HEAD
- P1 PROPOSED PEDESTRIAN HEAD
- PROPOSED PEDESTRIAN PUSH BUTTON
- PROPOSED 12 X 12 PULL BOX
- PROPOSED 13 X 24 HAND HOLE
- === PROPOSED 3" PVC CONDUIT TYPE NM
- PROPOSED CONTROLLER CABINET W/CONC PAD
- ▲ DETECTOR KEY
- ⊕ PROPOSED 360° VIDEO CAMERA DETECTION
- ⊕ PROPOSED PREEMPTION CONFIRMATION STROBE
- ▨ VIDEO DETECTION ZONE
- III PROPOSED EMERGENCY VEHICLE PRE-EMPTION DETECTOR

**CONSTRUCTION NOTES**

- THE TOP OF ALL MAST ARM FOUNDATIONS IN SIDEWALK AREAS SHALL BE LOCATED FLUSH WITH FINISH GRADE.
- THE TOP OF ALL MAST ARM FOUNDATIONS IN GRASSY AREAS SHALL BE LOCATED 3"± ABOVE FINISHED GRADE.
- TS POST/POLE, WITH PEDESTRIAN PUSH BUTTON, NOT LOCATED WITHIN A PAVED SURFACE SHALL BE POSITIONED SO AS TO PROVIDE A 10" MAX CLEAR REACH ZONE BETWEEN THE PEDESTRIAN PUSH BUTTON AND THE PAVED SURFACE PER 521 CMR AND AS SHOWN IN THE CONSTRUCTION DETAILS.



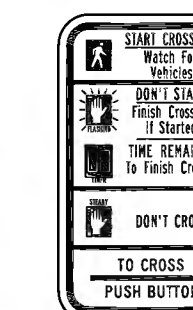
P1-P4



ALL COUNTDOWN PEDESTRIAN SIGNAL DISPLAYS SHALL BE EQUIPPED W/L.E.D. MODULES (16 INCH DISPLAY).

**ACCESSIBLE PEDESTRIAN SIGNALS (APS):**

ALL PROPOSED ACCESSIBLE PEDESTRIAN SIGNALS MUST FULLY COMPLY WITH THE UNITED STATES ACCESS BOARD PROWAG SUPPLEMENTAL TECHNICAL REQUIREMENTS UNDER CHAPTER 4. THIS INCLUDES OPERABLE PARTS (R403), CLEAR SPACES (R404), AND REACH RANGES (R406) AS RELATES TO ACCESSIBLE PEDESTRIAN SIGNALS AND PEDESTRIAN PUSH BUTTONS.



**PROPOSED R10-3E**

TO BE MOUNTED WITH EACH ACCESSIBLE PEDESTRIAN SIGNAL PROPOSED.

**ACCESSIBLE PEDESTRIAN SIGNALS (APS) SPEECH MESSAGE NOTE:**

BUTTONS P1, P2, P3, P4 SHALL BE PROGRAMMED WITH THE APPROPRIATE SPEECH MESSAGE FOR WALK INDICATING THE STREET CROSSING.

**MAJOR ITEMS REQUIRED**

PAY ITEM	QUANTITY	ITEM
804.3	296	3 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC -(UL)
811.31	3	PULL BOX 12" X 12"
815.1	1	SERVICE CONNECTION (OVERHEAD)
	1	8' SIGNAL POST & BASE STANDARD - INCL FOUNDATION
	4	10' SIGNAL POST & BASE STANDARD - INCL FOUNDATION
	9	SIGNAL HEAD 1 WAY - 3 SECTION 12" LED LENS
	1	SIGNAL HEAD 1 WAY - 4 SECTION 12" LED LENS
	4	16" LED PEDESTRIAN SIGNAL HEAD
	4	ACCESSIBLE PEDESTRIAN SIGNAL, SIGN, AND SADDLE
	1	TRAFFIC SIGNAL CONTROLLER - 80 TS2 TYP 1 CONTROLLER IN A TYPE 5 BASE MOUNTED CABINET INCLUDING FOUNDATION AND CONCRETE PAD
	1	360° VIDEO DETECTION CAMERA, VDP, AND CABLES
	1	VIDEO IMAGE PROCESSOR
	1	VIDEO DETECTION RACK
	3	SINGLE CHANNEL PREEMPTION DETECTOR & CABLE
	1	4 CHANNEL OPTICAL SIGNAL PROCESSOR
	1	PRE-EMPTION CARD RACK AND HARNESS
1	PRE-EMPTION CONFIRMATION STROBE	
1	GPS CLOCK	
1	PLUS ALL WIRE, CABLE, MOUNTING HARDWARE, EQUIPMENT & MATERIALS NECESSARY TO COMPLETE THE INSTALLATION	
1	SYSTEM MASTER CONTROLLER	
817.8	1	45' MAST ARM & FOUNDATION - ORNAMENTAL



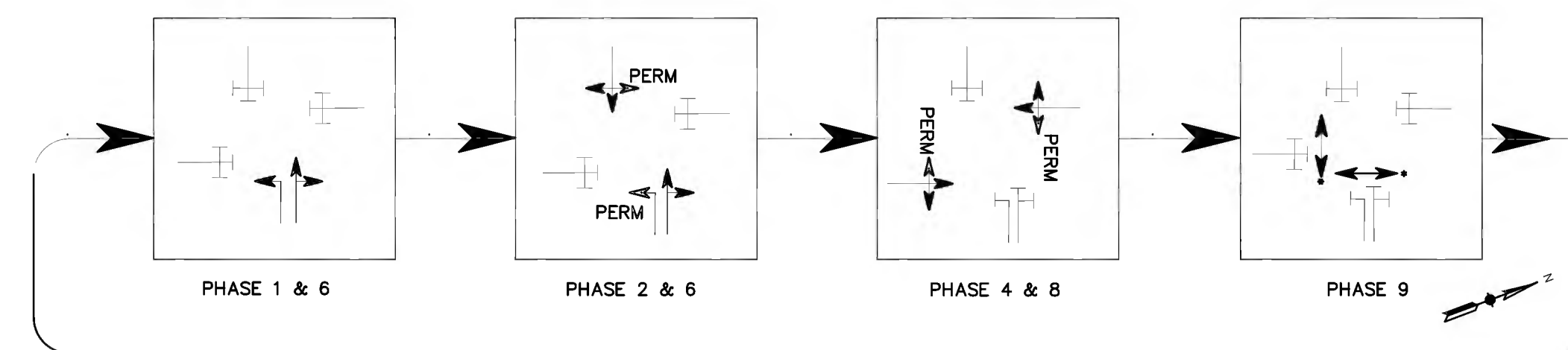
## SIGNAL SEQUENCING & TIMING FOR FULLY ACTUATED CONTROL

	DIRECTION	HOUSING	Ø/OL	PHASE 1			PHASE 2			PHASE 4			PHASE 6			PHASE 8			PHASE 9			FLASHING OPERATION PER MUTCD SEC. 4D-12
				PREEMPTION II			PREEMPTION I			PREEMPTION II			PREEMPTION III									
				1	2	3	4	5	6	7	8	9	16	17	18	19	20	21	22	23	25	
MIN GREEN				5			5			5			5			5						
PASSAGE TIME				2			2			2			2			2						
MAX I				4.5			79.5			28.5			89.5			28.5						
MAX II				9.5			72.5			30.5			87.5			30.5						
YEL CLEAR				3.5			3.5			3.5			3.5			3.5						
RED CLEAR					2.0			2.0			2.0			2.0			2.0				3	
WALK																				7		
PED CLEAR																					11	
HUDSON RD	WB L	A	1,6	←G	←Y	←R	←R	←R	←R	←R	←R	←R	←FY	←Y	←R	←R	←R	←R	←R	←R	←R	←FR
HUDSON RD	EB	D,E	2	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
TI-SALES DR	SB	G,H	4	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	FR
HUDSON RD	WB	B,J,K	6	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	FY
PEAKHAM RD	NB	C,F	8	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	FR
PEDESTRIAN	N,S,E,W	P1-P4	9	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	OUT
DETECTORS				NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			-			
RECALL				OFF			SOFT			OFF			SOFT			OFF			OFF			
DUAL ENTRY				OFF			OFF			ON			OFF			ON			-			
MAX I: MON-FRI 5AM-10AM MAX II: ALL OTHER TIMES																						

\* UPON PEDESTRIAN PUSH BUTTON ACTIVATION

### SIGNAL TIMING AND COORDINATION NOTES

- IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
- THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
- IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
- IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.



**PREFERENTIAL PHASE SEQUENCE**

#### NOTES:

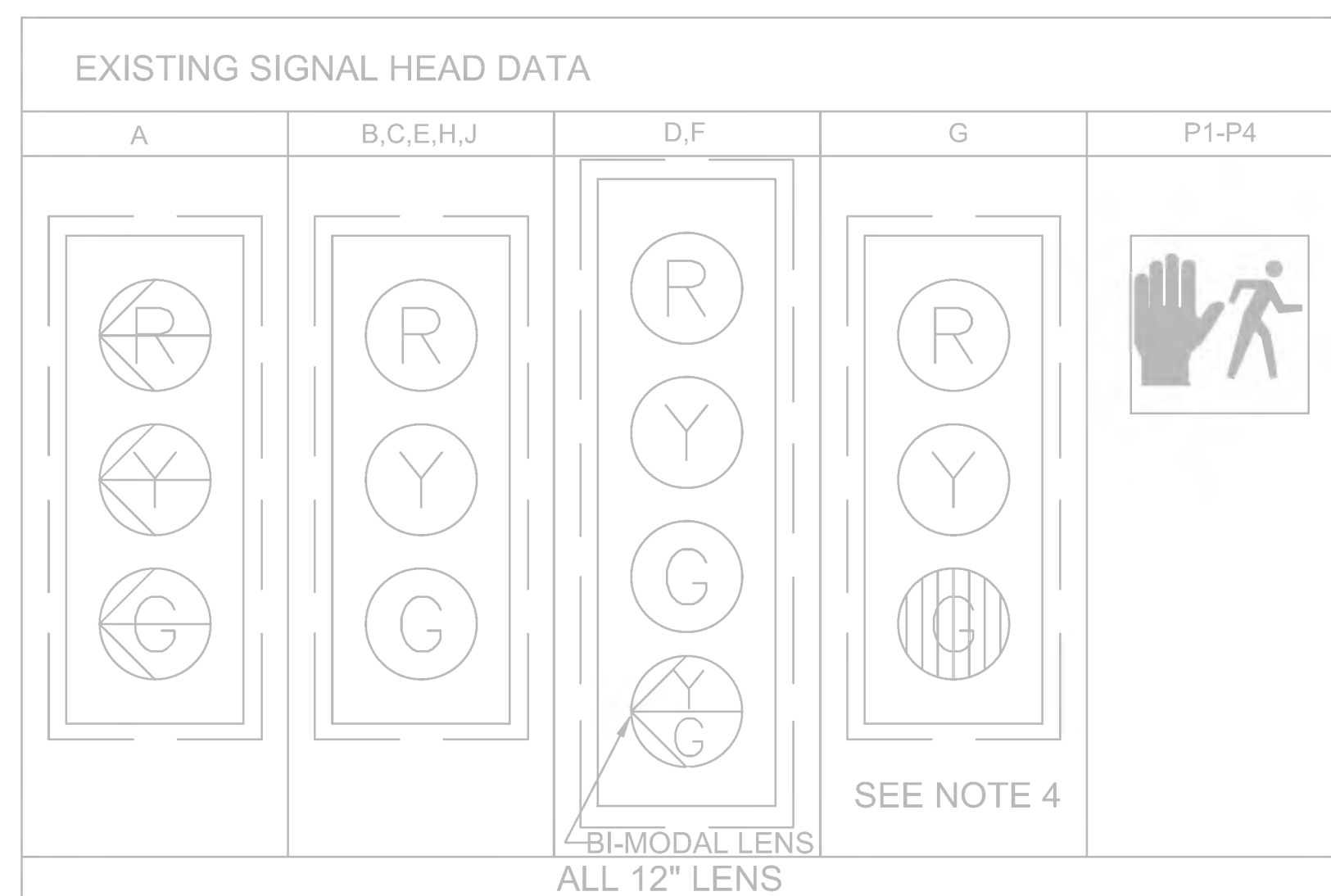
- AUTOMATIC FLASHING OPERATION PER 2009 M.U.T.C.D. OR AS AMENDED.
- PERM=PERMISSIVE
- ACTUATED SIGNAL OPERATION FOR 24 HOURS PER DAY, FLASHING OPERATION FOR EMERGENCY ONLY.

### PRE-EMPTION SIGNAL SEQUENCE

	DIRECTION	HOUSING	PREEMPTION I			PREEMPTION II			PREEMPTION III		
			1	2	3	4	5	6	7	8	9
HUDSON RD	WB L	A	←R	←R	←R	←G	←Y	←R	←R	←R	←R
HUDSON RD	EB	D,E	G	Y	R	R	R	R	R	R	R
TI-SALES DR	SB	G,H	R	R	R	R	R	R	R	R	R
HUDSON DR	WB	A,B,J,K	R	R	R	G	Y	R	R	R	R
PEAKHAM RD	NB	C,F	R	R	R	R	R	R	G	Y	R

### EMERGENCY VEHICLE PRE-EMPTION PHASING AND PRIORITY NOTES:

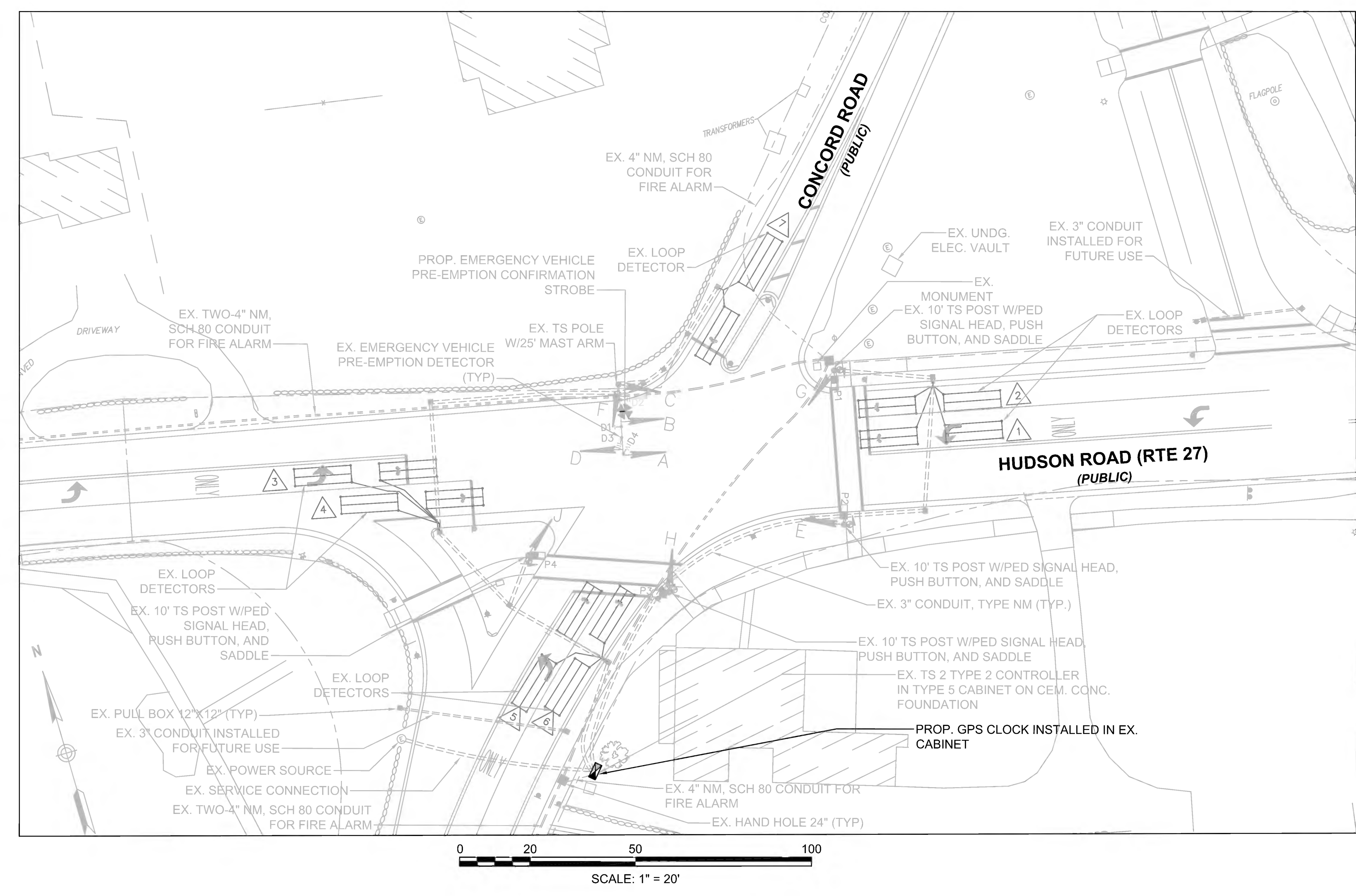
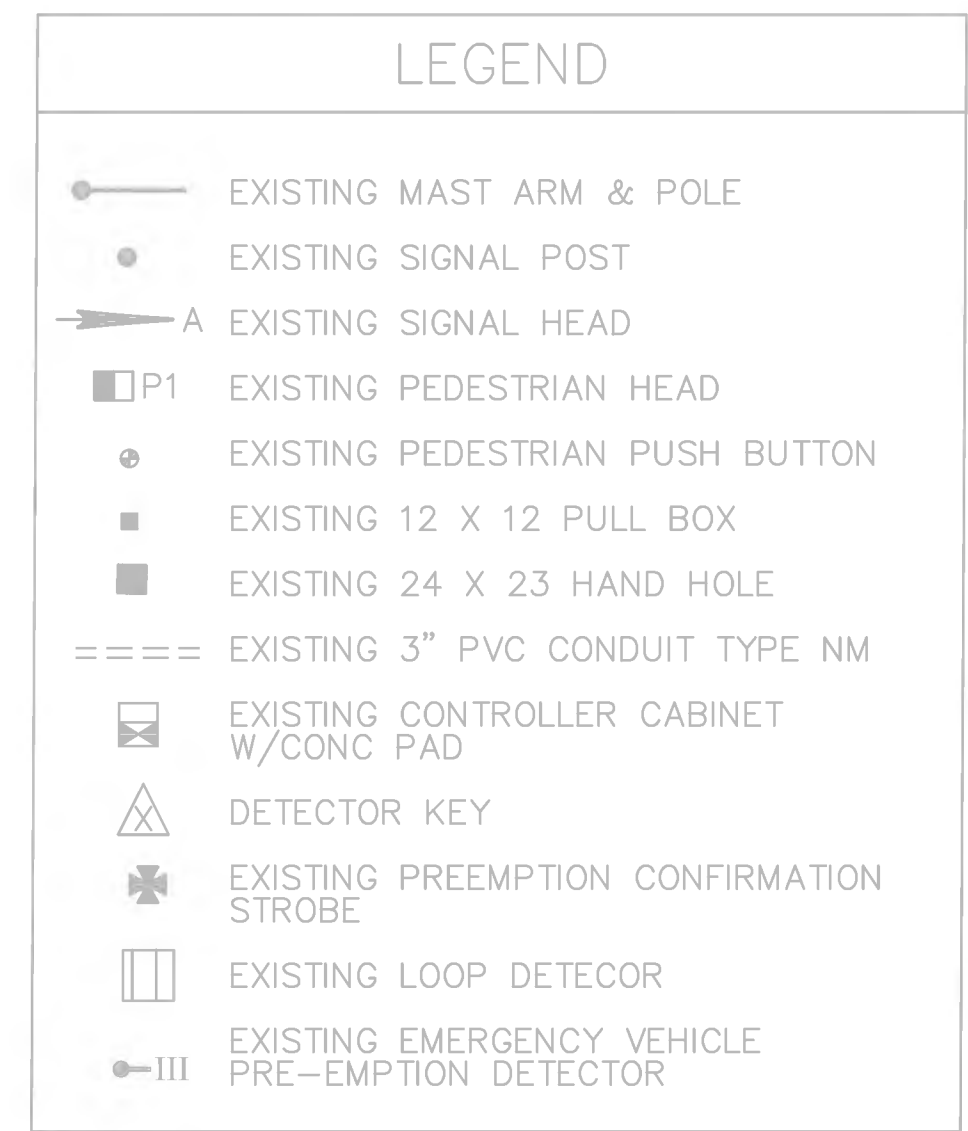
- EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
- IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY PREEMPTION OPTICAL DETECTOR 1 (OR 2, 3) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND THEN HOLD IN PRE-EMPTION PHASE I (OR II, III) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL THE PRE-EMPTION SIGNAL CEASES.
- THE CONTROLLER SHALL THEN PROVIDE PRE-EMPTION PHASE CLEARANCE (4 SECONDS: YELLOW AND 2 SECOND: ALL RED) AND THEN SERVICE AN ADDITIONAL EMERGENCY VEHICLE PRE-EMPTION PHASE IF NECESSARY FOLLOWED BY A PRE-EMPTION CLEARANCE.
- RESUME NORMAL SIGNAL OPERATION.
- MINIMUM GREEN AND NORMAL VEHICLE OR PEDESTRIAN CLEARANCE TIME, SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
- PREEMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE-EMPTION GREEN IS ON.
- THERE IS NO PREEMPTION ON THE TI-SALES DRIVEWAY APPROACH TO THE INTERSECTION



**EXISTING LOOP DETECTOR DATA**

DETECTOR NO.	NO. SECTION/ SIZE	NO. OF TURNS	OPERATIONS	DELAY/ EXIT	CALL PHASE	LOOP CONNECTION
1	2-6'X20' QUADRUPOLE	2-4-2	PRESCENCE	2 SEC DELAY	Ø1	SERIES
2	2-6'X20' QUADRUPOLE	2-4-2	PRESCENCE	0	Ø6	SERIES
3	2-6'X20' QUADRUPOLE	2-4-2	PRESCENCE	2 SEC DELAY	Ø5 (SEE NOTE 2)	SERIES
4	2-6'X20' QUADRUPOLE	2-4-2	PRESCENCE	0	Ø2	SERIES
5	2-6'X20' QUADRUPOLE	2-4-2	PRESCENCE	2 SEC DELAY	Ø3 (SEE NOTE 3)	SERIES
6	2-6'X20' QUADRUPOLE	2-4-2	PRESCENCE	0	Ø8	SERIES
7	2-6'X20' QUADRUPOLE	2-4-2	PRESCENCE	0	Ø4	SERIES

NOTES:  
1. DELAY AND EXTENSION TIMINGS SHALL BE PROGRAMMED IN THE CONTROLLER ONLY  
2. LOOP GROUP 3 SHALL CALL/EXTEND Ø2, THEN SWITCH TO CALL/EXTEND Ø5.  
3. LOOP GROUP 5 SHALL CALL/EXTEND Ø3, THEN SWITCH TO CALL/EXTEND Ø8.



**MAJOR ITEMS REQUIRED**

PAY ITEM	QUANTITY	ITEM
816.2	1	GPS CLOCK PLUS ALL WIRE, CABLE, MOUNTING HARDWARE, EQUIPMENT & MATERIALS NECESSARY TO COMPLETE THE INSTALLATION



SEQUENCE AND TIMING FOR FULLY ACTUATED CONTROL

SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	165	319
PROJECT FILE NO.		608164	

TRAFFIC SIGNAL PLANS  
HUDSON RD & CONCORD RD  
LOCATION NO. 2

APPROACH	DIRECTION	HOUSING	PHASE 1			PHASE 2			PHASE 3			PHASE 4			PHASE 5			PHASE 6			PHASE 8			PHASE 9			FLASHING OPERATION PER MUTCD SEC. 4D-12
			PREEMPTION II			PREEMPTION I			PREEMPTION III			PREEMPTION IIII			PREEMPTION I			PREEMPTION II			PREEMPTION III						
OLD SUDBURY RD (RTE 27)	WB	A	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FLASH
OLD SUDBURY RD (RTE 27)	WB	B,C	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
HUDSON ROAD (RTE 27)	EB	D	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
HUDSON ROAD (RTE 27)	EB	E	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
CONCORD ROAD	NB	F	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
CONCORD ROAD	NB	G	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
CONCORD ROAD	SB	H,J	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
PEDESTRIAN X-ING	NB-SB	P1-P2	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OUT
PEDESTRIAN X-ING	EB-WB	P3-P4	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OUT
TIMING IN SECONDS																											
MINIMUM GREEN (INITIAL)			5			10			5			5			5			10			5						
PASSAGE TIME (VEHICLE)			2			4.5			2			2.5			2			3.5			2						
MAXIMUM 1			5			68			10			28			11			62			43						
MAXIMUM 2			11			58			9			33			8			61			47						
YELLOW CLEARANCE				3			4			3			4			3			4			4					
RED CLEARANCE					2			2			2			1			2			2			1			3	
PEDESTRIAN WALK																									7		
PEDESTRIAN CLEARANCE																									8		
DETECTOR MEMORY			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			-						
RECALL			OFF			SOFT			OFF			OFF			SOFT			OFF			-						
DUAL ENTRY			OFF			OFF			OFF			ON			OFF			OFF			ON						
MAX I: MON-FRI 5AM-10AM MAX II: ALL OTHER TIMES			ø1	ø2	ø3	ø4	ø5	ø6	ø8	ø9																	

NOTES:

- NEW TIMINGS ARE SHOWN IN BLACK. TABLE CONTENTS IN GREY ARE UNCHANGED FROM EXISTING. AUTOMATIC FLASHING OPERATION PER 2009 M.U.T.C.D. or AS AMENDED
- \*UPON PEDESTRIAN PUSH BUTTON ACTIVATION
- PERM=PERMISSIVE
- ACTUATED FOR 24 HOURS PER DAY, FLASHING OPERATION FOR EMERGENCY ONLY.

PRE-EMPTION SIGNAL SEQUENCE

APPROACH	DIRECTION	HOUSING	PREEMPTION I			PREEMPTION II			PREEMPTION III			PREEMPTION IIII	
			ø2&ø5			ø1&ø6			ø3&ø8			ø4	
OLD SUDBURY RD (RTE 27)	WB	A	R	R	R	G	Y	R	R	R	R	R	R
OLD SUDBURY RD (RTE 27)	WB	B,C	R	R	R	R	R	R	R	R	R	R	R
HUDSON RD (RTE 27)	EB	D	R	R	R	G	Y	R	R	R	R	R	R
HUDSON RD (RTE 27)	EB	E	R	R	R	G	Y	R	R	R	R	R	R
CONCORD RD	NB	F	R	R	R	R	R	R	R	R	R	R	R
CONCORD RD	NB	G	R	R	R	R	R	R	R	R	R	R	R
CONCORD RD	SB	H,J	R	R	R	R	R	R	R	R	R	R	R

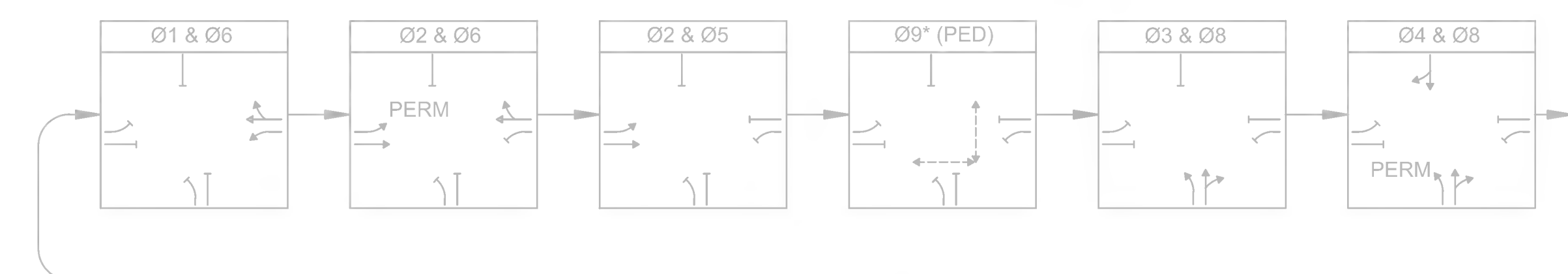
EMERGENCY VEHICLE PRE-EMPTION OPERATION:

- EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT THIS INTERSECTION.
- PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH DETECTORS D1, D2, D3, OR D4 ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (D1 HIGHEST AND D4 LOWEST)
- IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2, D3, D4) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE-EMPTION PHASE #1 (OR #2,#3,#4) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE-EMPTION PHASE CLEARANCES FOR THE ASSOCIATED PHASE(S) AS SHOWN IN THE SEQUENCE AND TIMING CHART AND SERVICE SUBSEQUENT EMERGENCY VEHICLE PRE-EMPTION PHASES AS NECESSARY.
- MINIMUM GREEN AND NORMAL VEHICLE CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
- PRE-EMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE-EMPTION GREEN IS ON.

SEQUENCE & TIMING NOTES:

- IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE. THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
- THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
- IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
- IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

PREFERENTIAL PHASE SEQUENCE



\* UPON PEDESTRIAN PUSH BUTTON ACTUATION

**HUDSON RD (RTE 27) AT  
PEAKHAM RD**

	PLAN 1 (SEC.)	PLAN 2 (SEC.)
Ø1&Ø6	10	16
Ø2&Ø6	85	77
Ø4&Ø8	34	36
Ø9**	21	21
CYCLE LENGTH	150	150
OFFSET*	0	0

**HUDSON RD (RTE 27) AT  
CONCORD RD**

	PLAN 1 (SEC.)	PLAN 2 (SEC.)
Ø1&Ø6	10	13
Ø2&Ø6	58	39
Ø2&Ø5	16	23
Ø9**	18	21
Ø3&Ø8	15	23
Ø4&Ø8	33	31
CYCLE LENGTH	150	150
OFFSET*	20	14

**NOTES:**

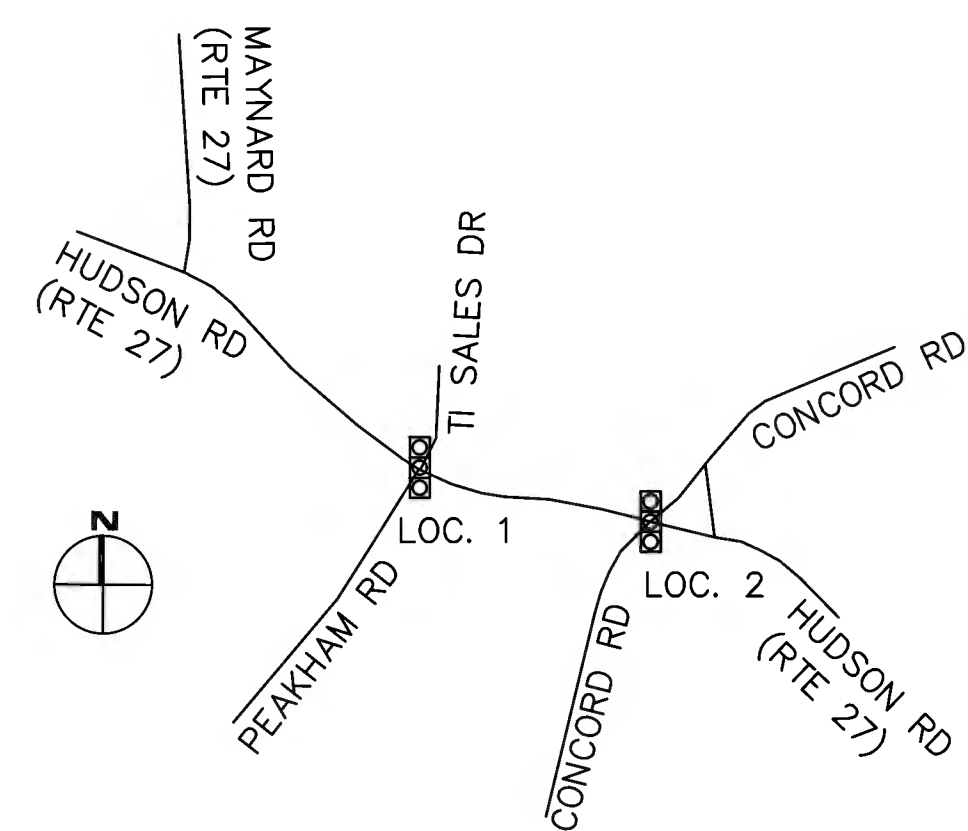
\*OFFSET REFERENCED TO Ø2+Ø6 START OF GREEN

\*\* PUSH-BUTTON ACTIVATED EXCLUSIVE PED PHASE IS NOT INCLUDED IN COORDINATION PLAN. CONTROLLER SHALL RE-COORDINATE TIMINGS AFTER EXCLUSIVE PED PHASE IS SERVED.

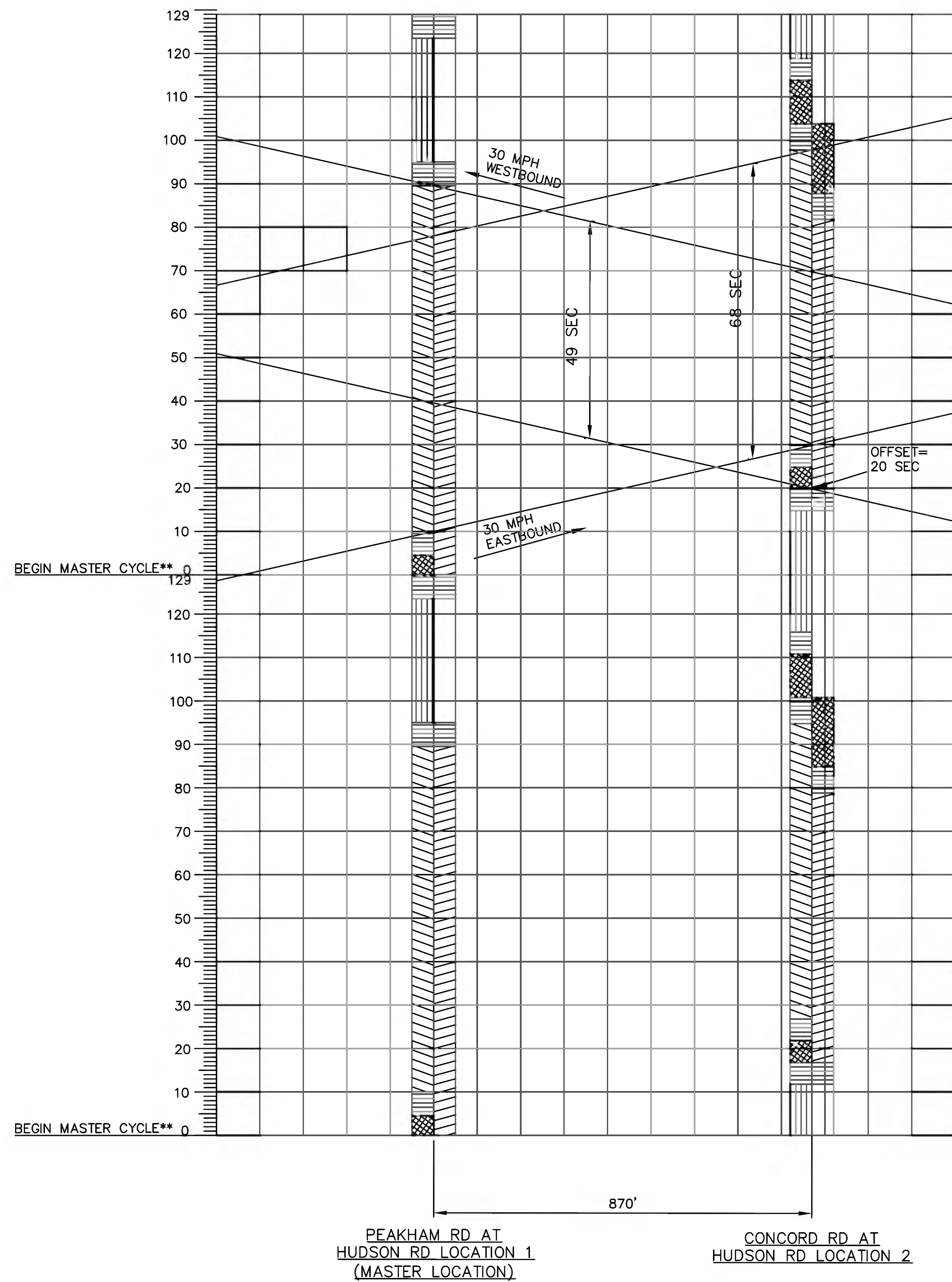
HUDSON RD AT PEAKHAM RD IS THE SYSTEM MASTER CONTROLLER LOCATION

**DAILY PROGRAMMING  
COORDINATION DATA**

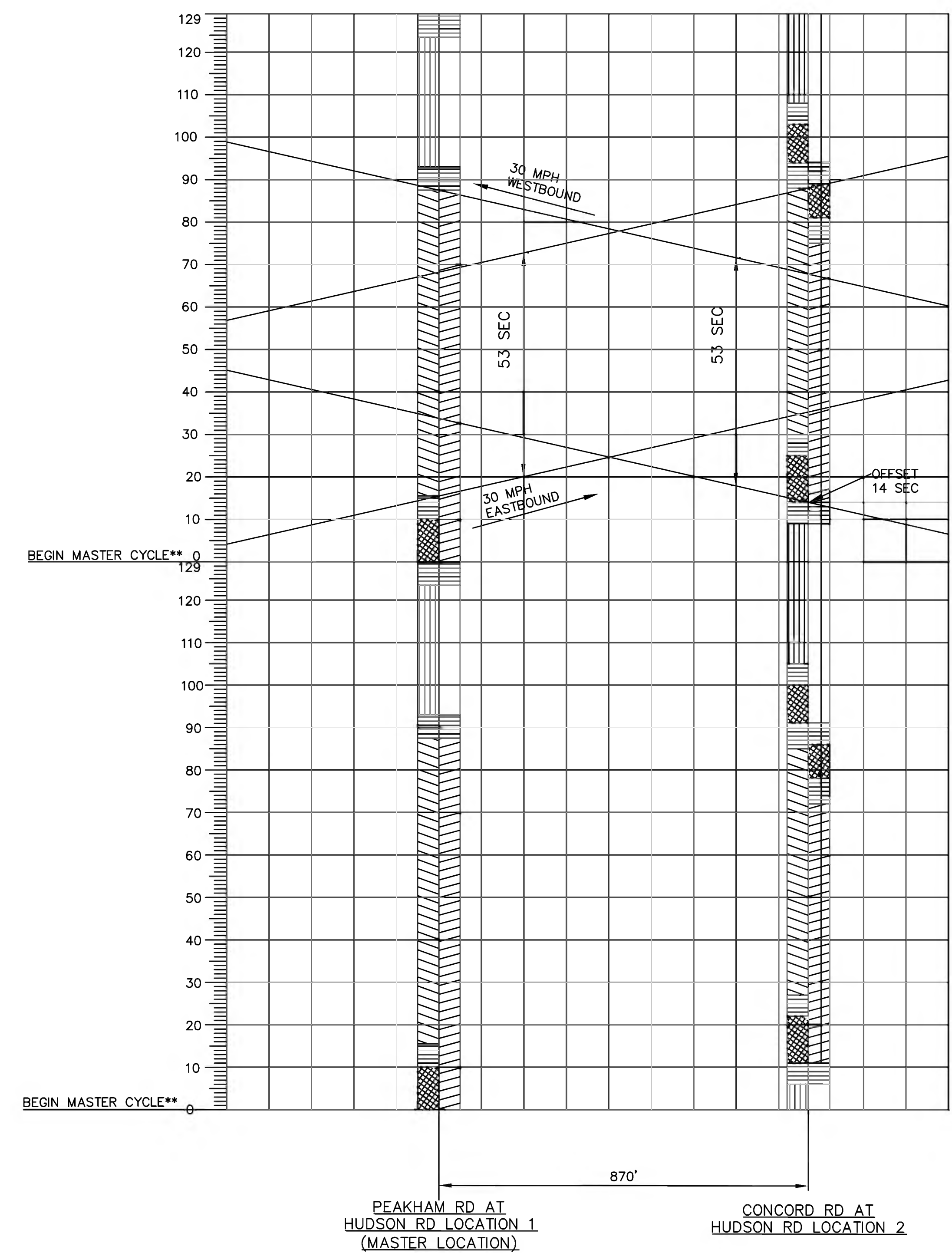
OPERATION MODE	MON. - FRI.	SATURDAY	SUNDAY
PLAN 1	05:00-10:00		
PLAN 2	00:00-4:59 10:01-23:59	00:00-23:59	00:00-23:59



TIMING PLAN #1



TIMING PLAN #2



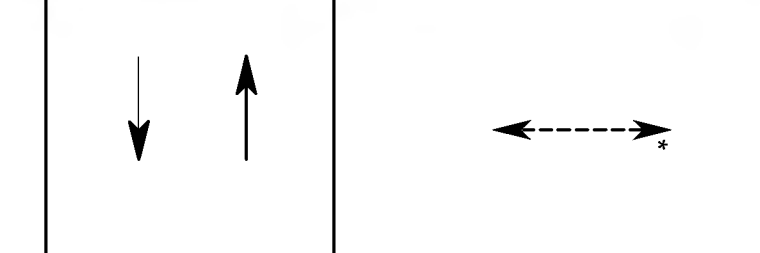
**LEGEND**

- YELLOW AND RED CLEARANCE INTERVAL
- EASTBOUND GREEN TIME (Ø2)
- WESTBOUND GREEN TIME (Ø6)
- LEFT TURN PHASE GREEN TIME (Ø1, Ø3 or Ø5)
- SOUTH GREEN TIME (Ø4)
- NORTH GREEN TIME (Ø8)
- 100' X 10 SEC.
- BANDWIDTH SLOPE = 25 MPH OR 36.7 FT/SEC

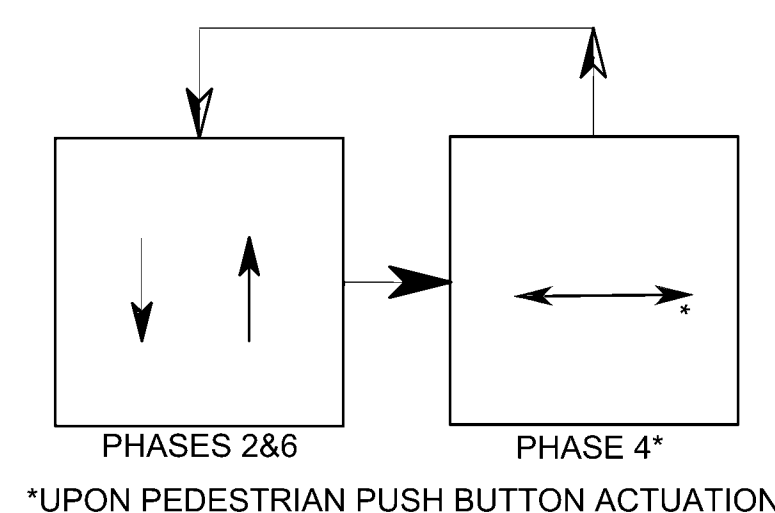


SEQUENCE AND TIMING										
	DIRECTION	HOUSING	Ø/OL	PHASES 2&6			PHASE 4*			FLASH
				1	2	3	4	5		
MIN INTERVAL				15						
MAXIMUM I				N/A						
MAXIMUM II				N/A						
FLASHING YELLOW						4				
STEADY YELLOW						3				
ALL RED							1.5			
STEADY RED/ PEDESTRIAN WALK								7		
FLASHING RED/ PEDESTRIAN CLEAR									12	
NORTH ROAD EB	C.D	2	DARK	FY	Y	R	R	FR	FY	
NORTH ROAD WB	A.B	6	DARK	FY	Y	R	R	FR	FY	
PEDESTRIAN N&S	P1-P2	4	DW	DW	DW	DW	W	FDW	OUT	
RECALL				NONE			NONE			

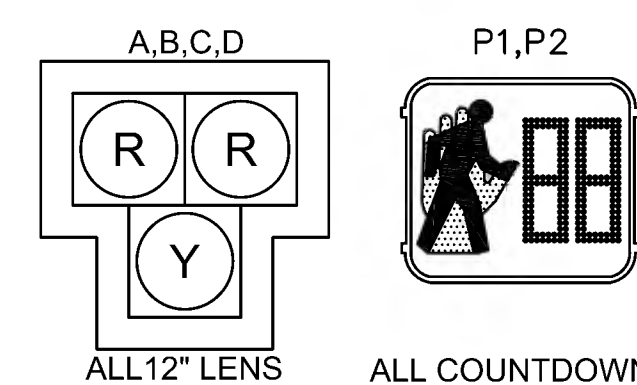
- NOTES:
1. AUTOMATIC FLASHING OPERATION PER MUTCD SECTION 4D.12
  2. \* UPON PEDESTRIAN PUSH BUTTON ACTUATION
  3. FR=ALTERNATING FLASHING RED
  4. STOP AND GO OPERATION FOR 24 HOURS PER DAY. FLASHING OPERATION FOR EMERGENCY ONLY



**PREFERENTIAL PHASE SEQUENCE**



\*UPON PEDESTRIAN PUSH BUTTON ACTUATION

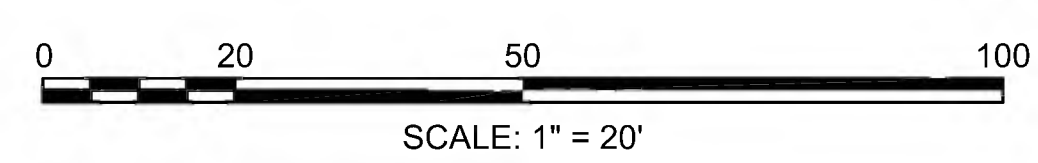
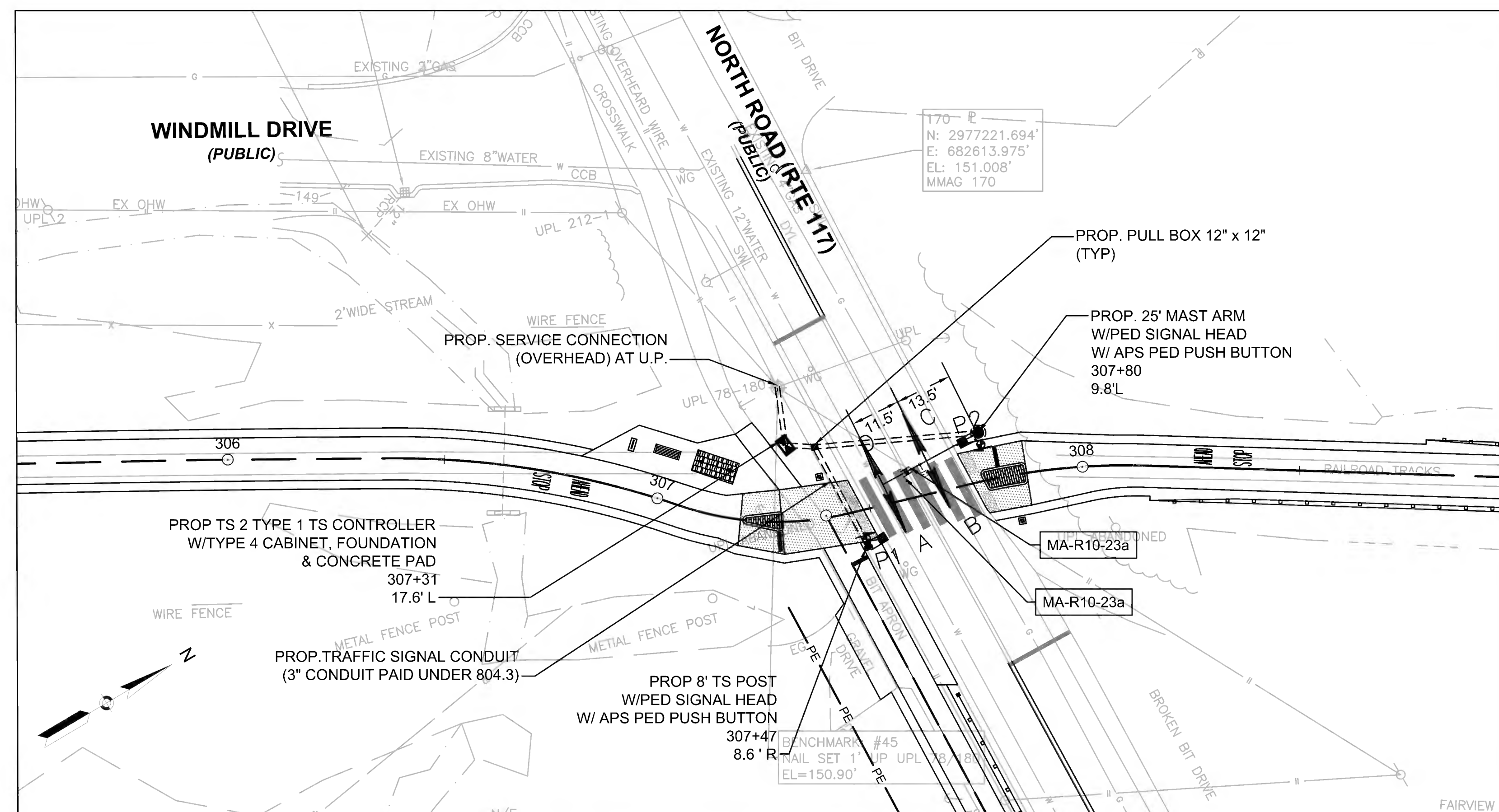


ALL COUNTDOWN PEDESTRIAN SIGNAL DISPLAYS SHALL BE EQUIPPED W/L.E.D. MODULES (16 INCH DISPLAY).

**PROPOSED SIGNAL INDICATIONS**

ALL SIGNAL HEADS SHALL BE RIGID MOUNTED & EQUIPPED WITH ±5" NON-LOUVERED BACKPLATES WITH 3" YELLOW RETROREFLECTIVE TAPE BORDERS.  
 \*\*\*\*ALL PROPOSED SIGNAL POSTS, BASES, BACKPLATES, SIGNAL HOUSINGS, AND BRACKETS SHALL BE FACTORY BLACK\*\*\*\*

LEGEND	
	PROPOSED MAST ARM & POLE
	PROPOSED SIGNAL POST
	PROPOSED SIGNAL HEAD
	PROPOSED PEDESTRIAN HEAD
	PROPOSED PEDESTRIAN PUSH BUTTON
	PROPOSED 12 X 12 PULL BOX
	PROPOSED 13 X 24 HAND HOLE
	PROPOSED 3" PVC CONDUIT TYPE NM
	PROPOSED CONTROLLER CABINET W/CONC PAD
	DETECTOR KEY
	PROPOSED 360° VIDEO CAMERA DETECTION
	PROPOSED PREEMPTION CONFIRMATION STROBE
	VIDEO DETECTION ZONE
	PROP. EMERGENCY VEHICLE PRE-EMPTION DETECTOR



- CONSTRUCTION NOTES**
1. THE TOP OF ALL MAST ARM FOUNDATIONS IN SIDEWALK AREAS SHALL BE LOCATED FLUSH WITH FINISH GRADE.
  2. THE TOP OF ALL MAST ARM FOUNDATIONS IN GRASSY AREAS SHALL BE LOCATED 3"± ABOVE FINISHED GRADE.
  3. TS POST/POLE, WITH PEDESTRIAN PUSH BUTTON, NOT LOCATED WITHIN A PAVED SURFACE SHALL BE POSITIONED SO AS TO PROVIDE A 10" MAX CLEAR REACH ZONE BETWEEN THE PEDESTRIAN PUSH BUTTON AND THE PAVED SURFACE PER 521 CMR AND AS SHOWN IN THE CONSTRUCTION DETAILS.

**ACCESSIBLE PEDESTRIAN SIGNALS (APS):**

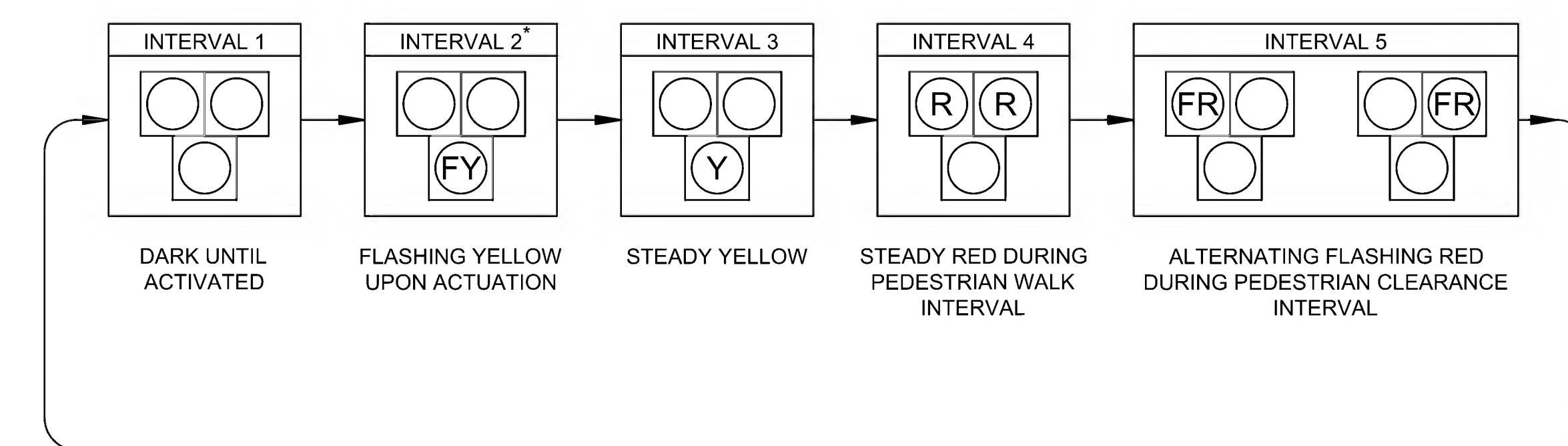
ALL PROPOSED ACCESSIBLE PEDESTRIAN SIGNALS MUST FULLY COMPLY WITH THE UNITED STATES ACCESS BOARD PROWAG SUPPLEMENTAL TECHNICAL REQUIREMENTS UNDER CHAPTER 4. THIS INCLUDES OPERABLE PARTS (R403), CLEAR SPACES (R404), AND REACH RANGES (R406) AS RELATES TO ACCESSIBLE PEDESTRIAN SIGNALS AND PEDESTRIAN PUSH BUTTONS.

**ACCESSIBLE PEDESTRIAN SIGNALS (APS) SPEECH MESSAGE NOTE:**

ALL PUSH BUTTONS AT THIS INTERSECTION SHALL BE PROGRAMMED WITH THE APPROPRIATE SPEECH MESSAGE FOR WALK INDICATING THE STREET CROSSING.

MAJOR ITEMS REQUIRED			
PAY ITEM	QUANTITY	ITEM	
804.3	91	3 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC -(UL)	
811.31	1	PULL BOX 12" X 12"	
815.3	1	SERVICE CONNECTION	
	1	25' MAST ARM - STEEL, INCL BASE & FOUNDATION	
	4	SIGNAL HEAD 1 WAY - 3 SECTION 12" LED LENS	
	2	16" LED PEDESTRIAN SIGNAL HEAD	
	2	ACCESSIBLE PEDESTRIAN SIGNAL WITH SIGN AND SADDLE	
	1	TRAFFIC SIGNAL CONTROLLER - TS2 TYPE 1, INCLUDING BASE MOUNTED CABINET NEMA TYPE 5 W CONCRETE PAD	
	2	ACCESSIBLE PEDESTRIAN SIGNAL WITH SIGN AND SADDLE	
	1	8" SIGNAL POST & BASE STANDARD - INCL FOUNDATION	
			PLUS ALL WIRE, CABLE, MOUNTING HARDWARE, EQUIPMENT & MATERIALS NECESSARY TO COMPLETE THE INSTALLATION

**HAWK (PEDESTRIAN) PHASE SEQUENCE**



- \* UPON PEDESTRIAN PUSH BUTTON ACTUATION  
 R = STEADY RED  
 FR = FLASHING RED  
 Y = STEADY YELLOW  
 FY = FLASHING YELLOW





**CONVENTIONAL ROADWAY**— A STREET OR HIGHWAY OTHER THAN A LOW-VOLUME ROAD, EXPRESSWAY, OR FREEWAY.

**EXPRESSWAY**— A DIVIDED HIGHWAY WITH PARTIAL CONTROL OF ACCESS.

**FREEWAY**— A DIVIDED HIGHWAY WITH FULL CONTROL OF ACCESS.

**LOW-VOLUME ROAD**— A FACILITY LYING OUTSIDE OF BUILT-UP AREAS OF CITIES, TOWNS, AND COMMUNITIES, AND IT SHALL HAVE A TRAFFIC VOLUME OF LESS THAN 400 ADIT. IT SHALL NOT BE A FREEWAY, EXPRESSWAY, INTERCHANGE RAMP, FREEWAY SERVICE ROAD OR A ROAD ON A DESIGNATED STATE HIGHWAY SYSTEM.

Source: MUTCD LATEST EDITION

**TAPER LENGTH CRITERIA FOR TEMPORARY TRAFFIC CONTROL ZONES**

TYPE OF TAPER	TAPER LENGTH (L)*
MERGING TAPER	AT LEAST L
SHIFTING TAPER	AT LEAST 0.5L
SHOULDER TAPER	AT LEAST 0.33L
ONE-LANE, TWO-WAY TRAFFIC TAPER	50 FT MIN.(15 m) 100 FT MAX.(30 m) MAX.
DOWNSTREAM TAPER	50 FT MIN.(15 m) 100 FT MAX.(30 m) PER LANE

Source: Table 6C-3 MUTCD LATEST EDITION

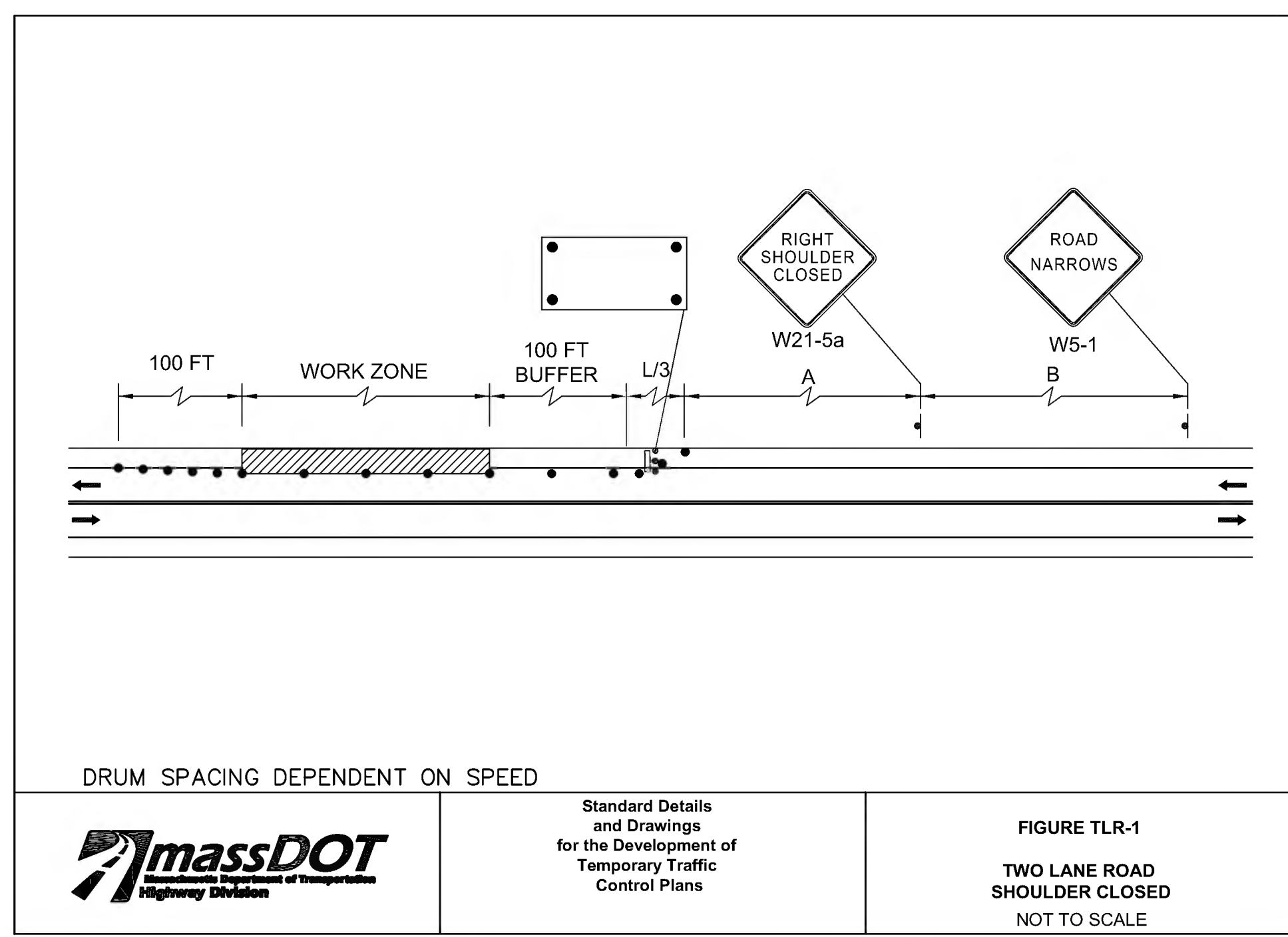
**FORMULAS FOR DETERMINING TAPER LENGTHS**

SPEED LIMIT (S)	TAPER LENGTH (L) FEET	SPEED LIMIT (S)	TAPER LENGTH (L) Meters
40 MPH OR LESS	$L = \frac{WS^2}{60}$	60 KM/H OR LESS	$L = \frac{WS^2}{155}$
45 MPH OR MORE	$L = WS$	70 KM/H OR MORE	$L = \frac{WS}{1.6}$

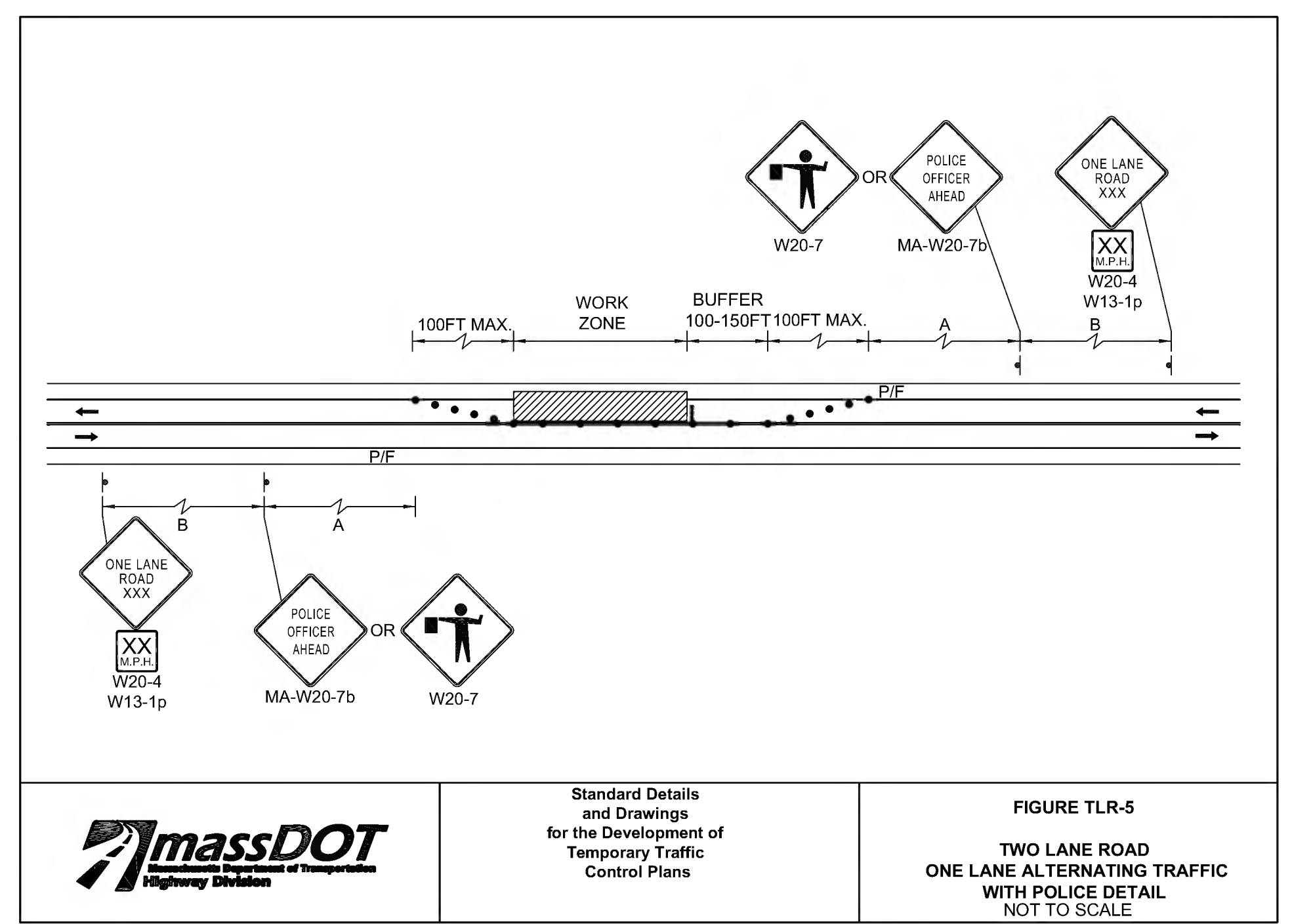
WHERE: L = TAPER LENGTH IN FEET (METERS)  
W = WIDTH OF OFFSET IN FEET (METERS)  
S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH (KM/H)

Source: Table 6C-4 MUTCD LATEST EDITION

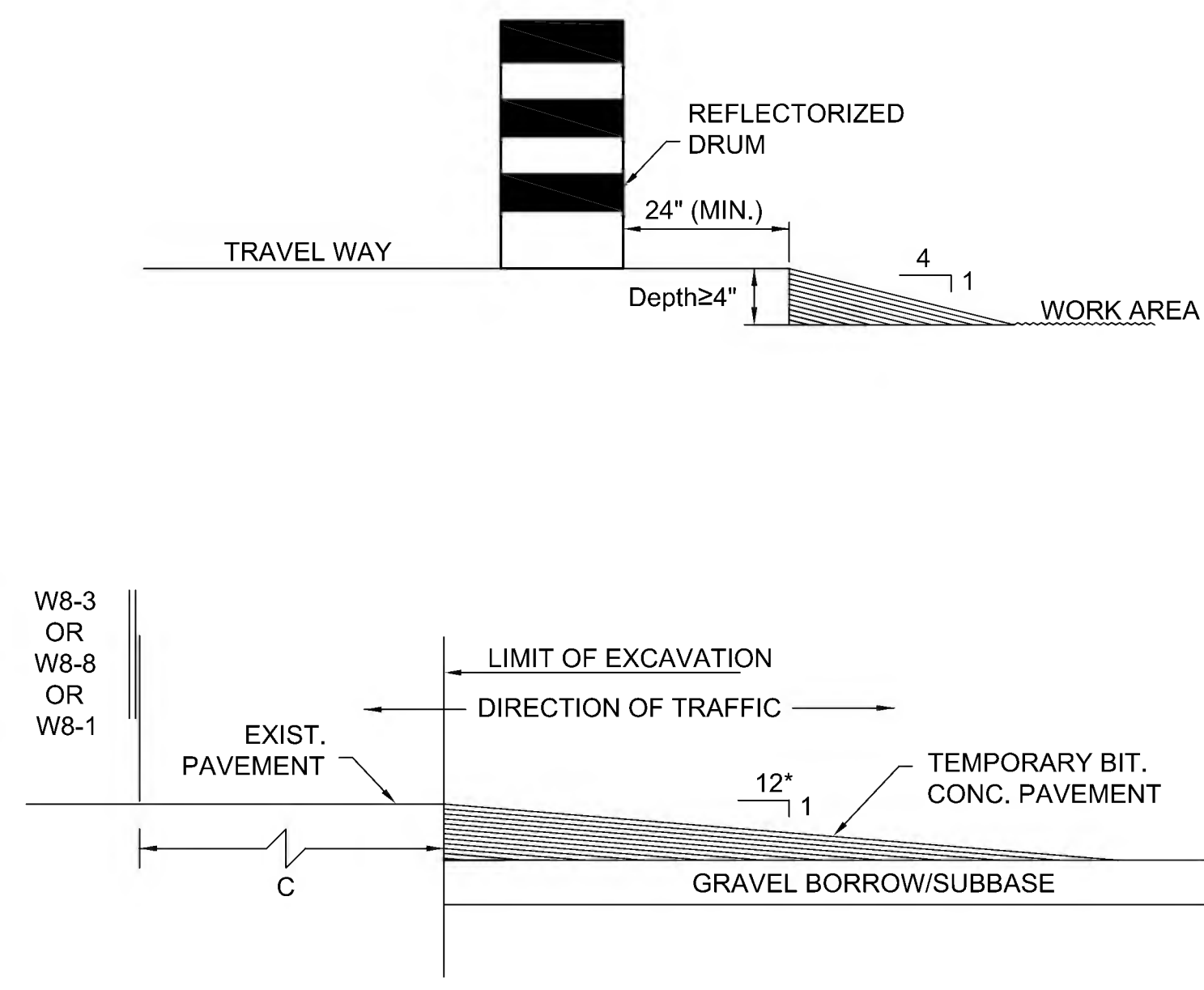
	Notes for Temporary Traffic Control Plans	FIGURE Gen-3 NOTES ON WORK ZONE DISTANCES
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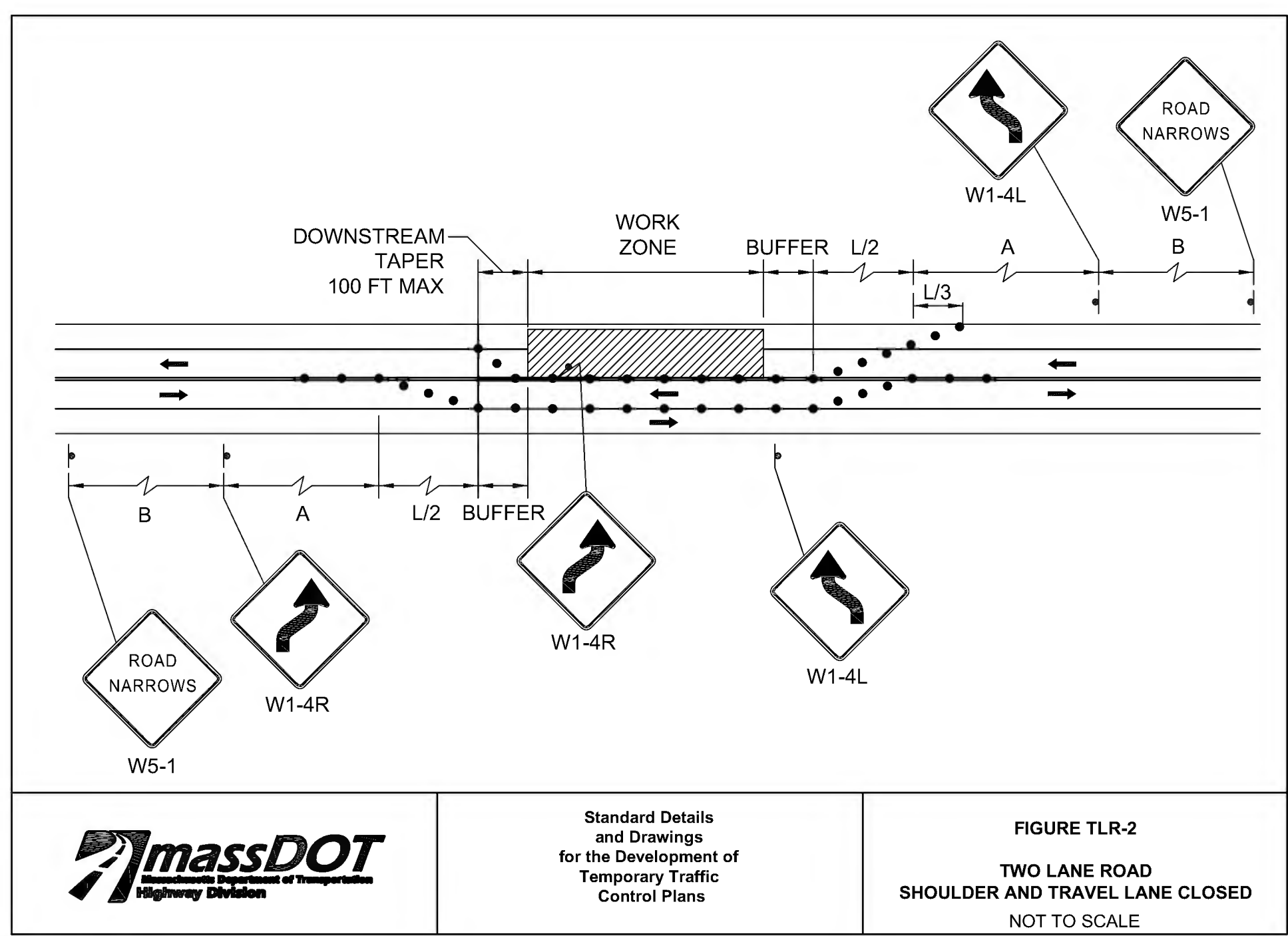
	Standard Details and Drawings for the Development of Temporary Traffic Control Plans	FIGURE TLR-1 TWO LANE ROAD SHOULDER CLOSED NOT TO SCALE
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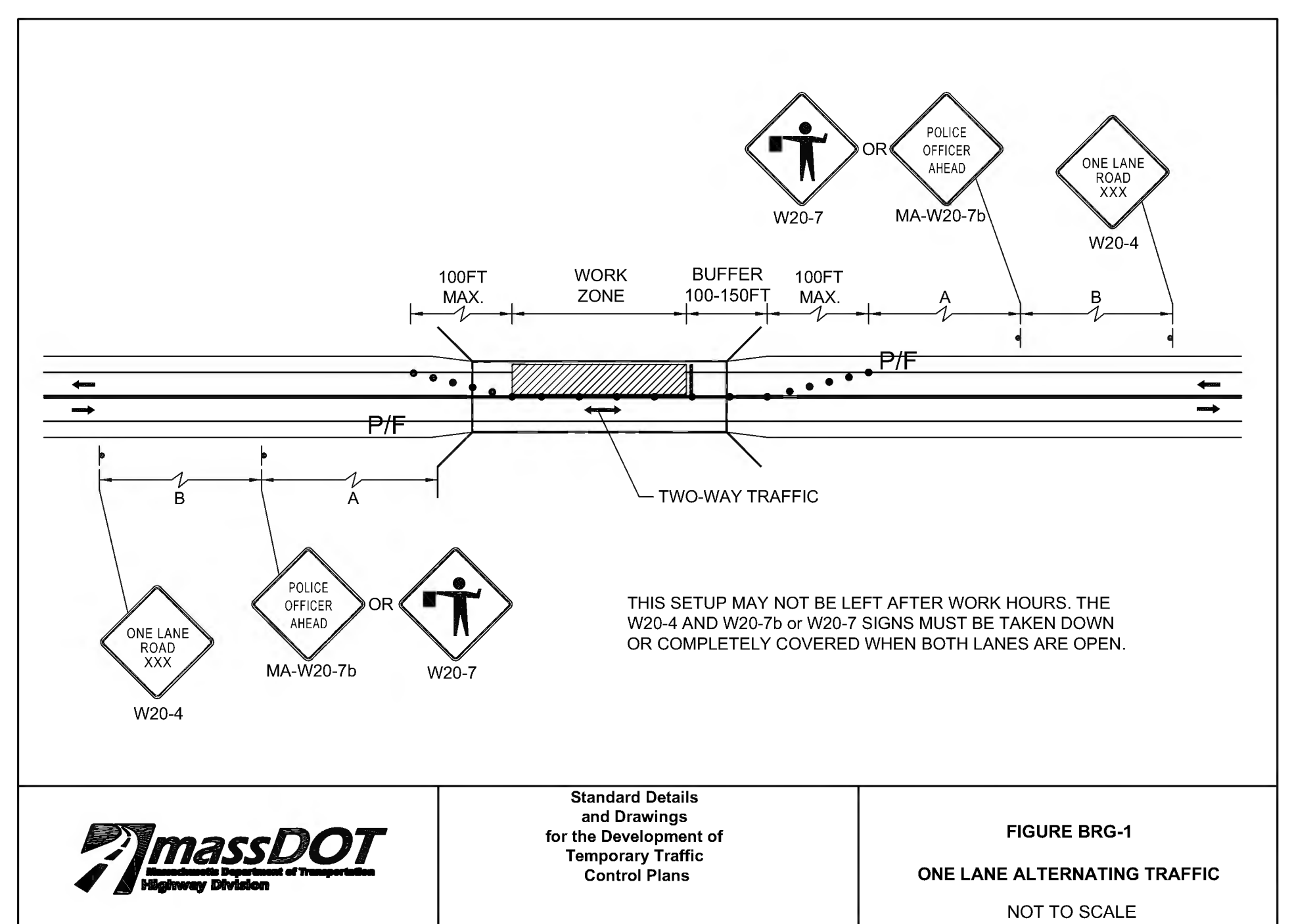
	Standard Details and Drawings for the Development of Temporary Traffic Control Plans	FIGURE TLR-5 TWO LANE ROAD ONE LANE ALTERNATING TRAFFIC WITH POLICE DETAIL NOT TO SCALE
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\* - INCREASE SLOPE RATIO FOR HIGHER SPEEDS

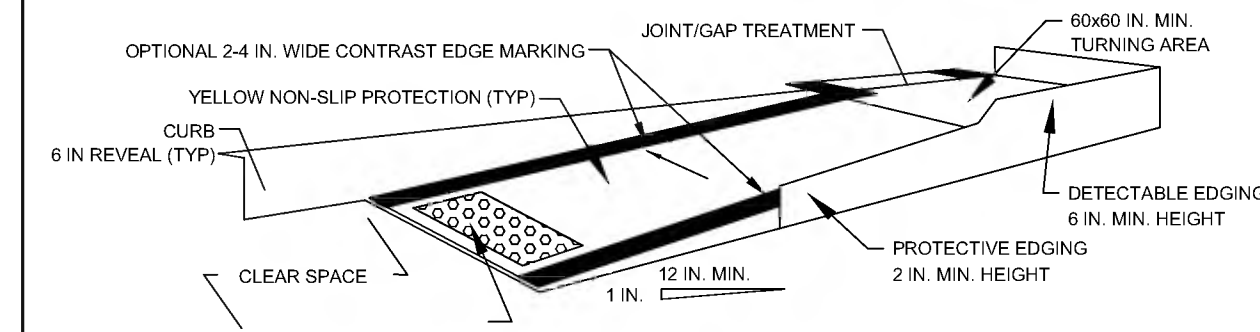


	Standard Details and Drawings for the Development of Temporary Traffic Control Plans	FIGURE TLR-2 TWO LANE ROAD SHOULDER AND TRAVEL LANE CLOSED NOT TO SCALE
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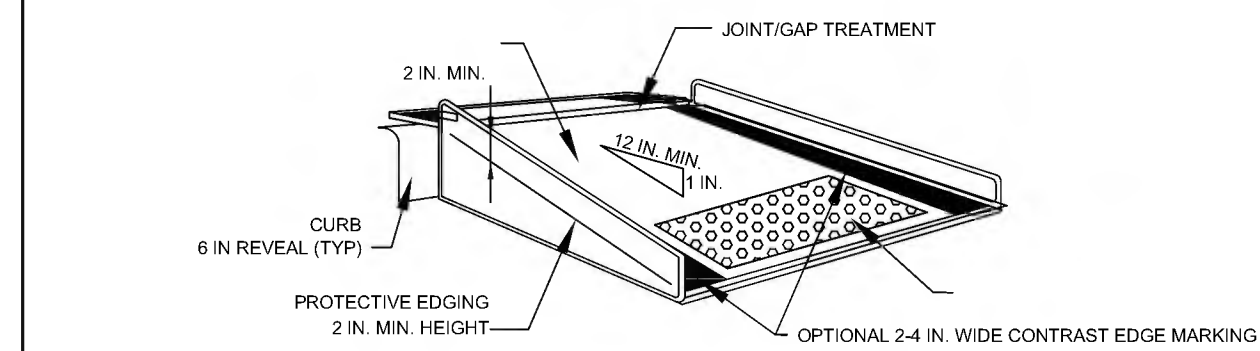


	Standard Details and Drawings for the Development of Temporary Traffic Control Plans	FIGURE BRG-1 ONE LANE ALTERNATING TRAFFIC NOT TO SCALE
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FIGURE 4  
TYPICAL PEDESTRIAN DEVICES  
(1 OF 2)  
NOT TO SCALE



TEMPORARY CURB RAMP-PARALLEL TO CURB

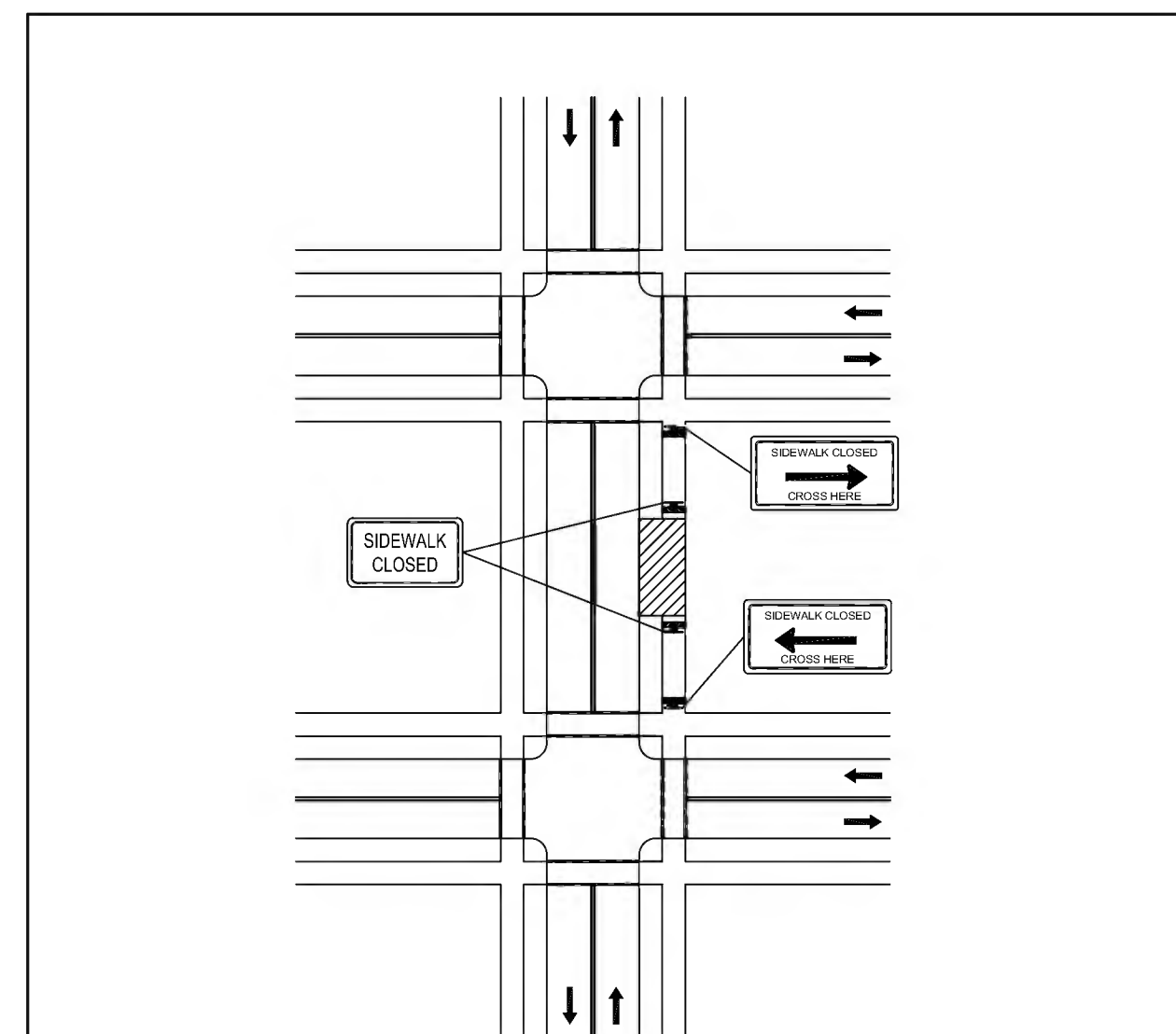


TEMPORARY CURB RAMP-PERPENDICULAR TO CURB

NOTES:

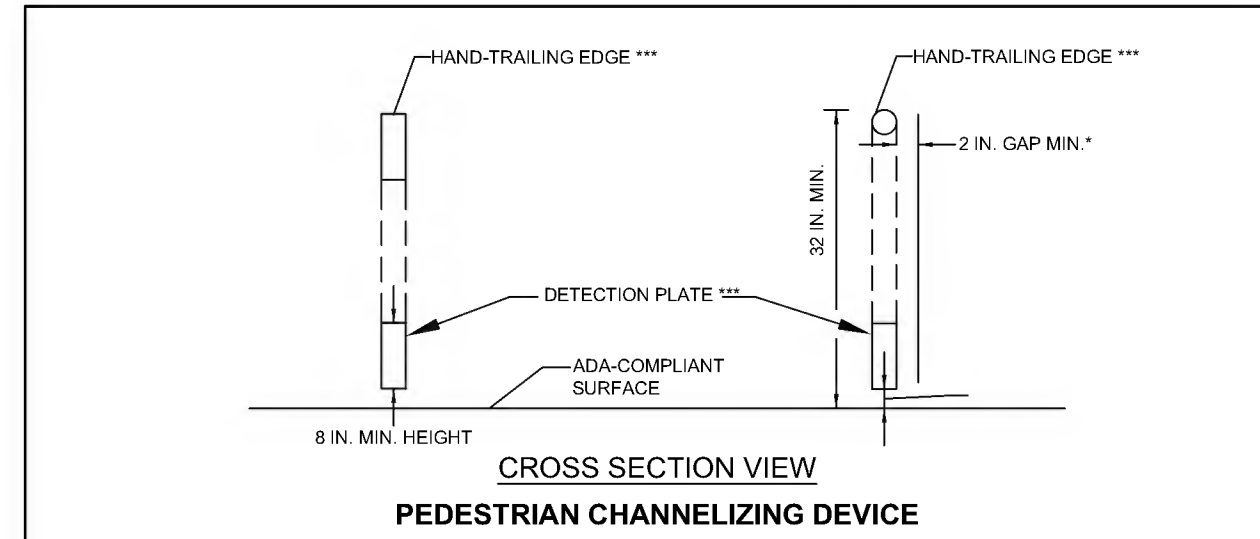
- CURB RAMPS SHALL BE 60 IN. MINIMUM WIDTH WITH A FIRM, STABLE, AND NON-SLIP SURFACE.
- PROTECTIVE EDGING WITH A 2 IN. MINIMUM HEIGHT SHALL BE INSTALLED WHEN THE CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 8 IN. OR GREATER OR HAS A SIDE APRON SLOPE STEEPER THAN 1:3 (33%). PROTECTIVE EDGING SHOULD BE CONSIDERED WHEN THE CURB RAMPS OR LANDING PLATFORMS HAVE A VERTICAL DROP OF 3 IN. OR MORE.
- PROTECTABLE EDGING WITH 6 IN. MINIMUM HEIGHT AND CONTRASTING COLOR SHALL BE INSTALLED ON ALL CURB RAMP LANDINGS WHERE THE WALKWAY CHANGES DIRECTION (TURNS).
- THE CURB RAMP WALKWAY AND LANDING AREA SURFACE SHALL BE OF A SOLID CONTINUOUS CONTRASTING COLOR ABUTTING UP TO THE EXISTING SIDEWALK.
- CURB RAMPS AND LANDINGS SHOULD HAVE A 1:50 (2%) MAX CROSS-SLOPE.
- CLEAR SPACE OF 48x48 IN. MINIMUM SHALL BE PROVIDED ABOVE AND BELOW THE CURB RAMP.
- WATER FLOW IN THE GUTTER SYSTEM SHALL HAVE MINIMAL RESTRICTION.
- LATERAL JOINTS OR GAPS BETWEEN SURFACES SHALL BE LESS THAN 0.5 IN. WIDTH.
- CHANGES BETWEEN SURFACE HEIGHTS SHOULD NOT EXCEED 0.5 IN. LATERAL EDGES SHOULD BE VERTICAL UP TO 0.25 IN. HIGH, AND BEVELED AT 1:2 BETWEEN 0.25 IN. AND 0.5 IN. HEIGHT.
- 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.

FIGURE 46  
TEMPORARY SIDEWALK CLOSURE

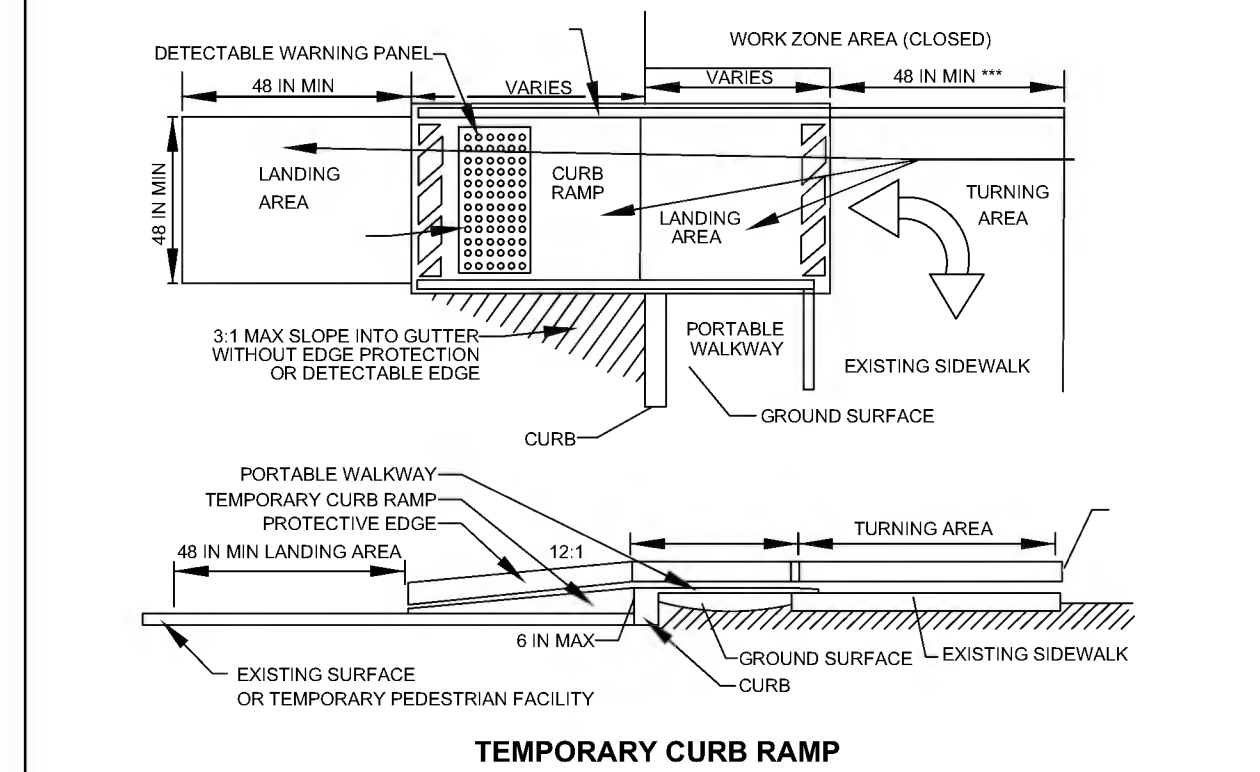


NOTES:

- CLOSURE OF A SIDEWALK FACILITY SHALL CONSTITUTE THE PROVISION FOR MANAGING PEDESTRIAN TRAFFIC AND ACCOMMODATING ALL USERS. IF THE EXISTING PEDESTRIAN ACCESS ROUTE(S) CAN BE TEMPORARILY RELOCATED ALONG THE EXISTING SIDEWALK, AND SAID FACILITY PROVIDES A MINIMUM WIDTH OF 48-INCHES OF SOLID, SMOOTH UNOBSTRUCTED SURFACE, THEN NO DETOURING OF THE ROUTE SHALL BE REQUIRED. DELINEATION OF THE WORK AREA IS STILL REQUIRED.
- IF IT IS NECESSARY TO DIVERT PEDESTRIAN TRAFFIC TO AN ALTERNATE ROUTE ACROSS THE ROADWAY FROM THE EXISTING FACILITY, THE FIGURE ABOVE SHALL BE FOLLOWED TO PROVIDE ADEQUATE DIRECTION TO PEDESTRIANS. ALTERNATE ROUTE SHALL PROVIDE THE SAME LEVEL OF ACCOMMODATION AS THE FACILITY THAT IS BEING DETOURED AND RETAIN ADA COMPLIANCE IN ITS ENTIRETY.
- FOR EMERGENCY OR SHORT-DURATION SIDEWALK CLOSURES OF 4-HOURS OR LESS, IT IS OPTIONAL TO HAVE ON-DEMAND PEDESTRIAN ASSISTANCE PERSONNEL AVAILABLE AT ALL TIMES DURING THE CLOSURE TO ASSIST THOSE MOBILITY CHALLENGED PERSONS WHO REQUIRE ADDITIONAL ASSISTANCE TO SAFELY NAVIGATE AROUND THE WORK AREA IN LIEU OF A FULL DETOUR.



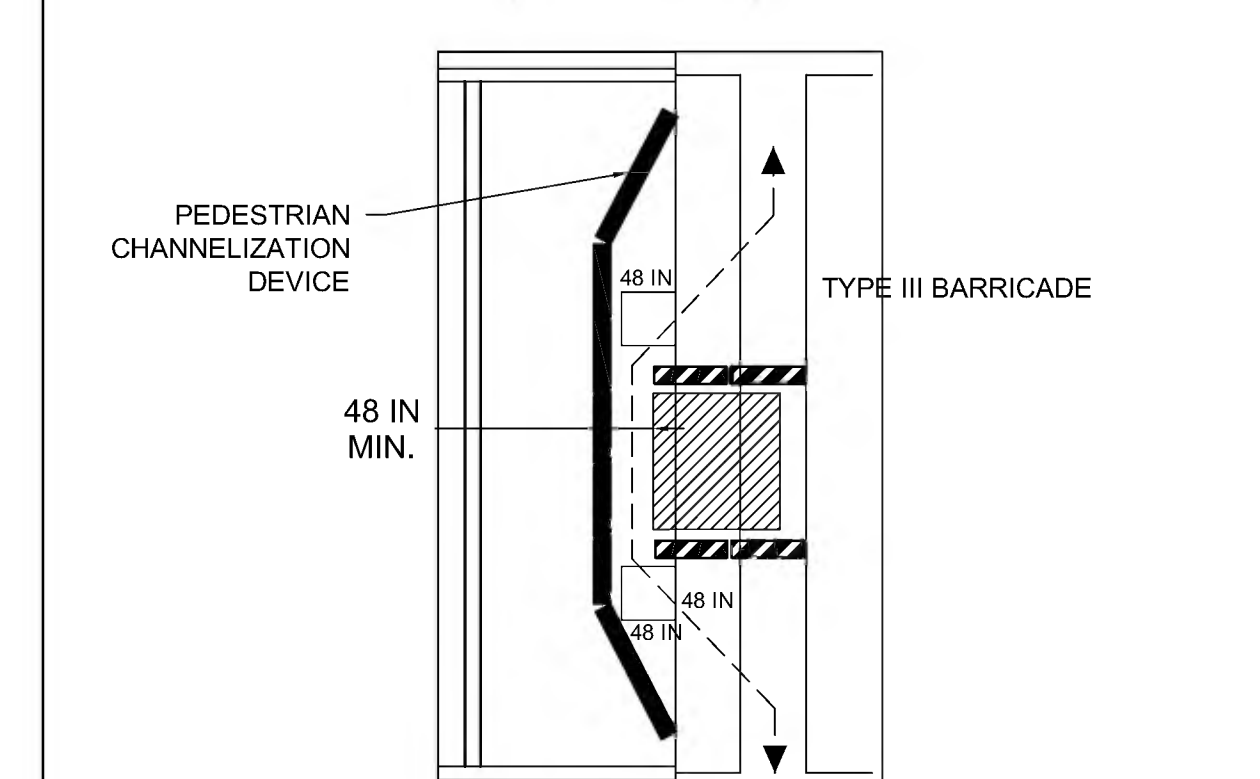
CROSS SECTION VIEW  
PEDESTRIAN CHANNELIZING DEVICE



TEMPORARY CURB RAMP

FIGURE 5  
TYPICAL PEDESTRIAN DEVICES  
(2 OF 2)  
NOT TO SCALE

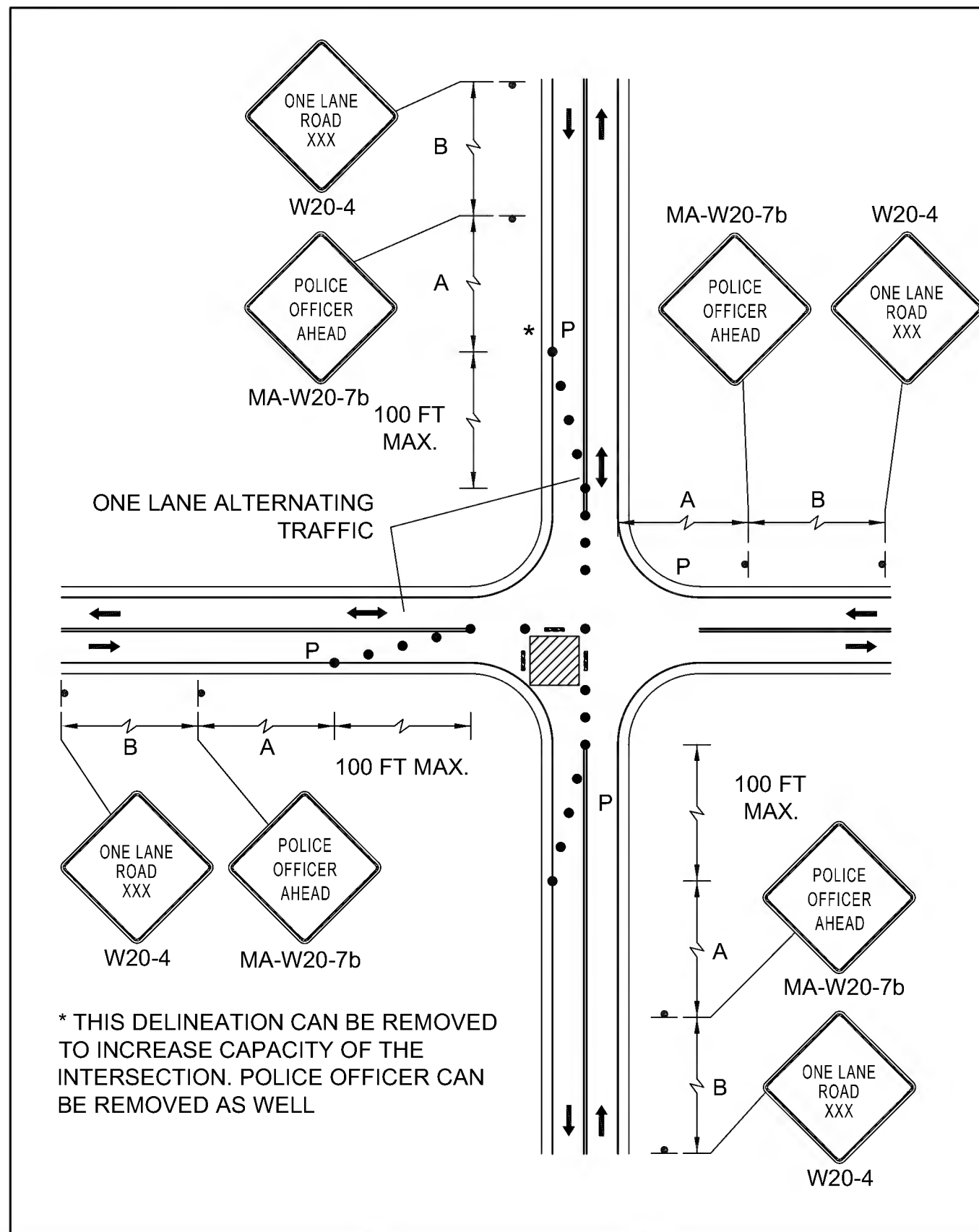
FIGURE 45  
PEDESTRIAN BYPASS



NOTES:

- WHEN EXISTING PEDESTRIAN FACILITIES ARE DISRUPTED, CLOSED, OR RELOCATED IN A TTC ZONE, TEMPORARY FACILITIES SHALL BE PROVIDED AND THEY SHALL BE DETECTABLE AND INCLUDE ACCESSIBILITY FEATURES CONSISTENT WITH THE FEATURES PRESENT IN THE EXISTING PEDESTRIAN FACILITY.
- A PEDESTRIAN CHANNELIZING DEVICE THAT IS DETECTABLE BY A PERSON WITH A VISUAL DISABILITY TRAVELING WITH THE AID OF A LONG CANE SHALL BE PLACED ALONG THE FULL LENGTH OF THE TEMPORARY PEDESTRIAN ROUTE.
- WHEN USED, TEMPORARY RAMPS SHALL COMPLY WITH AMERICANS WITH DISABILITIES ACT.
- THE ALTERNATE PATHWAY SHOULD HAVE A SMOOTH CONTINUOUS HARD SURFACE FOR THE ENTIRE LENGTH OF THE TEMPORARY PEDESTRIAN FACILITY.
- THE TEMPORARY SIDEWALK SHOULD BE A MINIMUM OF 4 FEET WIDE. IF THE SIDEWALK EXCEEDS 200 FEET THEN A 5 FOOT BY 5 FOOT PASSING ZONE SHALL BE PROVIDED NEAR THE MID-POINT OF THE CLOSURE.
- THE PROTECTIVE REQUIREMENTS OF A TTC WORK ZONE MAY HAVE AN IMPACT IN DETERMINING THE NEED FOR TEMPORARY TRAFFIC BARRIERS AND THEIR USE IN PROVIDING PEDESTRIAN DELINEATION SHOULD BE BASED ON ENGINEERING JUDGMENT.
- ON-DEMAND PEDESTRIAN ASSISTANCE PERSONNEL TO ASSIST WITH NAVIGATION AROUND THE CLOSURE/WORK AREA MAY BE CONSIDERED AS AN OPTION IN PLACE OF PROVIDING ADA/AAB DEVICES FOR WORK FOR CLOSURES LASTING 4 HOURS OR LESS.
- CONTROLS ONLY FOR PEDESTRIAN TRAFFIC ARE SHOWN; VEHICULAR TRAFFIC SHOULD BE HANDLED AS SHOWN ELSEWHERE. THESE DETAILS ARE USED IN CONJUNCTION WITH THE PROPOSED LANE CLOSURE DETAILS AND DURING CONSTRUCTION STAGING, AS DETERMINED BY THE ENGINEER.

FIGURE Int-2  
SINGLE LANE APPROACH  
ONE QUADRANT CLOSURE  
NOT TO SCALE



\* THIS DELINEATION CAN BE REMOVED TO INCREASE CAPACITY OF THE INTERSECTION. POLICE OFFICER CAN BE REMOVED AS WELL

TEMPORARY TRAFFIC CONTROL PLANS  
TYPICAL DETAILS



**TEMPORARY TRAFFIC CONTROL PLANS  
SIGN SUMMARY**



**W20-1 WITH MA-D3-1 DETAIL**  
N.T.S.

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (in)			COLOR			SIGN FACE AREA (S.F.)
	WIDTH (IN)	HEIGHT (IN)		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	BACK-GROUND	LEGEND	BORDER	
R3-7L	30	30		SEE FHWA 2004 STANDARD HIGHWAY SIGNS MANUAL & 2012 SUPPLEMENT (ENGLISH VERSION)			WHITE	BLACK	BLACK	6.25
R3-7R	30	30					WHITE	BLACK	BLACK	6.25
R9-8	36	18					WHITE	BLACK	BLACK	4.5
R9-9	24	12					WHITE	BLACK	BLACK	2
R9-10	24	12					WHITE	BLACK	BLACK	2
R9-11L	24	18					WHITE	BLACK	BLACK	3
R9-11R	24	18					WHITE	BLACK	BLACK	3
R9-11aL	24	18					WHITE	BLACK	BLACK	3
R9-11aR	24	18					WHITE	BLACK	BLACK	3
W1-4L	36	36					FLRSCNT. ORANGE	BLACK	BLACK	9
W1-4R	36	36					FLRSCNT. ORANGE	BLACK	BLACK	9
W4-2L	36	36					FLRSCNT. ORANGE	BLACK	BLACK	9
MA-W4-7L	36	36		SEE MASSDOT 2016 STANDARD SIGNS BOOK			FLRSCNT. ORANGE	BLACK	BLACK	9
W5-1	36	36		SEE FHWA 2004 STANDARD HIGHWAY SIGNS MANUAL & 2012 SUPPLEMENT (ENGLISH VERSION)			FLRSCNT. ORANGE	BLACK	BLACK	9
W8-3	36	36					FLRSCNT. ORANGE	BLACK	BLACK	9
W11-2	30	30					FLRSCNT. YELLOW /GREEN	BLACK	BLACK	6.25
W13-1	24	24					FLRSCNT. ORANGE	BLACK	BLACK	4

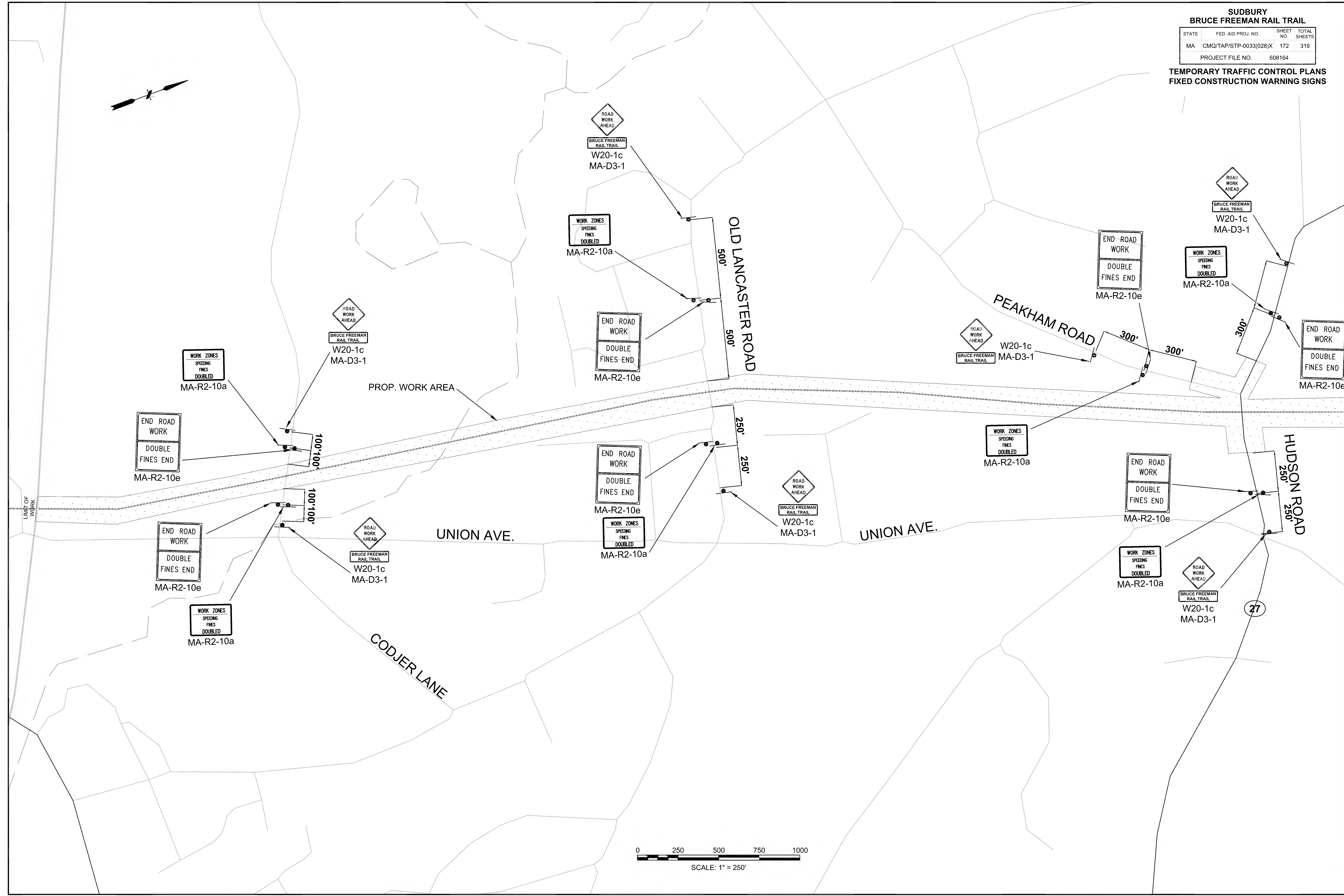
IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (in)			COLOR			SIGN FACE AREA (S.F.)
	WIDTH (IN)	HEIGHT (IN)		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	BACK-GROUND	LEGEND	BORDER	
W16-7PL	24	12		SEE FHWA 2004 STANDARD HIGHWAY SIGNS MANUAL & 2012 SUPPLEMENT (ENGLISH VERSION)			FLRSCNT. YELLOW /GREEN	BLACK	BLACK	2
W16-9P	24	12					FLRSCNT. YELLOW /GREEN	BLACK	BLACK	2
W20-4	36	36					FLRSCNT. ORANGE	BLACK	BLACK	9
W20-5L	36	36					FLRSCNT. ORANGE	BLACK	BLACK	9
W20-5R	36	36					FLRSCNT. ORANGE	BLACK	BLACK	9
W20-7a	36	36					FLRSCNT. ORANGE	BLACK	BLACK	9
MA-W20-7b	36	36		SEE MASSDOT 2016 STANDARD SIGNS BOOK			FLRSCNT. ORANGE	BLACK	BLACK	9
W21-5aR	36	36		SEE FHWA 2004 STANDARD HIGHWAY SIGNS MANUAL & 2012 SUPPLEMENT (ENGLISH VERSION)			FLRSCNT. ORANGE	BLACK	BLACK	9

**FIXED CONSTRUCTION WARNING SIGN PLAN**

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	QUANTITY	TEXT DIMENSIONS (in)			COLOR			POST SIZE AND NUMBER REQUIRED	SIGN FACE AREA (S.F.)	TOTAL AREA NEEDED (S.F.)
	WIDTH (IN)	HEIGHT (IN)			LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	BACK-GROUND	LEGEND	BORDER			
MA-D3-1	40	18		14	5C	3	N/A	FLRSCNT. ORANGE	BLACK	BLACK	MOUNTED W/ W20-1	5	70
MA-R2-10a	48	36		15	SEE MASSDOT 2016 STANDARD SIGNS BOOK			FLRSCNT. ORANGE / WHITE	BLACK	BLACK	U-CHAN. 15 REQ'D	12	180
MA-R2-10e	36	48		14	SEE MASSDOT 2016 STANDARD SIGNS BOOK			FLRSCNT. ORANGE / WHITE	BLACK	BLACK	U-CHAN. 28 REQ'D	12	168
W20-1c	36	36		14	5C	3	N/A	FLRSCNT. ORANGE	BLACK	BLACK	U-CHAN. 14 REQ'D	9	126

**TYPICAL CONSTRUCTION SIGNING**

N.T.S.

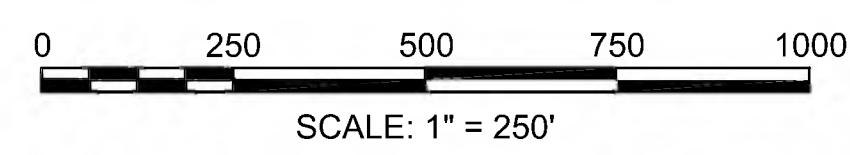
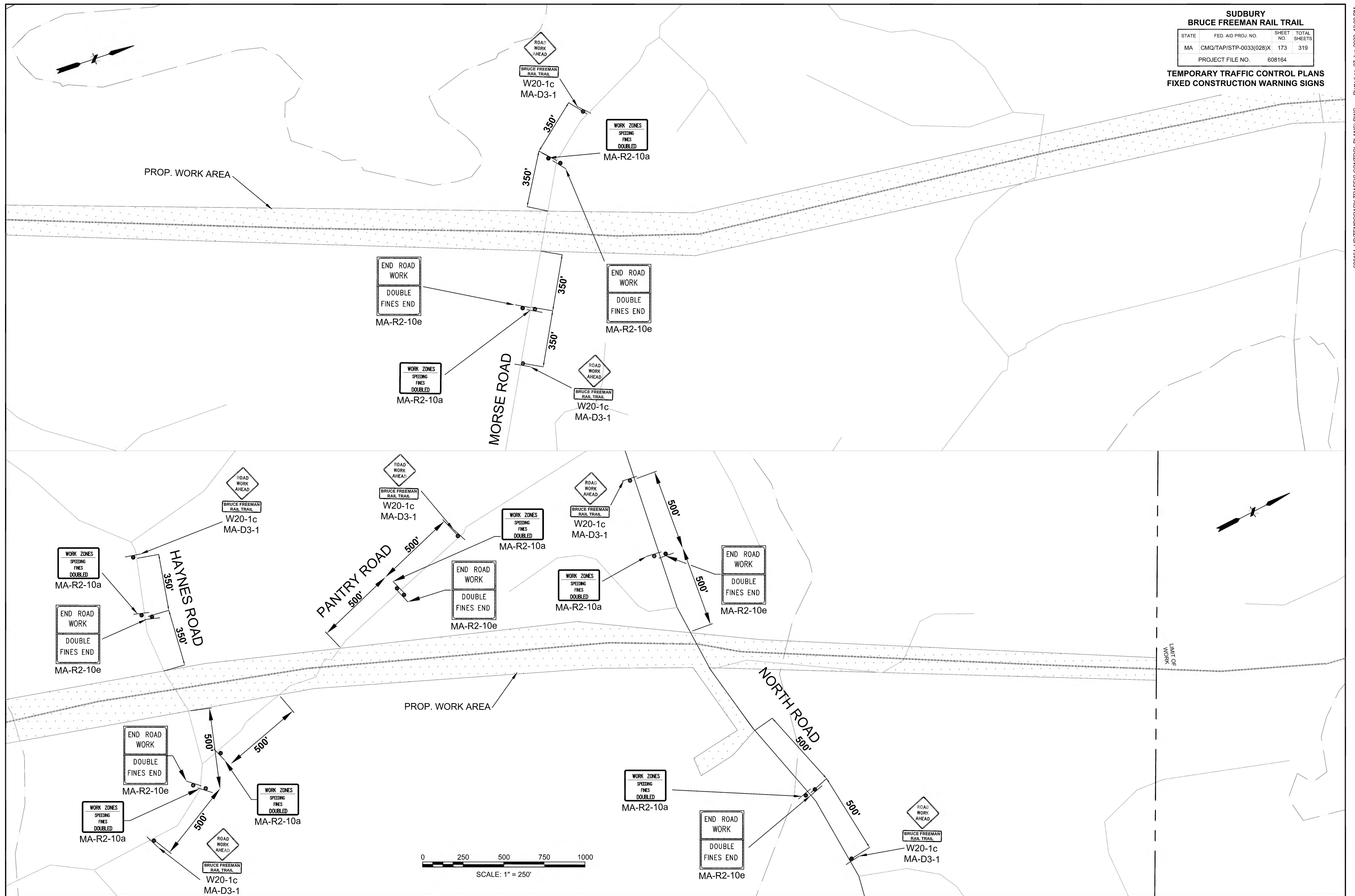




**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	173	319
PROJECT FILE NO.		608164	

**TEMPORARY TRAFFIC CONTROL PLANS**  
**FIXED CONSTRUCTION WARNING SIGNS**

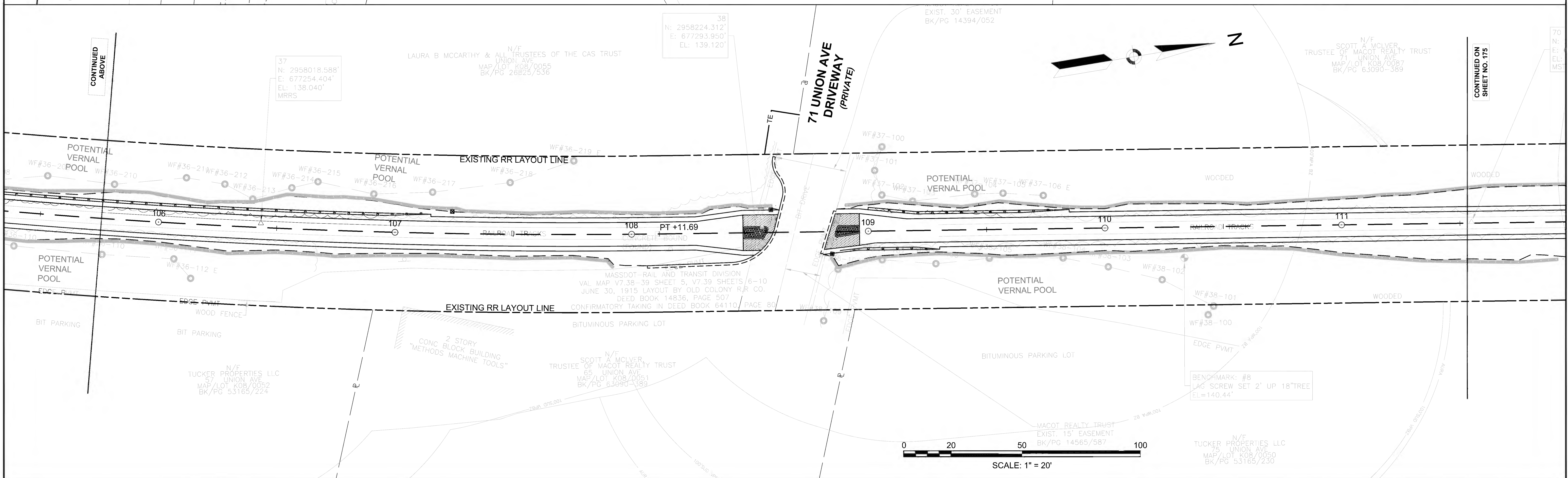
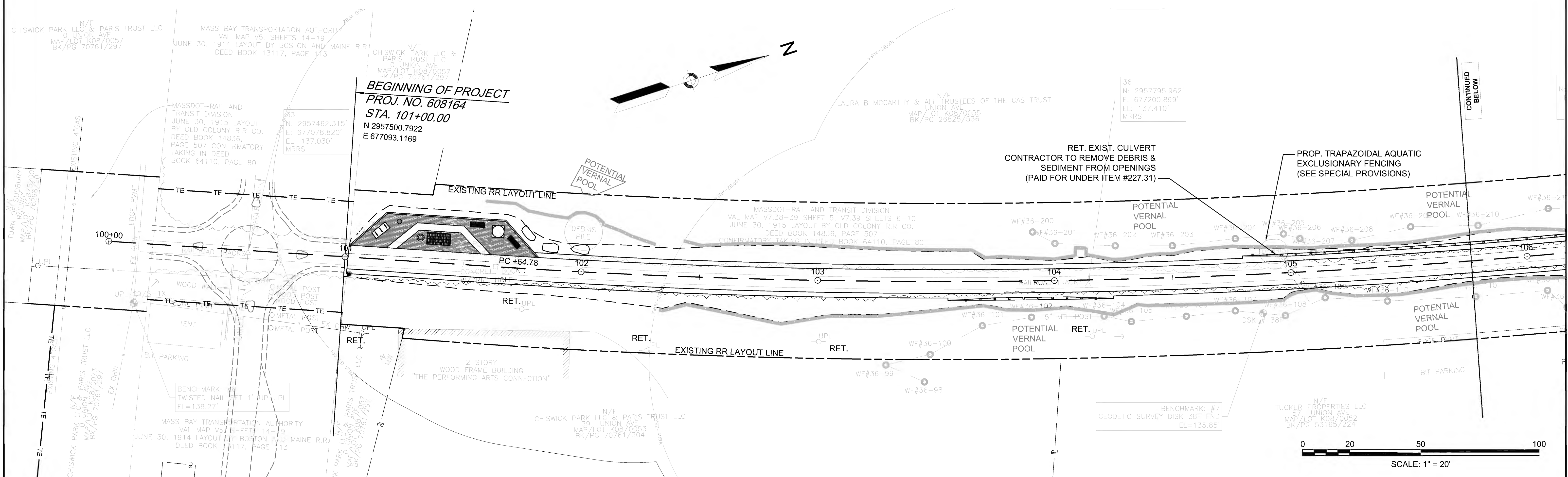


- DRAINAGE AND UTILITY NOTES:**
1. PROP. CONCRETE HEADWALLS SHALL CONFORM TO MASSDOT DETAIL, E 206.4.0 & E 206.6.0.
  2. ALL CATCH BASIN FRAME AND GRATES TO BE MASSDOT CASCADE TYPE.

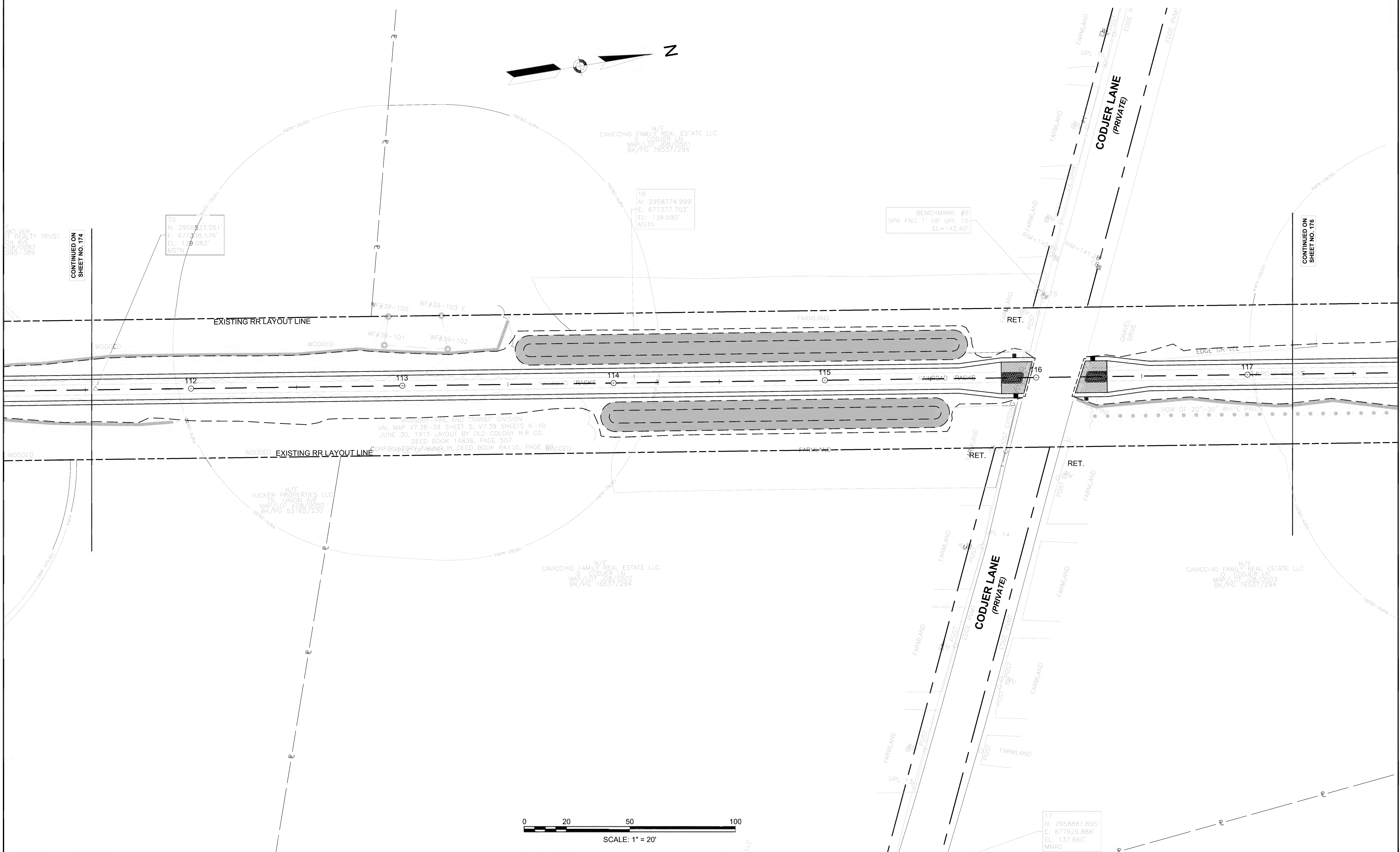
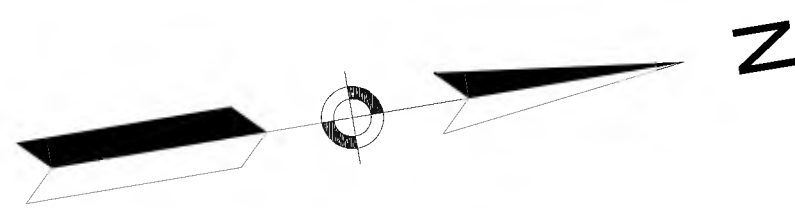
**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	174	319
PROJECT FILE NO.		608164	

**DRAINAGE & UTILITY PLANS**

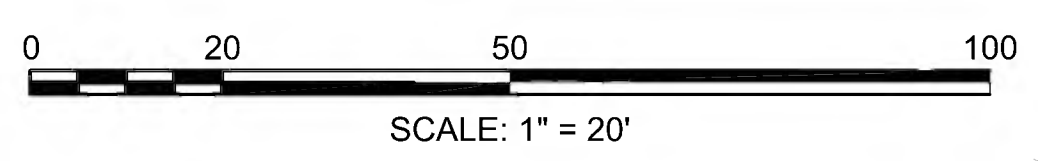






CONTINUED ON  
SHEET NO. 174

CONTINUED ON  
SHEET NO. 176



MCLIVER  
REALTY TRUST  
75 UNION AVE  
SUDBURY, MA 01907  
978-389-3894

70  
N: 2958523.051'  
E: 677336.576'  
EL: 139.083'  
MSTN

16  
N: 2958774.999'  
E: 677377.703'  
EL: 139.590'  
MSTN

BENCHMARK: #9  
SPK FND 1' UP UPL 15  
EL=142.40'

TUCKER PROPERTIES LLC  
75 UNION AVE  
SUDBURY, MA 01907  
978-389-3894

CAVICCHIO FAMILY REAL ESTATE LLC  
0 CODJER LN  
SUDBURY, MA 01907  
978-389-3894

CAVICCHIO FAMILY REAL ESTATE LLC  
0 CODJER LN  
SUDBURY, MA 01907  
978-389-3894

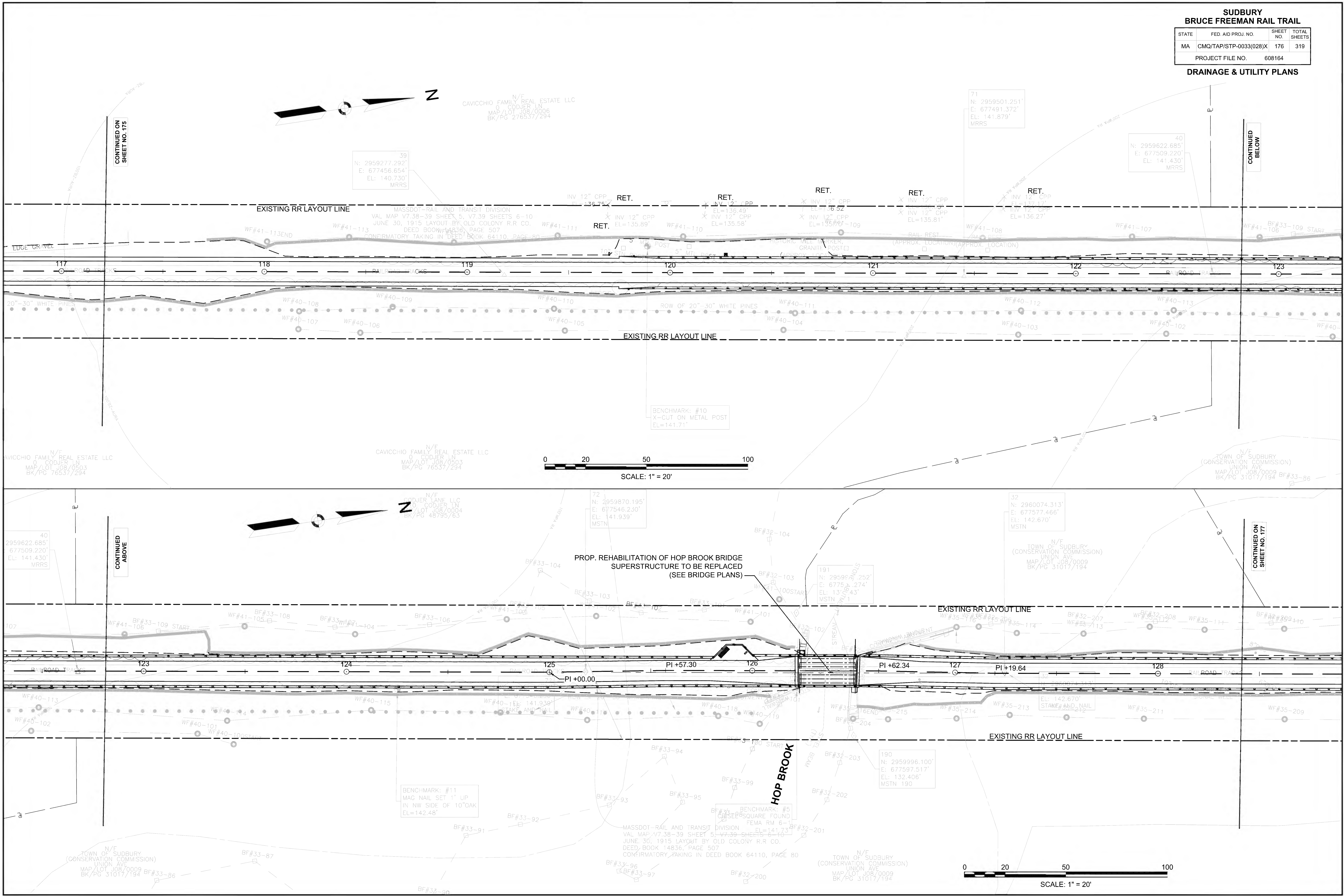
17  
N: 2958881.855'  
E: 677626.888'  
EL: 137.660'  
MMAC

**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	176	319

PROJECT FILE NO. 608164

**DRAINAGE & UTILITY PLANS**



CONTINUED ON SHEET NO. 175

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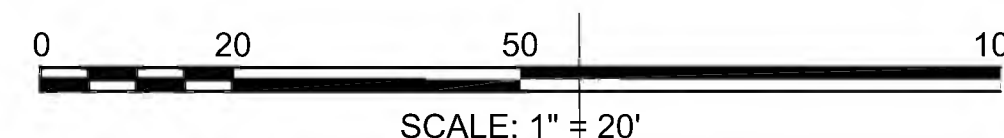
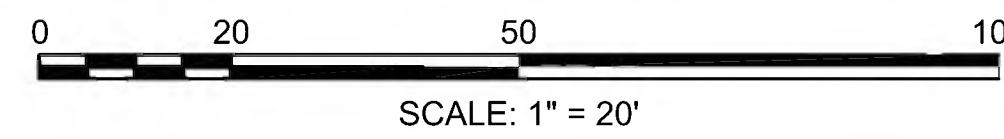
CONTINUED ON SHEET NO. 177

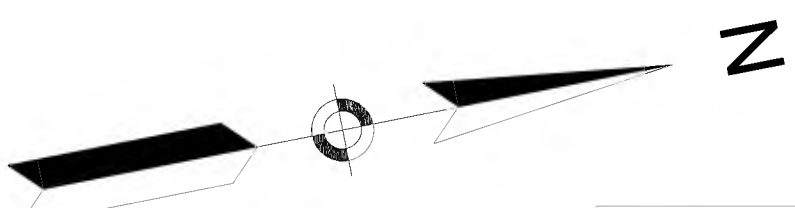


**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	177	319
PROJECT FILE NO.		608164	

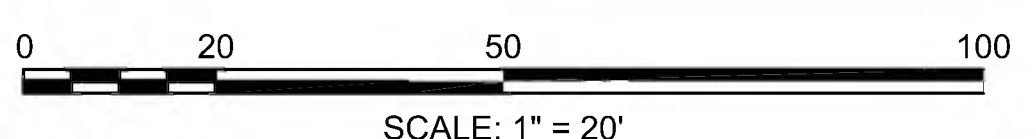
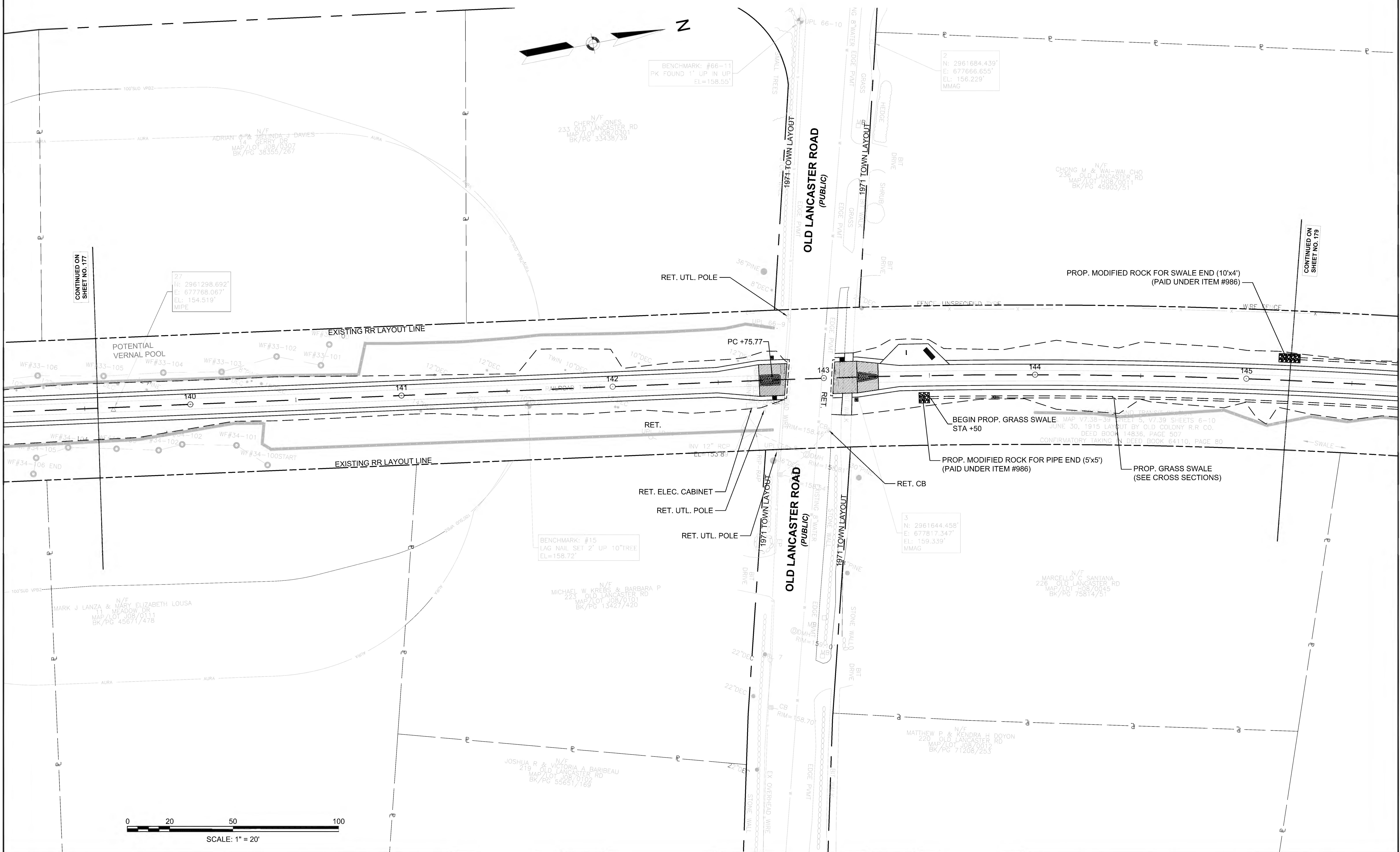
**DRAINAGE & UTILITY PLANS**





CONTINUED ON SHEET NO. 177

CONTINUED ON SHEET NO. 179

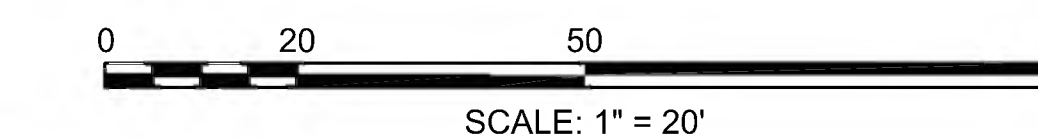
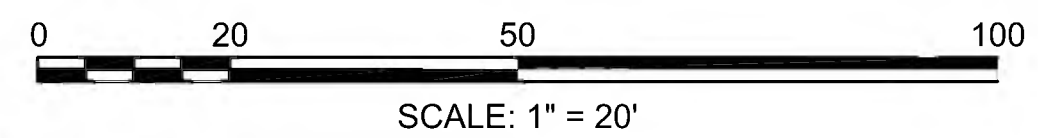
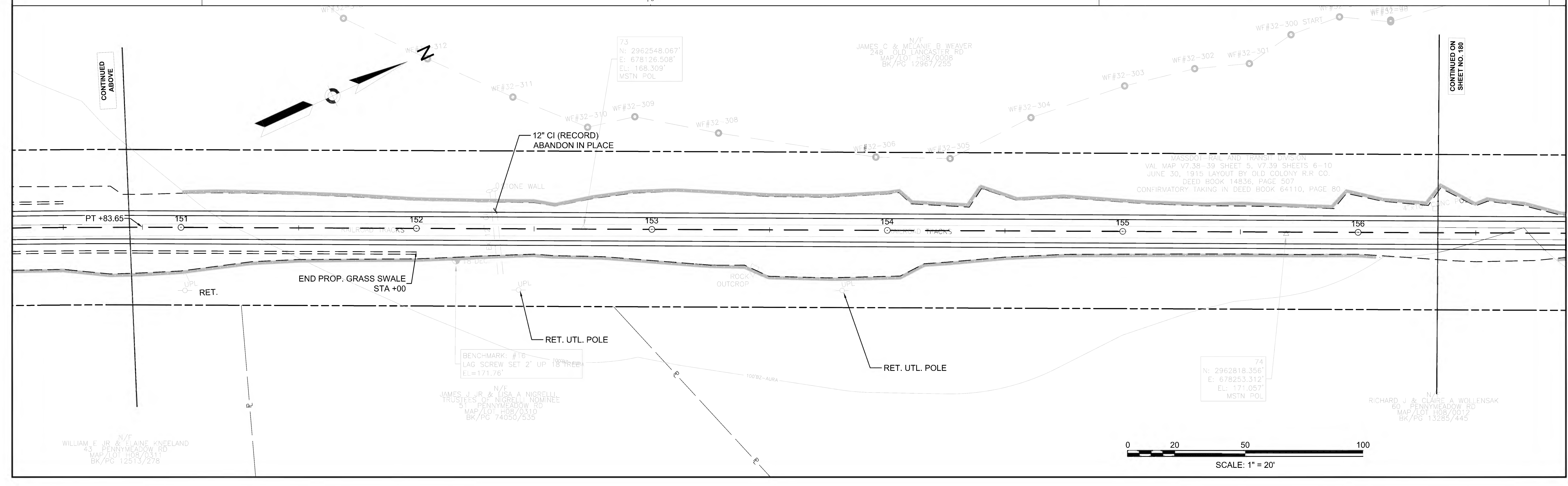
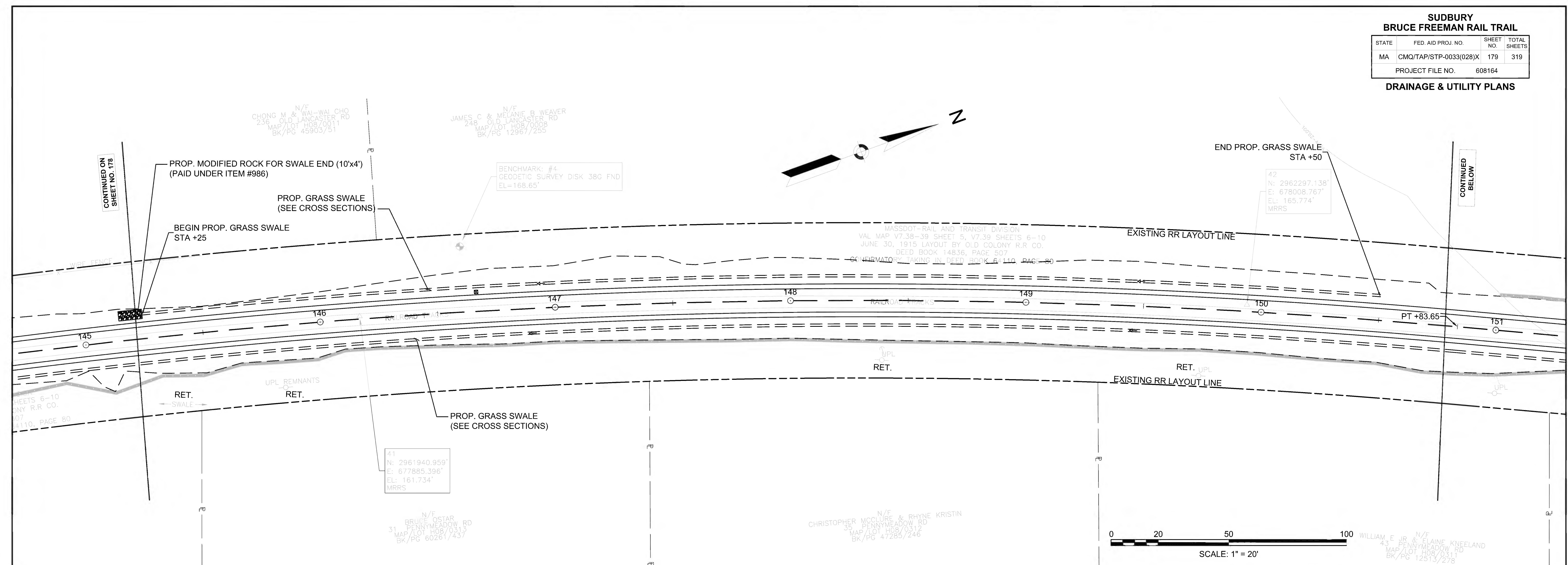




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	179	319
PROJECT FILE NO.		608164	

**DRAINAGE & UTILITY PLANS**



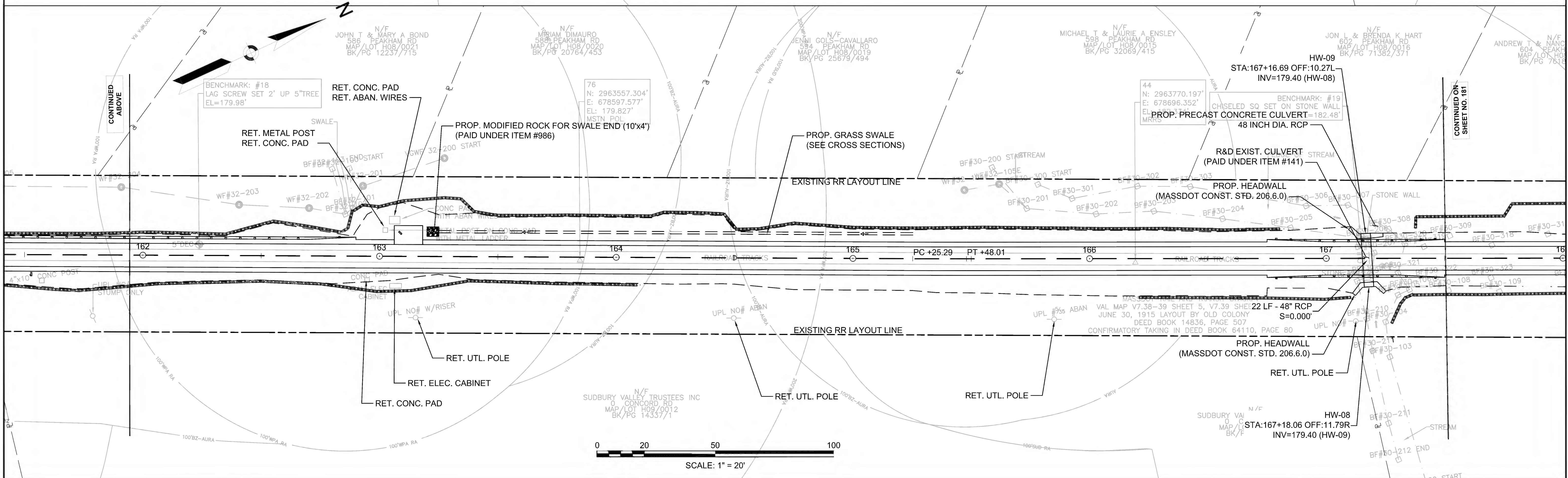
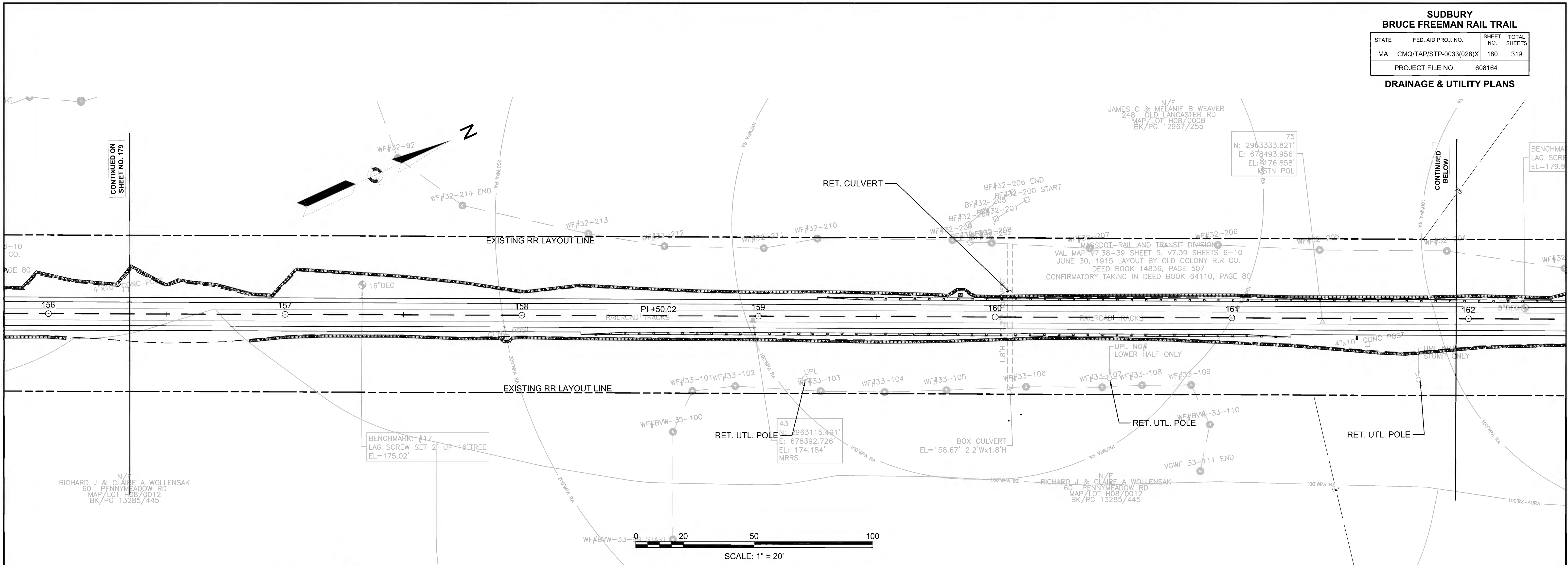
Plotted on 28-Jun-2022 9:49 AM

608164\_HD(DRAINAGE & UTILITY PLANS).DWG

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BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	180	319
PROJECT FILE NO.		608164	

**DRAINAGE & UTILITY PLANS**

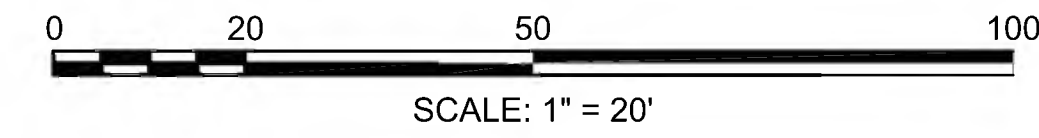
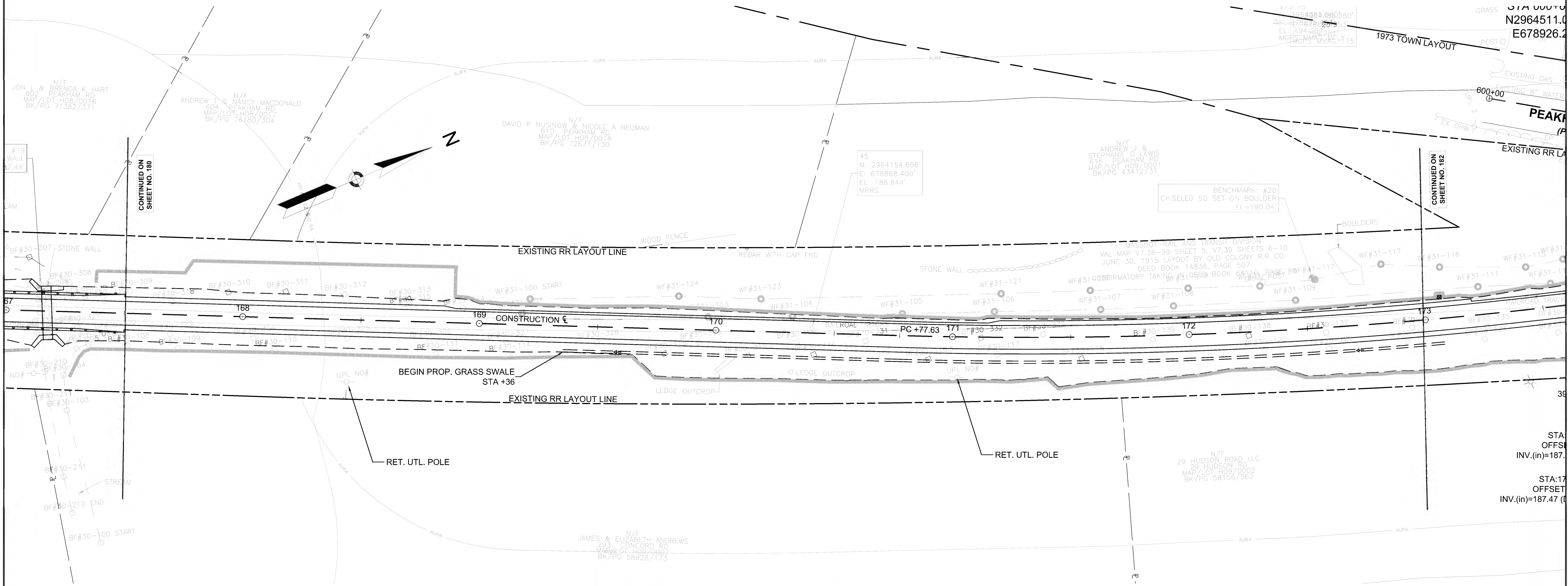




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	181	319
PROJECT FILE NO.		608164	

**DRAINAGE & UTILITY PLANS**



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SHEET NO. 180

CONTINUED ON  
SHEET NO. 182

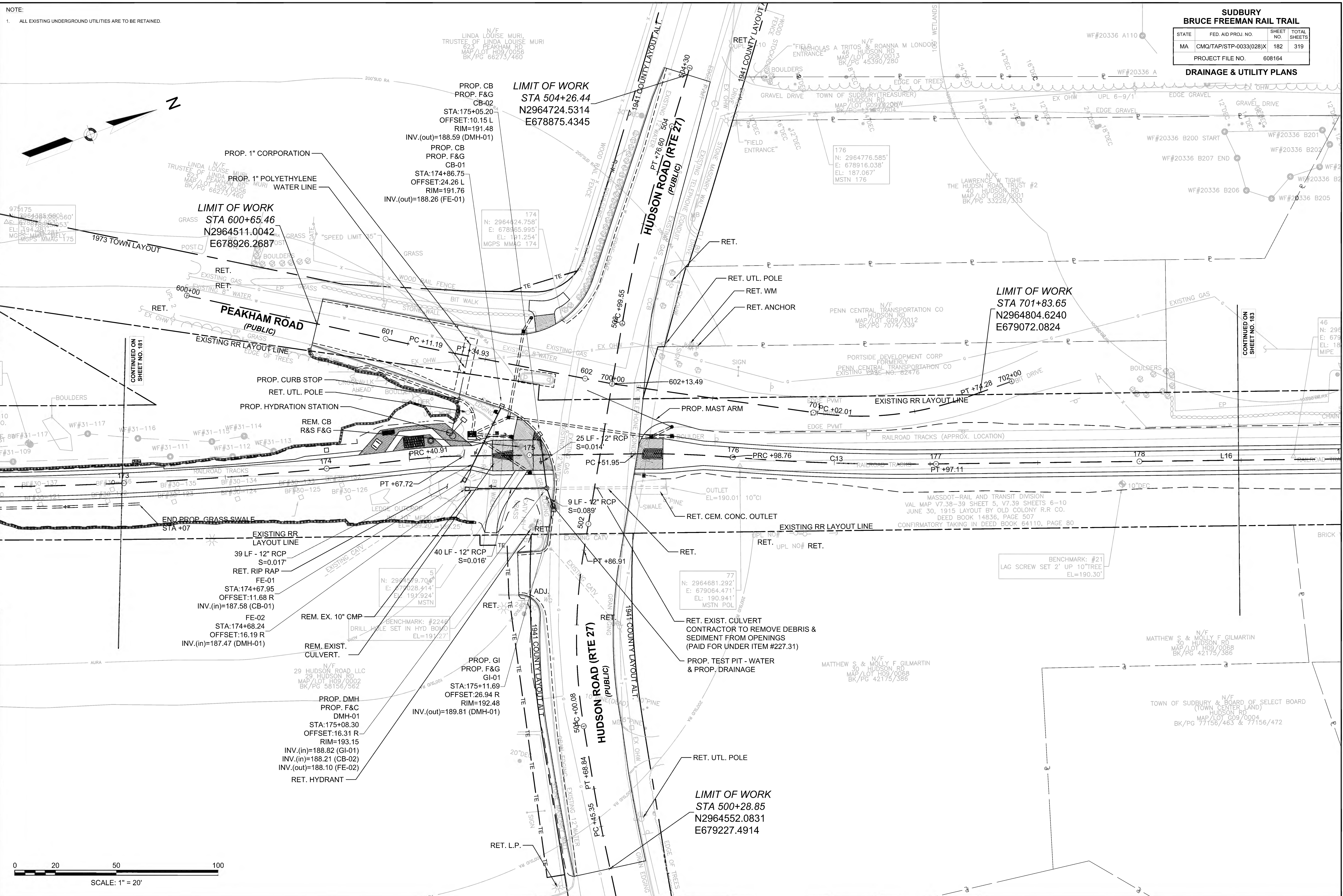
BENCHMARK: #20  
CHISELED SQ SET ON BOULDER  
EL=190.04'

STA 00+00  
N2964511.0  
E678926.2

STA:  
OFFS:  
INV.(in)=187.  
  
STA:17  
OFFSET  
INV.(in)=187.47 (

NOTE:  
1. ALL EXISTING UNDERGROUND UTILITIES ARE TO BE RETAINED.

SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003(028)X	182	319
PROJECT FILE NO.		608164	
DRAINAGE & UTILITY PLANS			



**LIMIT OF WORK**  
STA 504+26.44  
N2964724.5314  
E678875.4345

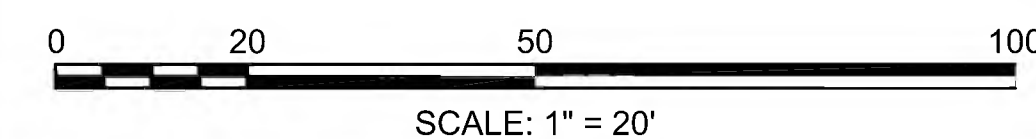
PROP. CB  
PROP. F&G  
CB-02  
STA:175+05.20  
OFFSET:10.15 L  
RIM=191.48  
INV.(out)=188.59 (DMH-01)

PROP. CB  
PROP. F&G  
CB-01  
STA:174+86.75  
OFFSET:24.26 L  
RIM=191.76  
INV.(out)=188.26 (FE-01)

**LIMIT OF WORK**  
STA 600+65.46  
N2964511.0042  
E678926.2687

**LIMIT OF WORK**  
STA 701+83.65  
N2964804.6240  
E679072.0824

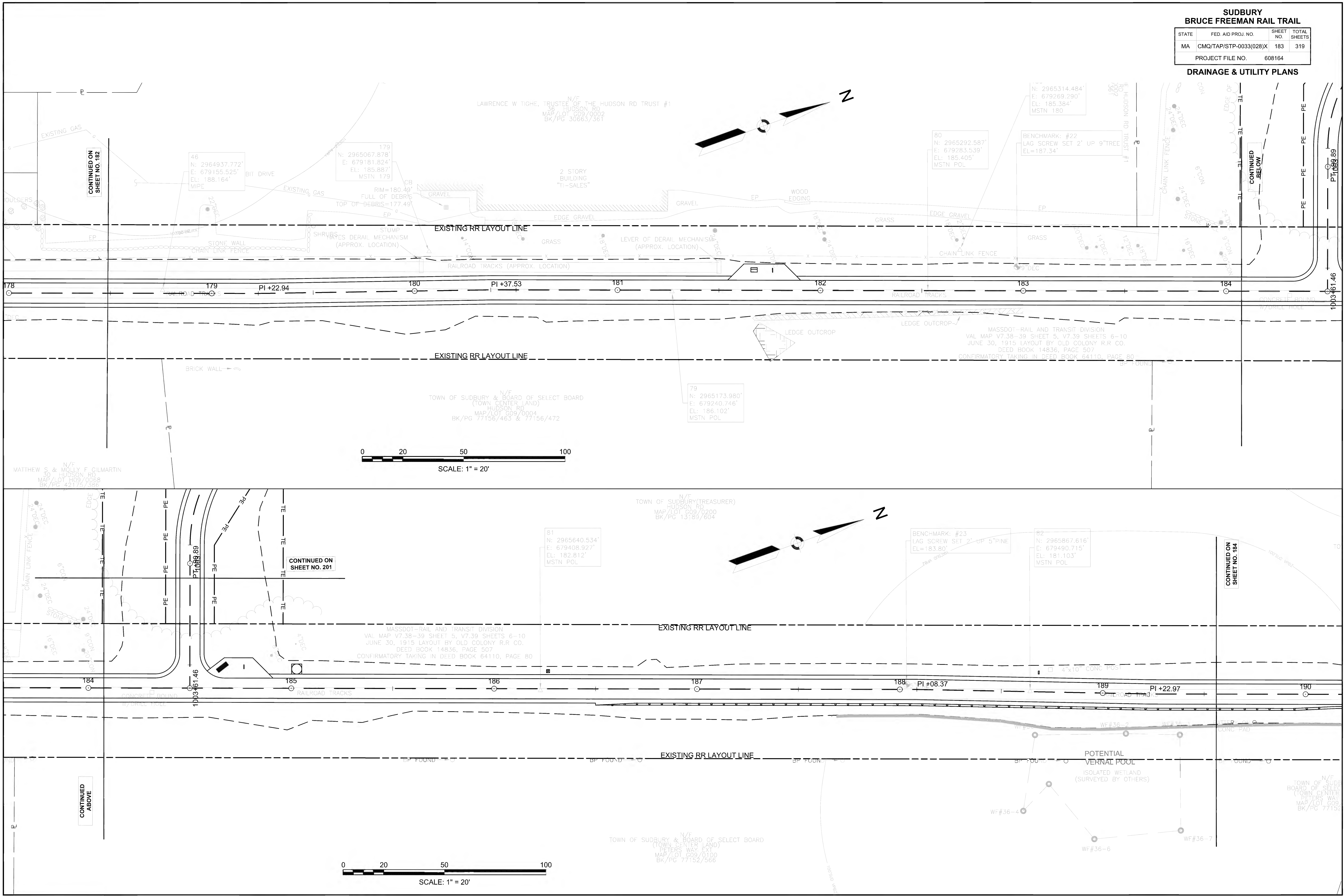
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STA 500+28.85  
N2964552.0831  
E679227.4914

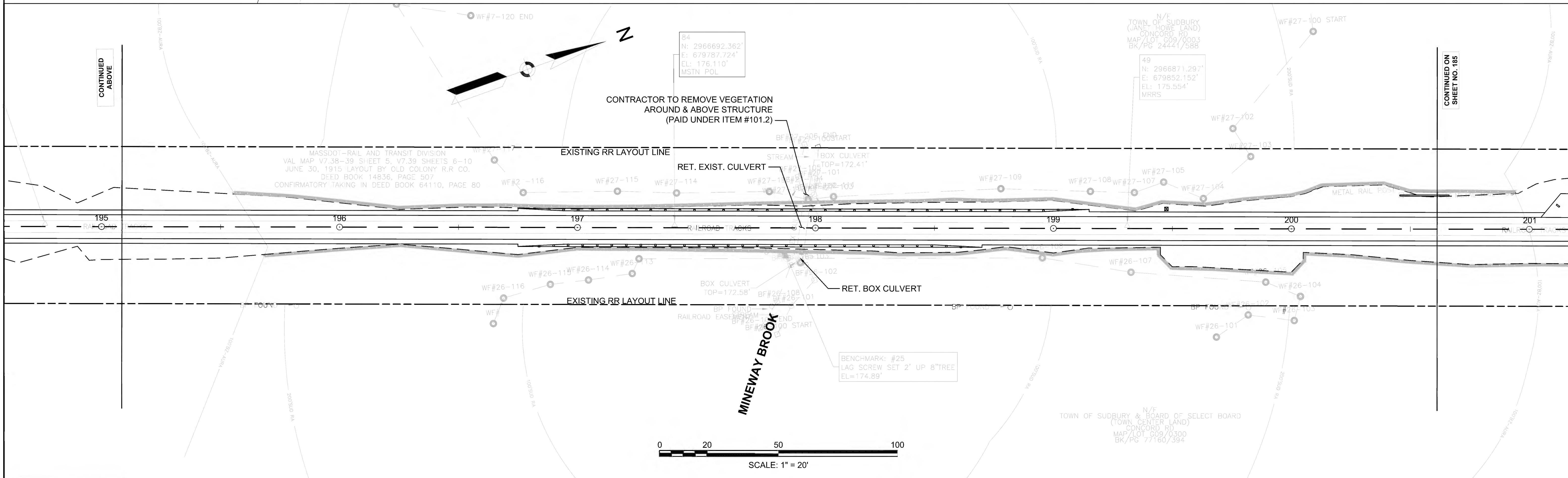
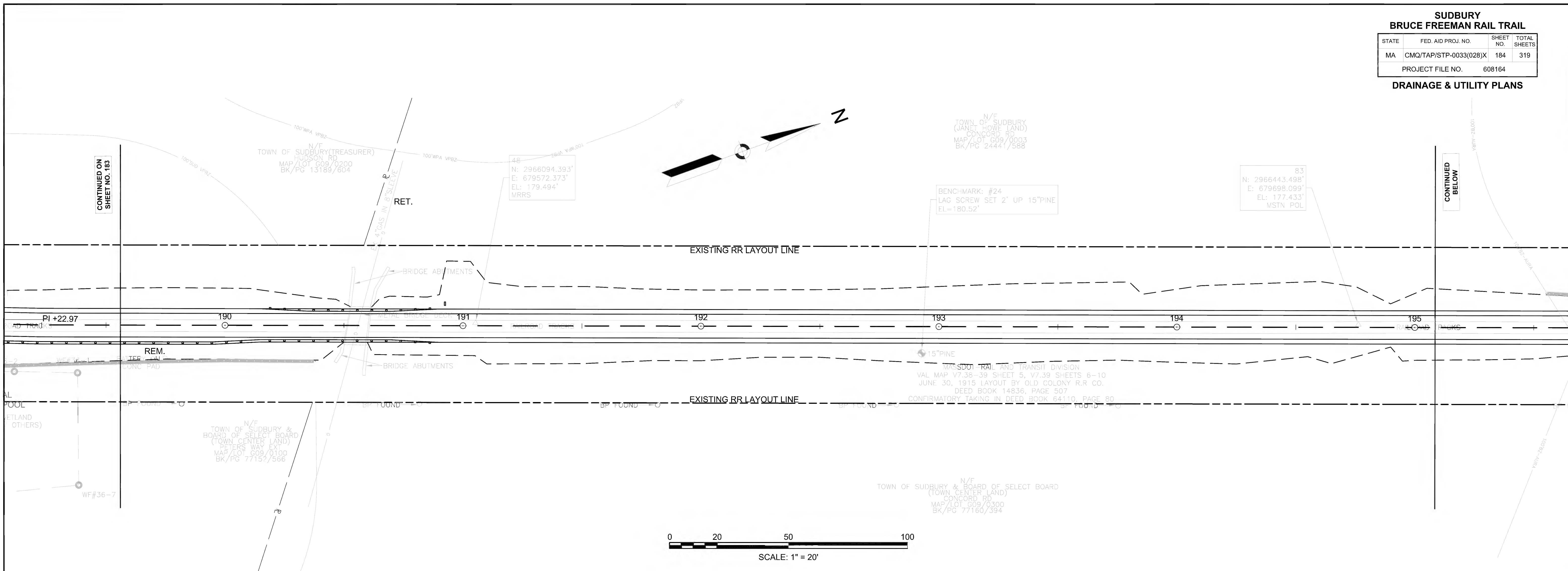


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SHEET NO. 181

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SHEET NO. 183





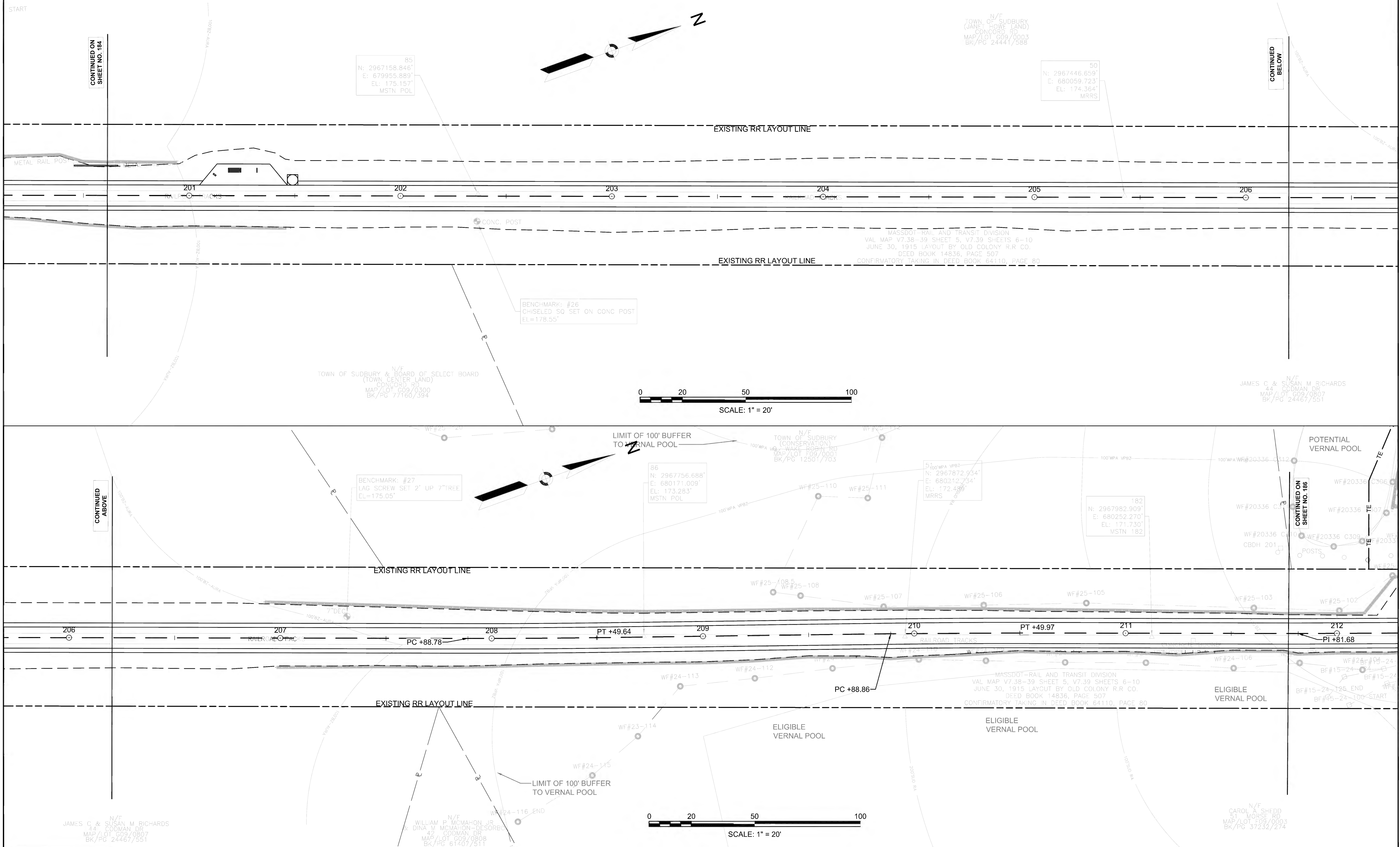




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	185	319
PROJECT FILE NO.		608164	

**DRAINAGE & UTILITY PLANS**

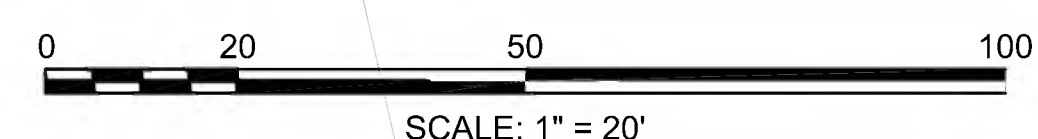
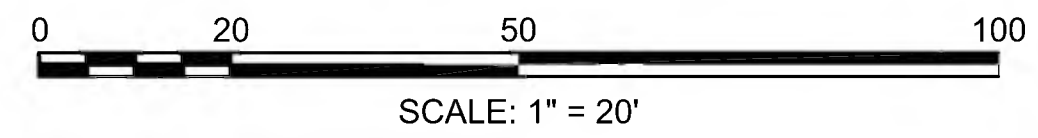


CONTINUED ON  
SHEET NO. 184

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BELOW

CONTINUED  
ABOVE

CONTINUED ON  
SHEET NO. 186



N/F  
TOWN OF SUDBURY  
(JANE I. HOWE LAND)  
CONCORD RD  
MAP/LOT 099/0003  
BK/PG 24421/588

N/F  
TOWN OF SUDBURY & BOARD OF SELECT BOARD  
(TOWN CENTER LAND)  
CONCORD RD  
MAP/LOT 009/0300  
BK/PG 77160/394

N/F  
TOWN OF SUDBURY  
(CONSERVATION)  
MAP/LOT F09/0001  
BK/PG 12501/703

N/F  
JAMES C & SUSAN M RICHARDS  
44 CODMAN DR  
MAP/LOT 008/0617  
BK/PG 24467/551

N/F  
JAMES C & SUSAN M RICHARDS  
44 CODMAN DR  
MAP/LOT 009/0807  
BK/PG 24467/551

N/F  
WILLIAM P MCMAHON JR  
& DINA V MCMAHON-DESOREL  
42 CODMAN DR  
MAP/LOT 009/0808  
BK/PG 61407/511

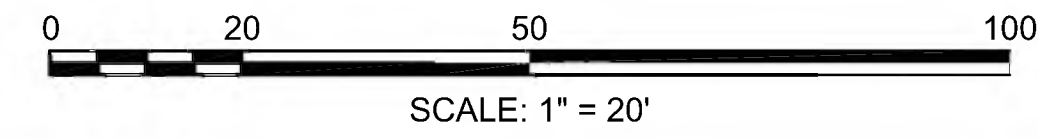
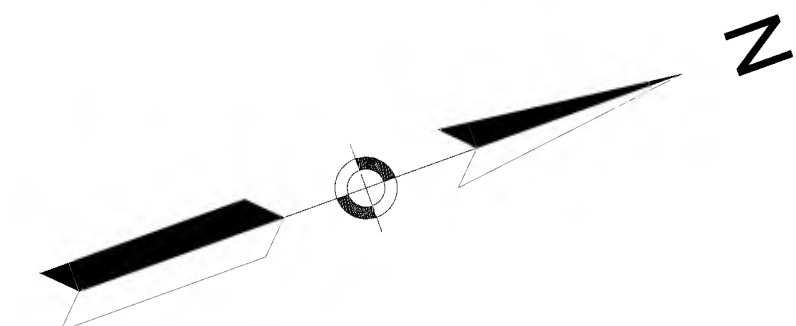
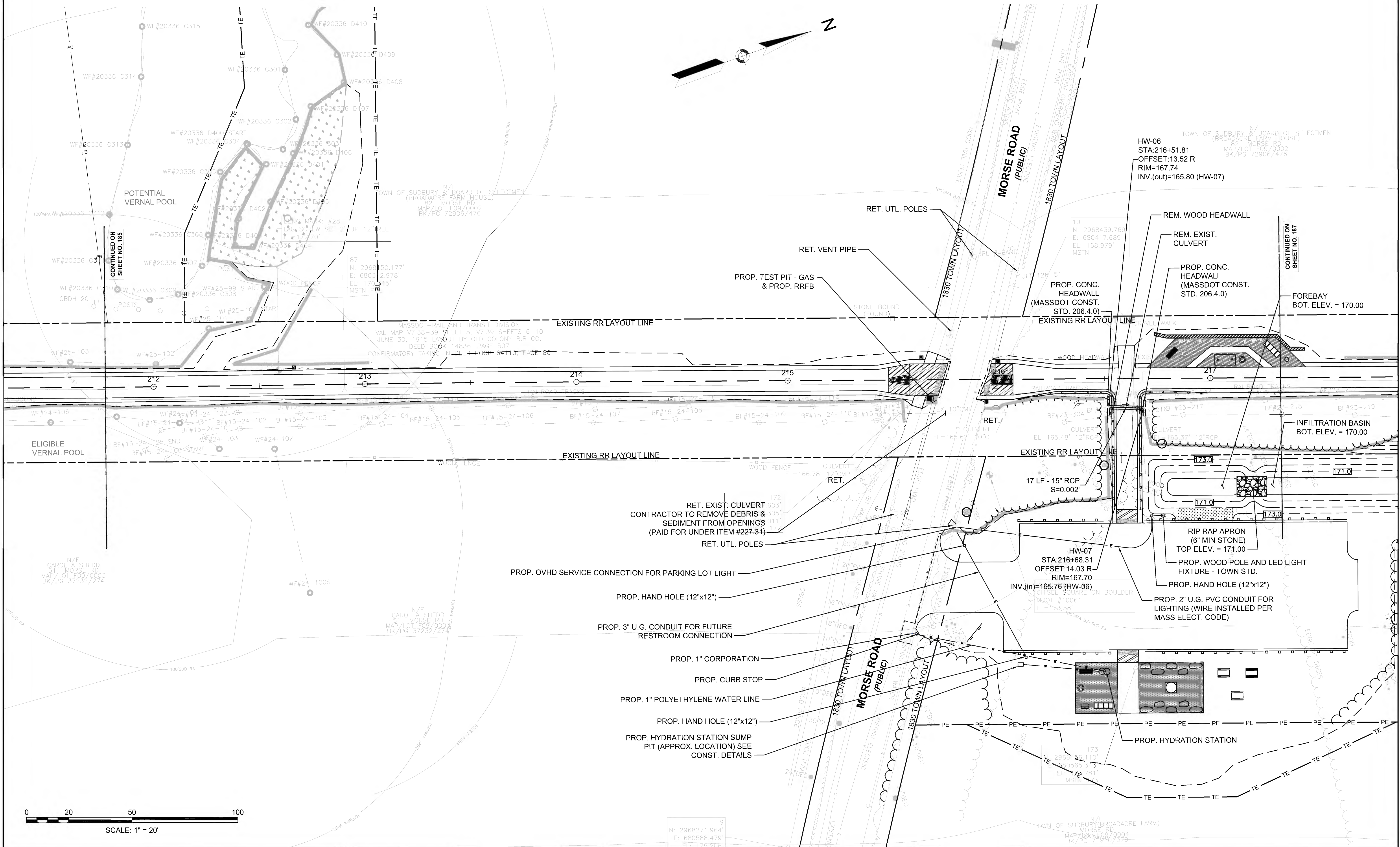
N/F  
CAROL A SHEDD  
51 MORSE RD  
MAP/LOT 009/0003  
BK/PG 37232/274



**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	186	319
PROJECT FILE NO.		608164	

**DRAINAGE & UTILITY PLANS**



N: 2968271.964  
E: 690588.479  
MSTN

N: 2968271.964  
E: 690588.479  
MSTN

CONTINUED ON  
SHEET NO. 185

CONTINUED ON  
SHEET NO. 187

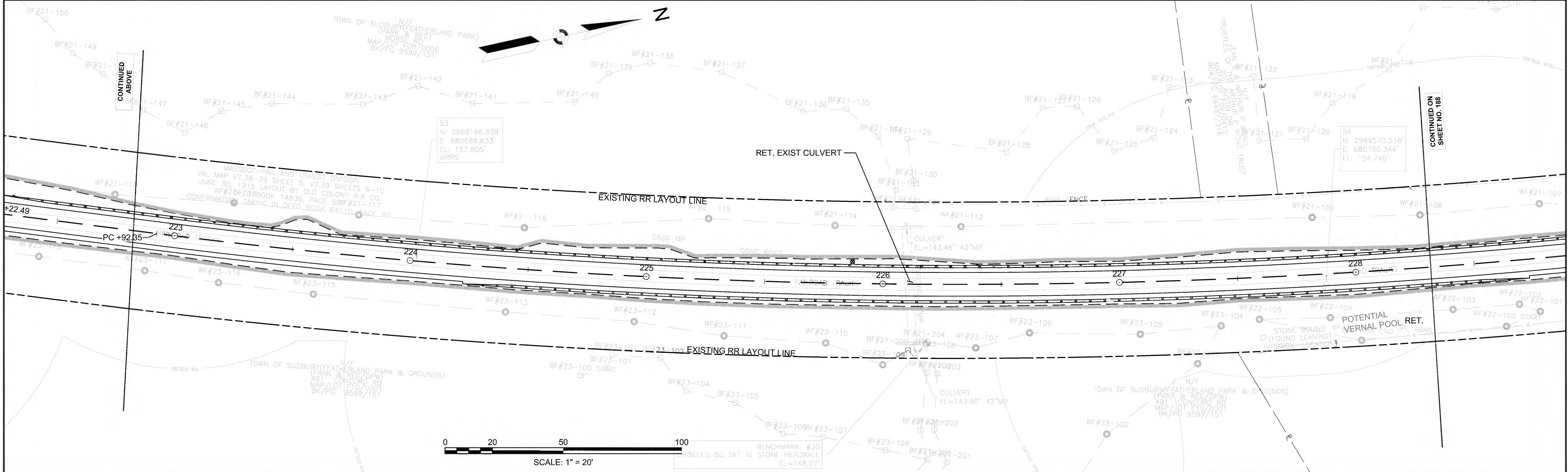
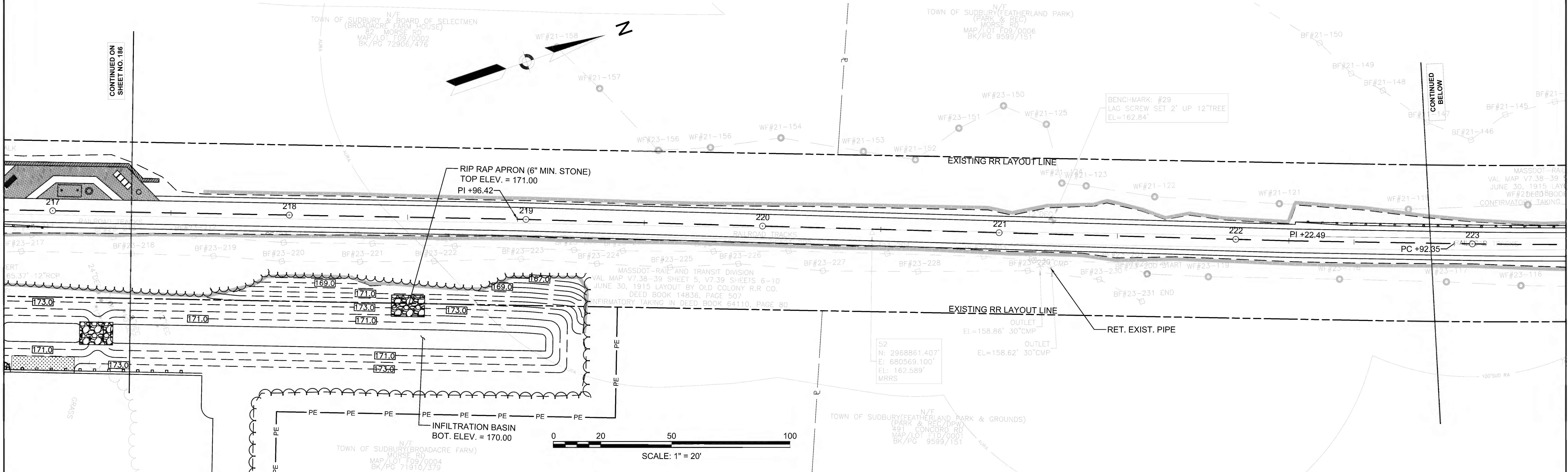
608164\_H0(DRAINAGE & UTILITY PLANS).DWG Plotted on 28-Jun-2022 9:51 AM



**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	187	319
PROJECT FILE NO.		608164	

**DRAINAGE & UTILITY PLANS**



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SHEET NO. 186

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BELOW

CONTINUED  
ABOVE

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SHEET NO. 188

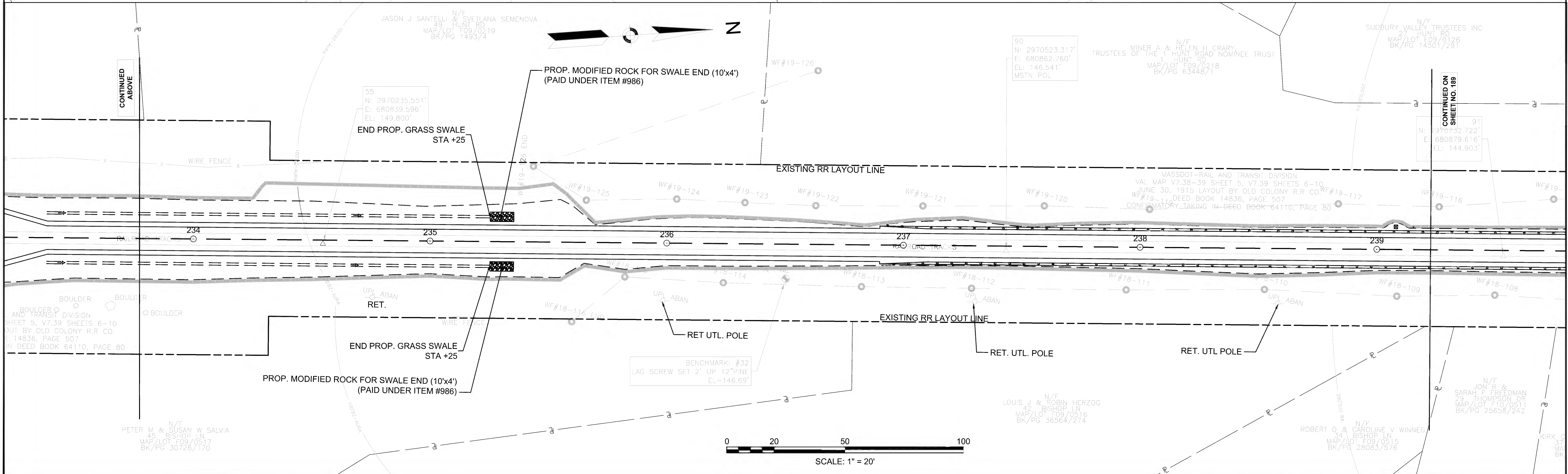
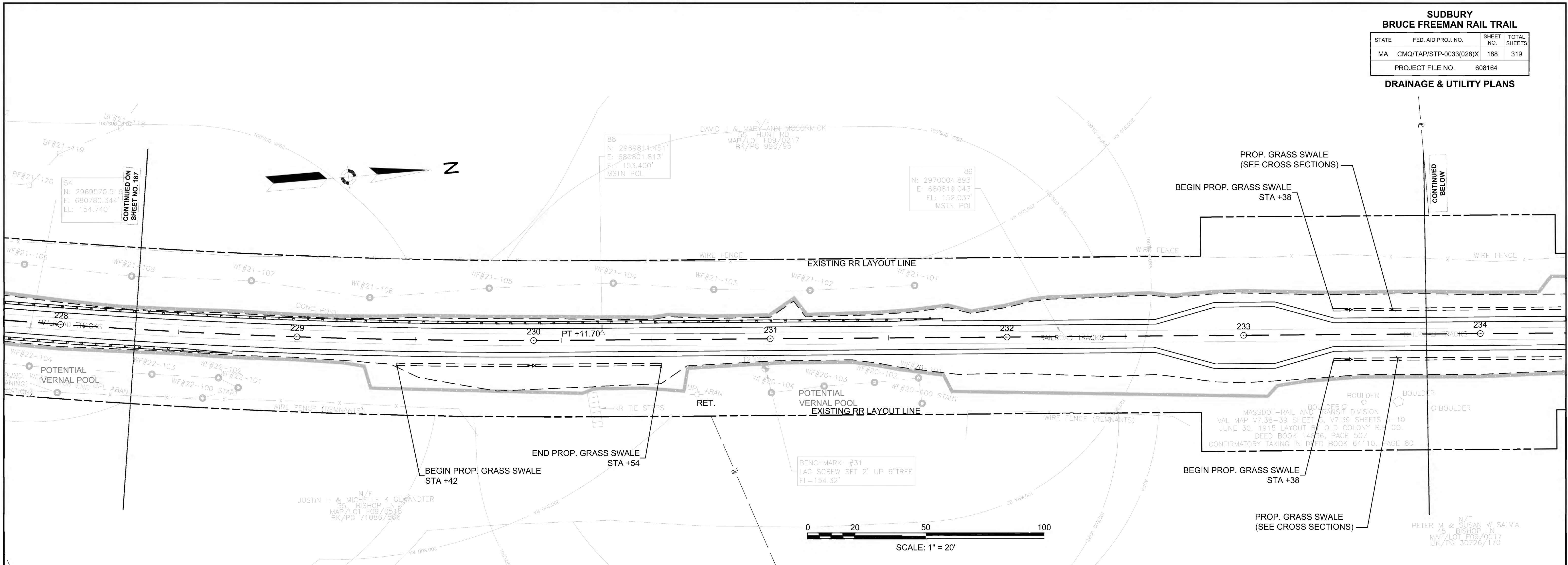


**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	188	319

PROJECT FILE NO. 608164

**DRAINAGE & UTILITY PLANS**

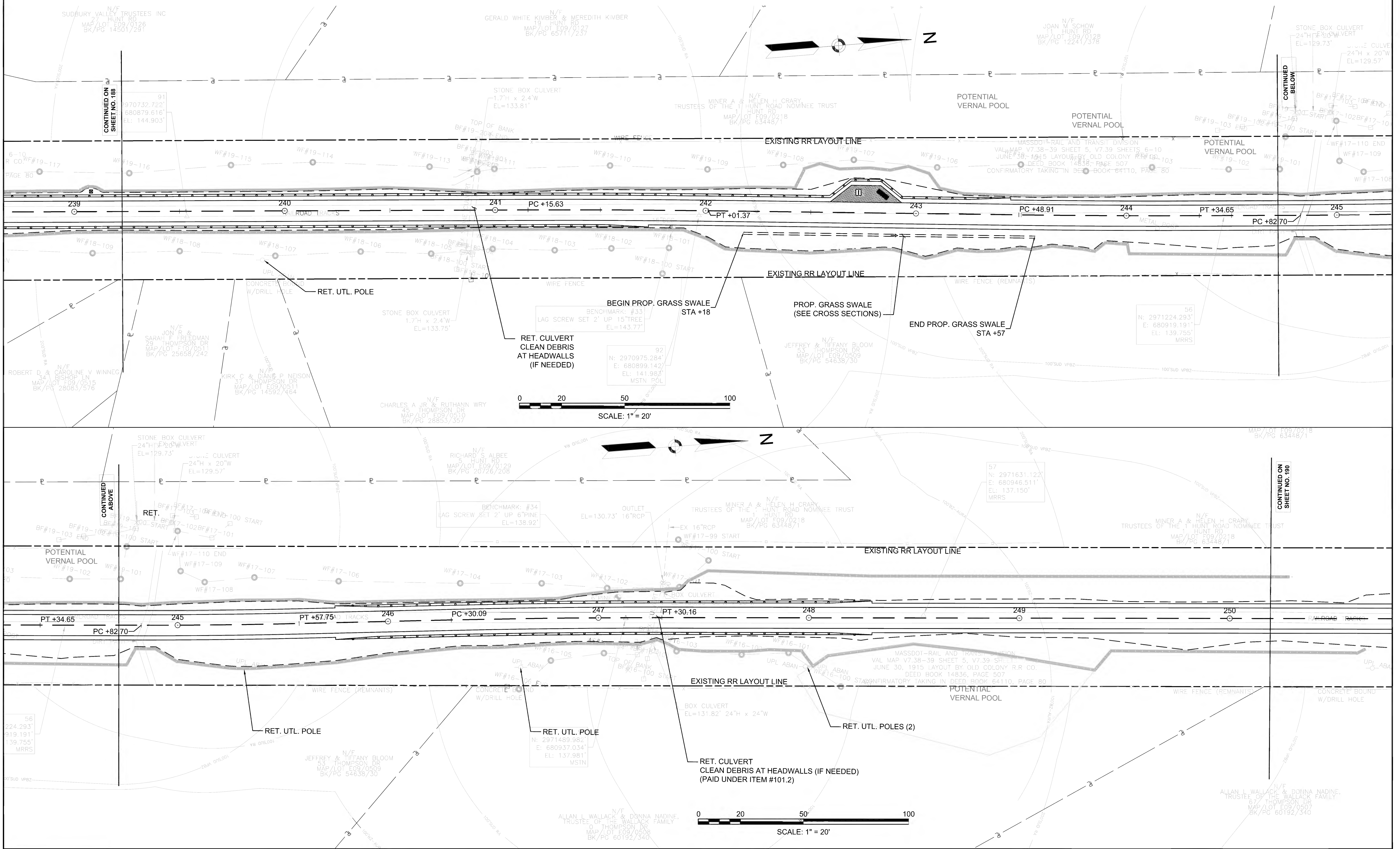




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	189	319
PROJECT FILE NO.		608164	

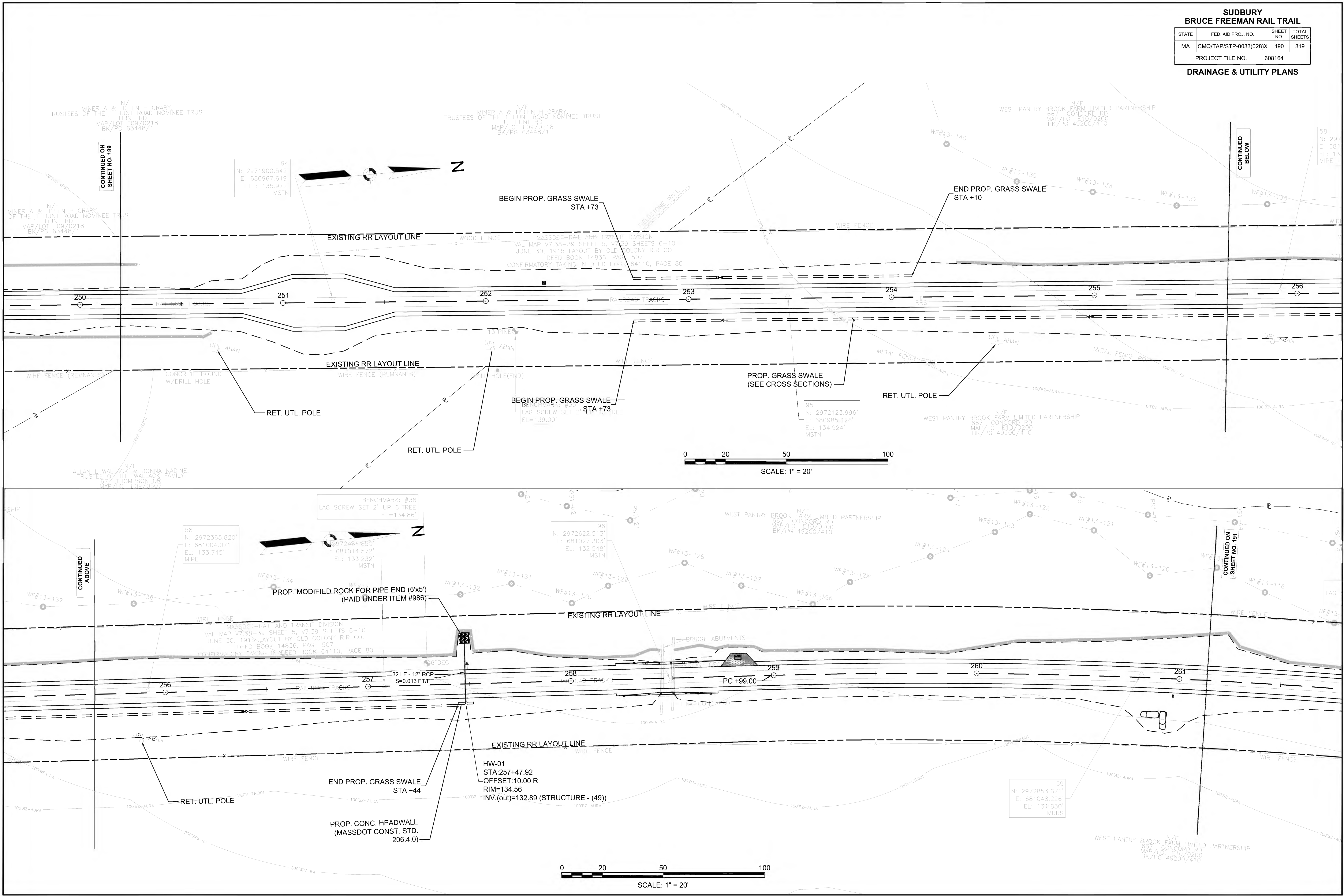
**DRAINAGE & UTILITY PLANS**



**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	190	319
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**DRAINAGE & UTILITY PLANS**

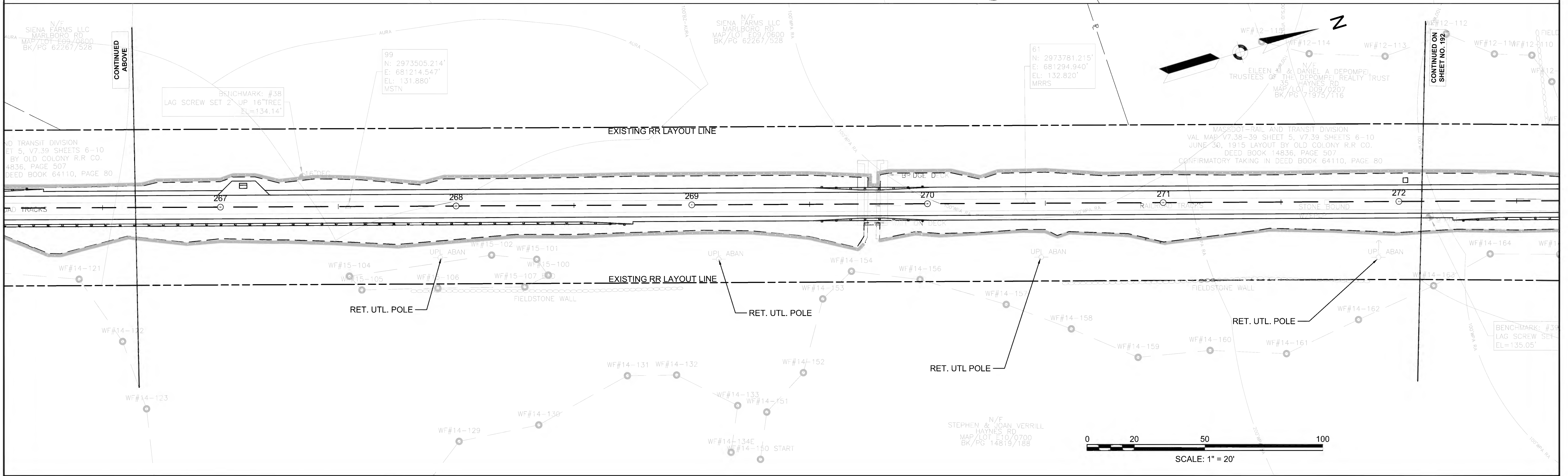
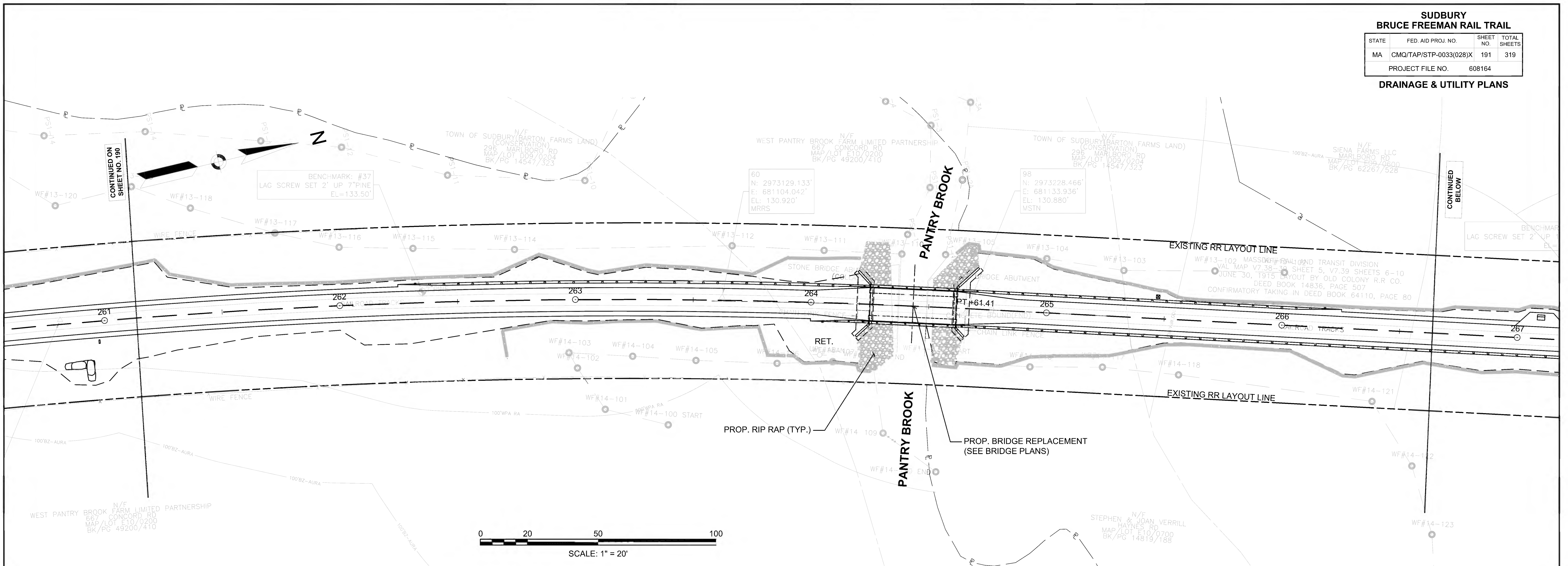




**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

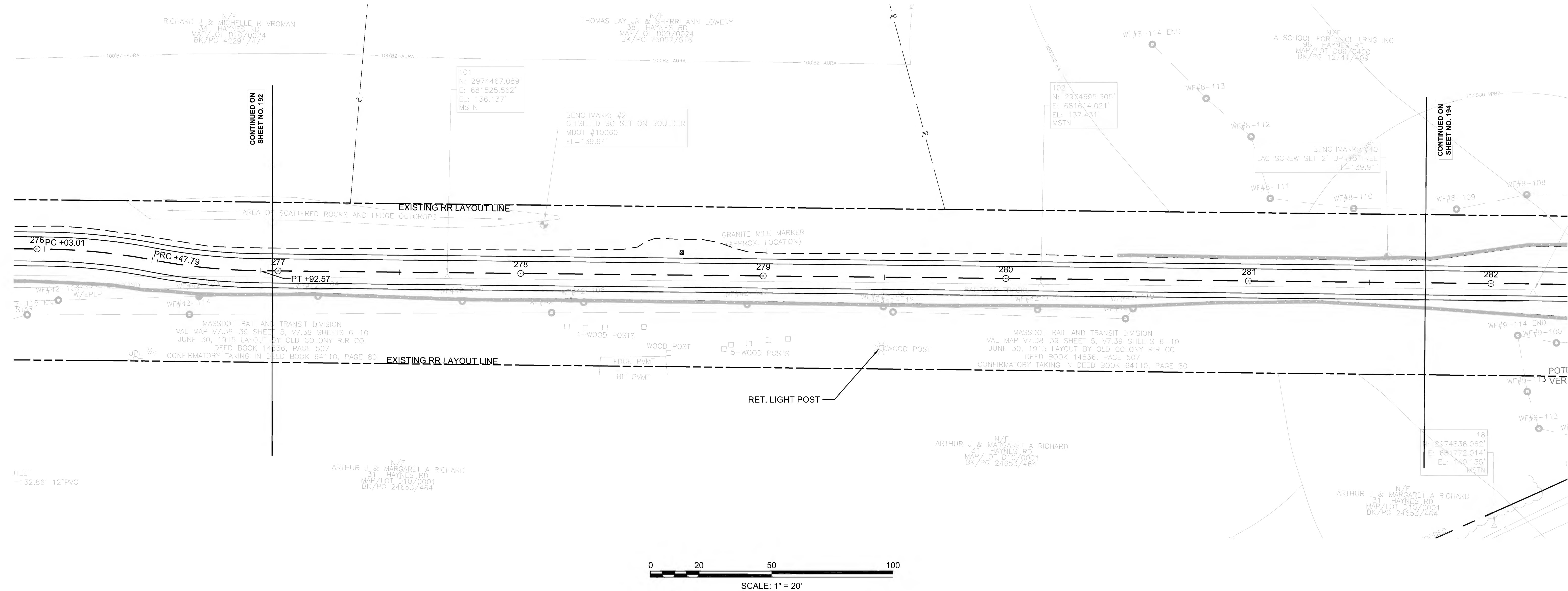
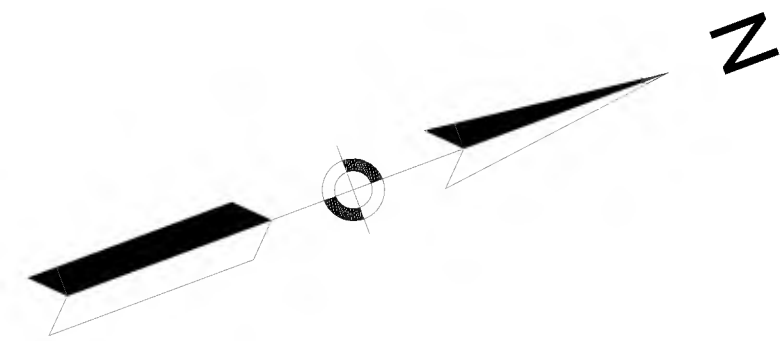
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MA	CMQ/TAP/STP-0033(028)X	191	319
PROJECT FILE NO.		608164	

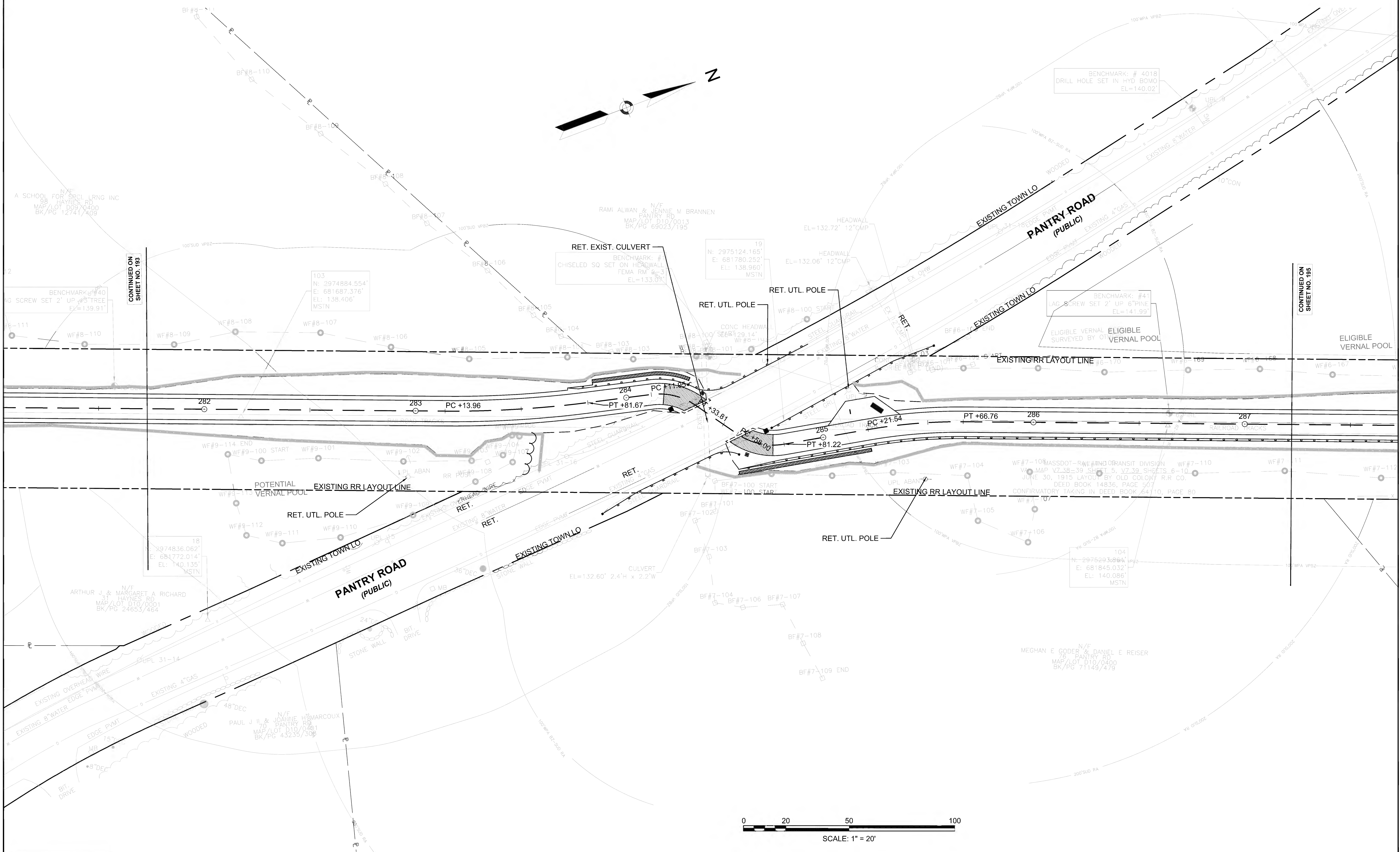
**DRAINAGE & UTILITY PLANS**





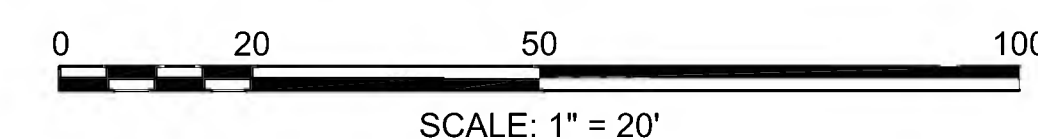






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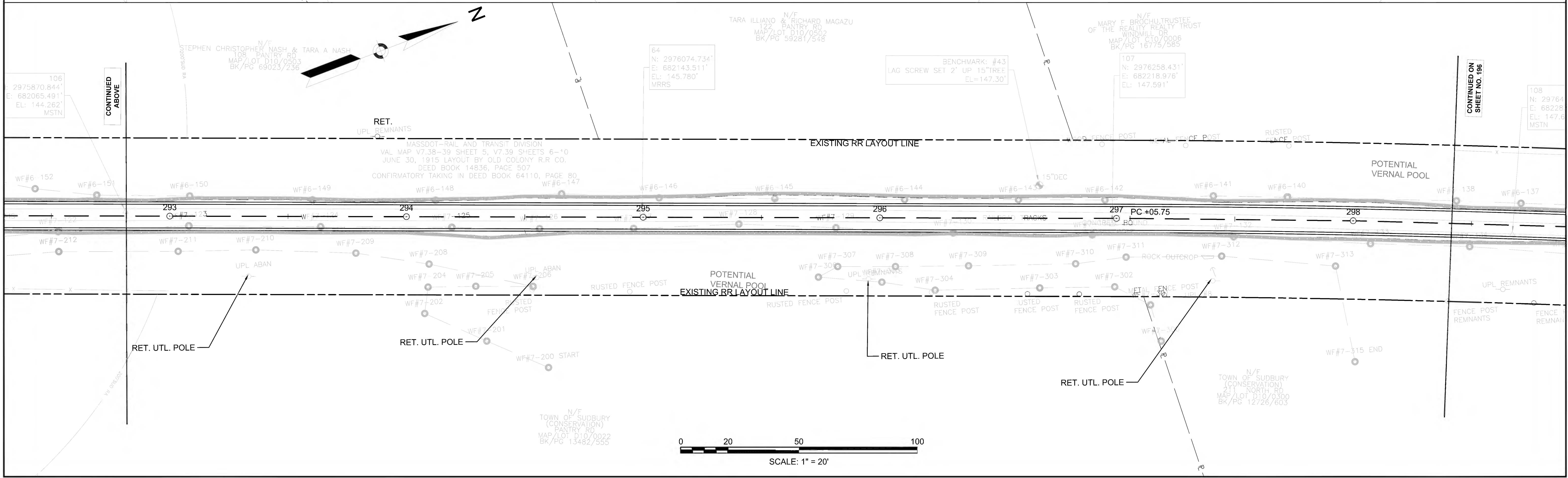
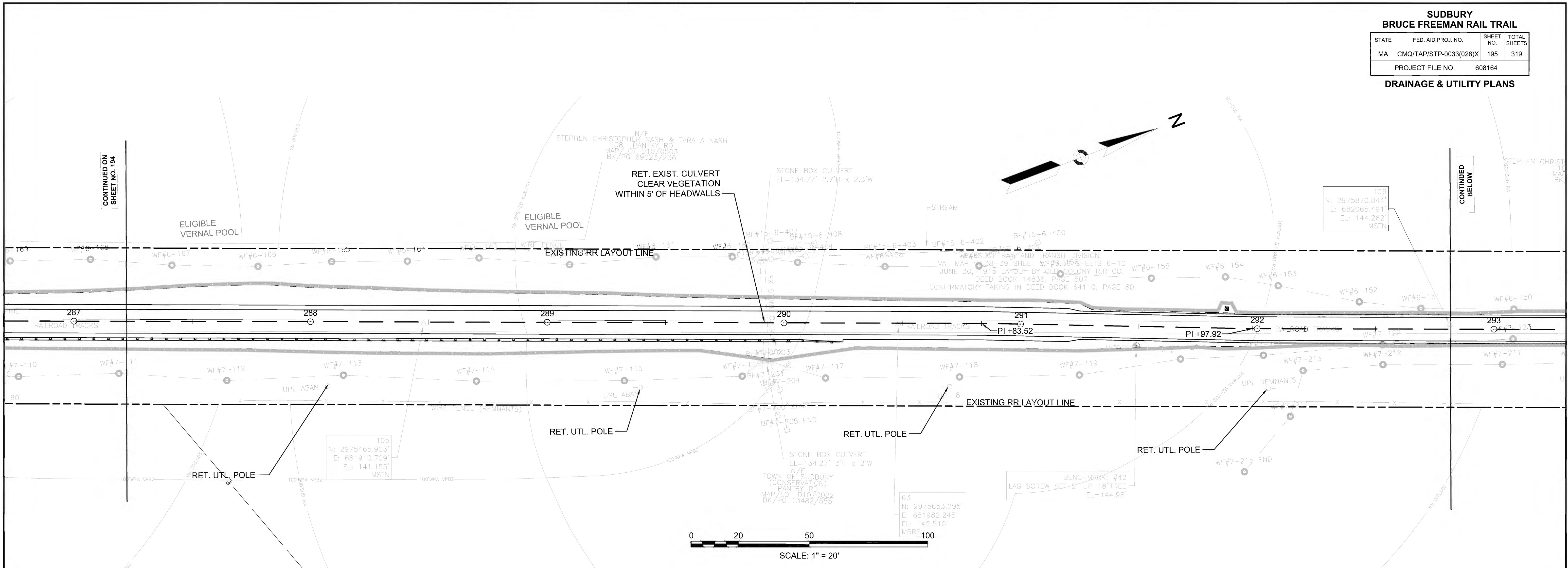




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BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	195	319
PROJECT FILE NO.		608164	

**DRAINAGE & UTILITY PLANS**



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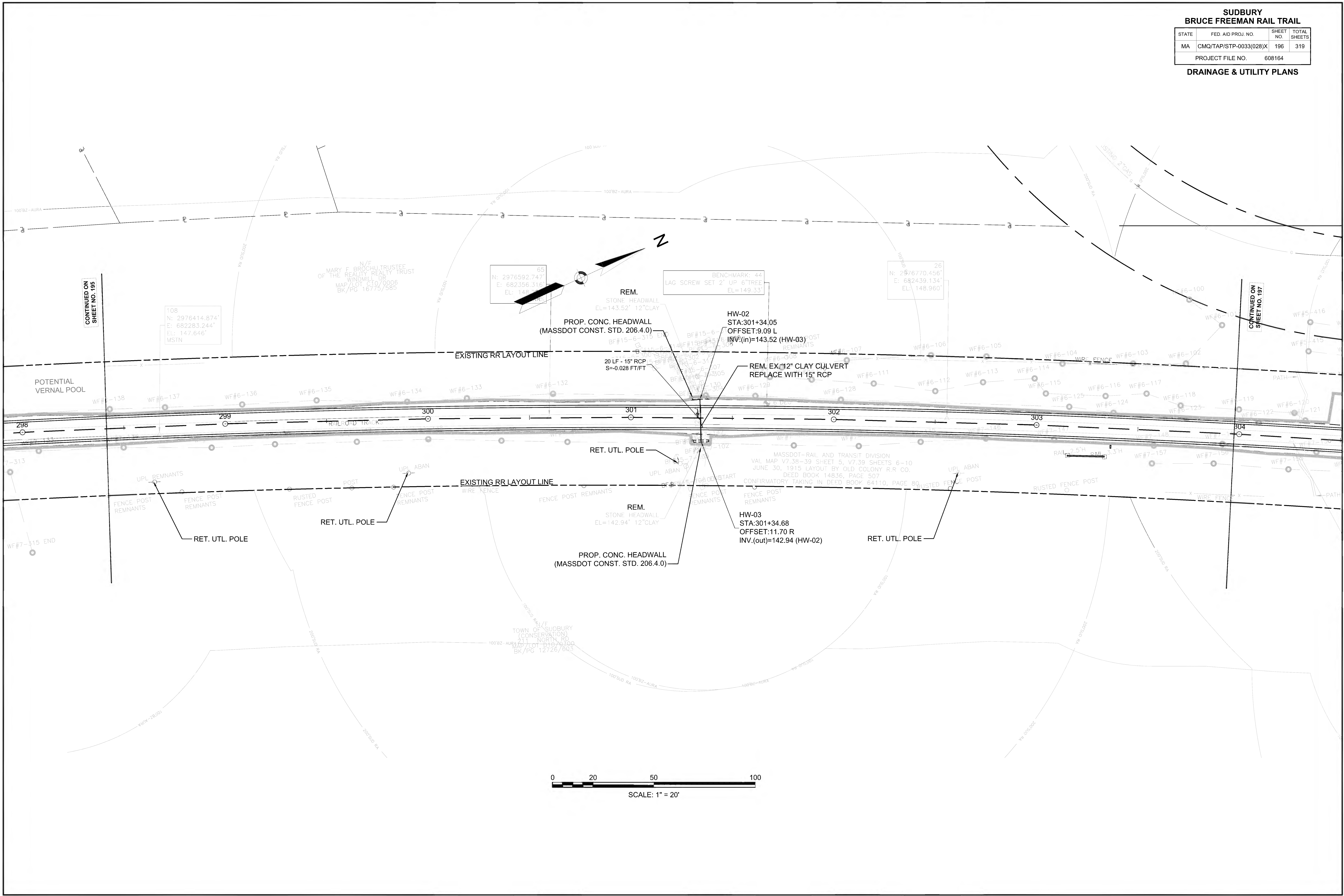
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BRUCE FREEMAN RAIL TRAIL**

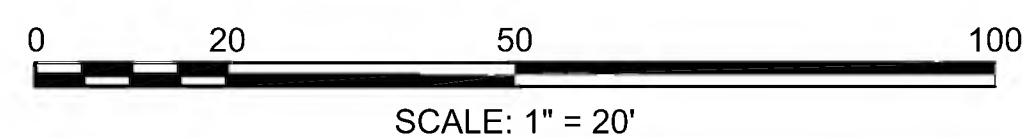
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MA	CMQ/TAP/STP-0033(028)X	196	319
PROJECT FILE NO.		608164	

**DRAINAGE & UTILITY PLANS**

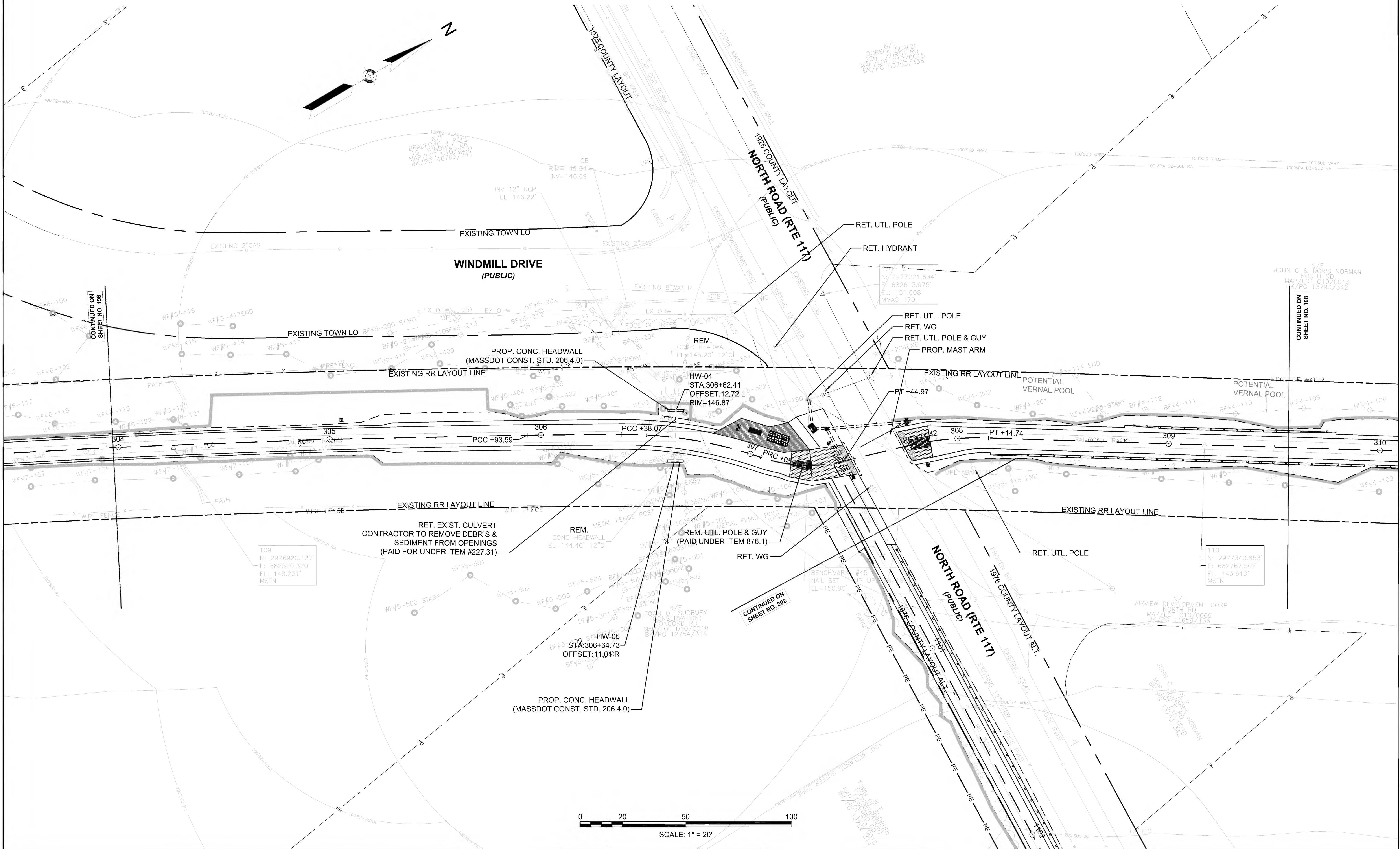


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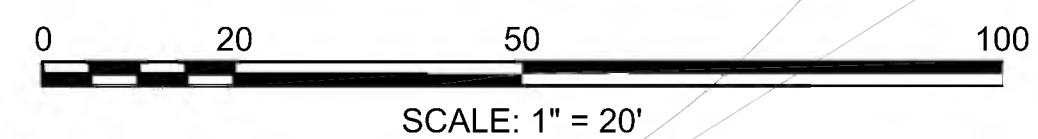




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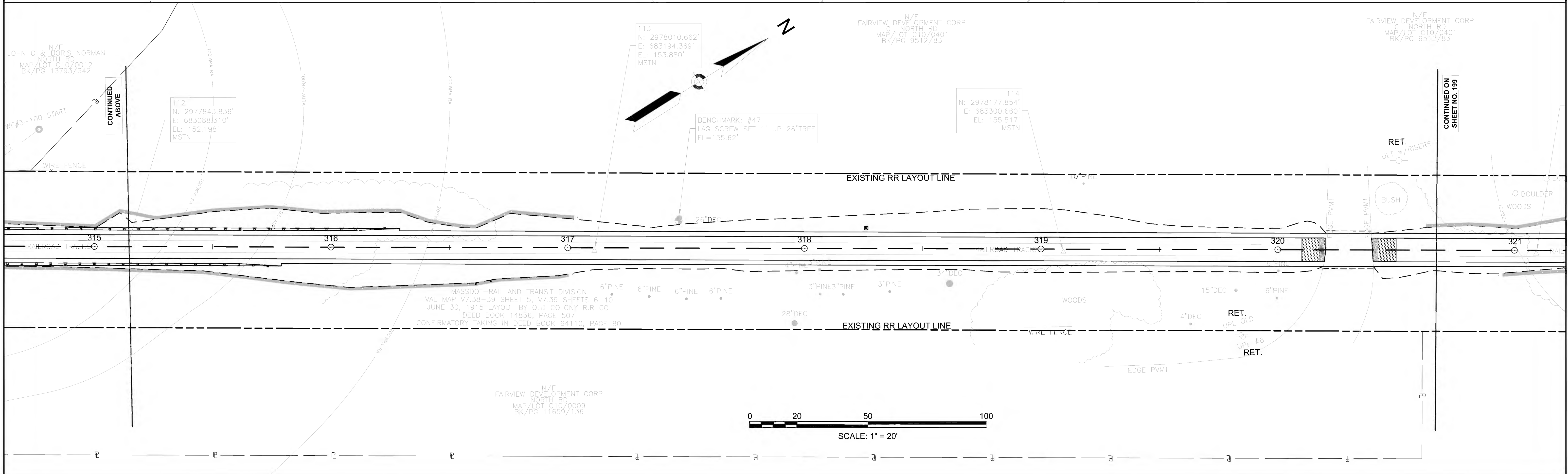
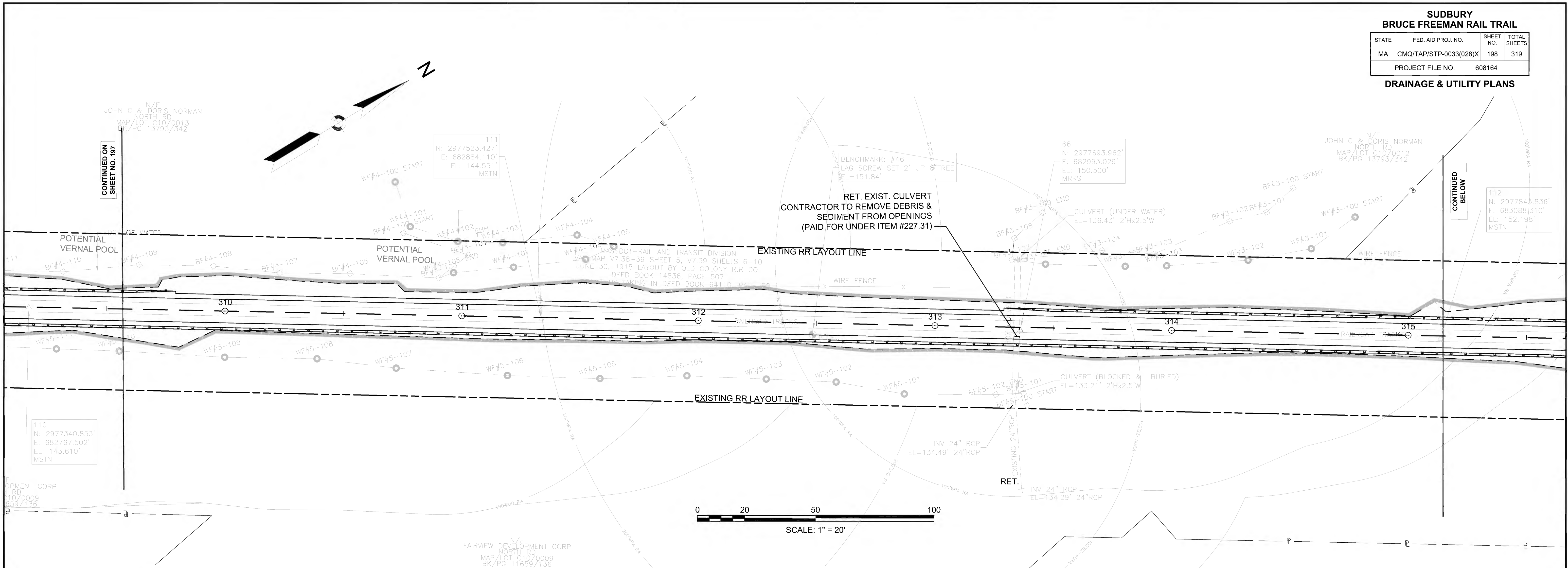
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**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	198	319
PROJECT FILE NO.		608164	

**DRAINAGE & UTILITY PLANS**



JOHN C & DORIS NORMAN  
NORTH RD  
MAP/LOT C10/0013  
BK/PG 13793/342

111  
N: 2977523.427'  
E: 682884.110'  
EL: 144.551'  
MSTN

BENCHMARK: #46  
LAG SCREW SET 2' UP 8" TREE  
EL=151.84'

66  
N: 2977693.962'  
E: 682993.029'  
EL: 150.500'  
MRRS

JOHN C & DORIS NORMAN  
NORTH RD  
MAP/LOT C10/0012  
BK/PG 13793/342

112  
N: 2977845.836'  
E: 683088.310'  
EL: 152.198'  
MSTN

110  
N: 2977340.853'  
E: 682767.502'  
EL: 143.610'  
MSTN

FAIRVIEW DEVELOPMENT CORP  
NORTH RD  
MAP/LOT C10/0009  
BK/PG 11659/136

FAIRVIEW DEVELOPMENT CORP  
NORTH RD  
MAP/LOT C10/0401  
BK/PG 9512/83

FAIRVIEW DEVELOPMENT CORP  
NORTH RD  
MAP/LOT C10/0401  
BK/PG 9512/83

JOHN C & DORIS NORMAN  
NORTH RD  
MAP/LOT C10/0012  
BK/PG 13793/342

112  
N: 2977845.836'  
E: 683088.310'  
EL: 152.198'  
MSTN

113  
N: 2978010.662'  
E: 683194.369'  
EL: 153.880'  
MSTN

BENCHMARK: #47  
LAG SCREW SET 1' UP 26" TREE  
EL=155.62'

114  
N: 2978177.854'  
E: 683300.660'  
EL: 155.517'  
MSTN

MASSDOT-RAIL AND TRANSIT DIVISION  
VAL MAP V7.38-39 SHEET 5, V7.39 SHEETS 6-10  
JUNE 30, 1915 LAYOUT BY OLD COLONY R.R. CO.  
DEED BOOK 14836, PAGE 507  
CONFIRMATORY TAKING IN DEED BOOK 64110, PAGE 80

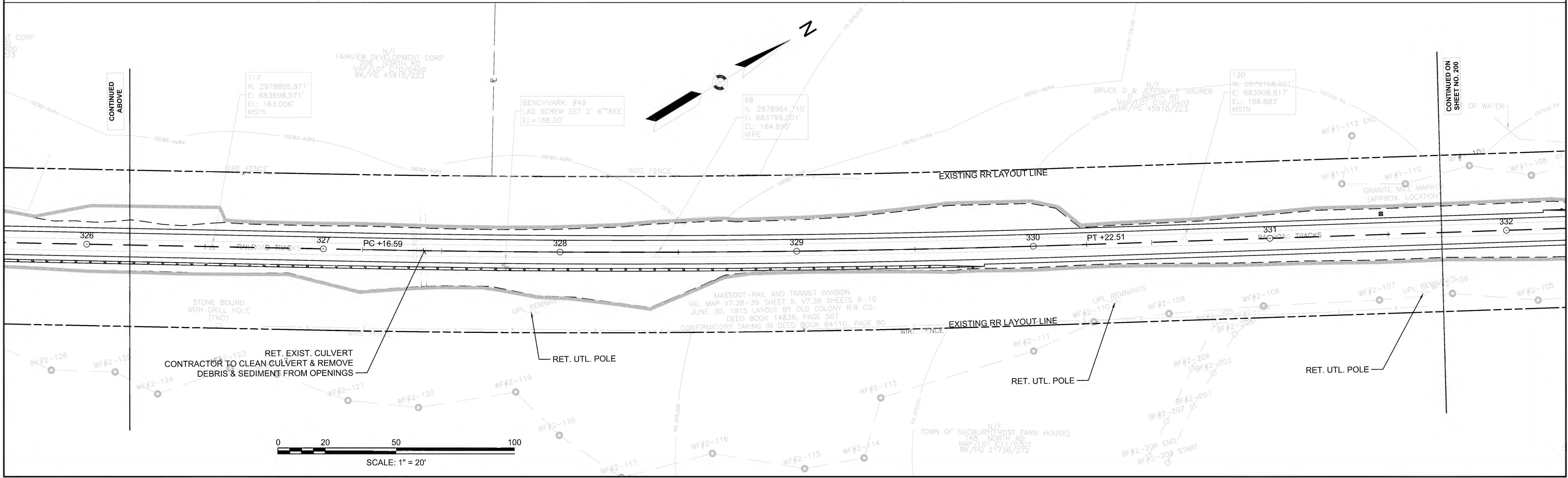
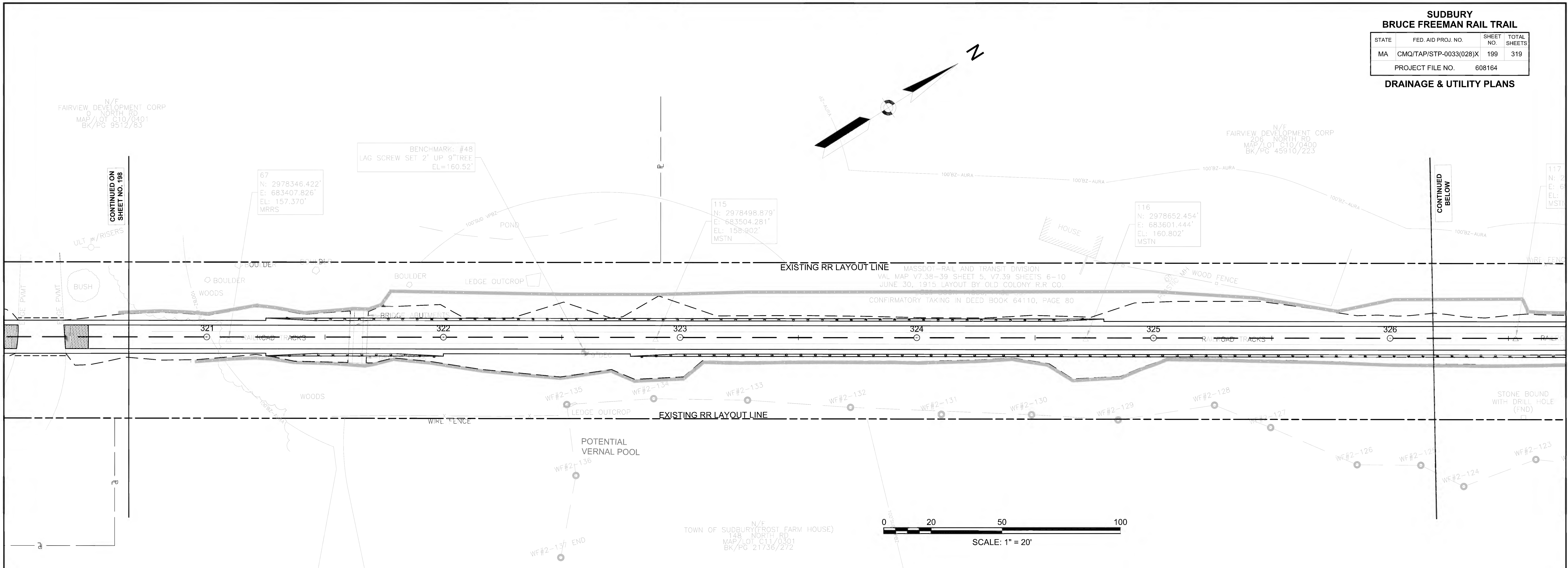
FAIRVIEW DEVELOPMENT CORP  
NORTH RD  
MAP/LOT C10/0009  
BK/PG 11659/136



**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

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PROJECT FILE NO.		608164	

**DRAINAGE & UTILITY PLANS**



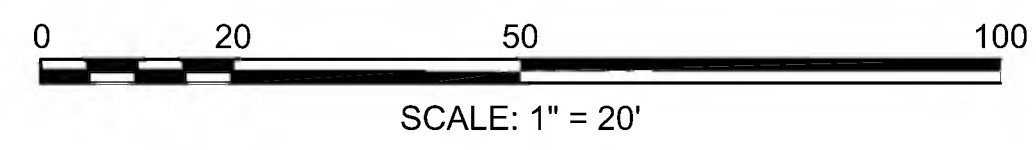
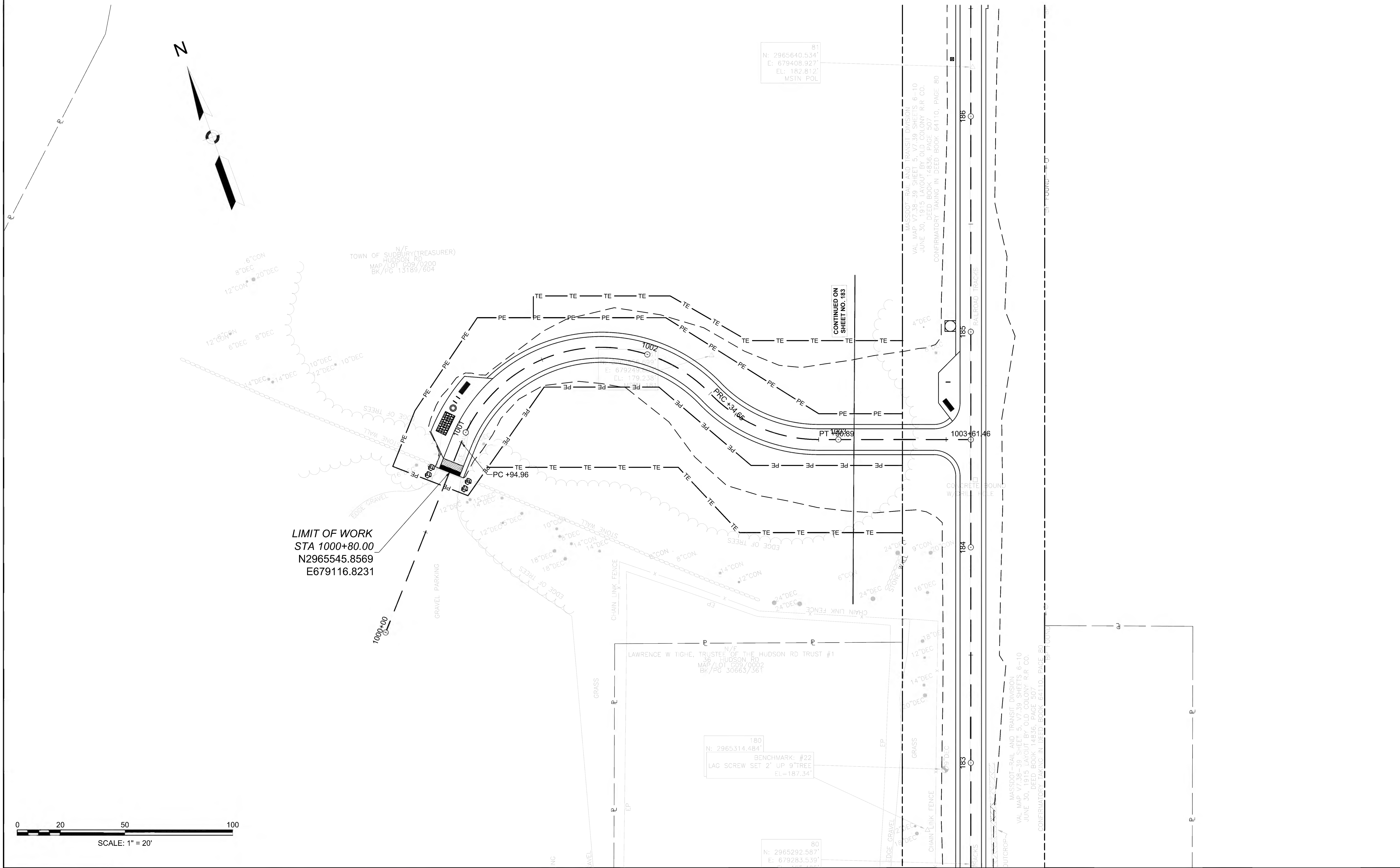




**SUDBURY  
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**DRAINAGE & UTILITY PLANS**



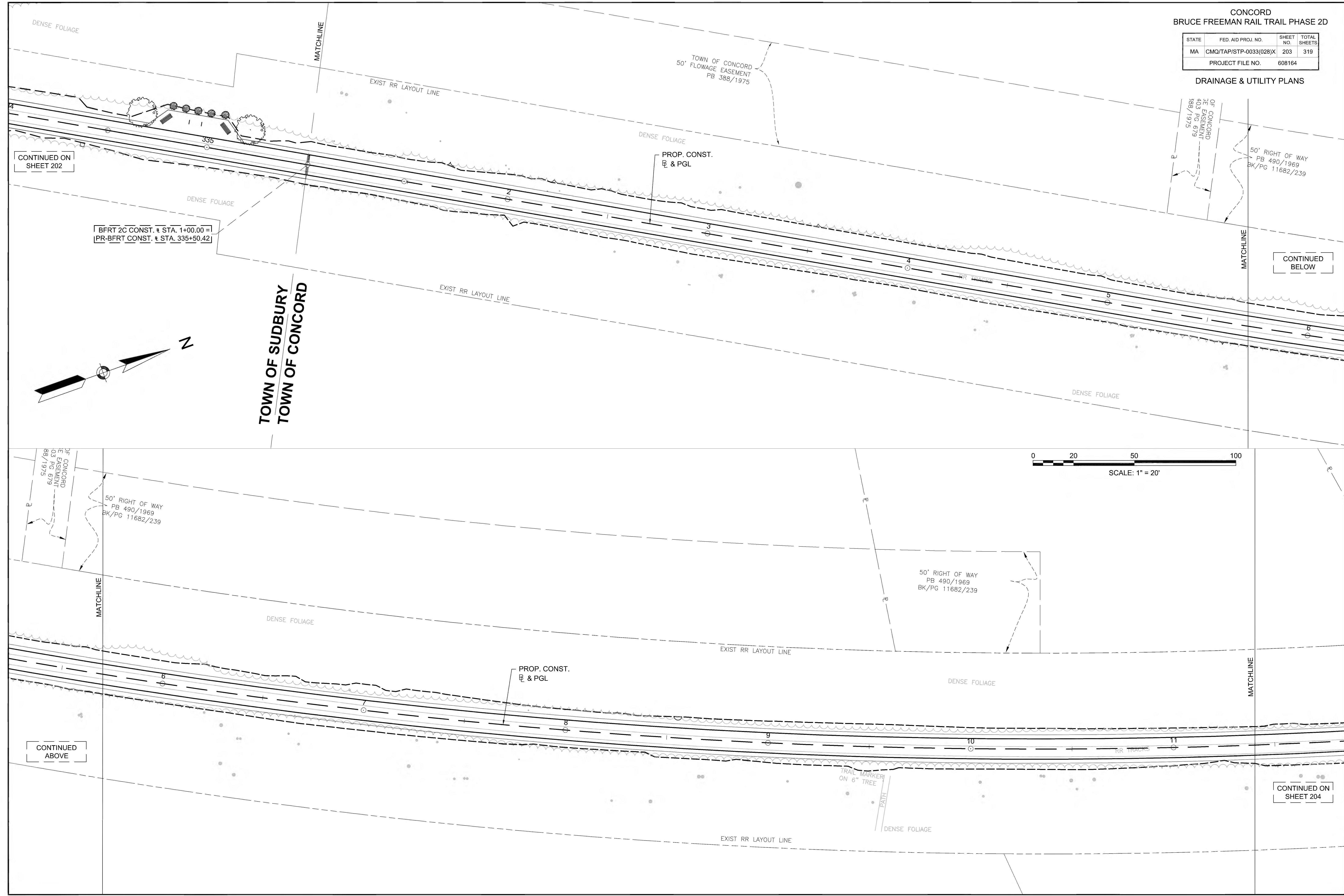




CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	203	319
PROJECT FILE NO.		608164	

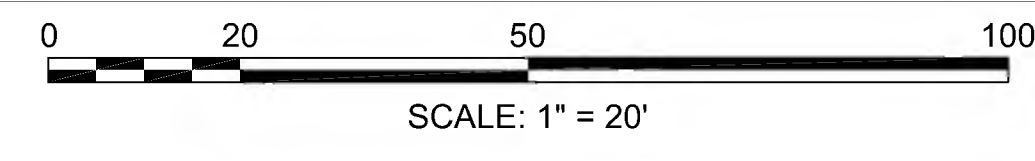
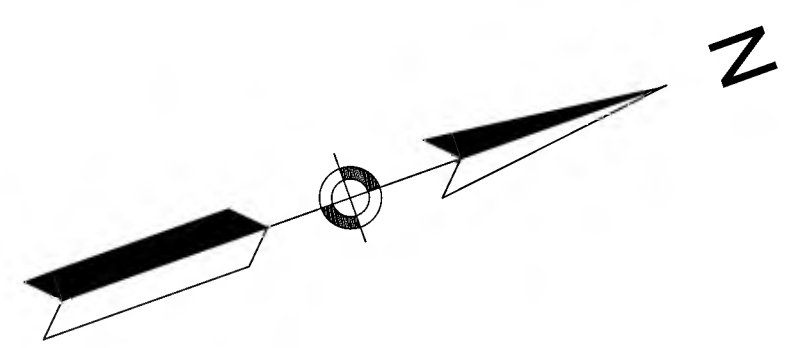
DRAINAGE & UTILITY PLANS



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BFRT 2C CONST. & STA. 1+00.00 =  
PR-BFRT CONST. & STA. 335+50.42

TOWN OF SUDBURY  
TOWN OF CONCORD



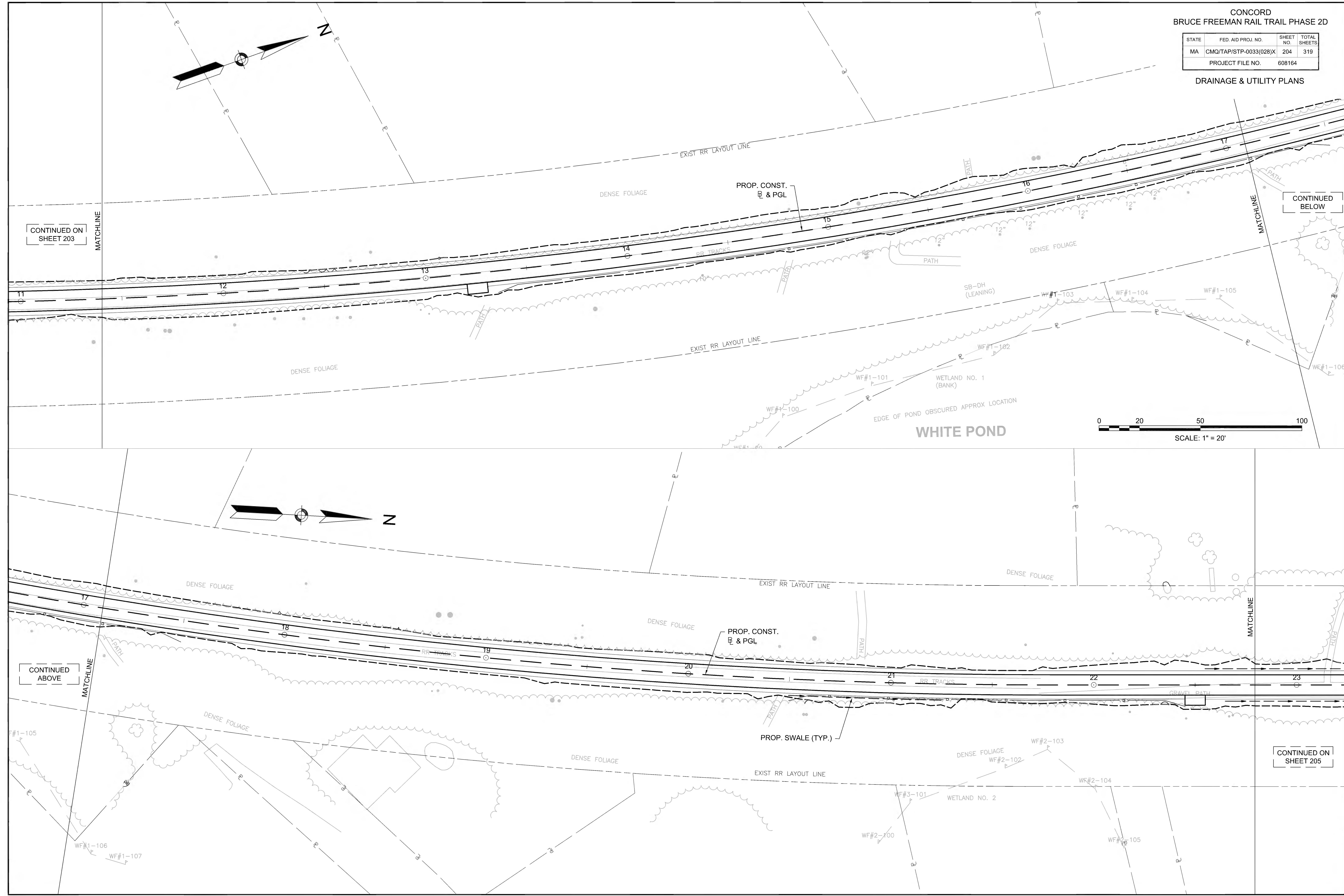
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CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	204	319
PROJECT FILE NO.		608164	

DRAINAGE & UTILITY PLANS

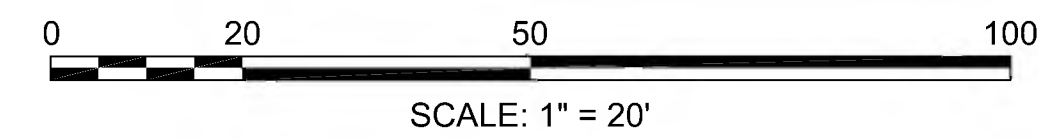


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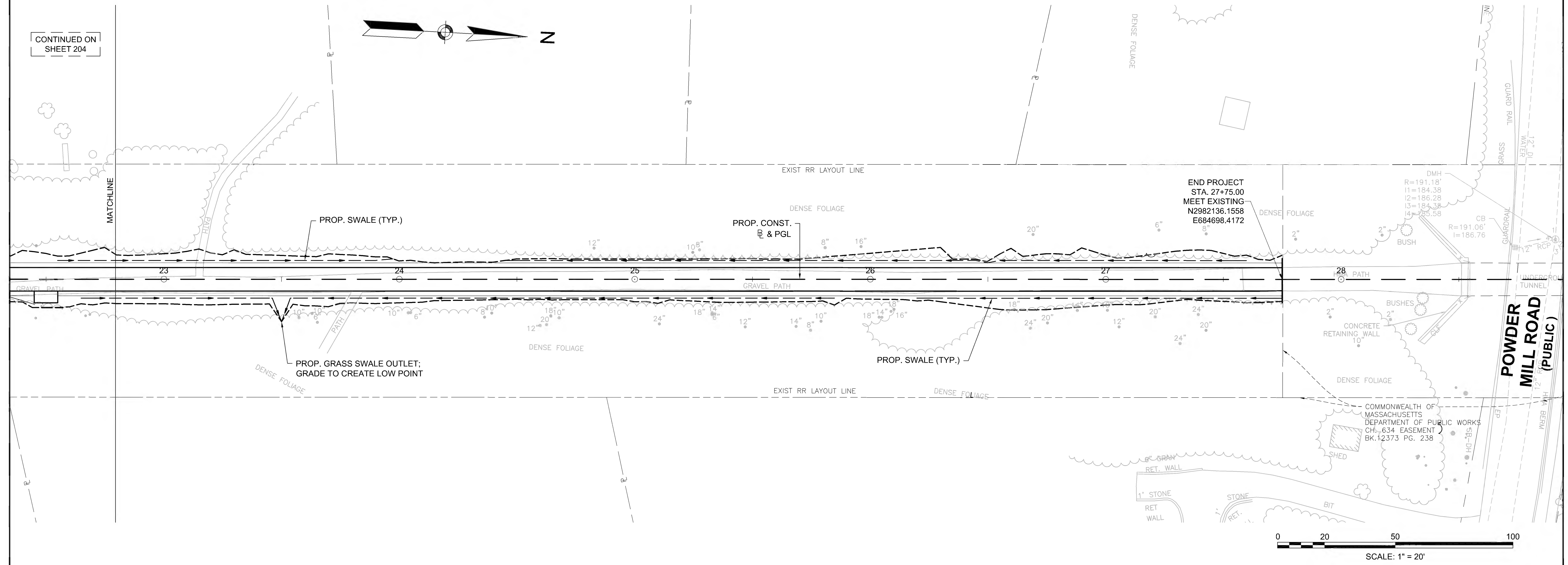
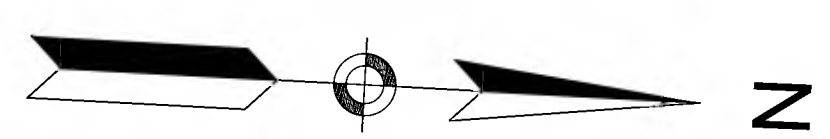


CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	205	319
PROJECT FILE NO.		608164	

DRAINAGE & UTILITY PLANS

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SHEET 204



**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	206	319
PROJECT FILE NO.		608164	

**WETLAND REPLICATION PLANS**

**WETLAND REPLICATION PLAN NOTES**

**GENERAL NOTES**

1. THE CONTRACTOR SHALL MAKE ALL NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN ALL NECESSARY PERMITS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL ALSO PAY ALL FEES AND POST ALL BONDS ASSOCIATED WITH THE SAME, AND COORDINATE WITH THE ENGINEER AND ARCHITECT AS REQUIRED.
2. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR JOB SITE SAFETY AND ALL CONSTRUCTION MEANS AND METHODS.
3. LIMIT OF WORK SHALL BE EROSION CONTROL BARRIERS, LIMIT OF GRADING AND SITE PROPERTY LINES AND/OR AS INDICATED ON DRAWINGS.
4. ANY ALTERATION TO THESE DRAWINGS MADE IN THE FIELD DURING CONSTRUCTION SHALL BE RECORDED BY THE CONTRACTOR ON RECORD DOCUMENTS.
5. ANY AREA OUTSIDE THE LIMIT OF WORK THAT IS DISTURBED SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO COST TO OWNER.
6. EXISTING TREES AND SHRUBS OUTSIDE THE LIMITS OF GRADING SHALL BE REMOVED ONLY UPON PRIOR APPROVAL OF THE OWNER.
7. FOR DRAWING LEGIBILITY, ALL EXISTING TOPOGRAPHIC FEATURES, EXISTING UTILITIES, PROPERTY BOUNDARIES, EASEMENTS, ETC. MAY NOT BE SHOWN ON ALL DRAWINGS. REFER TO ALL REFERENCED DRAWINGS AND OTHER DRAWINGS IN THIS SET FOR ADDITIONAL INFORMATION.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ALL PERMIT CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING, SECURING AND COMPLIANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) CONSTRUCTION GENERAL PERMIT, AS ADMINISTERED BY THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY.

**EROSION CONTROL AND SEDIMENTATION NOTES**

1. CONTRACTOR SHALL MAINTAIN ANY EROSION CONTROL MEASURES DURING THE ENTIRE CONSTRUCTION PERIOD.
2. ANY SEDIMENT TRACKED ONTO THE PUBLIC RIGHT-OF-WAYS SHALL BE SWEEPED AT THE END OF EACH WORKING DAY.
3. ALL DEBRIS GENERATED DURING SITE PREPARATION ACTIVITIES SHALL BE LEGALLY DISPOSED OF OFF SITE.
4. SITE ELEMENTS TO REMAIN MUST BE PROTECTED FOR DURATION OF PROJECT.
5. ADDITIONAL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED AS CONDITIONS WARRANT OR AS DIRECTED BY THE OWNER OR OWNER'S REPRESENTATIVE (E.G., PROFESSIONAL ENGINEER, WETLAND SCIENTIST, CERTIFIED ECOLOGICAL RESTORATION PRACTITIONER).
6. THE WETLAND REPLICATION SITE WILL BE ACCESSED FROM THE BRUCE FREEMAN RAIL TRAIL. ALL POINTS OF CONSTRUCTION EGRESS OR INGRESS SHALL BE MAINTAINED TO PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADS.
7. EXTREME CARE SHALL BE EXERCISED SO AS TO PREVENT ANY UNSUITABLE MATERIAL FROM ENTERING WETLAND LOCATED OUTSIDE THE LIMIT OF WORK AND OFF PROPERTY.
8. ADDITIONAL EROSION CONTROLS SHALL BE LOCATED AS CONDITIONS WARRANT OR AS DIRECTED BY THE OWNER OR THEIR REPRESENTATIVE.

**LAYOUT AND MATERIALS NOTES**

1. ALL LINES AND DIMENSIONS ARE PARALLEL OR PERPENDICULAR TO THE LINES FROM WHICH THEY ARE MEASURED UNLESS OTHERWISE INDICATED.
2. CONTRACTOR SHALL REPORT SIGNIFICANT CONFLICTS TO THE OWNER AND THE ENGINEER FOR RESOLUTION.
3. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN SITE PLAN DIMENSIONS AND BUILDING PLANS BEFORE PROCEEDING WITH ANY PORTION OF SITE WORK WHICH MAY BE AFFECTED SO THAT PROPER ADJUSTMENTS TO THE SITE LAYOUT CAN BE MADE IF NECESSARY.
4. PROTECT EXISTING PROPERTY MONUMENTS AND ABUTTING PROPERTIES DURING CONSTRUCTION ACTIVITIES.

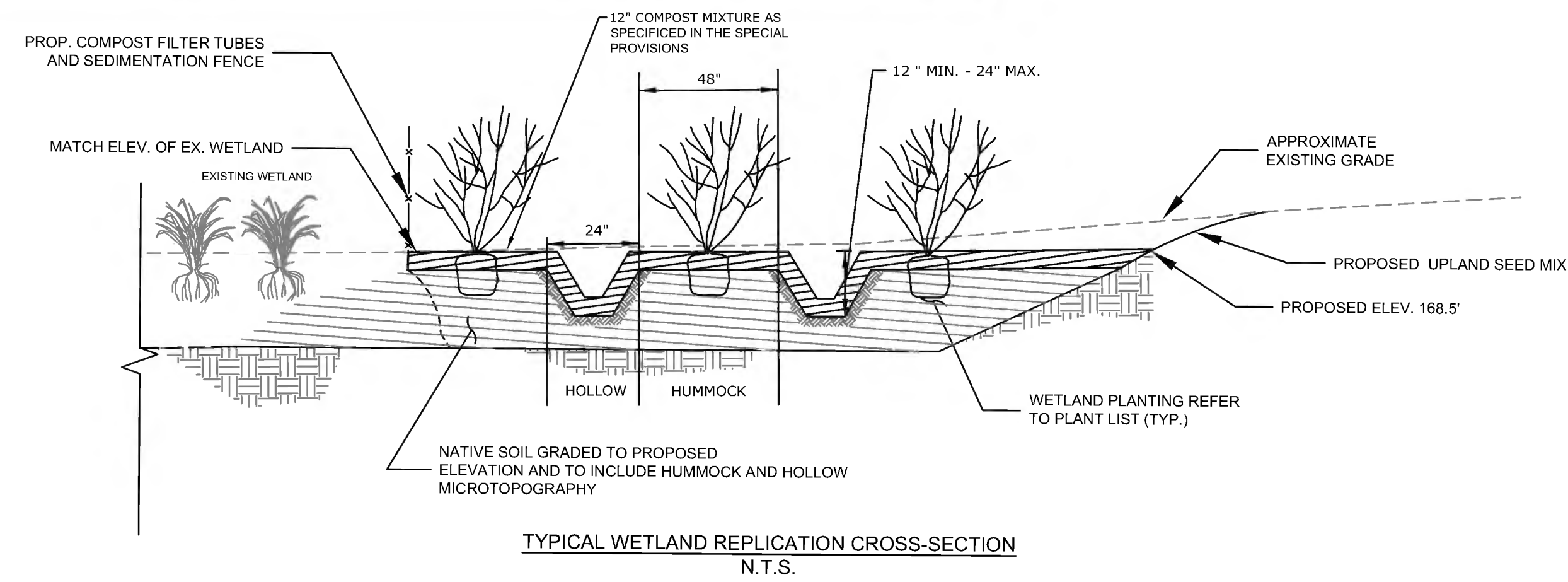
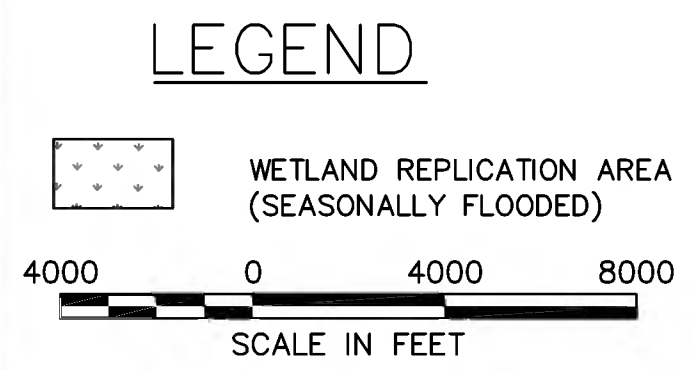
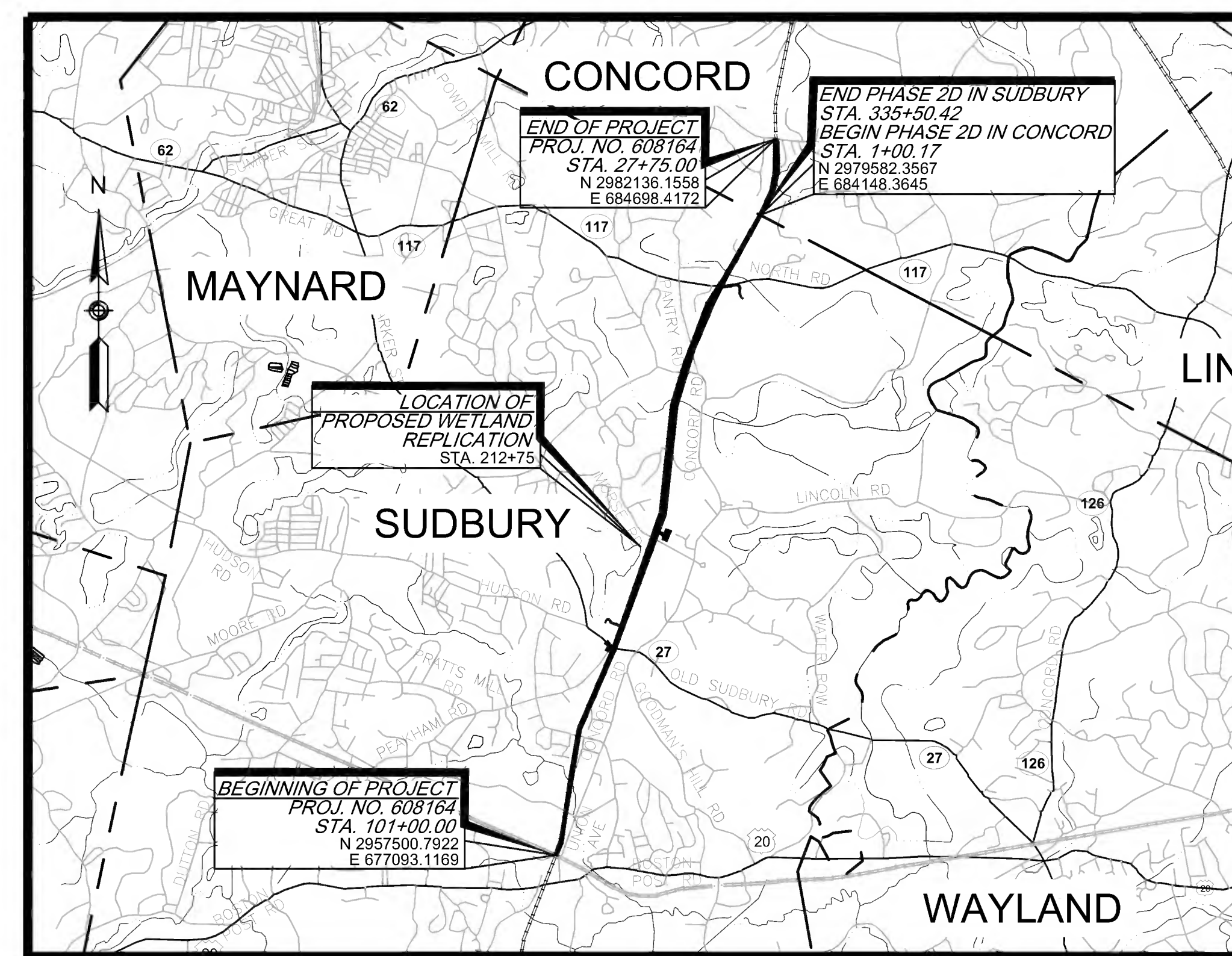
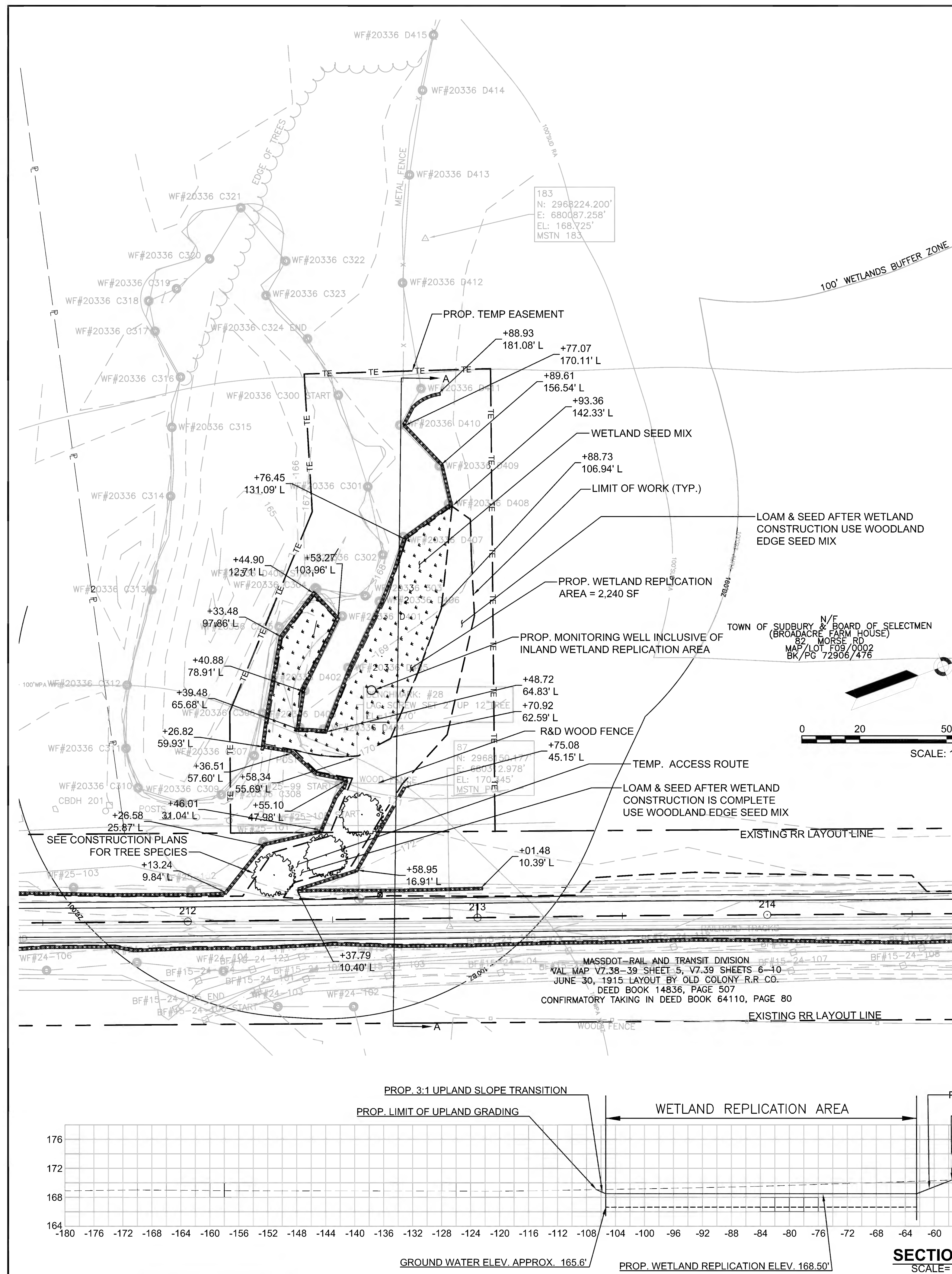
**GRADING, DRAINAGE AND UTILITY NOTES**

1. UNDERGROUND UTILITIES WERE COMPILED FROM AVAILABLE RECORD PLANS OF UTILITY COMPANIES AND PUBLIC AGENCIES, ARE APPROXIMATE AND ASSUMED. BEFORE COMMENCING SITE WORK IN ANY AREA, CONTACT "DIG SAFE" AT 1-888-344-7233 AND THE OWNER TO ACCURATELY LOCATE UNDERGROUND UTILITIES. ANY DAMAGE TO EXISTING UTILITIES OR STRUCTURES SHALL BE THE CONTRACTOR'S RESPONSIBILITY. NO EXCAVATION SHALL BE DONE UNTIL UTILITY COMPANIES AND THE OWNER ARE PROPERLY NOTIFIED IN ADVANCE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS DO NOT CONFLICT WITH ANY KNOWN EXISTING OR OTHER PROPOSED IMPROVEMENTS. IF ANY CONFLICTS ARE DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE ENGINEER PRIOR TO INSTALLATION OF ANY PORTION OF THE SITE WORK WHICH WOULD BE AFFECTED.
3. ALL WORK PERFORMED AND ALL MATERIALS FURNISHED SHALL CONFORM WITH THE LINES, GRADES AND OTHER SPECIFIC REQUIREMENTS OR SPECIFICATIONS FOR THE PROJECT AS SHOWN ON THE PLANS.
4. THE CONTRACTOR SHALL VERIFY EXISTING GRADES IN THE FIELD AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE ENGINEER OR CERTIFIED ECOLOGICAL RESTORATION PRACTITIONER. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES, AS REQUIRED. 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 OWNER AND ENGINEER FOR RESOLUTION.
5. THE CONTRACTOR SHALL REMOVE ALL EROSION CONTROL BARRIERS AFTER REVEGETATION OF DISTURBED AREAS AND AFTER APPROVAL OF THE CONSERVATION COMMISSION AND WETLAND SPECIALIST OR CERTIFIED ECOLOGICAL RESTORATION PRACTITIONER.
6. PITCH EVENLY BETWEEN SPOT GRADES.

**WETLAND CONSTRUCTION NOTES**

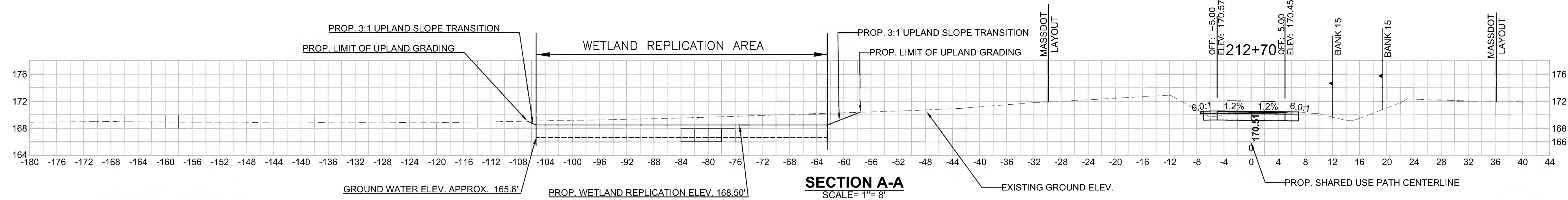
1. A PRECONSTRUCTION MEETING SHALL BE HELD BEFORE INITIATING CONSTRUCTION. THE PRECONSTRUCTION MEETING SHALL BE ATTENDED BY THE DESIGNATED PROFESSIONAL WETLAND SCIENTIST, SITE ENGINEER, CONSTRUCTION GENERAL MANAGER, SITE CONTRACTOR, LANDSCAPE CONTRACTOR, AND ANY OTHER CONTRACTOR INVOLVED IN THE REPLICATION ACTIVITY.
2. WETLAND REPLICATION SHALL BE CONDUCTED IN ACCORDANCE WITH THESE DRAWINGS, SPECIAL PROVISIONS AND REQUIREMENTS OUTLINED IN THE ORDER OF CONDITIONS AS ISSUED BY THE TOWN OF SUDBURY CONSERVATION COMMISSION.
3. ALL EXISTING WETLAND DELINEATION WITHIN 100 FEET OF THE WORK AREA WILL BE RE-FLAGGED EVERY 25 FEET.
4. EROSION CONTROLS SHALL BE INSTALLED PER EROSION CONTROL PLAN, REPAIRED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD OF WETLAND MITIGATION AND UNTIL THE SITE IS FULLY STABILIZED BY VEGETATION (SEED MIX). EROSION CONTROLS SHALL THEN BE REMOVED FROM THE SITE.
5. A WETLAND SCIENTIST SHALL BE ON SITE TO MONITOR PLANTING AND GRADING OF THE WETLAND REPLICATION AREA TO ENSURE COMPLIANCE WITH APPROVED PLANS.
6. INVASIVE NON-NATIVE PLANT SPECIES IN OR IMMEDIATELY ADJACENT TO REPLICATION AREA SHALL BE IDENTIFIED AND TAGGED FOR ERADICATION OR REMOVAL. REMOVED INVASIVE PLANT MATERIAL SHALL BE DISPOSED OF AT AN APPROVED OFF-SITE LOCATION.
7. IF USED, HERBICIDE SELECTION AND TIMING FOR INVASIVE SPECIES CONTROL SHALL BE APPROVED BY A PROFESSIONAL WETLAND SCIENTIST OR OTHER QUALIFIED PROFESSIONAL.
8. IF USED, HERBICIDE APPLICATION FOR INVASIVE SPECIES CONTROL SHALL BE PERFORMED BY A PROFESSIONAL CERTIFIED BY THE STATE OF MASSACHUSETTS. DOCUMENTATION OF CERTIFICATION SHALL BE SUBMITTED TO THE SITE CONSTRUCTION GENERAL MANAGER.
9. GRADING AND PLANTINGS WILL NOT BE CONDUCTED DURING PERIODS OF HIGH WATER. CONSTRUCTION OF THE REPLICATION AREA WILL CONTINUE UNINTERRUPTED TO AVOID EROSION AND THE SILTATION OF WETLANDS.
10. COMPACTION OF SOILS IN THE WETLAND REPLICATION AREA SHALL BE MINIMIZED TO THE MAXIMUM EXTENT PRACTICABLE BY THE USE OF LOW-GROUND PRESSURE MACHINERY.
11. SHOULD COMPACTION OCCUR, SOILS SHALL BE TILLED OR DISKED IN TWO DIRECTIONS TO RE-FRACTURE A MINIMUM OF TWELVE (12) INCHES BELOW FINISHED GRADE.
12. BURIED ORGANIC WETLAND SOILS ENCOUNTERED DURING EXCAVATION MAY BE LEFT IN PLACE. IF TEMPORARY STOCKPILING OF WETLAND SOIL IS NECESSARY, MATERIAL MUST BE COVERED TO PREVENT LEACHING, MOISTURE LOSS AND SEDIMENT TRANSPORT.
13. GRADING LINES DEPICTED ON THE PLAN ARE DRAWN SMOOTHLY. ACTUAL SURFACE GRADES ACROSS WETLAND 'FLOOR' SHALL REFLECT HUMMOCK AND HOLLOW TOPOGRAPHY OF NATURAL WETLANDS.
14. THE SUBGRADE OF WETLAND REPLACEMENT AREAS WILL BE GRADED A MINIMUM OF ONE FOOT BELOW THE ADJACENT WETLANDS. NO GRADING WILL BE PERMITTED WITHIN THE EXISTING WETLAND AREAS EXCEPT TO CUT OPENINGS IN BERMS TO ESTABLISH HYDRAULIC CONDUCTIVITY BETWEEN THE REPLACEMENT WETLAND AND THE WETLAND REPLICATION.
15. FINAL SUB-GRADES SHALL BE REVIEWED AND APPROVED BY A PROFESSIONAL WETLAND SCIENTIST AFTER REVIEW OF SEASONAL, LOCAL HIGH GROUNDWATER MONITORING DATA AND FIELD CONDITIONS. MODIFICATIONS OF FINAL GRADES MAY BE MADE IN THE FIELD AS DIRECTED BY A PROFESSIONAL WETLAND SCIENTIST OR CERTIFIED ECOLOGICAL RESTORATION PRACTITIONER.
16. A TWELVE-INCH LAYER OF NATURAL ORGANIC SOIL OR MIXTURE OF GOOD QUALITY TOPSOIL AND CLEAN LEAF COMPOST PER THE SOIL SPECIFICATIONS OF ITEM 755.35 WILL BE PLACED IN THE BOTTOM OF THE REPLACEMENT AREA. SOIL AND COMPOST SHOULD BE CERTIFIED FREE OF INVASIVE PLANT SEEDS OR OTHER ARTIFICIAL MATERIAL.
17. SIDE SLOPES OF NON-WETLAND (UPLAND) AREAS SHALL BE GRADED WITH A MINIMUM OF FOUR INCHES OF THE SOIL MIXTURE AS DESCRIBED ABOVE.
18. NO SOIL AMENDMENT OR FERTILIZER SHALL BE APPLIED OR ADDED UNLESS DIRECTED BY A PROFESSIONAL WETLAND SCIENTIST.
19. WHERE CALLED FOR, REPLICATION AREAS SHALL BE SEEDED IMMEDIATELY FOLLOWING PLACEMENT AND FINAL GRADING INCLUDING MICROTOPOGRAPHY. SPRING SEEDING SHOULD OCCUR AFTER THE GROUND THAWS AND BEFORE JUNE 30. FALL SEEDING SHOULD OCCUR AFTER OCTOBER 15 AND BEFORE THE SOIL FREEZES.
20. ALL WETLAND AREAS SHALL BE SEEDED USING THE SEED MIX SPECIFIED IN ITEM 765.554 WETLAND MIX/BASIN MIX AND SHALL BE APPLIED AT A RATE ACCORDING TO THE ITEM SPECIFICATION.
21. UPLAND AREAS SHALL BE SEEDED USING THE SEED MIX SPECIFIED IN ITEM 765.416. UPLAND SHADE MIX AND SHALL BE APPLIED AT A RATE ACCORDING TO THE ITEM SPECIFICATION.
22. SEED SHALL BE FRESH, RECLEANED SEED OF THE LATEST CROP. SEED SHALL BE DELIVERED TO THE SITE IN THE ORIGINAL CONTAINERS WHICH SHALL BEAR THE VENDOR'S GUARANTEE OF ANALYSIS.
23. DEVIATIONS FROM THE PLANTING SCHEDULE AND/OR APPROVED PLANTING LIST MUST BE APPROVED IN ADVANCE BY A PROFESSIONAL WETLAND SCIENTIST OR CERTIFIED ECOLOGICAL RESTORATION PRACTITIONER.
24. THE LANDSCAPE CONTRACTOR SHALL CLEAN UP AND REMOVE ANY DEBRIS FROM THE SITE CAUSED BY THE LANDSCAPE CONTRACTOR.
25. PLANT LISTS MAY BE ALTERED BASED ON FIELD CONDITIONS AS DIRECTED BY A PROFESSIONAL WETLAND SCIENTIST.
26. ALL PLANT MATERIALS SHALL CARRY A FULL GUARANTEE FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE TO INCLUDE PROMPT TREATMENT OR REMOVAL AND REPLACEMENT OF ANY PLANTS FOUND TO BE IN AN UNHEALTHY CONDITION BY THE WETLAND SPECIALIST OR LANDSCAPE ARCHITECT. ALL REPLACEMENTS SHALL BE OF THE SAME KINDS AND SIZE OF PLANTS SPECIFIED IN THE PLANT LIST.
27. WETLAND REPLICATION AREAS WILL BE INSPECTED IN ACCORDANCE WITH THE SPECIFICATIONS OF ITEM 755.35 INLAND WETLAND REPLICATION AND ITEM 755.76 WETLAND MONITORING REPORTS TO IDENTIFY INVASIVE SPECIES AND A REPORT DETAILING TO RELATIVE SUCCESS OF THE MITIGATION PLAN IN TERMS OF BOTH THE HEALTH AND SURVIVAL OF WETLAND PLANTINGS SHALL BE PREPARED.
28. DURING AND AFTER THE FIRST AND SECOND GROWING SEASON, THE SUCCESS OF THE VEGETATIVE GROWTH WILL BE REVIEWED AND EVALUATED. ADDITIONAL VEGETATION WILL BE PLANTED AS NECESSARY TO REPLACE STRESSED OR MISSING VEGETATION AND TO ACHIEVE THE 75% SURVIVAL RATE SPECIFIED IN THE SPECIAL PROVISIONS.





**WETLAND REPLICATION AREA PLANT LIST**

SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE	COMMENTS
<b>TREES</b>					
AR	8	ACER RUBRUM	RED MAPLE	4'-6' HT.	10' O.C.
BA	5	BETULA ALLEGHANIENSIS	YELLOW BIRCH	4'-6' HT.	10' O.C.
FP	3	FRAXINUS PENNSYLVANICA	GREEN ASH	4'-6' HT.	10' O.C.
UA	3	ULMUS RUBRA	SLIPPERY ELM	4'-6' HT.	10' O.C.
<b>SHRUBS</b>					
CR	6	CLETHRA ALNIFOLIA	SWEET PEPPERBUSH	2'-3' HT.	10' O.C. GROUPS OF 3
IV	6	ILEX VERTICILLATA	WINTERBERRY HOLLY	2'-3' HT.	10' O.C. GROUPS OF 3
LB	6	LINDERA BENZOIN	SPICEBUSH	2'-3' HT.	10' O.C. GROUPS OF 3
VC	6	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	2'-3' HT.	10' O.C. GROUPS OF 3
VD	6	VIBURNUM DENTATUM	NORTHERN ARROWWOOD	2'-3' HT.	10' O.C. GROUPS OF 3
VL	6	VIBURNUM LENTAGO	NANNYBERRY	2'-3' HT.	10' O.C. GROUPS OF 3

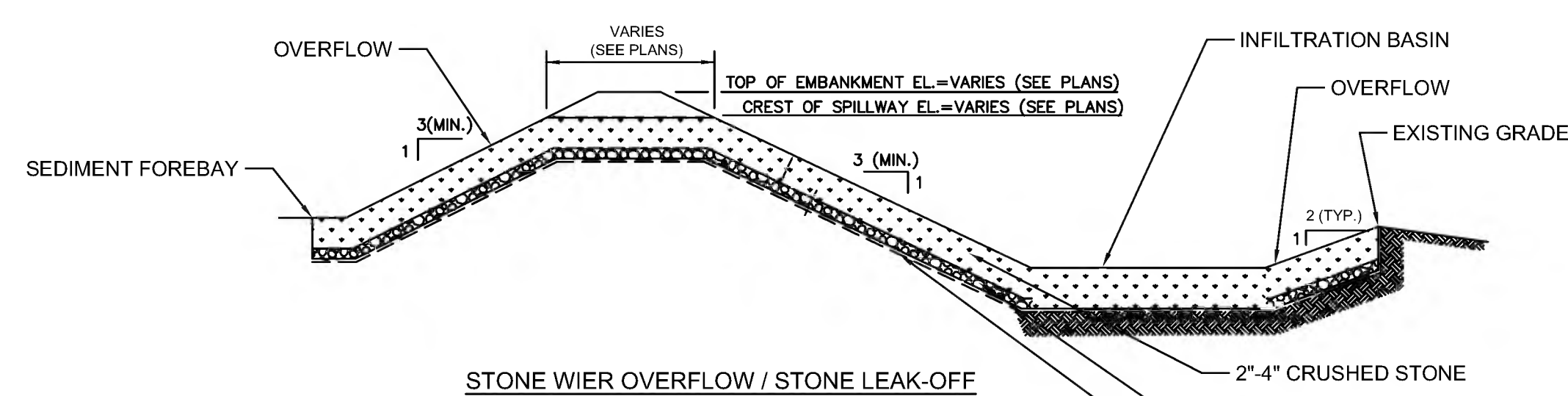










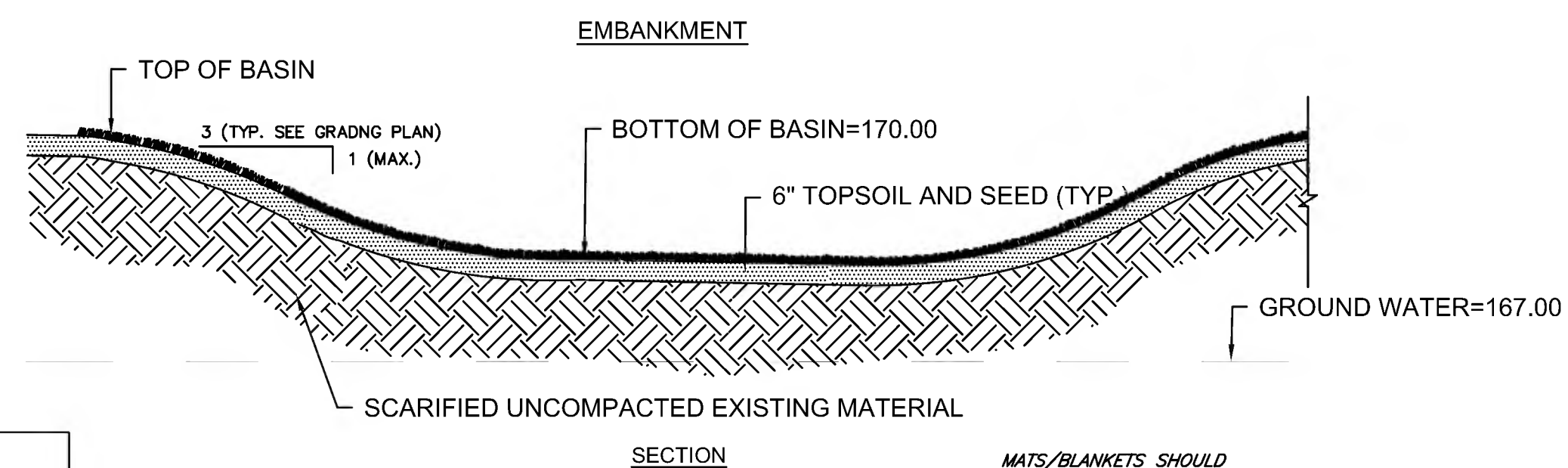


**NOTES:**

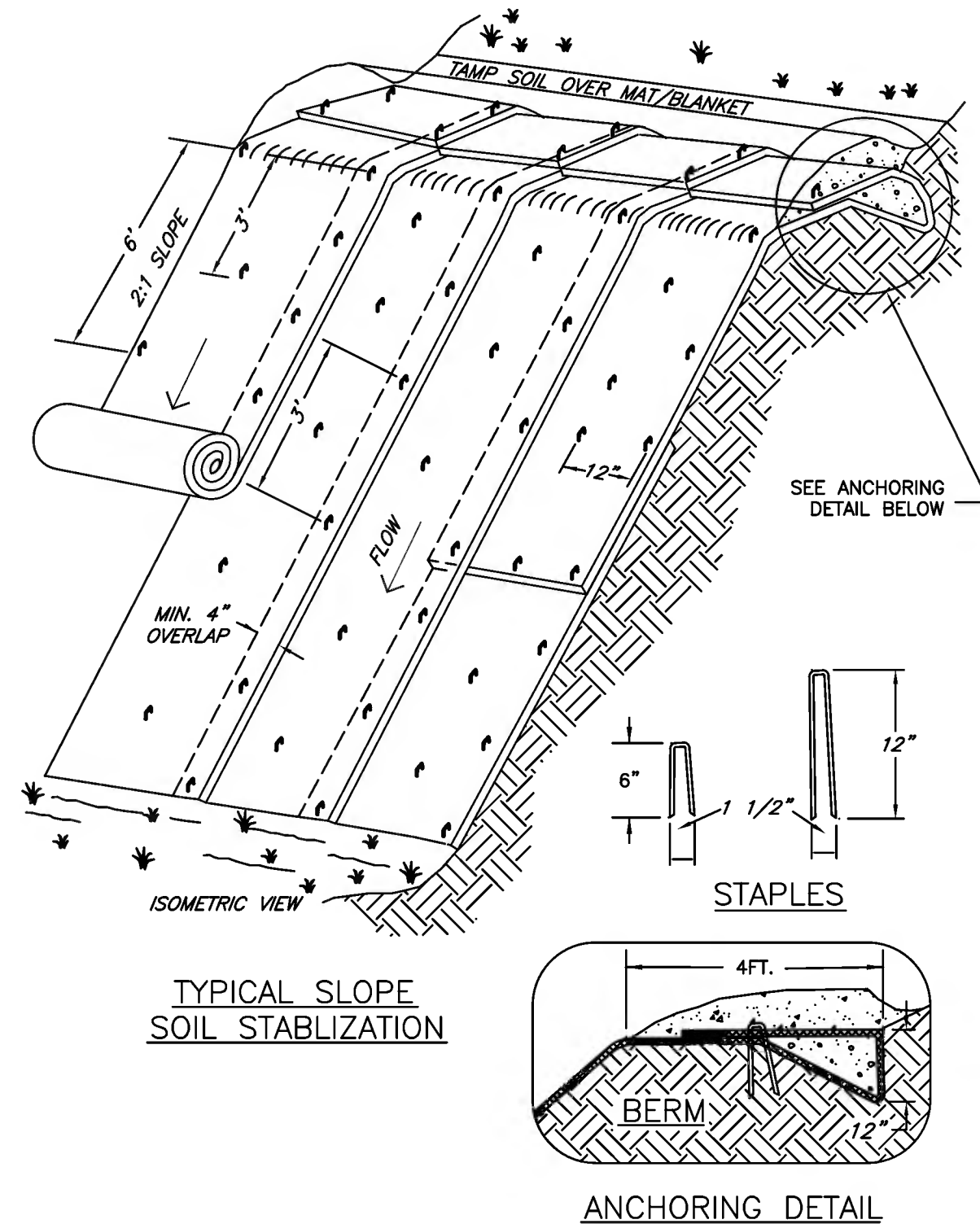
1. IMPERVIOUS MATERIAL FOR USE IN BASIN EMBANKMENT AREAS AND WHERE SHOWN ON THE PLANS SHALL BE COMPOSED OF CLAYS, SILTY CLAYS, OR CLAYEY SILTS. THE SOIL SHALL BE FREE OF RUBBISH, ICE, VEGETATIVE MATTER, LOAM, OR OTHER DEBRIS AND HAVE THE FOLLOWING GRADATION AS DEFINED BY A STANDARD SIEVE TEST (ASTM D422):

MIN. PERCENT PASSING (BY WT.)	SEIVE SIZE
100	3.5"
80-100	3/4"
40-90	No. 4
30-85	No. 40
25-75	No. 200

2. PERVIOUS BACKFILL MATERIAL FOR USE IN FILL AREAS ASSOCIATED WITH BASIN EMBANKMENTS SHALL BE COMPOSED OF ORDINARY BORROW MATERIAL (ITEM 150.) OR EXCAVATED MATERIAL FROM THE SITE DEEMED RE-USEABLE BY THE ENGINEER. SATISFACTORY ON-SITE MATERIAL SHALL HAVE SOIL CLASSIFICATION GROUPS OF GW, GP, GM, SW, SP, AND SM ACCORDING TO ASTM D 2487, OR A COMBINATION OF THESE GROUPS AND SHALL BE FREE OF ROCK OR GRAVEL LARGER THAN 3 INCHES (75 MM) IN ANY DIMENSION, DEBRIS, WASTE, FROZEN MATERIALS, VEGETATION, AND OTHER DELETERIOUS MATTER.



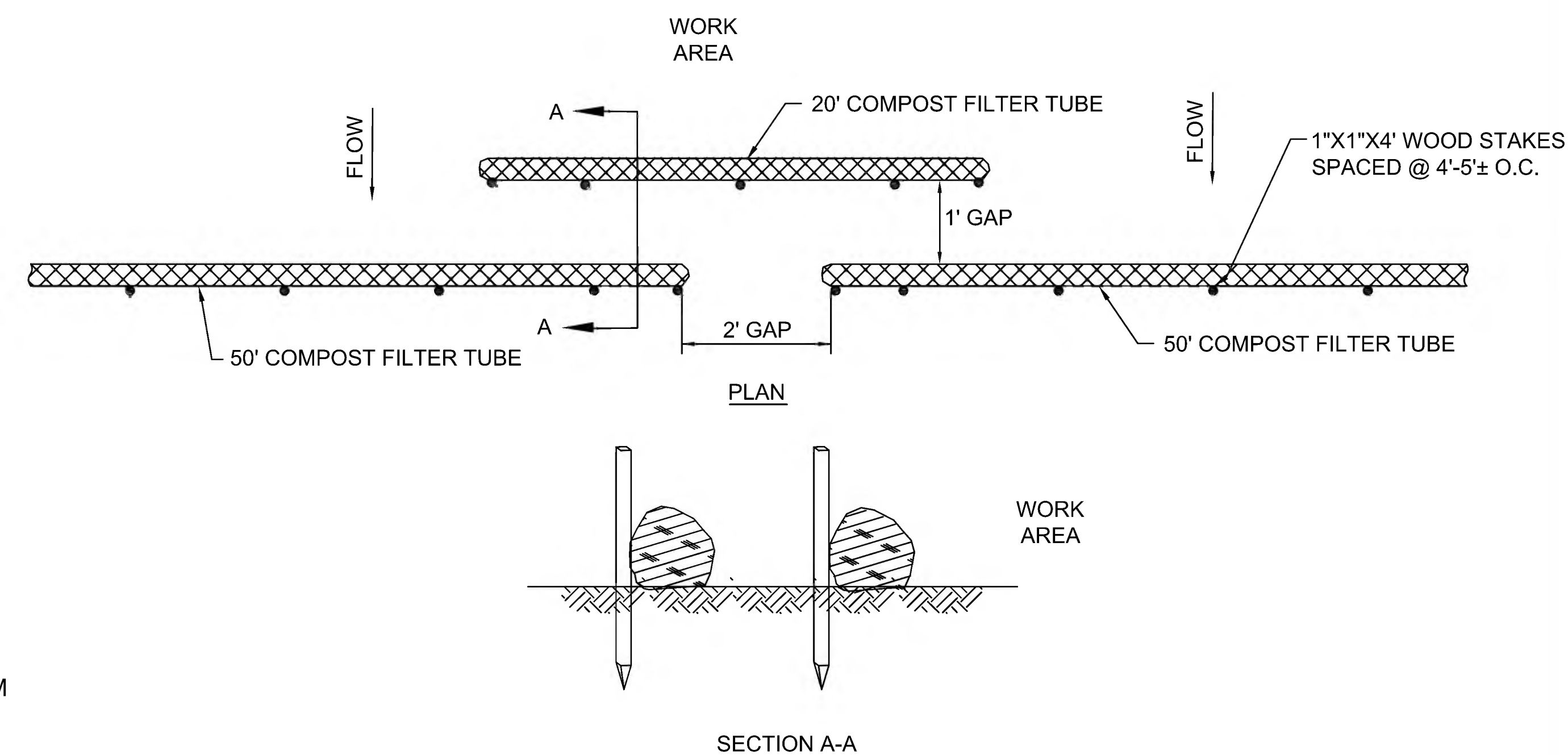
MATS/BLANKETS SHOULD BE INSTALLED VERTICALLY DOWNSLOPE.



**NOTES:**

1. MATTING FOR EROSION CONTROL MUST BE MADE FROM 100% BIODEGRADABLE MATERIAL.  
2. STAPLES OR STAKES MAY BE USED TO SECURE THE MATTING. THE STAPLES OR STAKES MUST BE MADE FROM A 100% BIODEGRADABLE MATERIAL.

**14 MATTING FOR EROSION CONTROL**  
SCALE: N.T.S.

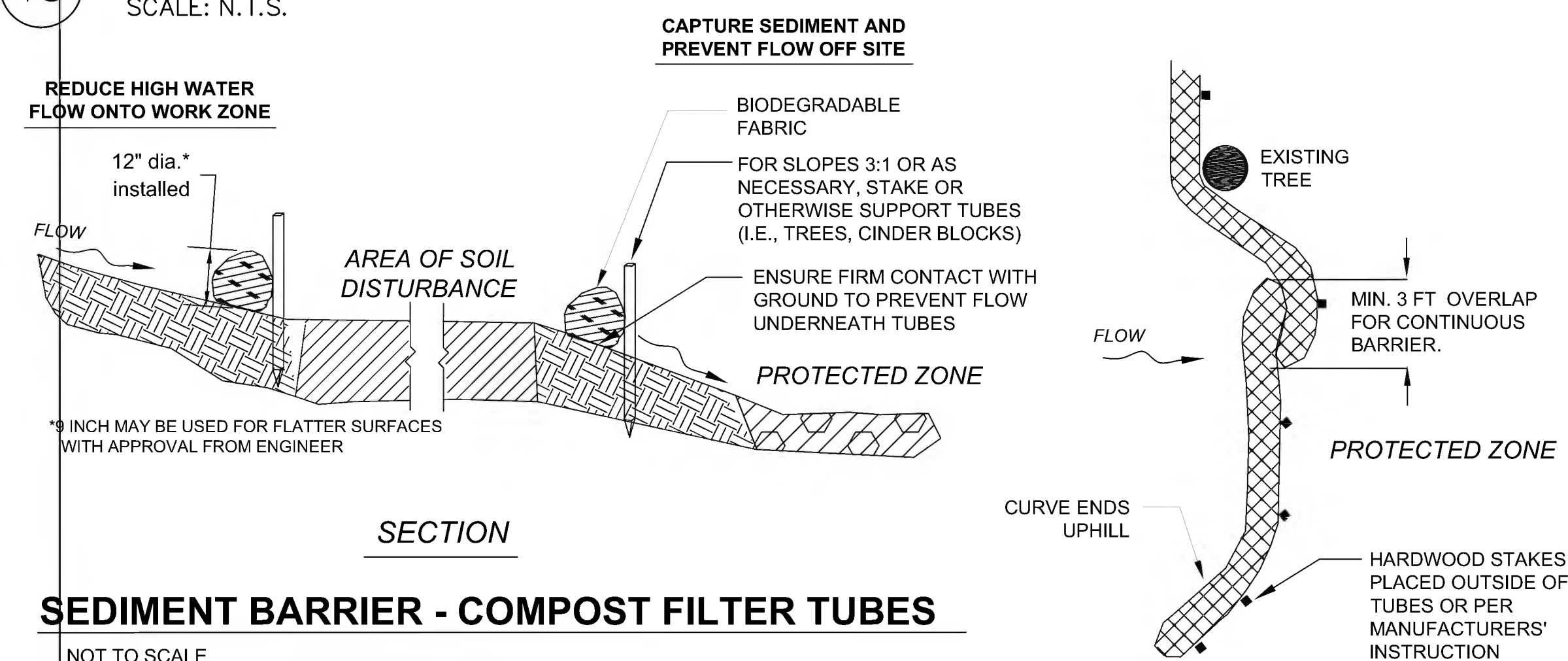


**NOTES:**

1. SYNCOPATED COMPOST FILTER TUBES SHALL BE USED WHEN BORDERING VERNAL POOLS AS SHOWN ON THE PLANS.

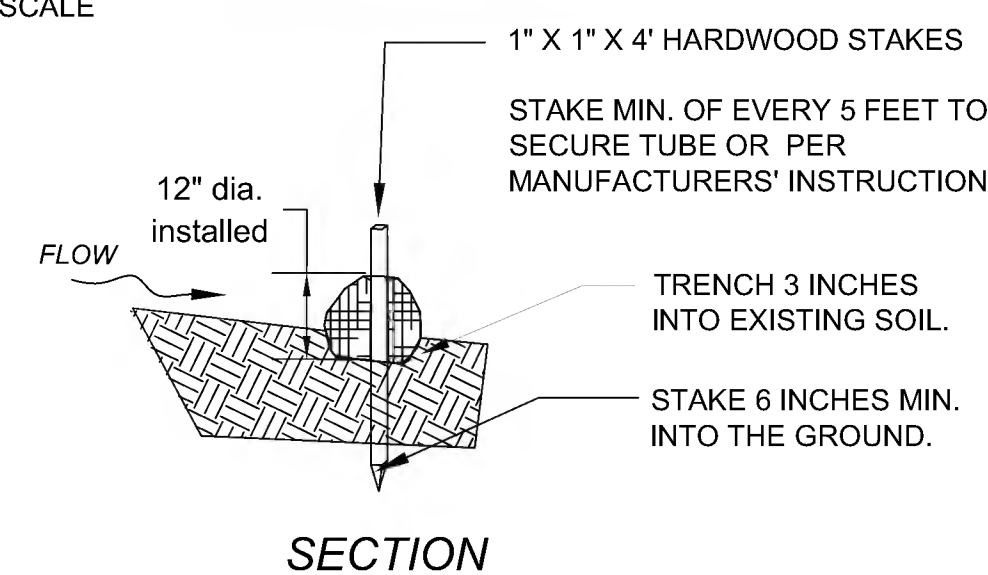
**15 SYNCOPATED SEDIMENT CONTROL BARRIER**  
SCALE: N.T.S.

**13 INFILTRATION BASIN**  
SCALE: N.T.S.



**SEDIMENT BARRIER - COMPOST FILTER TUBES**

NOT TO SCALE



**12 INCH STRAW WATTLE**

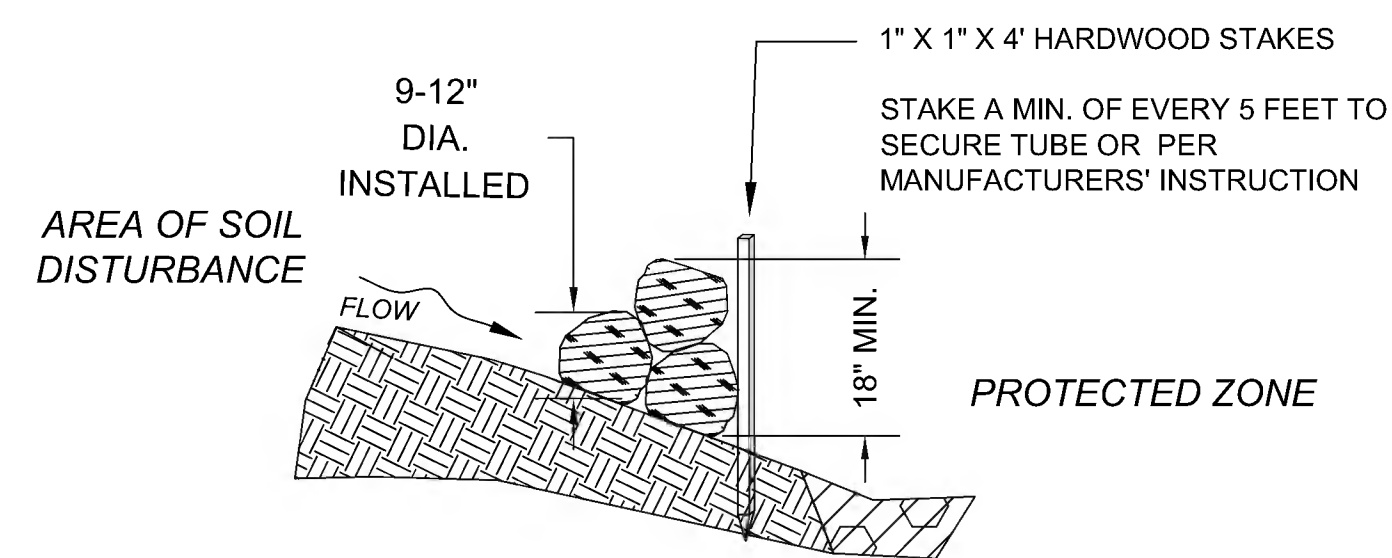
NOT TO SCALE

PLACE TUBE ALONG CONTOURS AND PERPENDICULAR TO FLOW.  
PLACE AS CLOSE TO LIMIT OF SOIL DISTURBANCE AS POSSIBLE  
ADJUST LOCATION AS REQUIRED FOR OPTIMUM EFFECTIVENESS. DO NOT INSTALL IN WATERWAYS.  
PLACE STAKES AS NEEDED TO SECURE TUBES IN PLACE.

**PLAN VIEW**

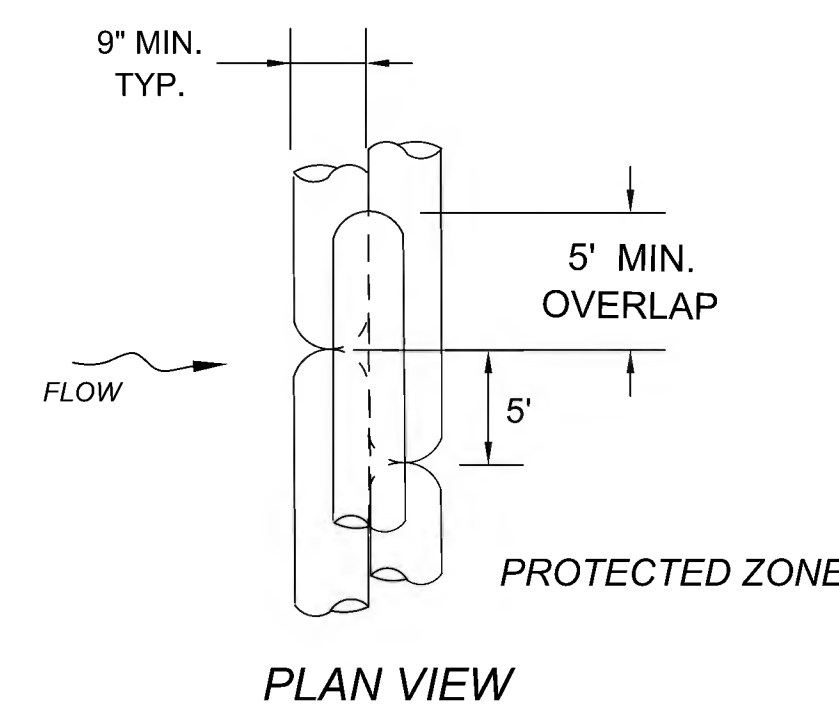
**COMPOST FILTER TUBE**

NOT TO SCALE

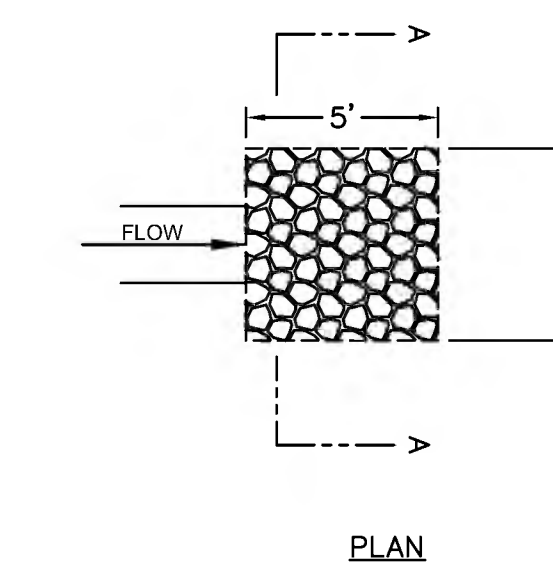


**COMPOST FILTER TUBE BERM (SLOPES 2:1 OR STEEPER)**

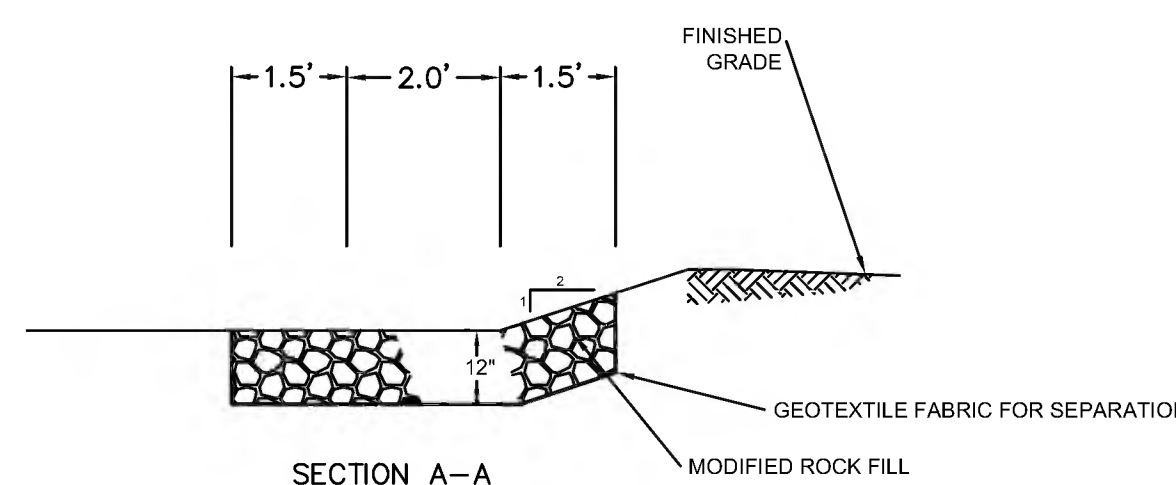
NOT TO SCALE



**PLAN VIEW**



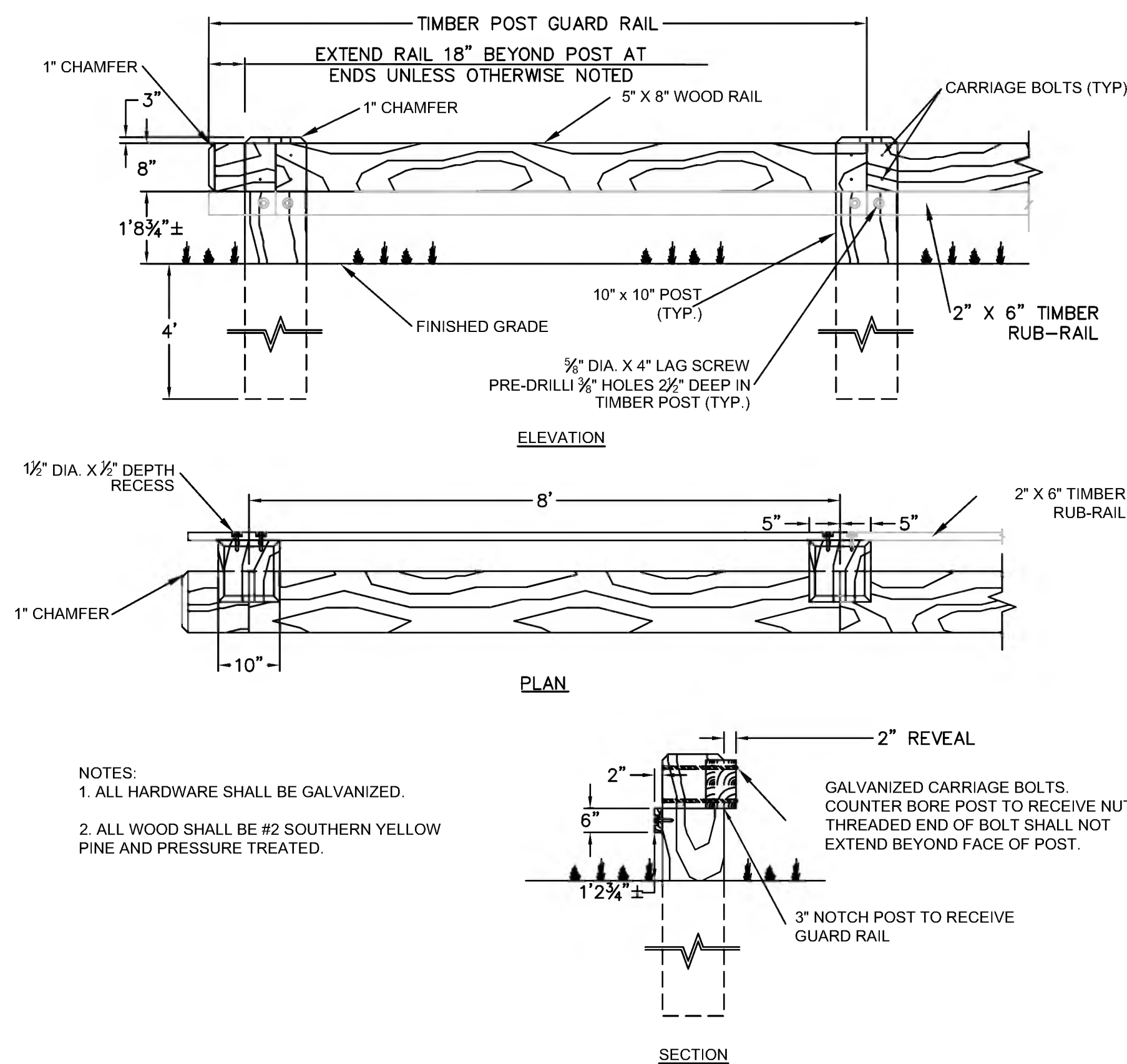
**PLAN**



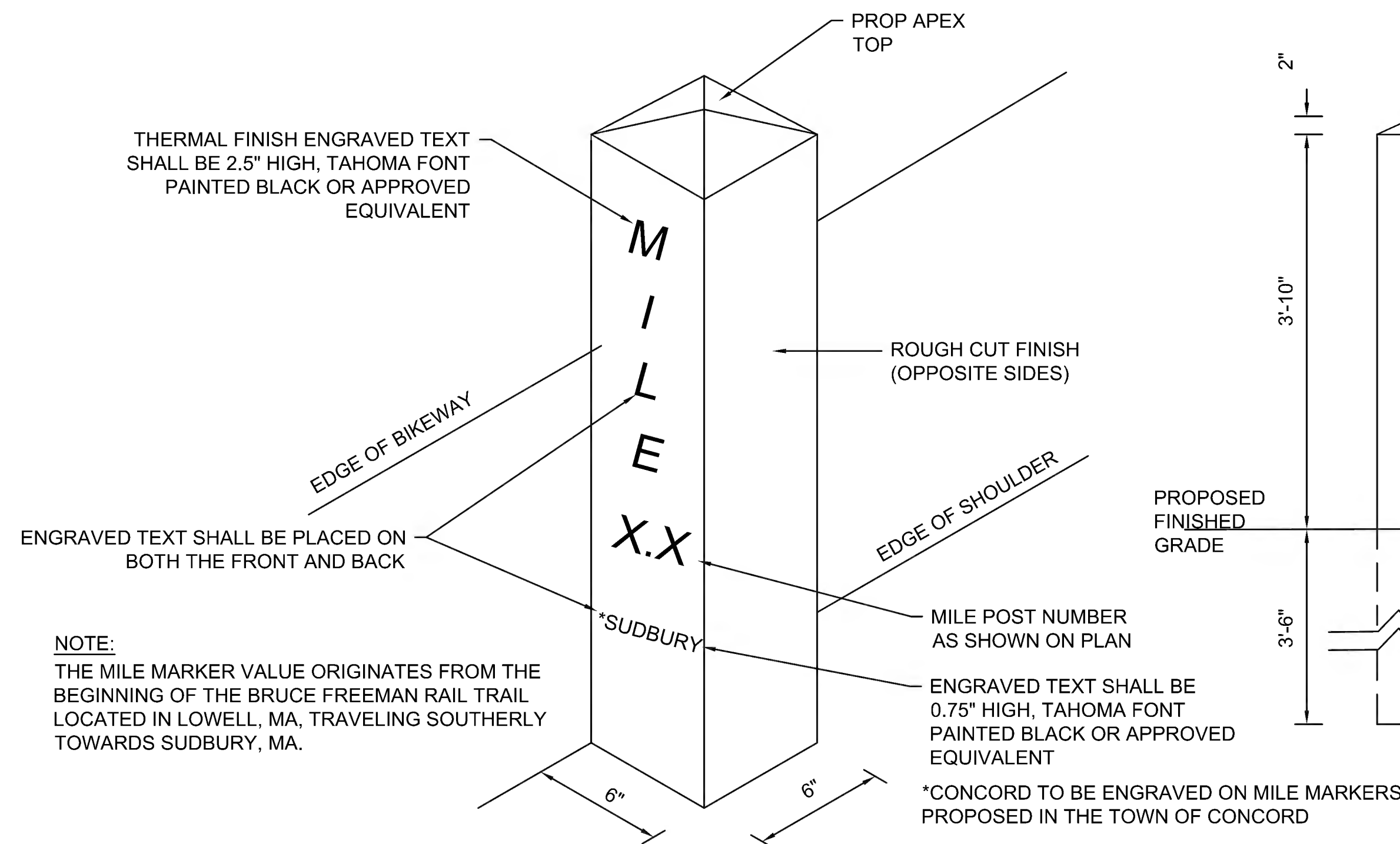
**17 MODIFIED ROCK FOR SWALE ENDS (5'X5')**  
SCALE: N.T.S.

**16 SEDIMENT BARRIERS - COMPOST FILTER TUBES**  
SCALE: N.T.S.

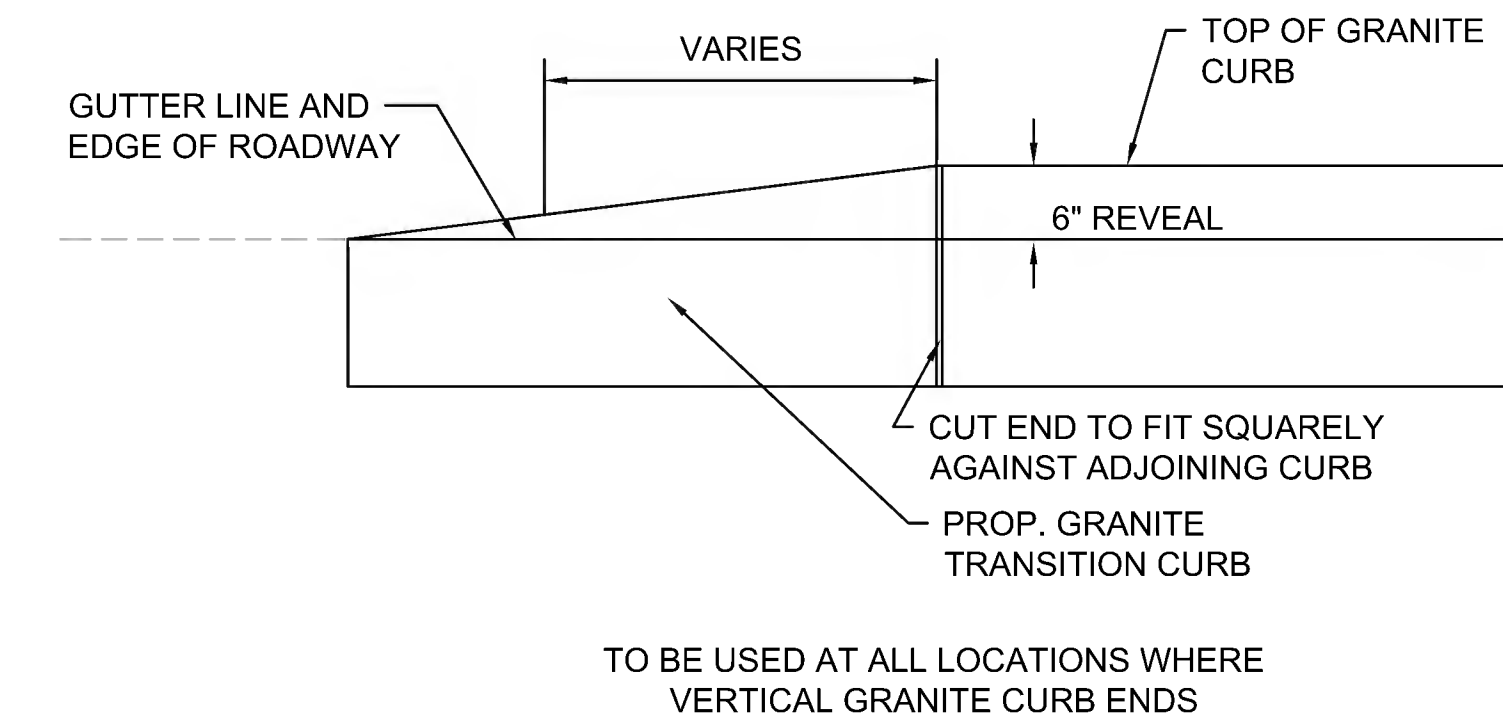




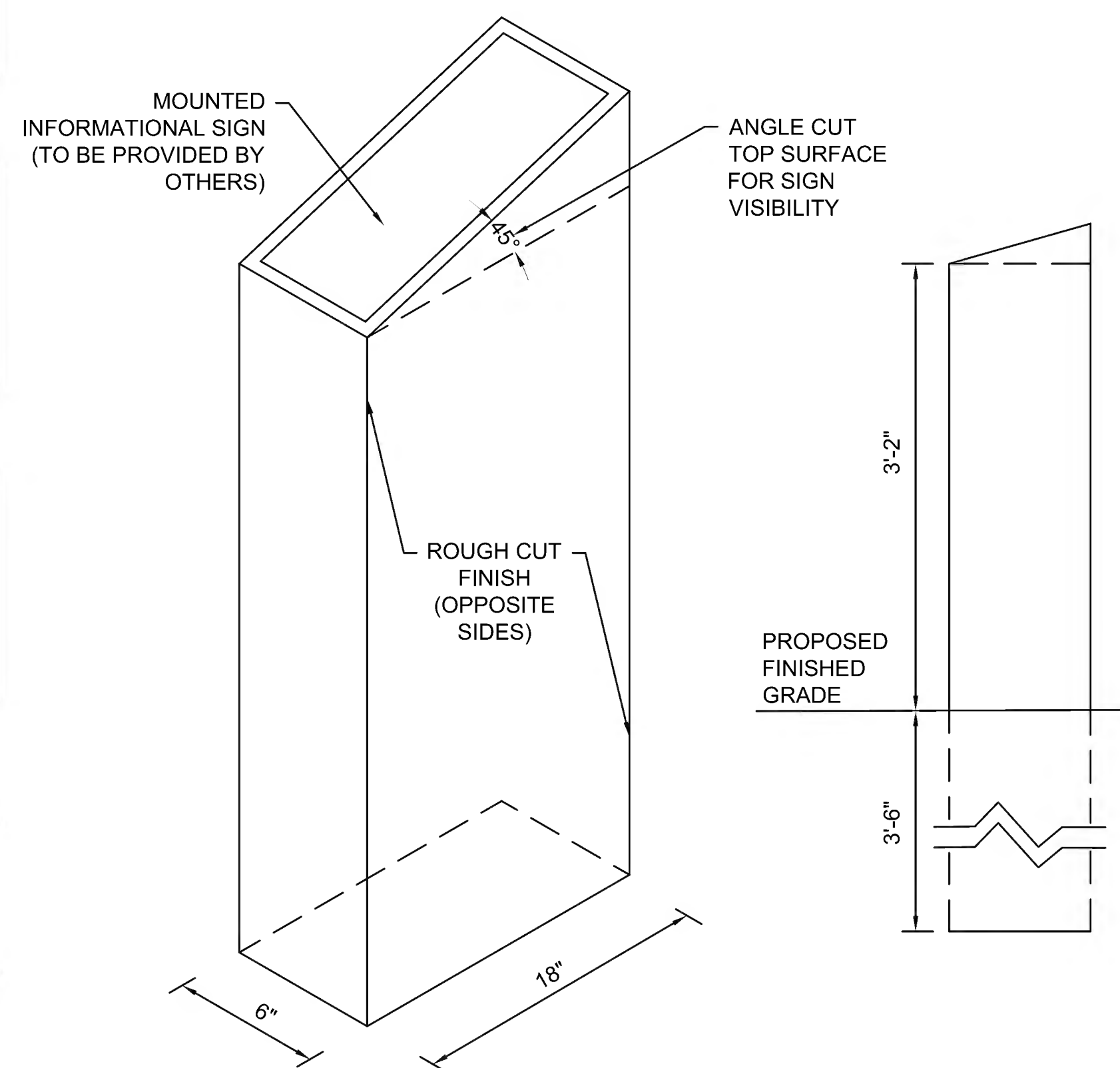
18 **TIMBER POST GUARDRAIL**  
 SCALE: N.T.S.



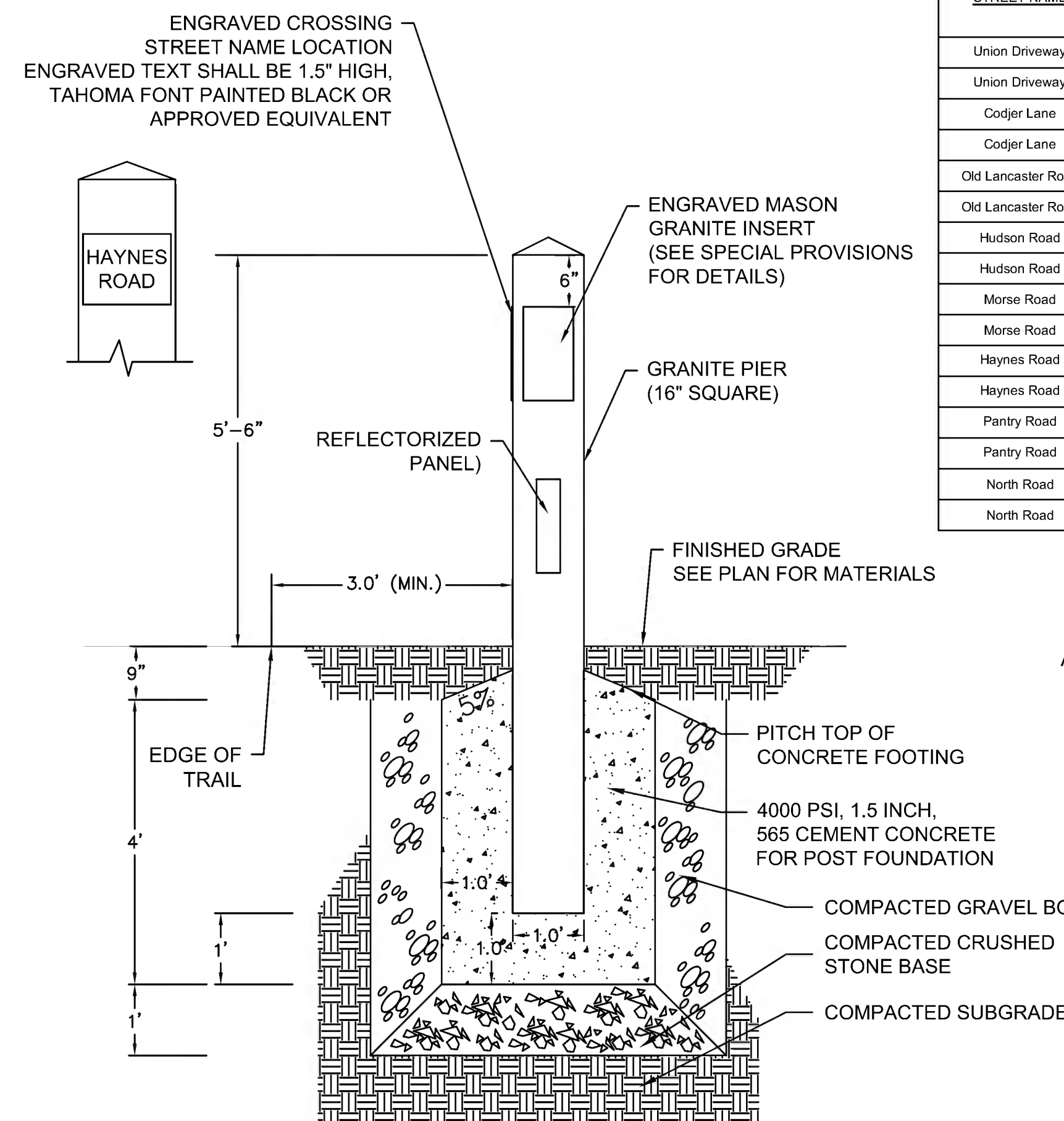
19 **GRANITE MILE MARKER**  
 SCALE: N.T.S.



20 **TRANSITION CURB DETAIL**  
 SCALE: N.T.S.

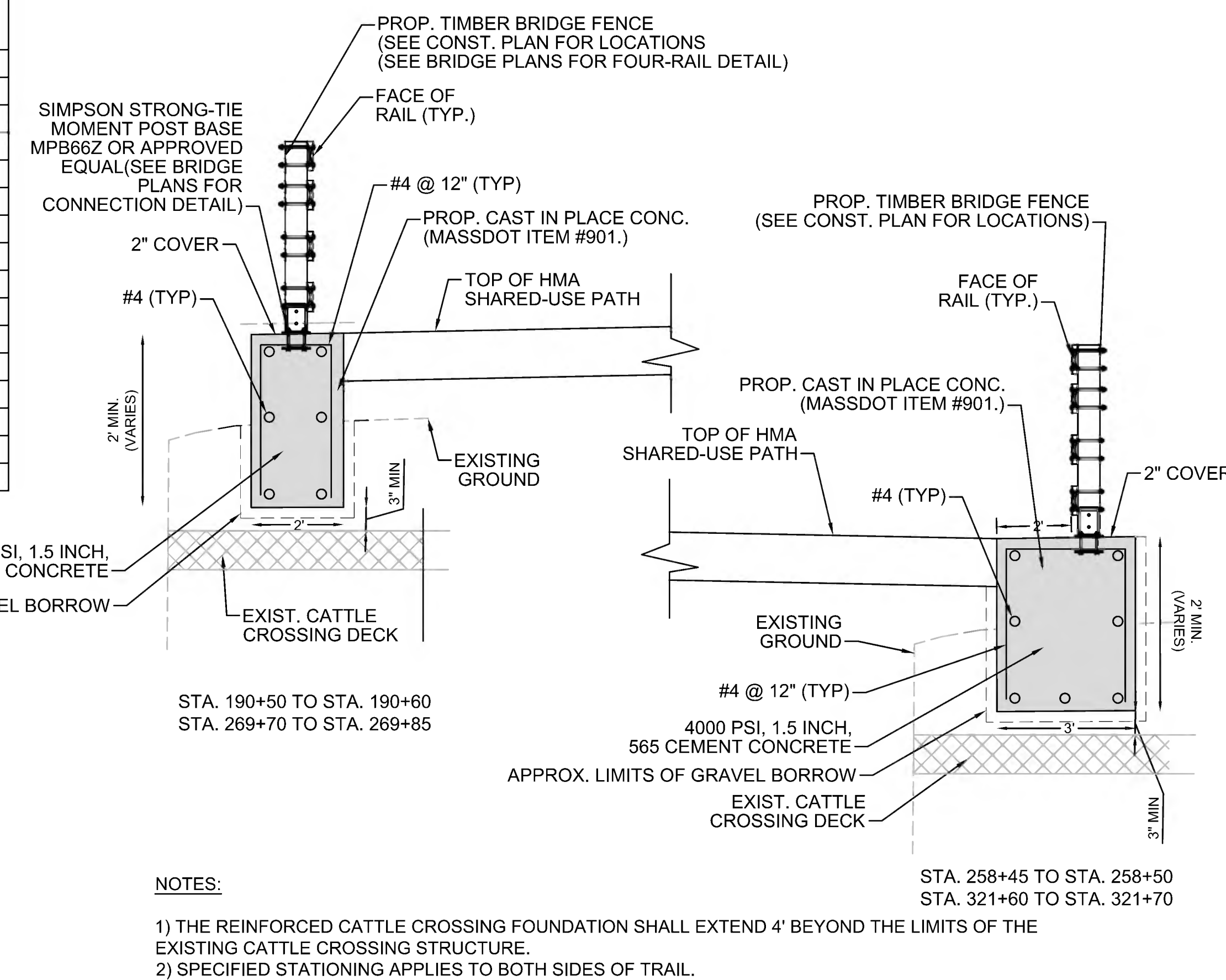


21 **GRANITE POST INTERPRETIVE SIGN**  
 SCALE: N.T.S.

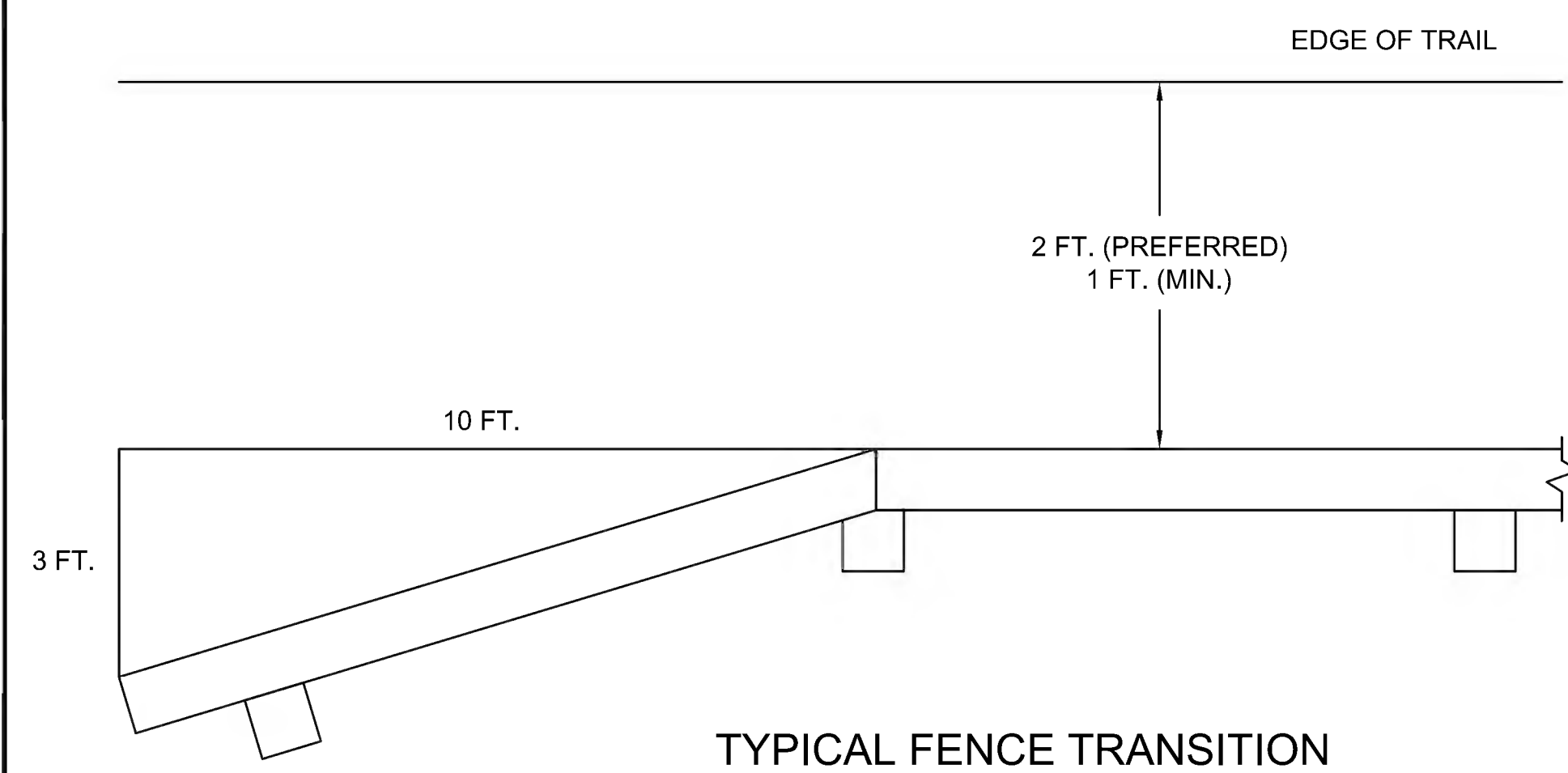


22 **GRANITE BRUCE FREEMAN RAIL TRAIL PIER**  
 SCALE: N.T.S.

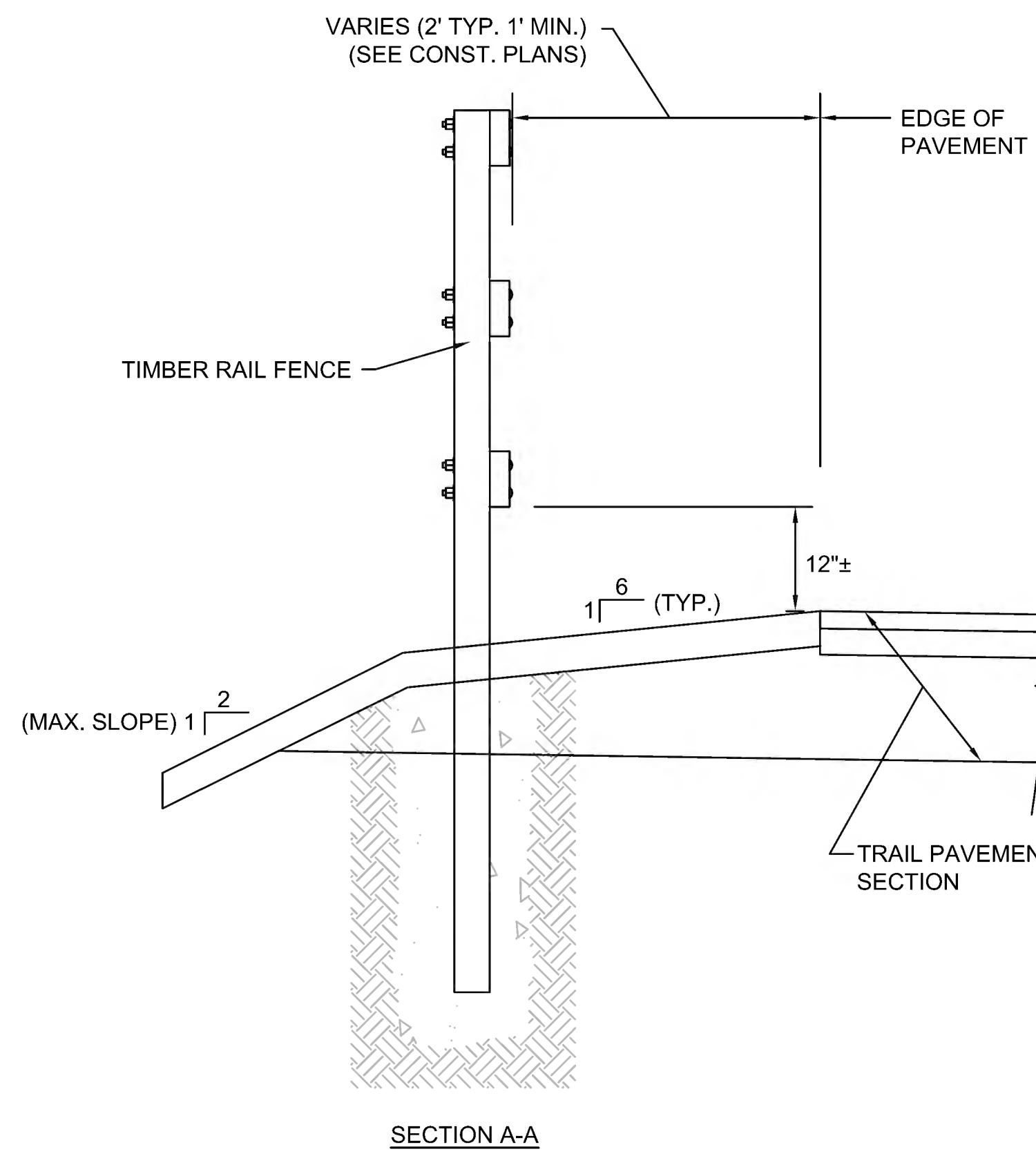
STREET NAME	STATION	OFFSET	SIDE
Union Driveway	108+41	9'	LT
Union Driveway	108+85	9'	RT
Codjer Lane	115+90	11'	LT
Codjer Lane	116+24	10'	RT
Old Lancaster Road	142+76	11'	LT*
Old Lancaster Road	143+15	11'	RT
Hudson Road	174+84	11'	LT
Hudson Road	175+55	11'	RT
Morse Road	215+63	11'	LT
Morse Road	215+94	11'	RT
Haynes Road	274+90	11'	LT
Haynes Road	275+20	11'	RT
Pantry Road	284+34	7'	LT
Pantry Road	284+66	7'	RT
North Road	307+40	9'	LT
North Road	307+84	11'	RT



23 **REINFORCED TIMBER CONNECTION AT CATTLE CROSSING**  
 SCALE: N.T.S.



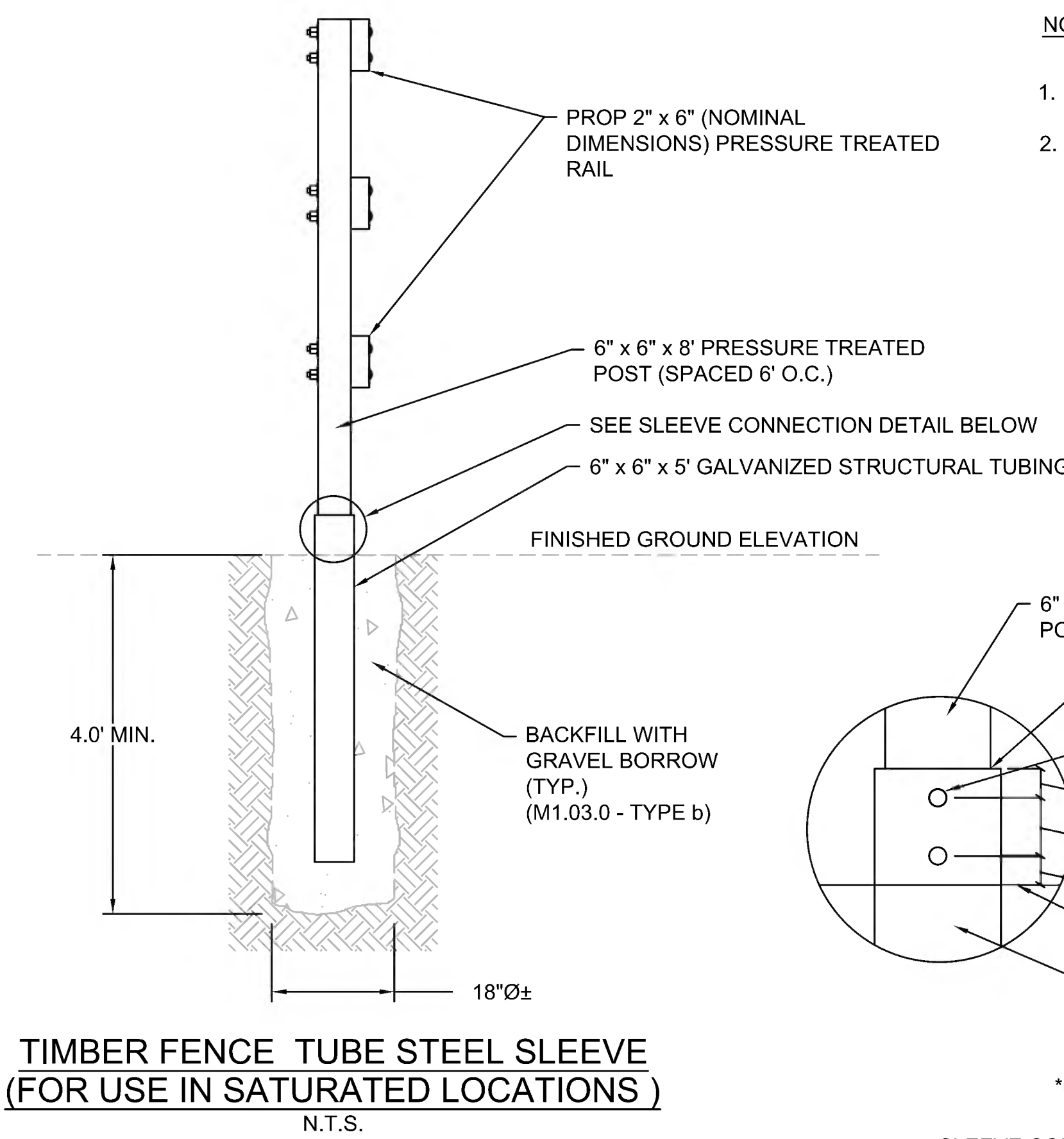
**TYPICAL FENCE TRANSITION  
AT FENCE APPROACHES**  
N.T.S.



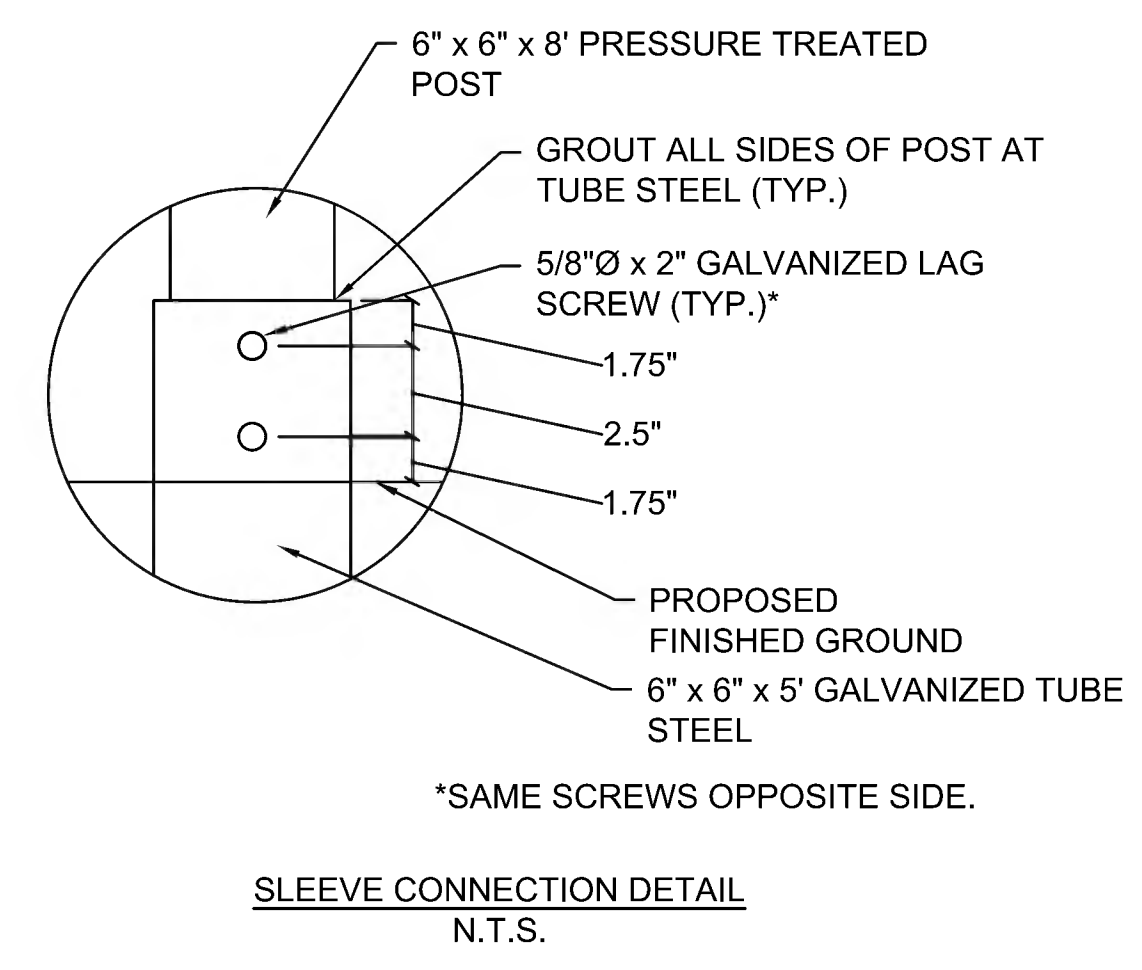
**SECTION A-A**

**SUGGESTED TIMBER RAIL FENCE CONSTRUCTION SEQUENCE**

1. AUGER OR DIG POST HOLE TO REQUIRED DIMENSIONS.
2. IF GROUND IS SATURATED, USE TUBE STEEL SLEEVE. SEE DETAIL ON THIS SHEET.
3. BACKFILL BOTTOM 6"± OF HOLE WITH GRAVEL AND COMPACT THOROUGHLY.
4. SET POST AND HOLD PLUMB DURING BACKFILLING.
5. BACKFILL WITH GRAVEL IN 12" LIFTS. COMPACT EACH LIFT THOROUGHLY.
6. CLAMP RAILS TO POSTS AND FIELD DRILL BOLT HOLES.
7. SET BOLTS, WASHERS AND NUTS.

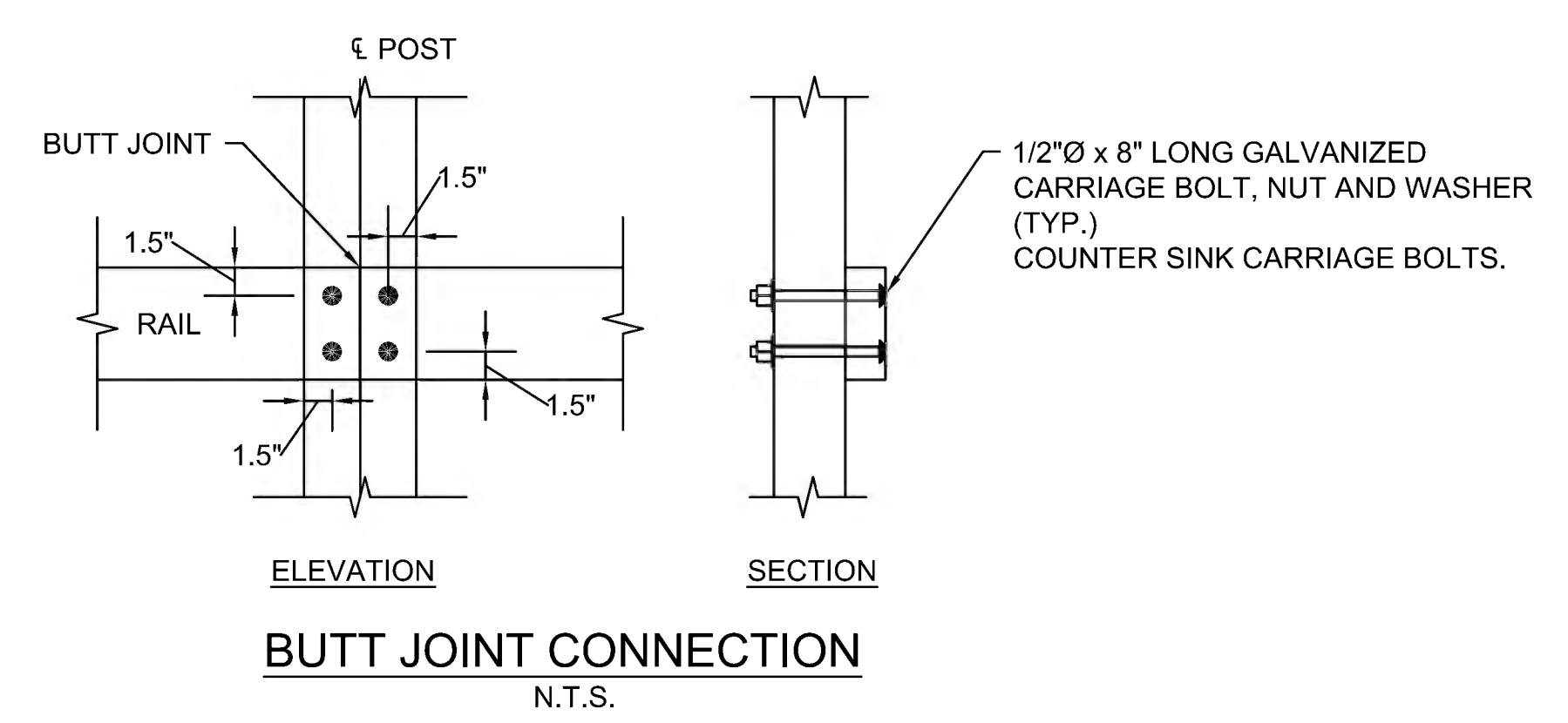


**TIMBER FENCE TUBE STEEL SLEEVE  
(FOR USE IN SATURATED LOCATIONS)**  
N.T.S.

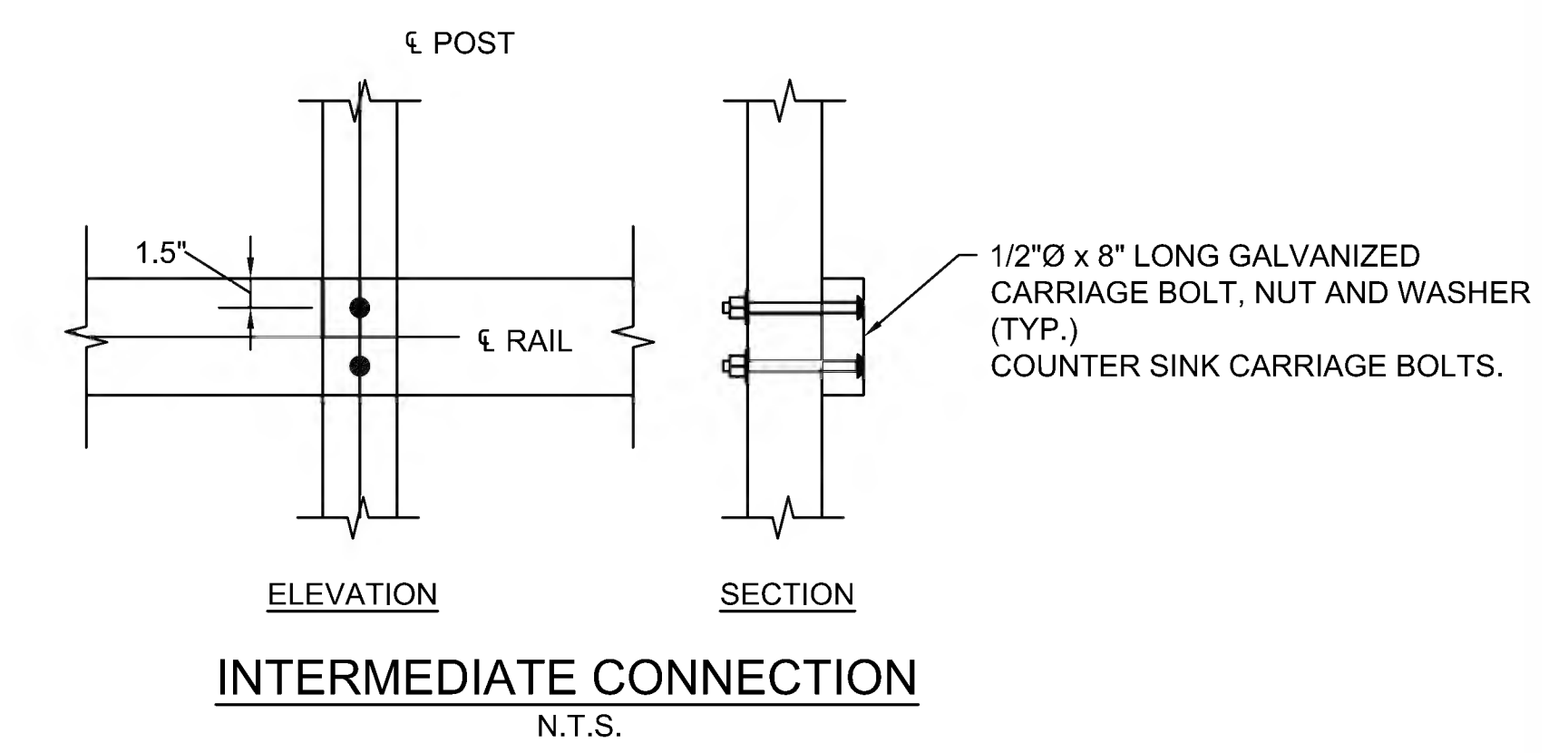


**SLEEVE CONNECTION DETAIL**  
N.T.S.

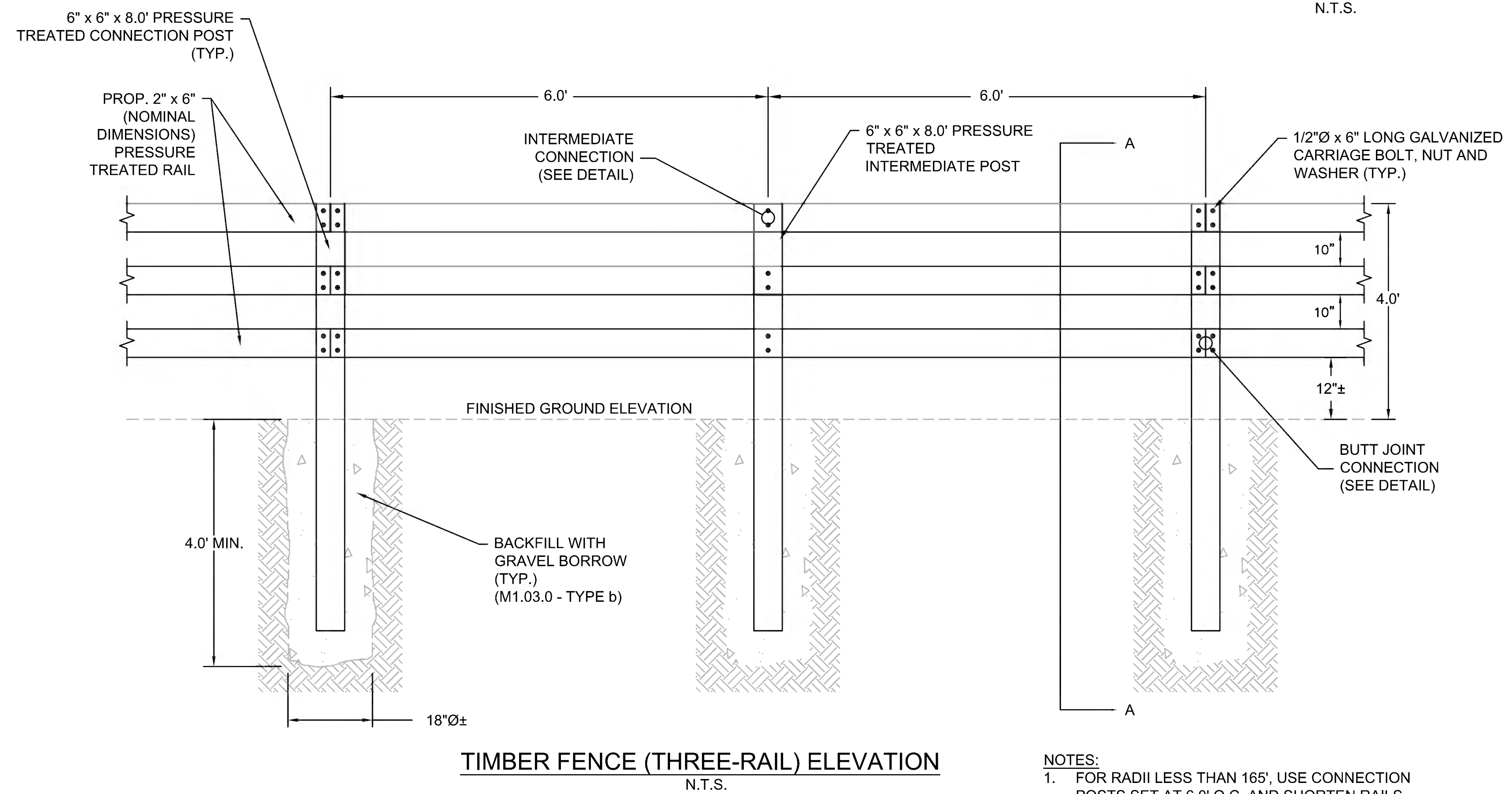
- NOTES:**
1. TIMBER PRESERVATIVES SHALL BE USED ON ALL WOOD TIMBER.
  2. ALL CUT ENDS SHALL BE PAINTED WITH PRESERVATIVE IN THE FIELD PER MANUFACTURERS DIRECTION.



**BUTT JOINT CONNECTION**  
N.T.S.



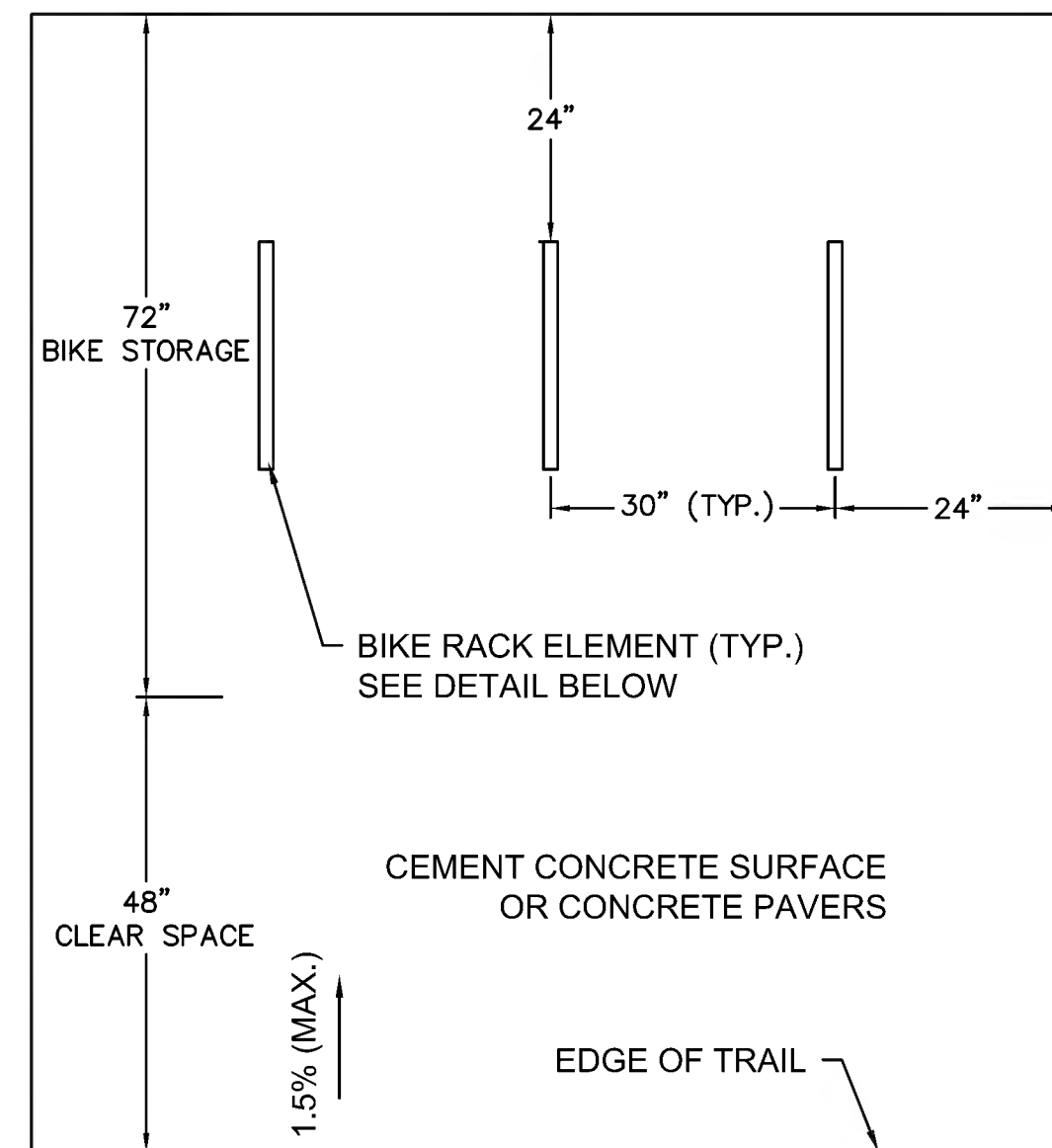
**INTERMEDIATE CONNECTION**  
N.T.S.



**TIMBER FENCE (THREE-RAIL) ELEVATION**  
N.T.S.

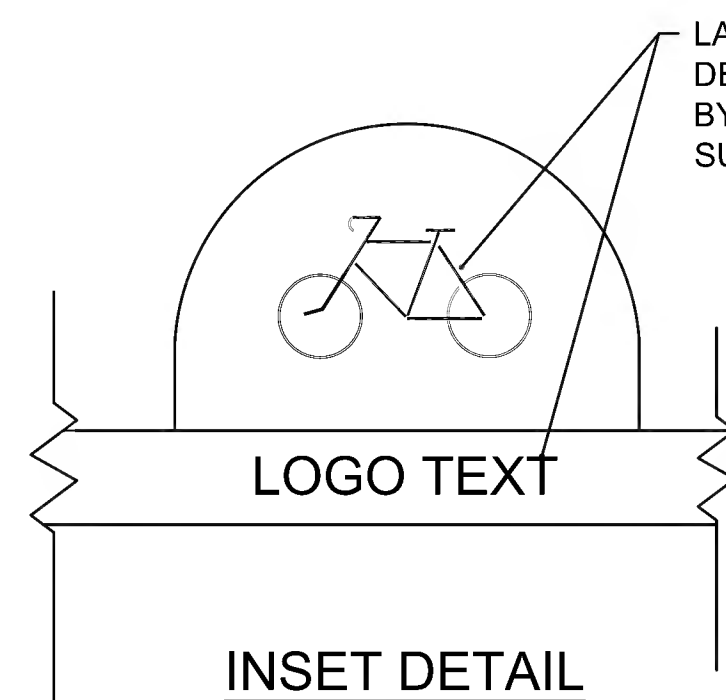
- NOTES:**
1. FOR RADII LESS THAN 165', USE CONNECTION POSTS SET AT 6.0' O.C. AND SHORTEN RAILS ACCORDINGLY.





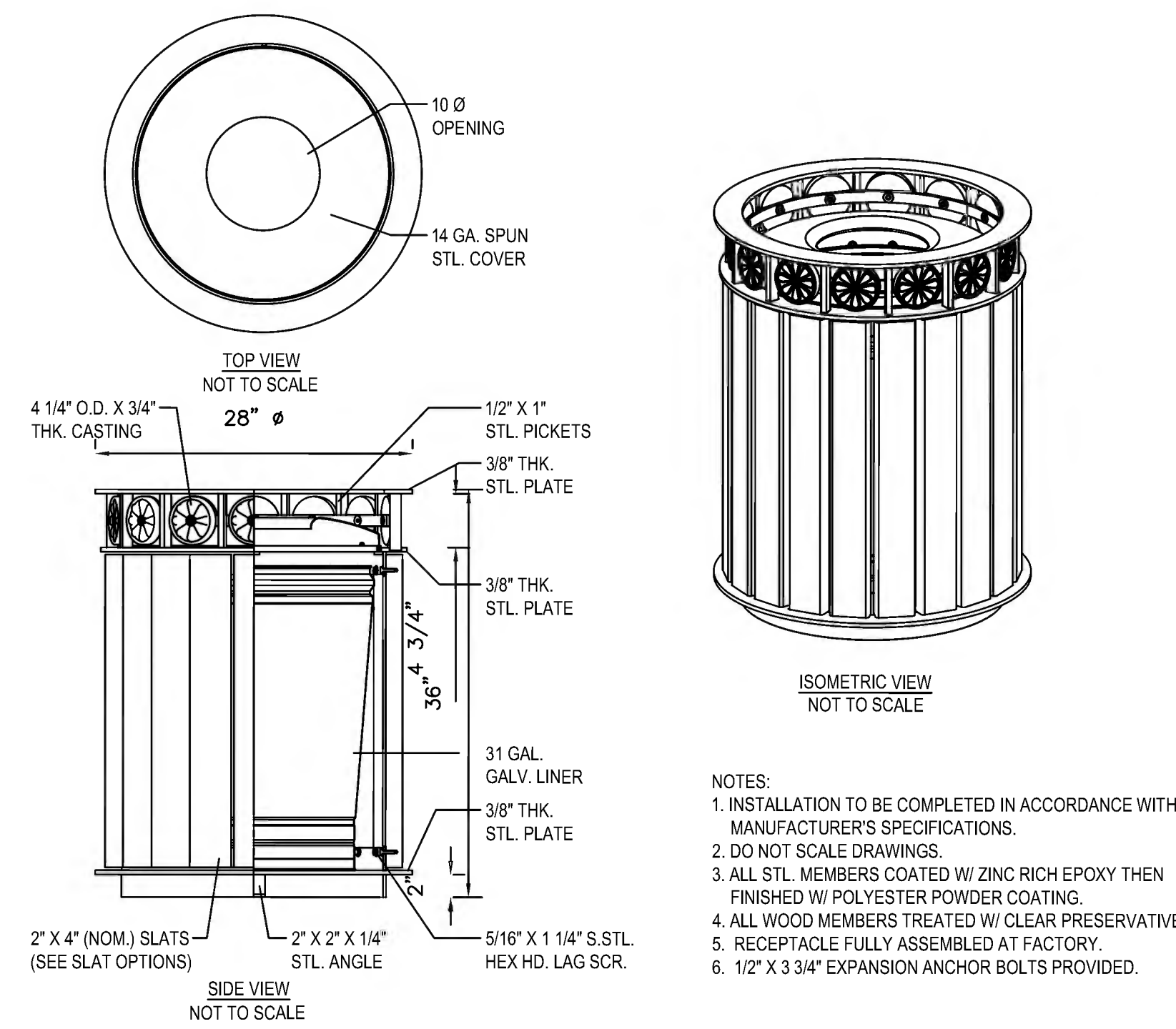
NOTES:  
• SEE PLANS FOR QUANTITY OF BIKE RACK ELEMENTS

**BICYCLE RACK PLACEMENT**



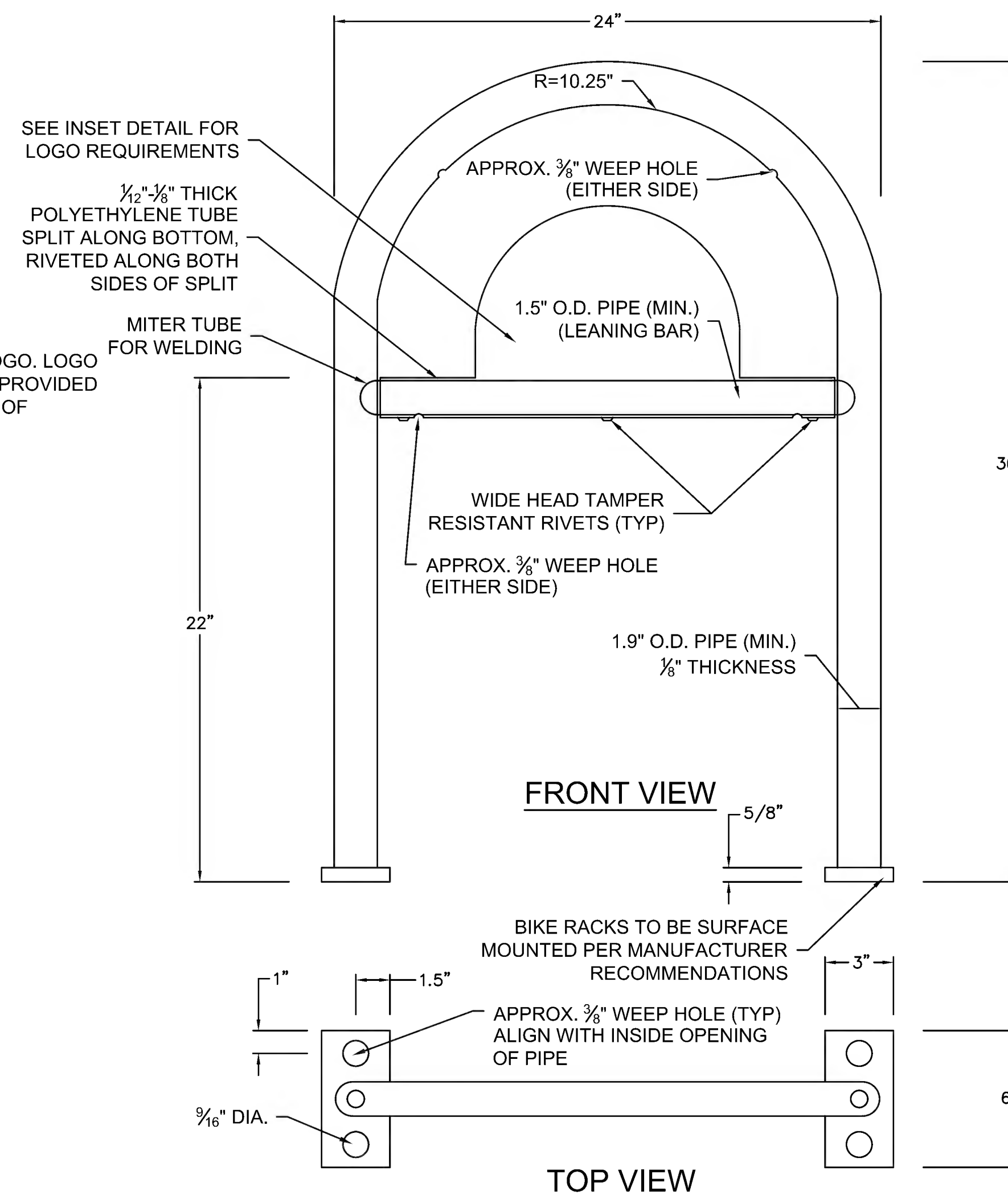
- NOTES:
1. EACH BIKE RACK SHALL INCLUDE A LASER-CUT LOGO. LOGO DETAIL TO BE PROVIDED BY THE TOWN OF SUDBURY.
  2. DIMENSIONS ARE APPROXIMATE AND WILL BE DETERMINED IN COORDINATION WITH THE MANUFACTURER. BIKE RACK ELEMENTS TO BE OF THE INVERTED "U".
  3. EACH BIKE RACK SHALL ACCOMMODATE TWO BICYCLES.
  4. ALL POSTS AND HARDWARE SHALL BE FACTORY COATED FEDERAL GREEN (SEE SPECIAL PROVISIONS)

**27 BICYCLE RACK**  
SCALE: N.T.S.



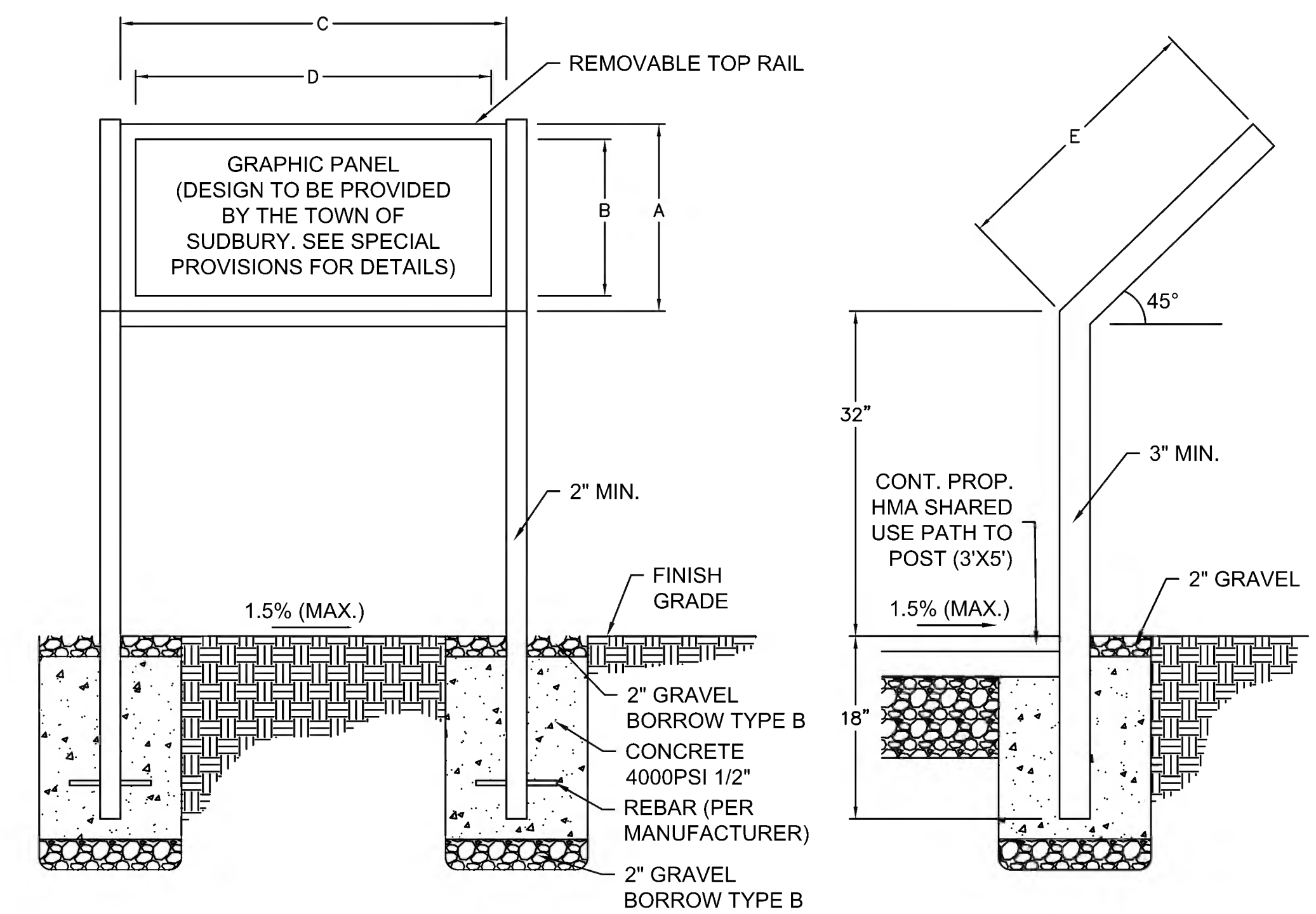
- NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
  2. DO NOT SCALE DRAWINGS.
  3. ALL STL. MEMBERS COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.
  4. ALL WOOD MEMBERS TREATED W/ CLEAR PRESERVATIVE.
  5. RECEPTACLE FULLY ASSEMBLED AT FACTORY.
  6. 1/2" X 3 3/4" EXPANSION ANCHOR BOLTS PROVIDED.

**25 TRASH RECEPTACLE**  
SCALE: N.T.S.



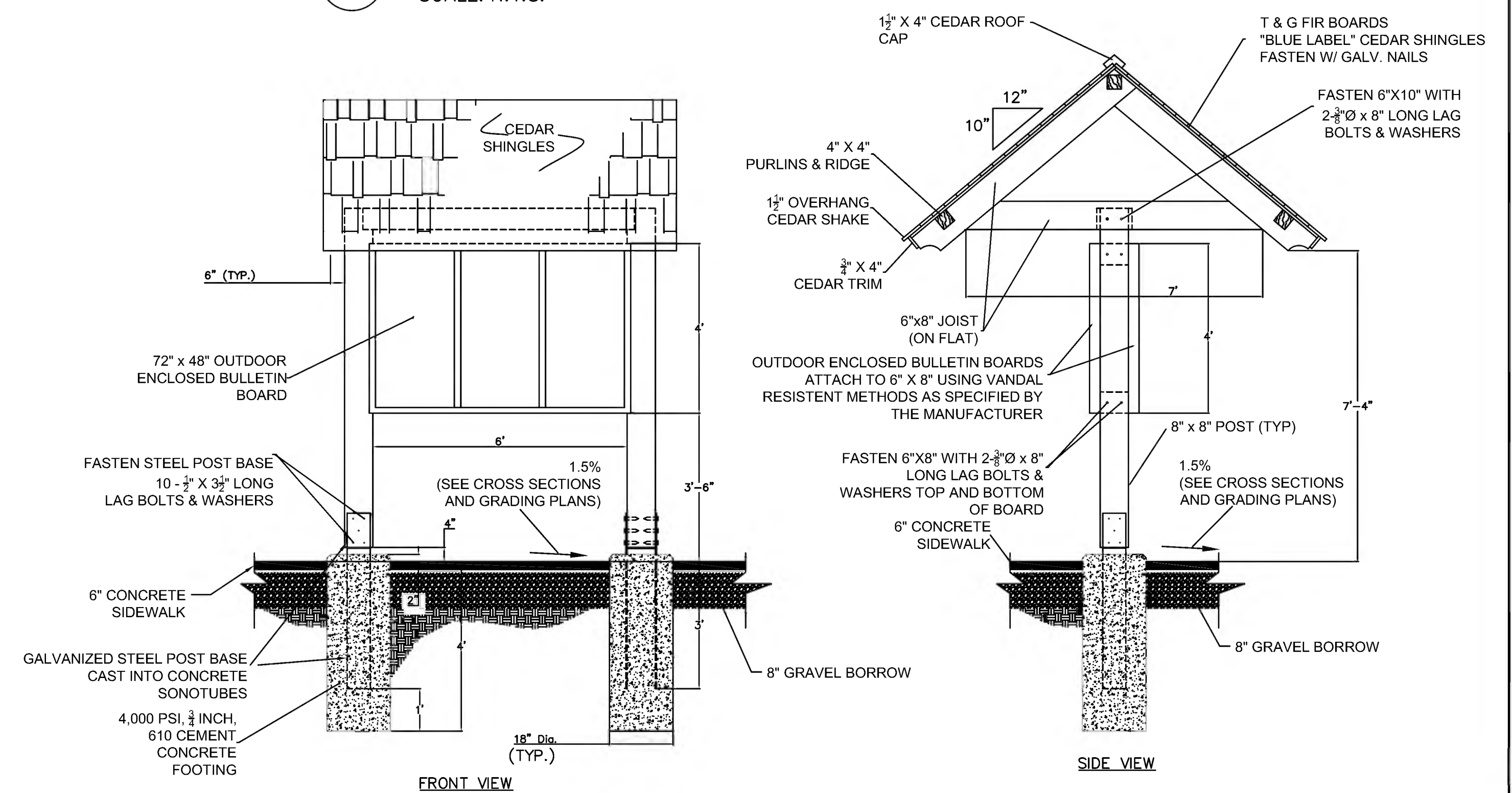
**28 DISPLAY BOARD**  
SCALE: N.T.S.

NOTE:  
INTERPRETATIVE PANEL SHALL BE SQUARE METAL POSTS AND IS INTENDED TO MATCH THE MASSACHUSETTS DCR STANDARDS.



SIGN TYPE	DIMENSION TABLE				
	HEIGHT	WIDTH		DEPTH	
	A	B	C	D	E
26" x 38"	26"	23"	38"	35"	26.5"

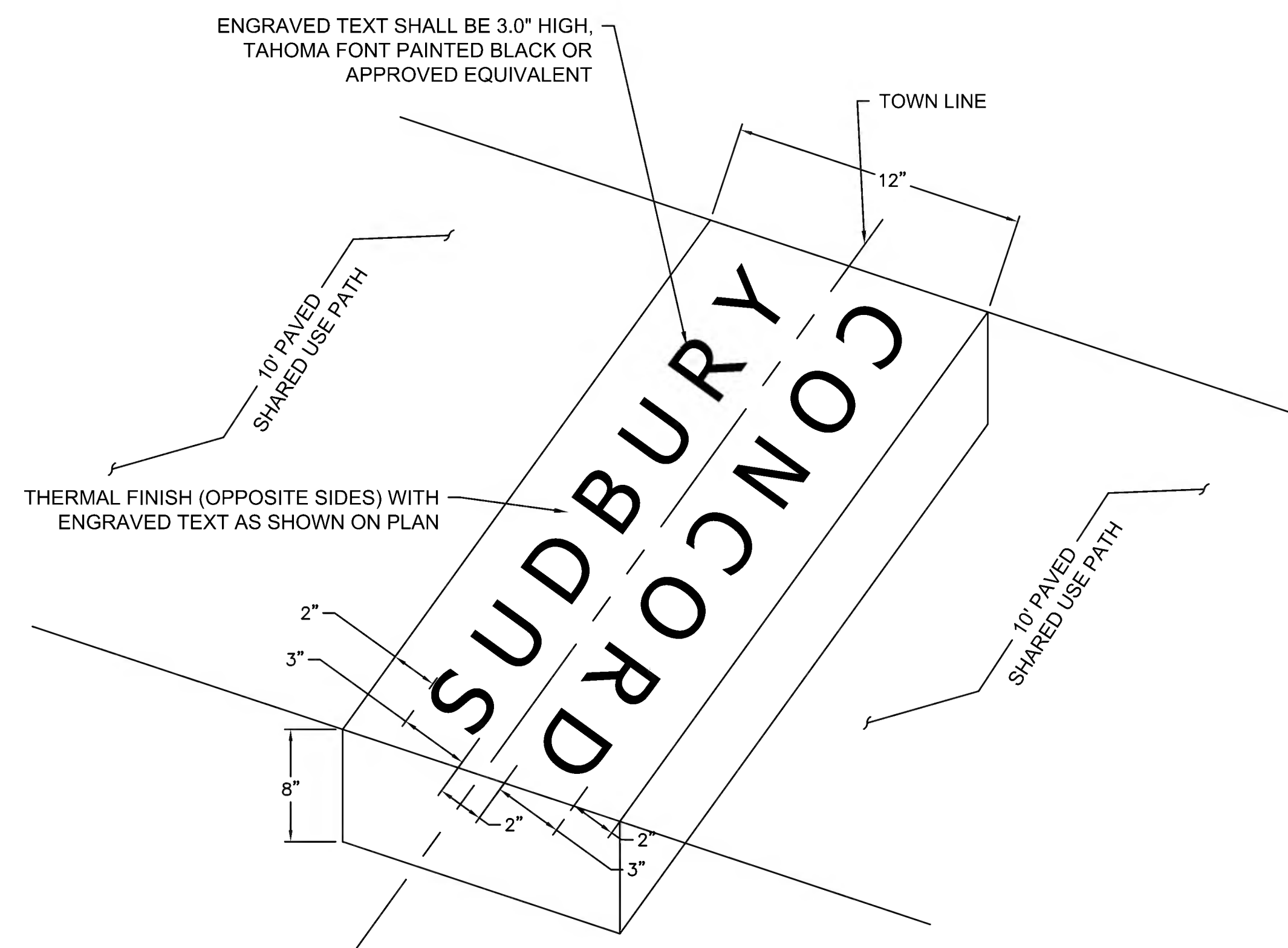
**26 INTERPRETATIVE SIGN**  
SCALE: N.T.S.



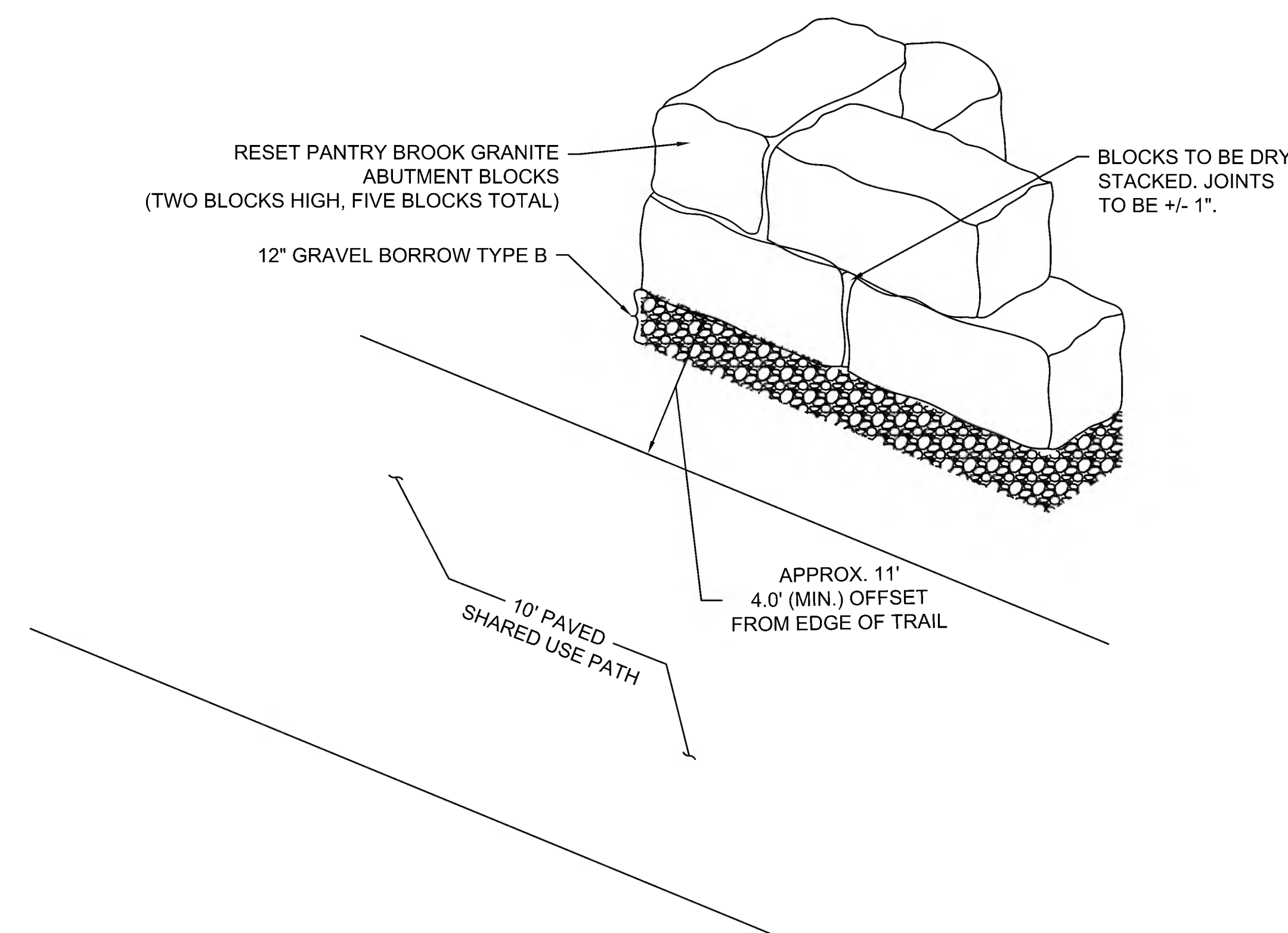
**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	214	319
PROJECT FILE NO.		608164	

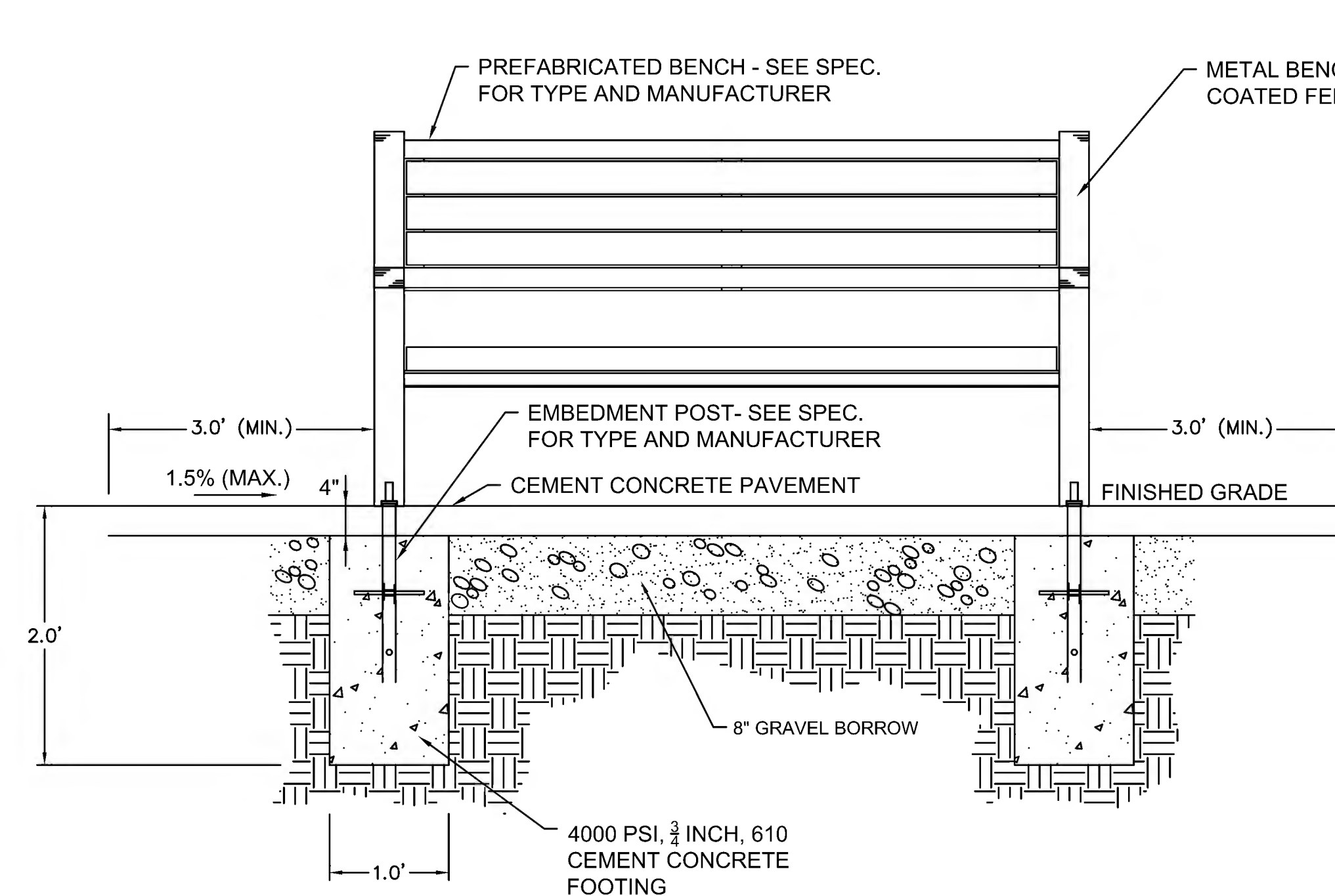
**CONSTRUCTION DETAILS**



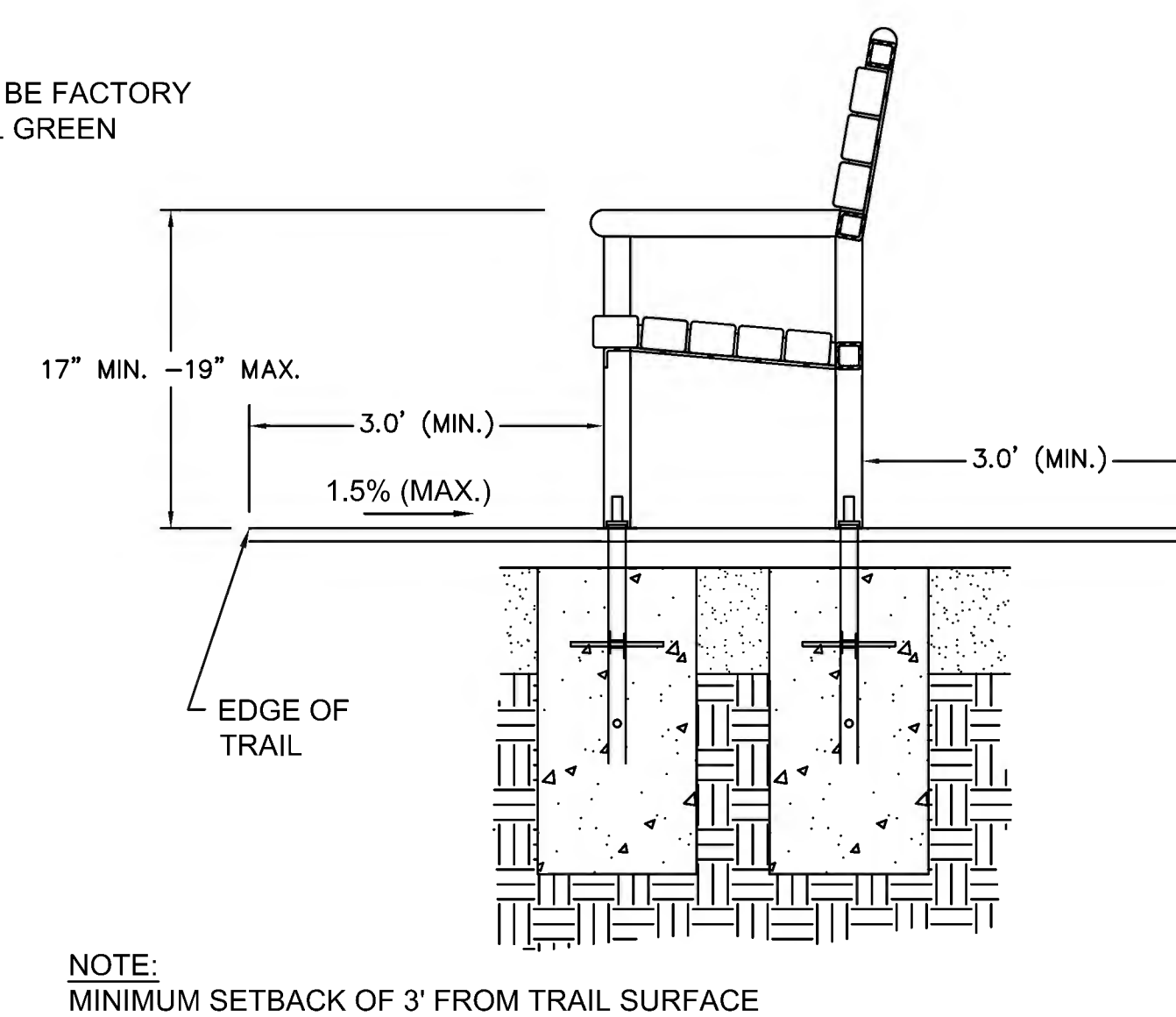
29 GRANITE TOWN LINE MARKER  
SCALE: N.T.S.



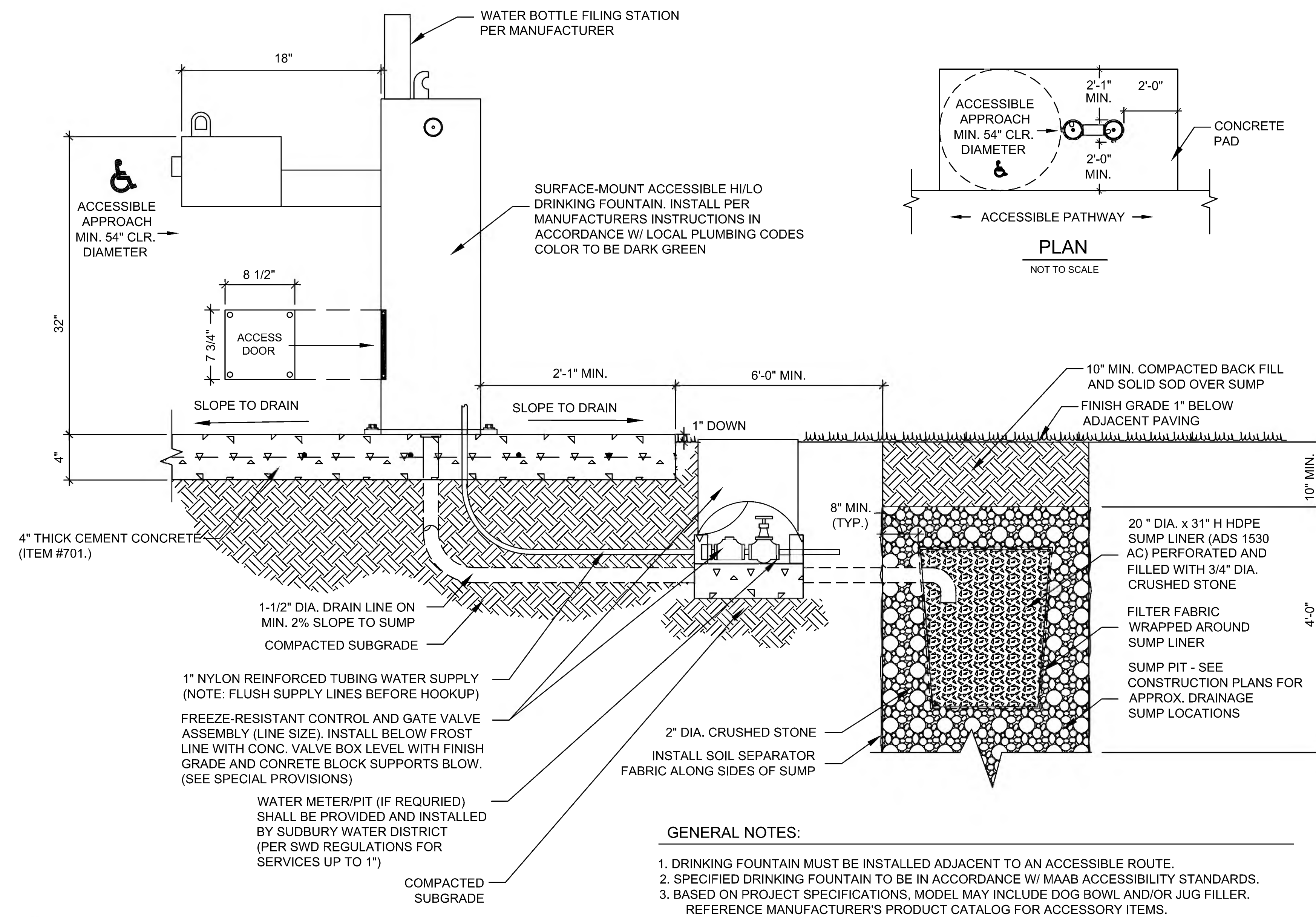
30 PANTRY BROOK ABUTMENT BLOCKS RESET STA. 260+89  
SCALE: N.T.S.



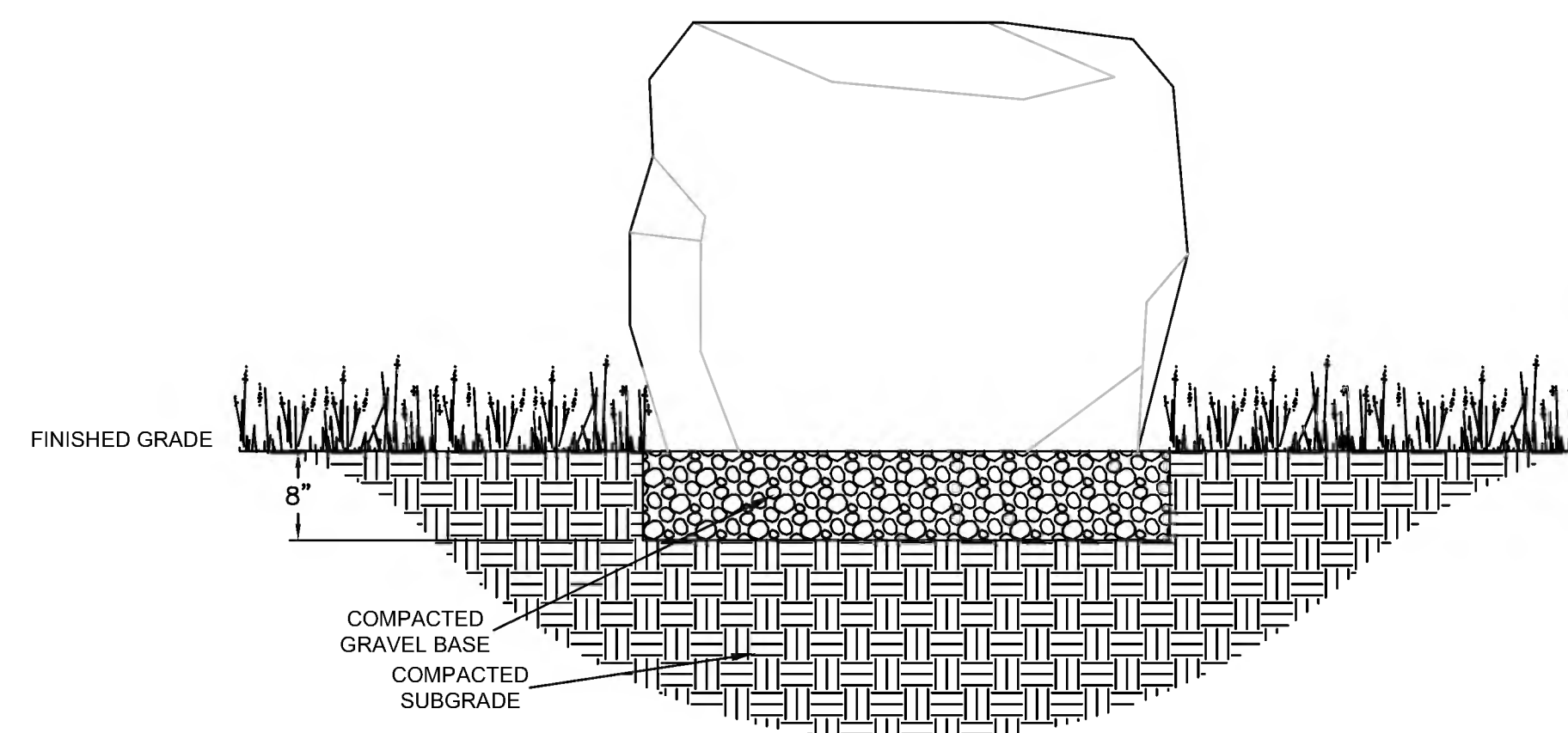
31 BENCH  
SCALE: N.T.S.



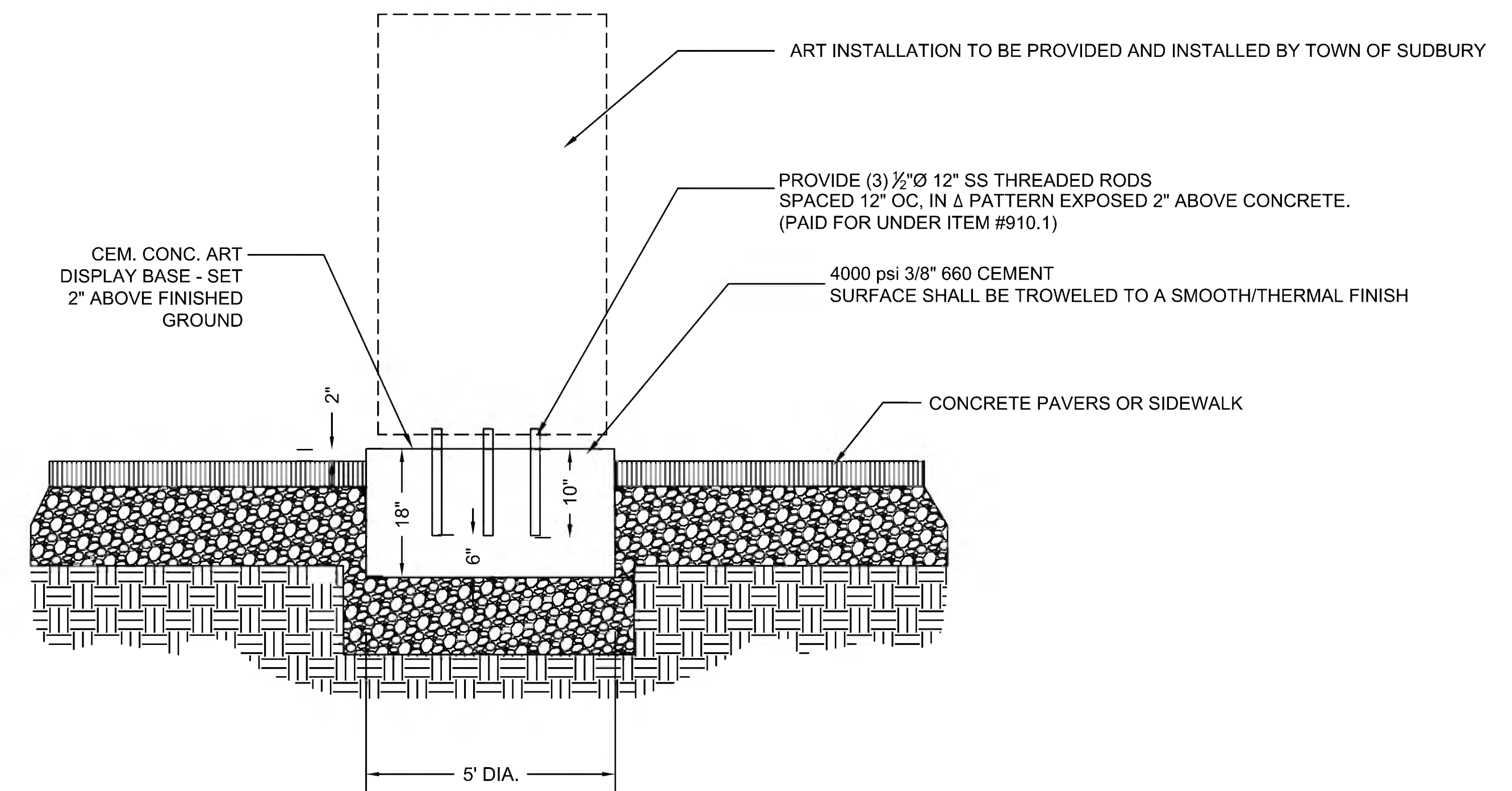




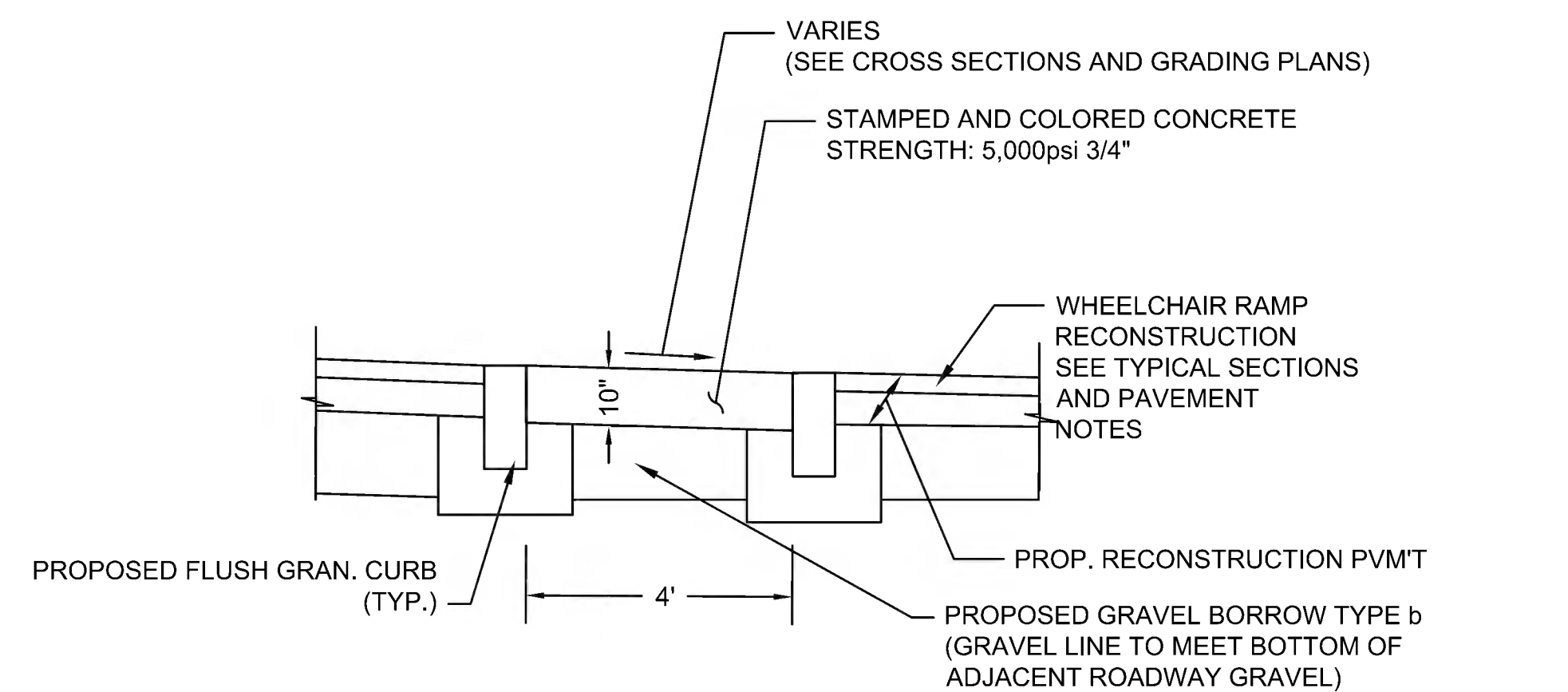
**32** HYDRATION STATION  
SCALE: N.T.S.



**33** BOULDER BARRIERS  
SCALE: N.T.S.

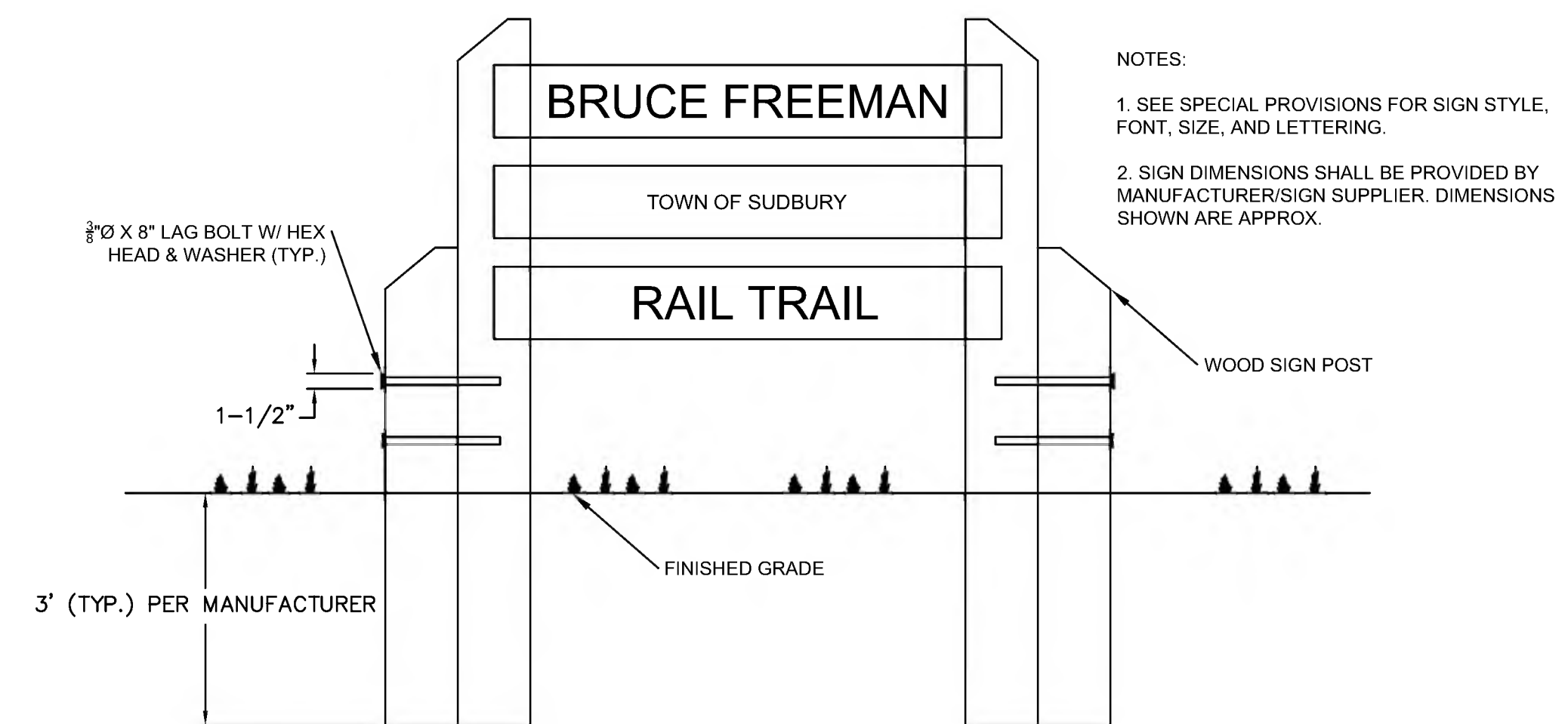


**34** CONCRETE ART DISPLAY BASE  
SCALE: N.T.S.



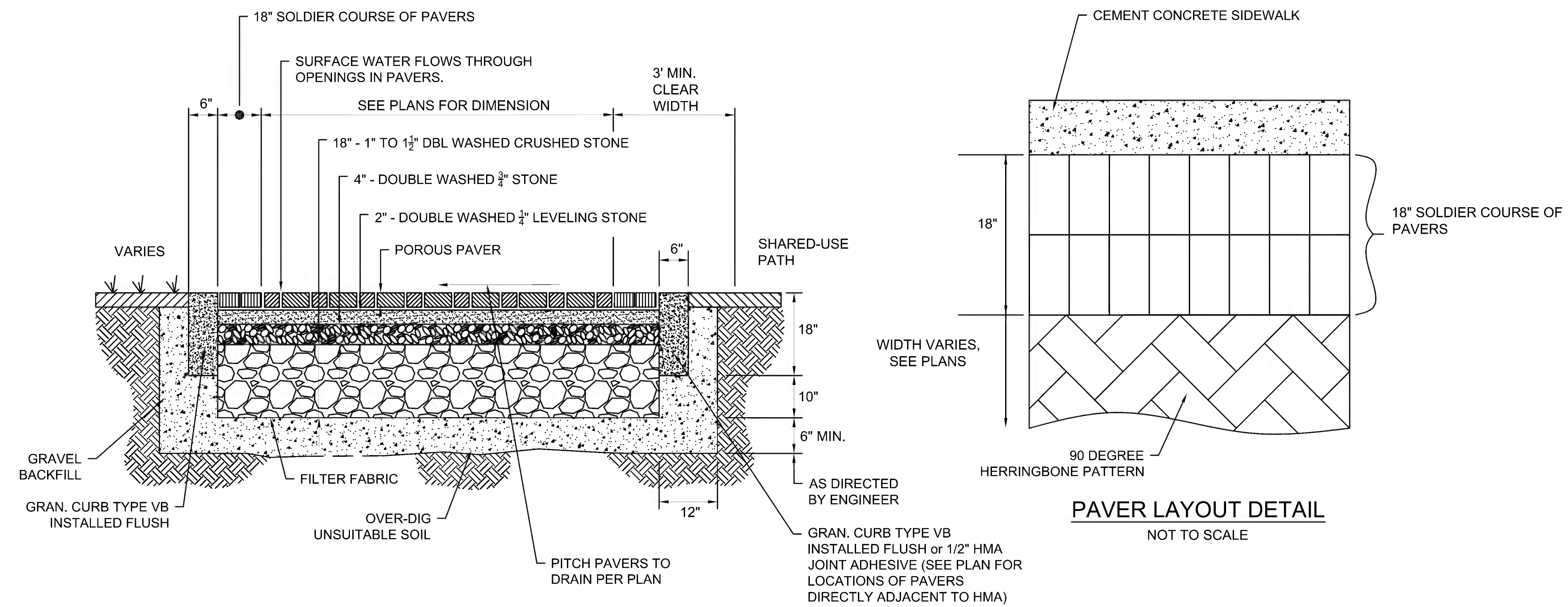
- NOTES:**
- 1) THIS ITEM IS INTENDED TO BE USED AT WHEEL CHAIR RAMPS DESIGNATED AS "STAMPED CONCRETE SPLITTER ISLAND" ON THE CONSTRUCTION PLANS.
  - 2) MEDIANS SHALL BE INSTALLED IN A SINGLE CONCRETE POUR WITH NO CONSTRUCTION (COLD) JOINTS IN THE CONCRETE.
  - 3) SAWN CONTRACTION JOINTS SHALL BE INSTALLED EVERY 20' (MAXIMUM). SEE SPECIAL PROVISIONS FOR MATERIALS AND METHOD OF JOINT INSTALLATION.
  - 4) A 2" TOOLED EDGE SHALL BE INSTALLED TO MAKE A SMOOTH TRANSITION TO THE ADJACENT PAVEMENT

**35** STAMPED & COLORED CONCRETE MEDIAN  
- COLONIAL RED (SPLITTER ISLAND)  
SCALE: N.T.S.

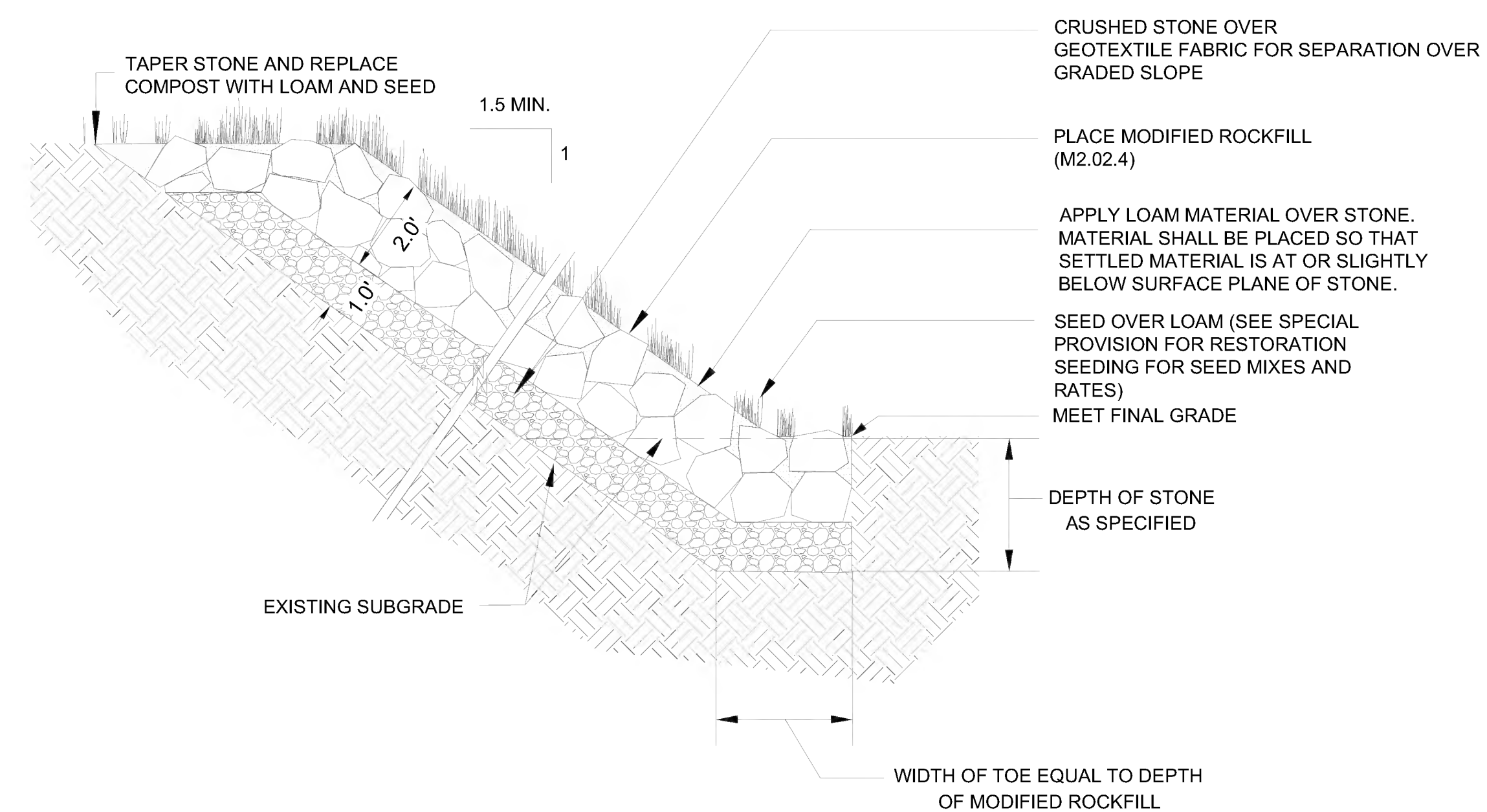


**36** BRUCE FREEMAN RAIL TRAIL ENTRANCE SIGN  
SCALE: N.T.S.



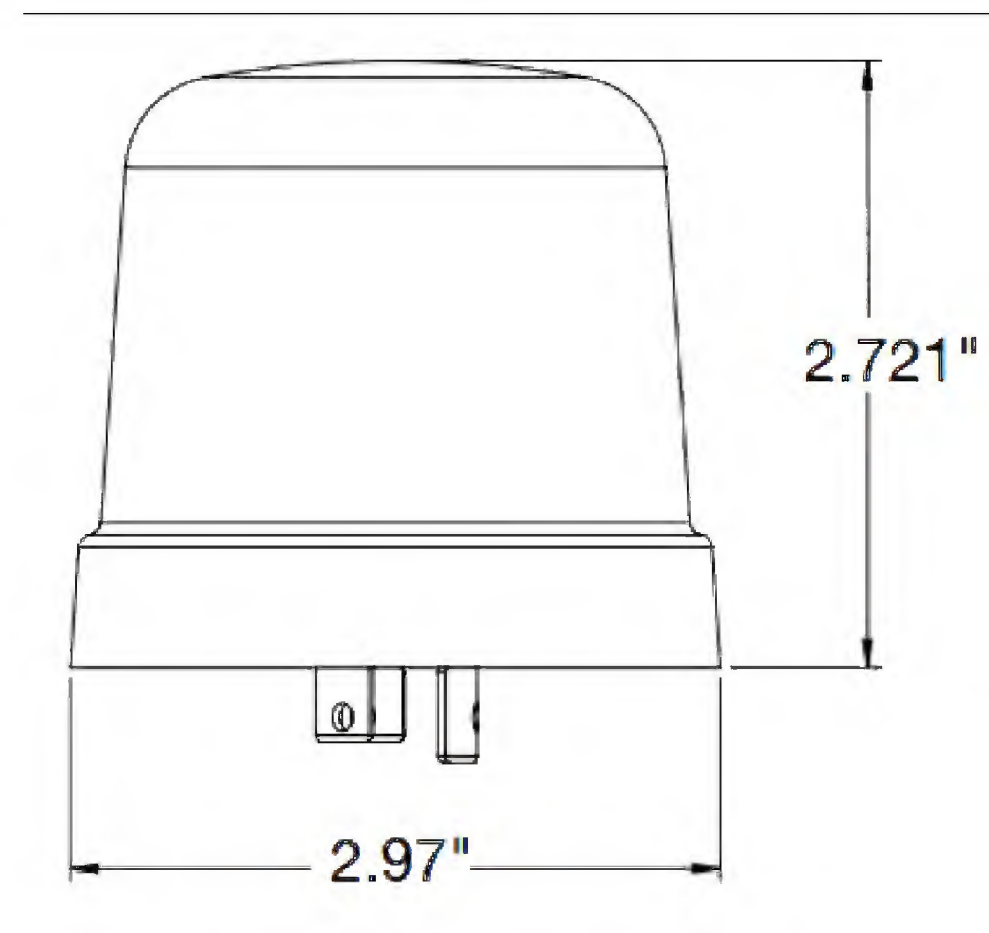


37 PERVIOUS PAVER TYPICAL SECTION  
SCALE: N.T.S.

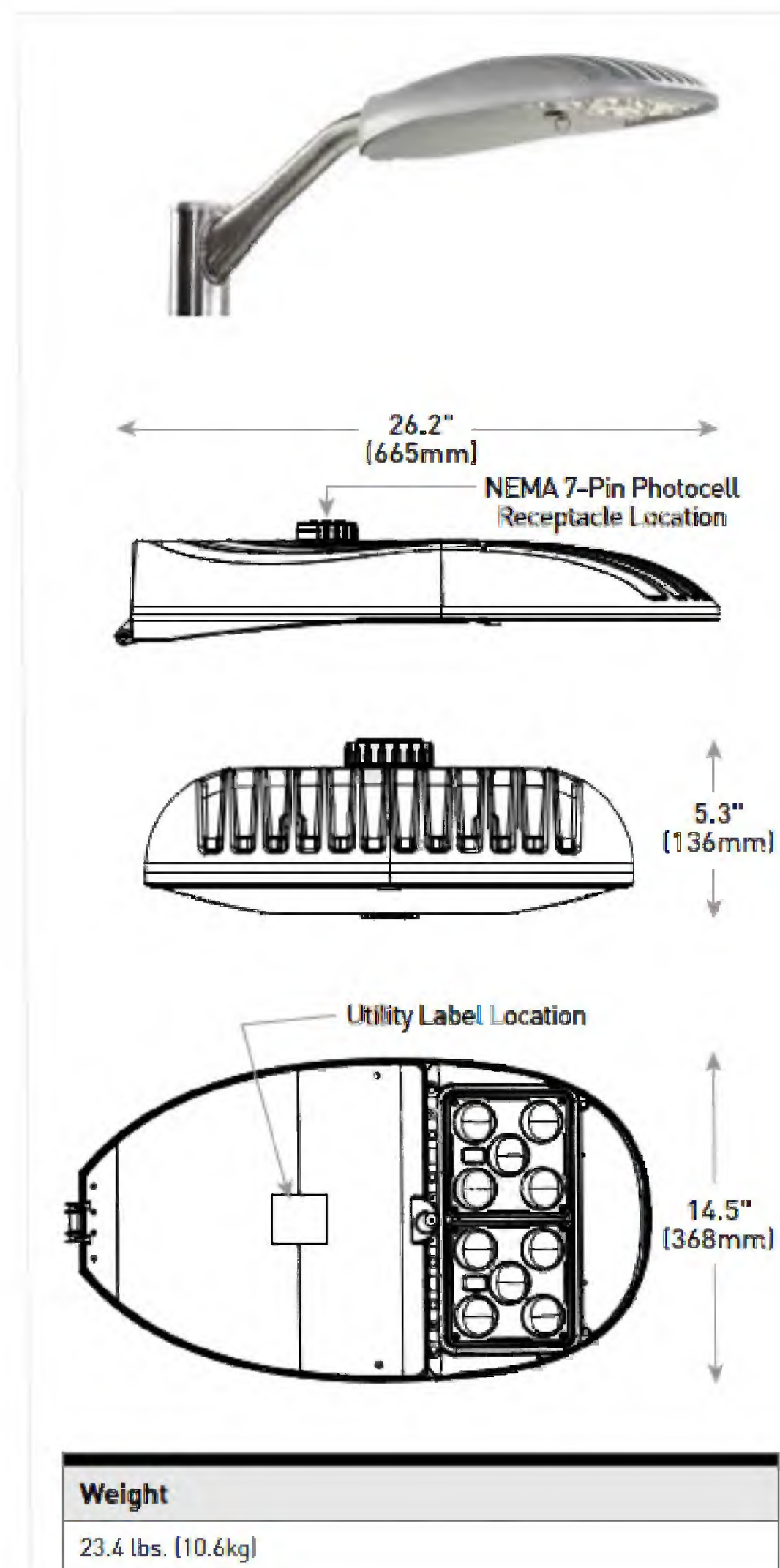


38 LOAM AND SEED OVER MODIFIED ROCKFILL  
SCALE: N.T.S.

120-277 VOLT ELECTRIC PHOTO CONTROL  
LOCKING TYPE MOUNTING



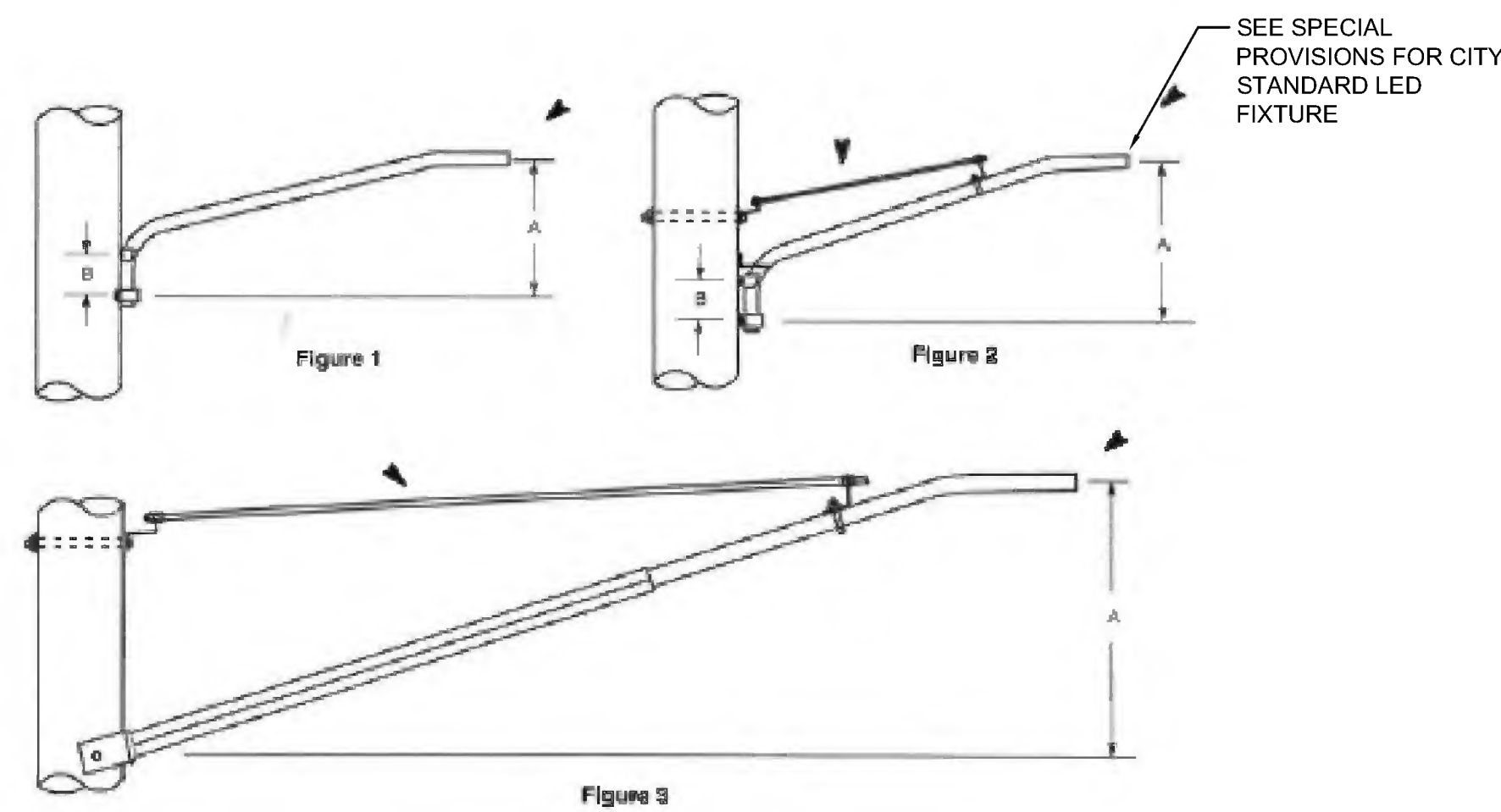
LED STREET/AREA LUMINARE



NOTES:

1. TO BE INSTALLED PER CITY STANDARD
2. HORIZONTAL TENSION MOUNTING
3. DIE CAST ALUMINUM HOUSING
4. INPUT VOLTAGE 120V - 277V
5. TO MEET ANSI C136.31-2001 AND 3G BRIDGE AND OVERPASS VIBRATION STANDARDS
6. TO DELIVER UP TO 23,800 LUMENS
7. WITH EFFICACY UP TO 139 LPW
8. CCT: 2700K, 3000K, 4000K, 5000K, 5700K

39 LED STREET/AREA LUMINARE (CITY STANDARD)  
SCALE: N.T.S.



Bracket Size	Bracket Style Figure No.	Approximate Dimensions in Inches		Item Number	DTR 21.112 Pagebook Variations
		A	B		
1 1/4" x 4'	1	18-19	11	511567	A thru C
1 1/4" x 6'	2	24-30	8-11	511568	D thru F
1 1/4" x 8'	2	19-31	8-13	511569	G thru I
1 1/4" x 10'	2	35-48	12-13	511570	J thru L
1 1/4" x 12'	3	40-43	—	511571	M thru O
1 1/4" x 16'	3	56-58	—	511572	P thru R
2" x 20'	3	67-73	—	511573	S thru U
2" x 8'	2	30	9	511496	V thru X

Notes

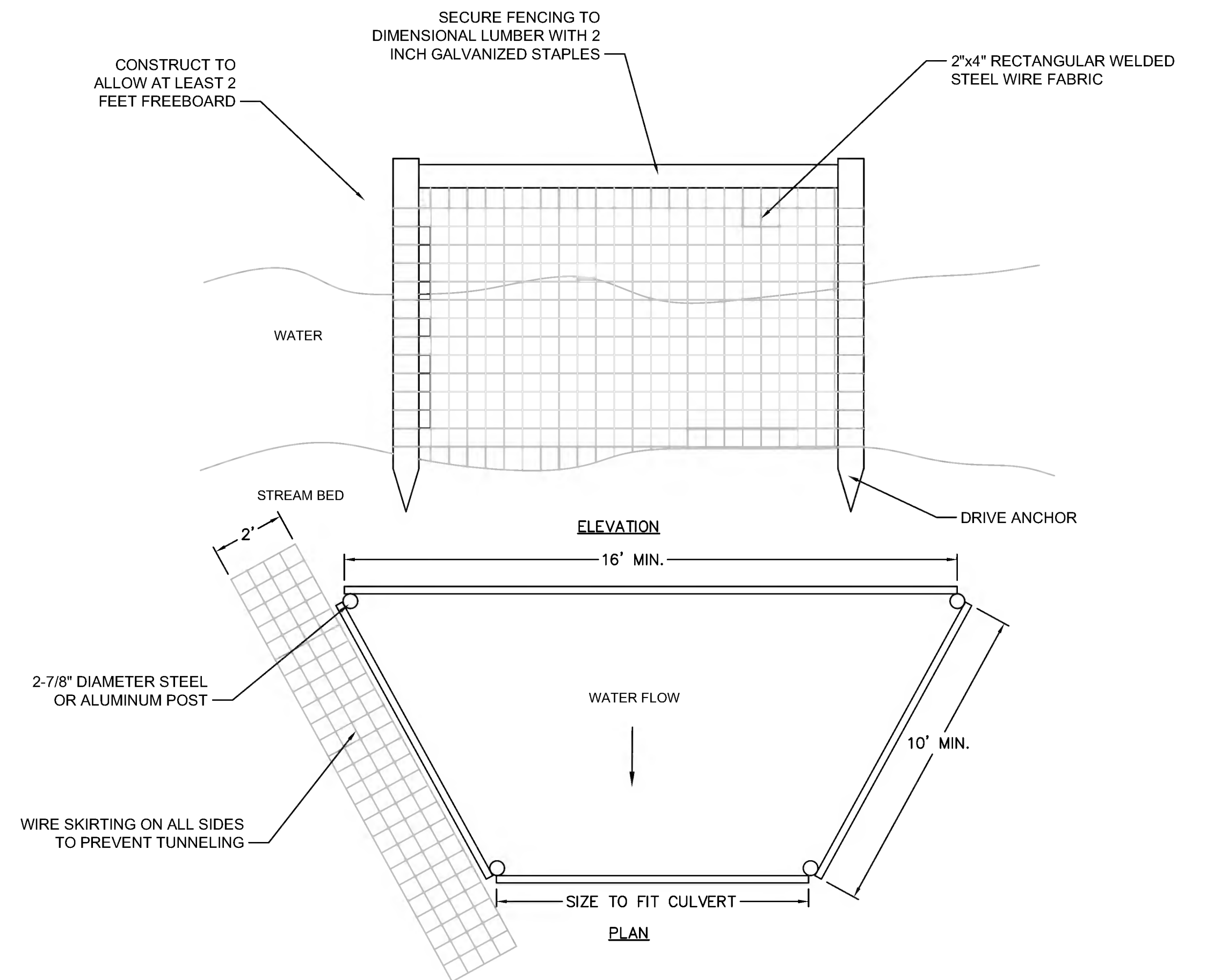
1. Dimensions shown do not necessarily apply to brackets purchased before 1967.
2. Variations shown depend on application.

DESIGNED BY	AREA AND MUNICIPAL - GALVANIZED STEEL STREET LIGHT BRACKET FOR WOOD POLES		
APPROVED BY	EVERSOURCE ENERGY	DESIGN & APPLICATION STANDARD	DTR 21.111 9

NOTE:

1. ITEM SHALL BE NON-PARTICIPATING

40 HIGHWAY LIGHTING FIXTURE ARM  
SCALE: N.T.S.



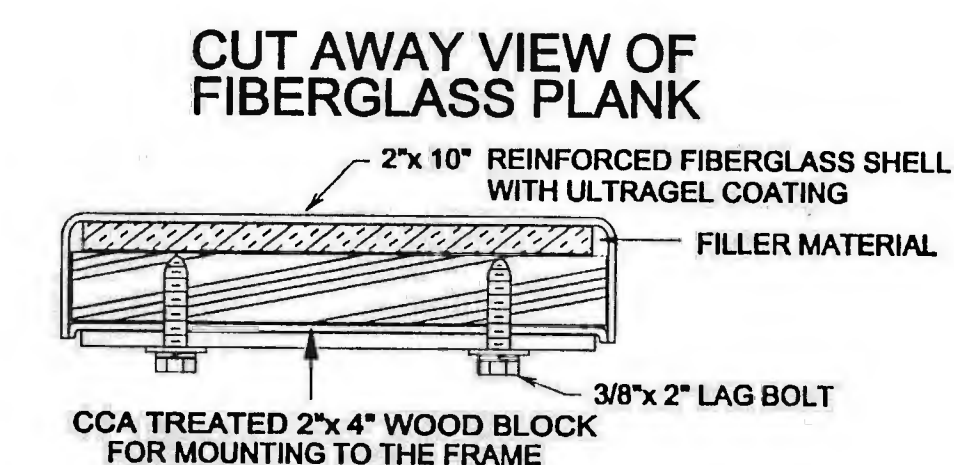
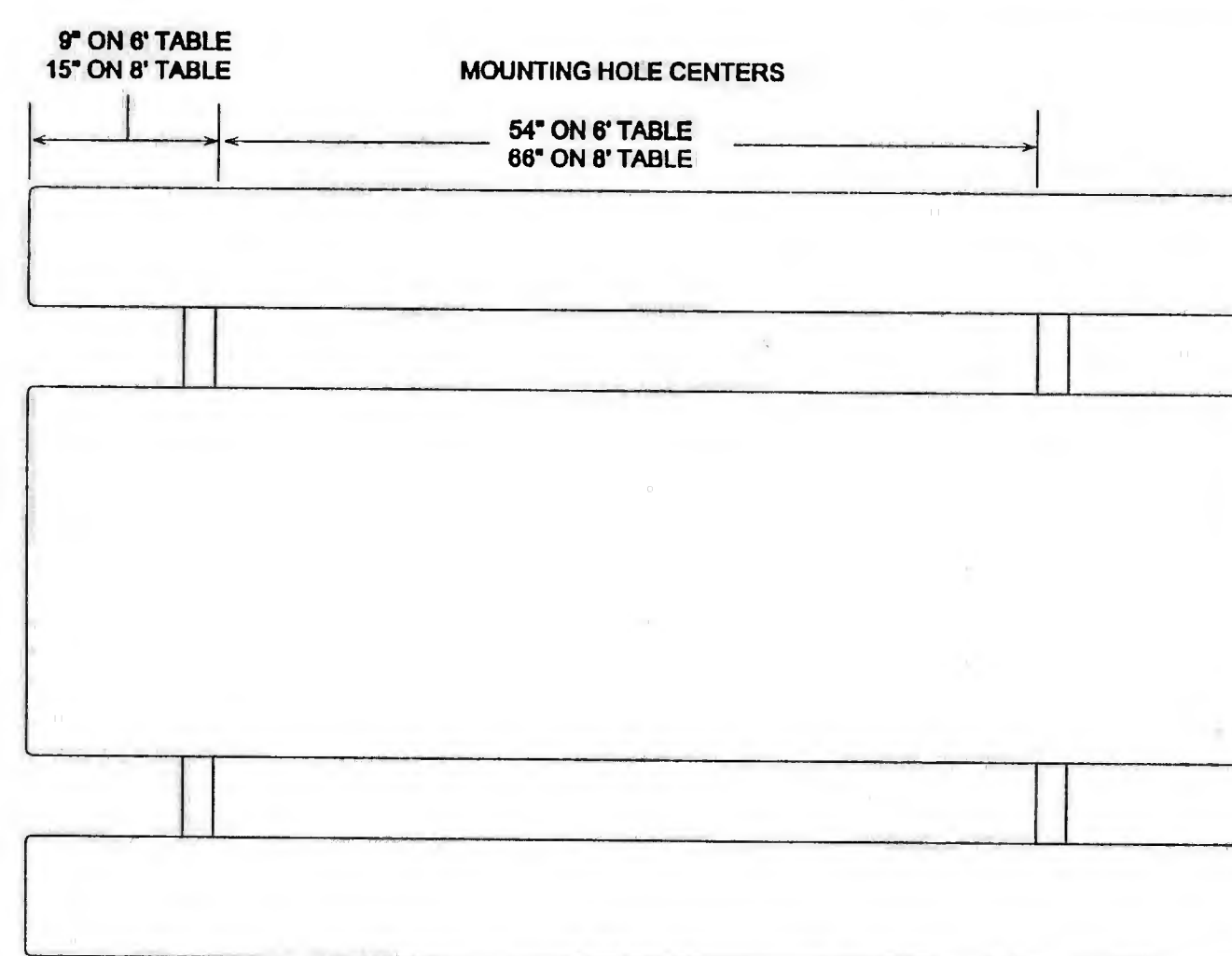
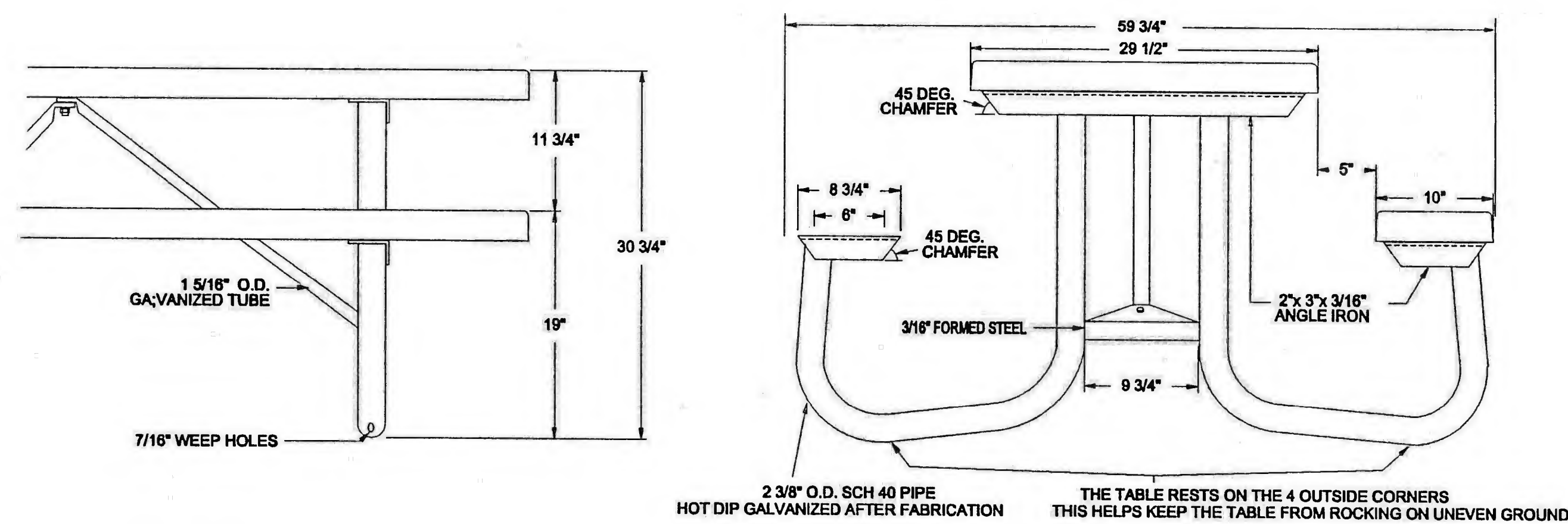
41 TRAPEZOIDAL AQUATIC EXCLUSIONARY FENCING  
SCALE: N.T.S.



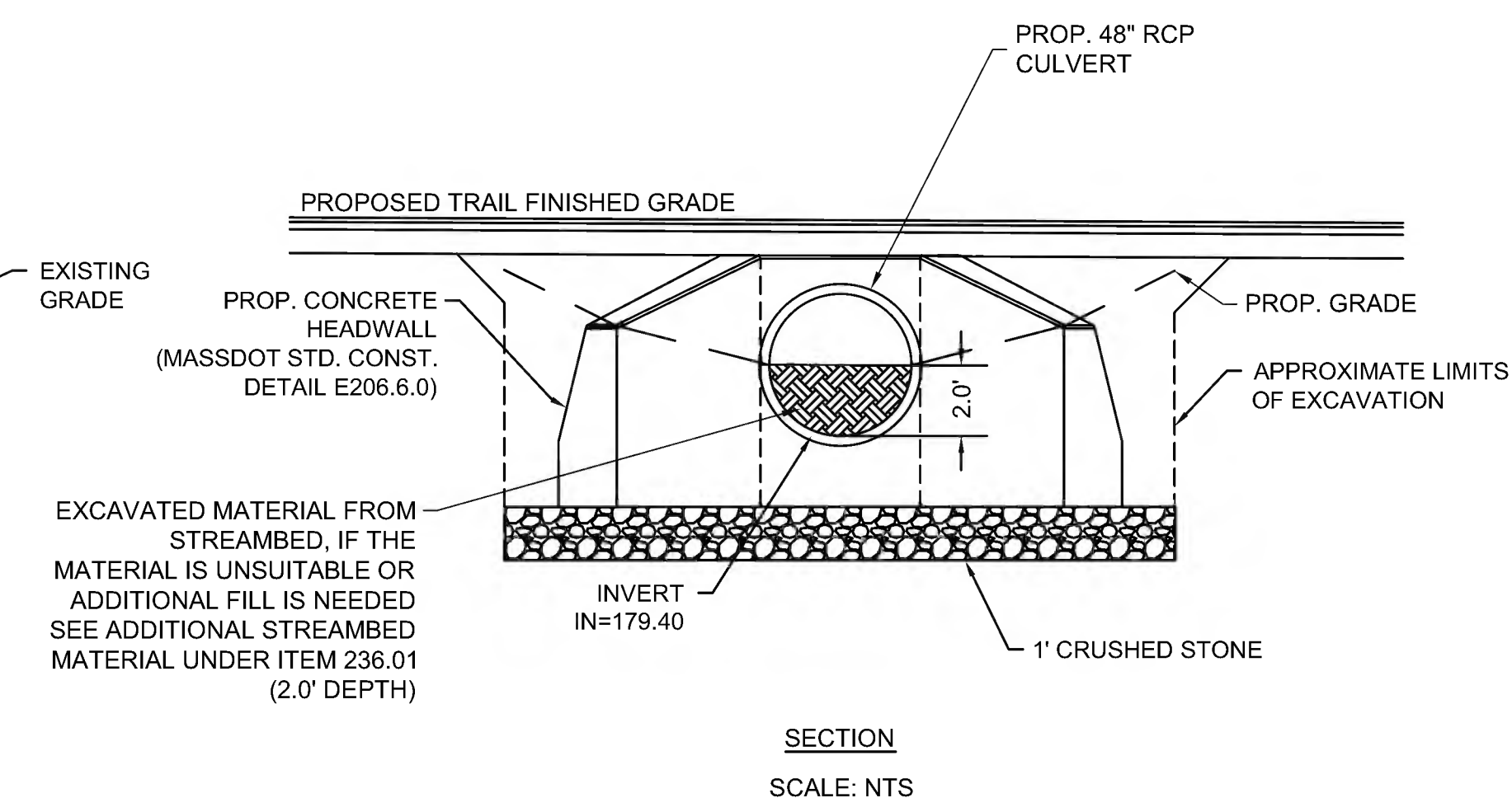
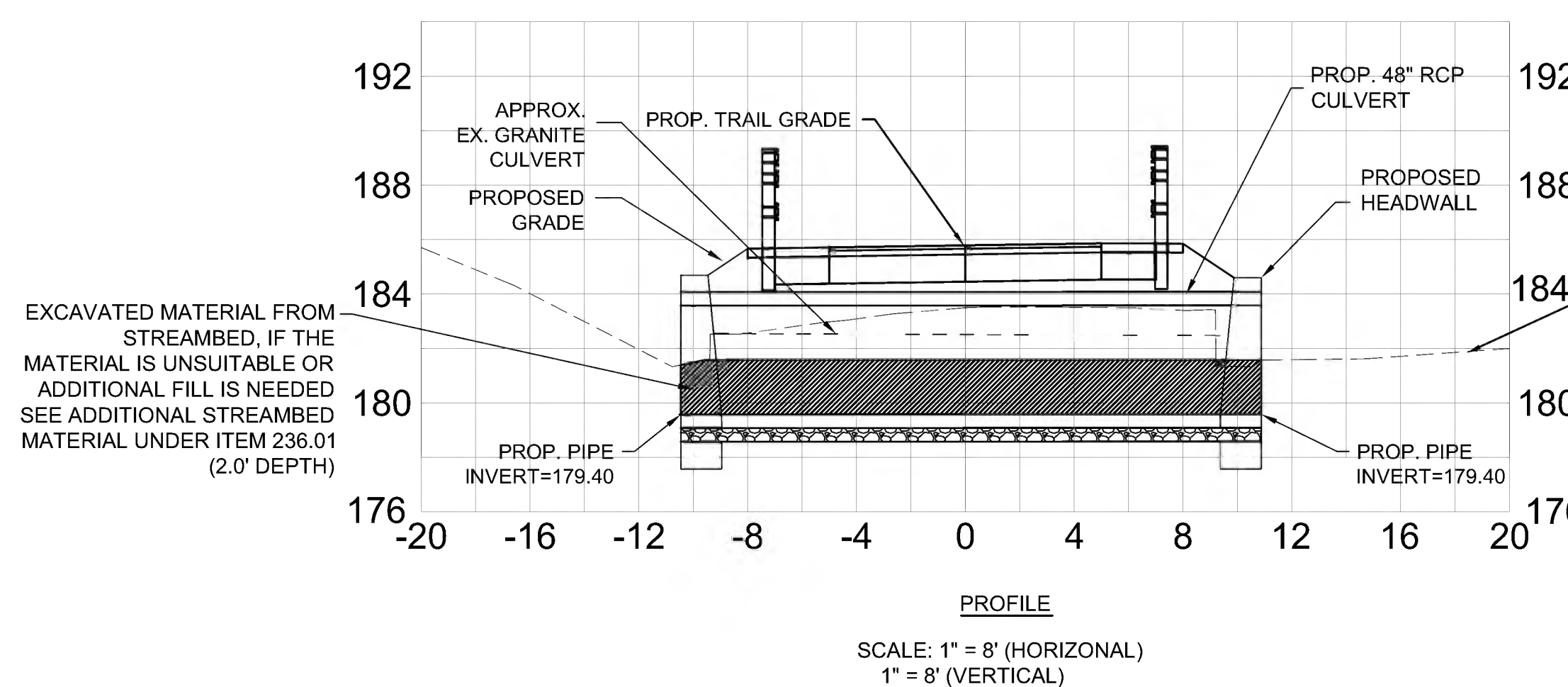
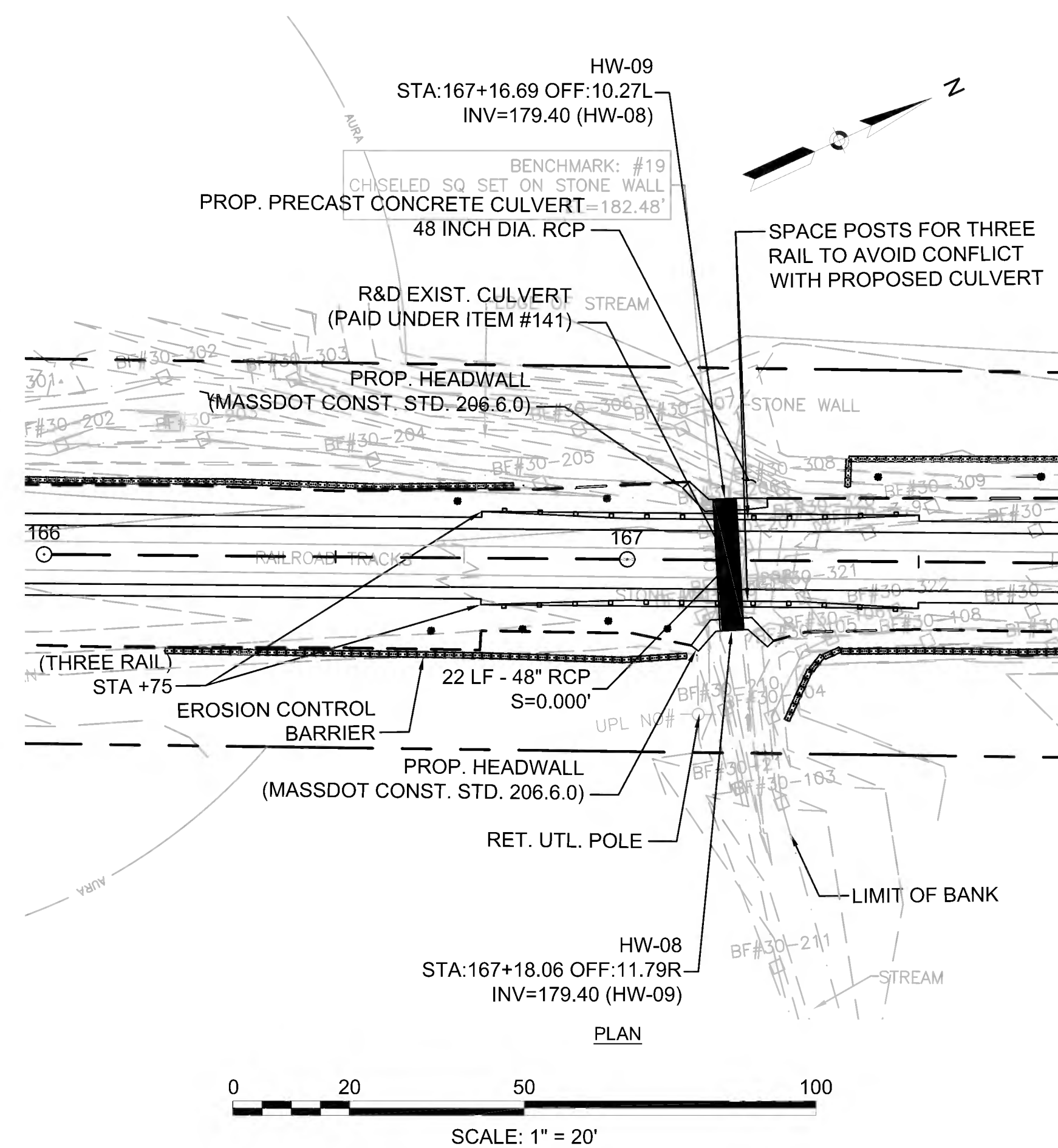
**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	219	319
PROJECT FILE NO.		608164	

**CONSTRUCTION DETAILS**



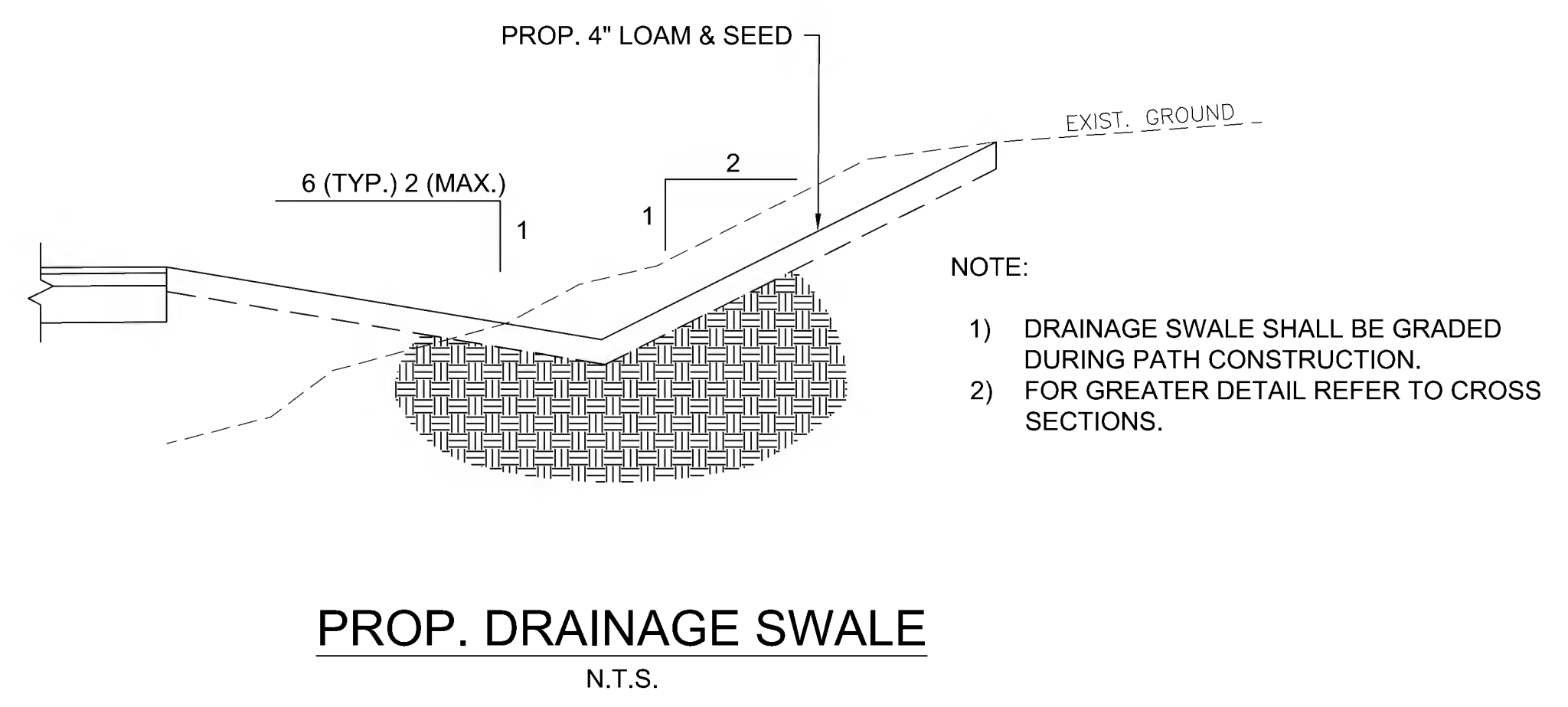
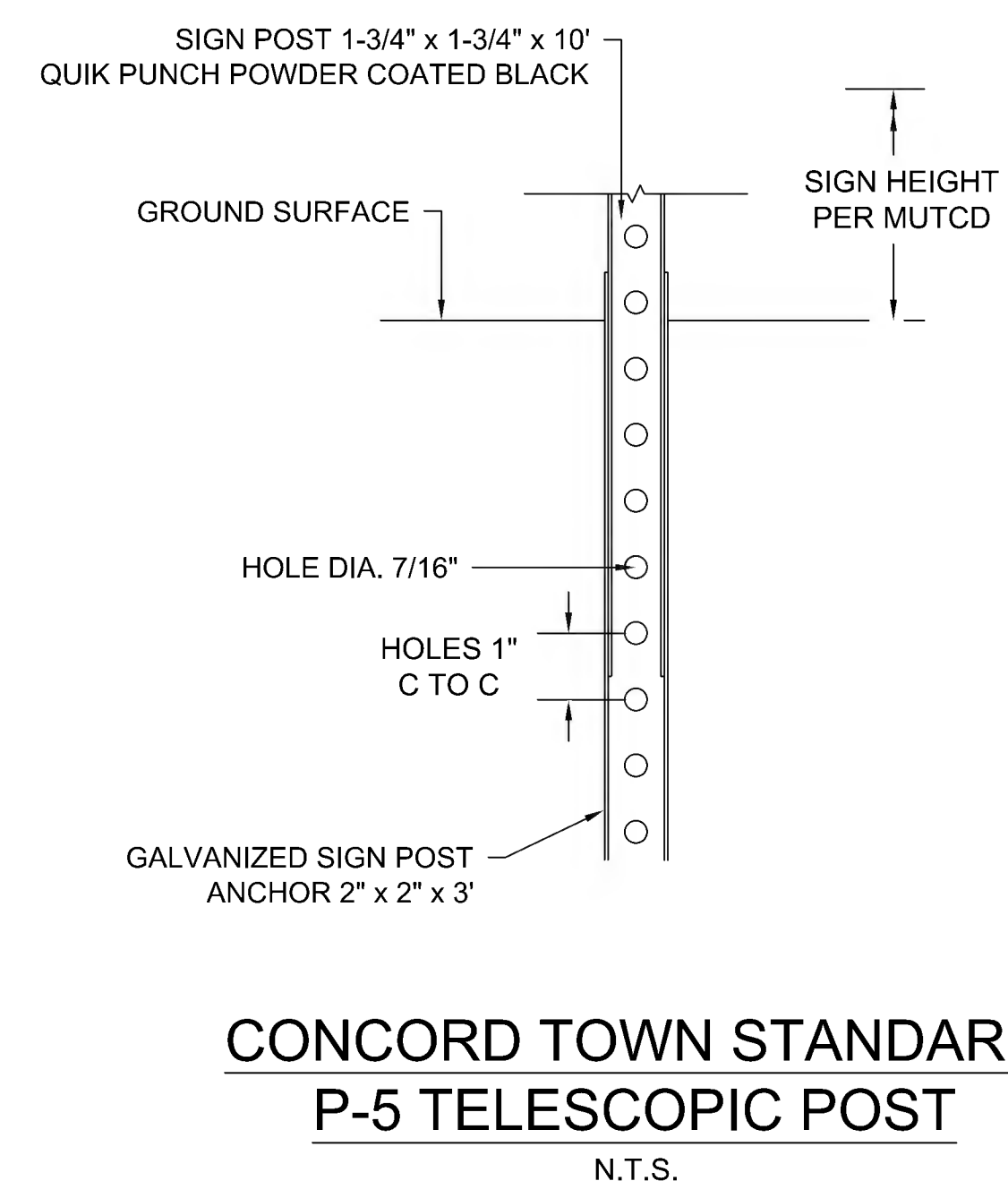
42 PICNIC TABLE  
SCALE: AS NOTED



43 CONCRETE CULVERT REPLACEMENT - STA 167+17  
SCALE: AS NOTED

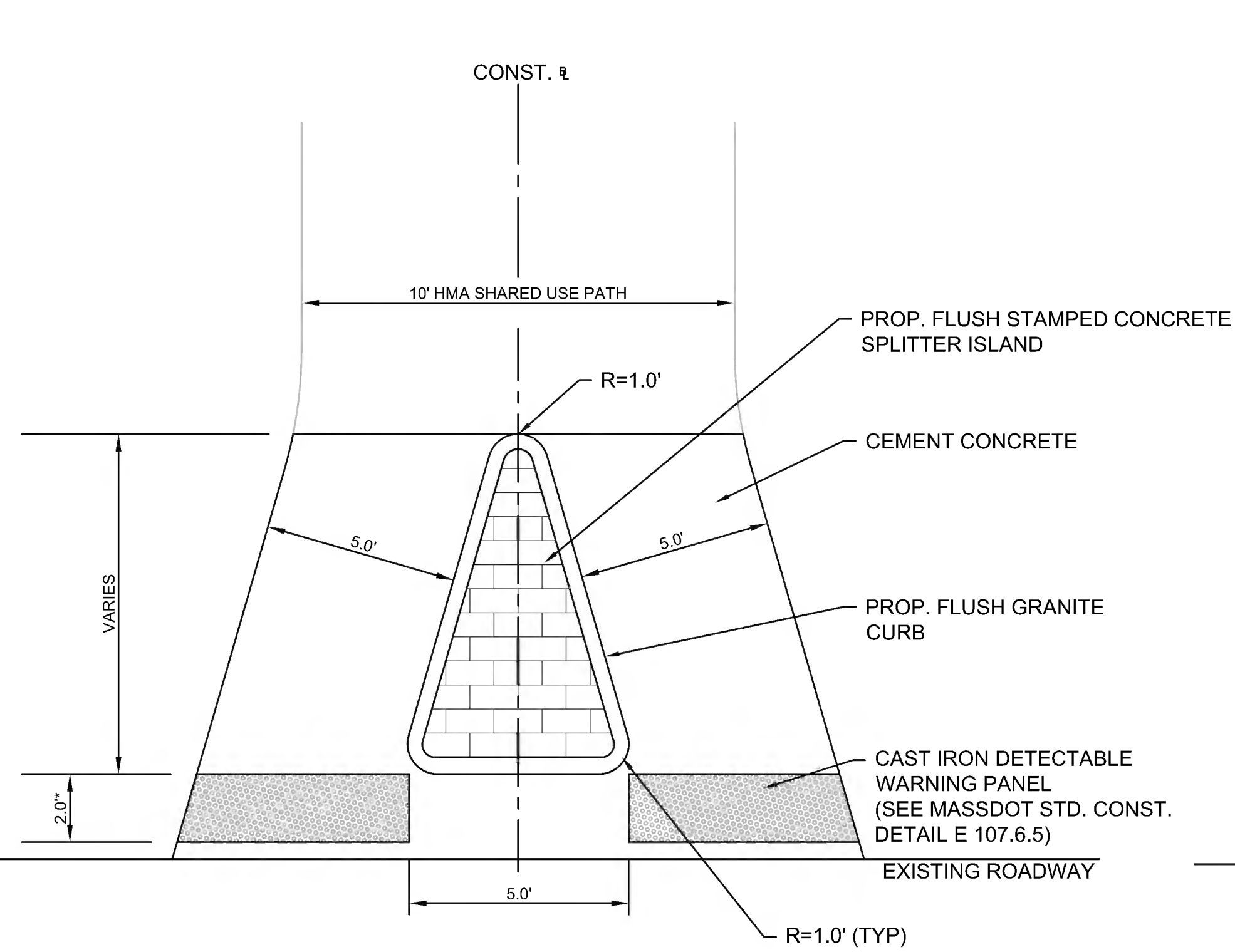
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	220	319
PROJECT FILE NO.		608164	

CONSTRUCTION DETAILS

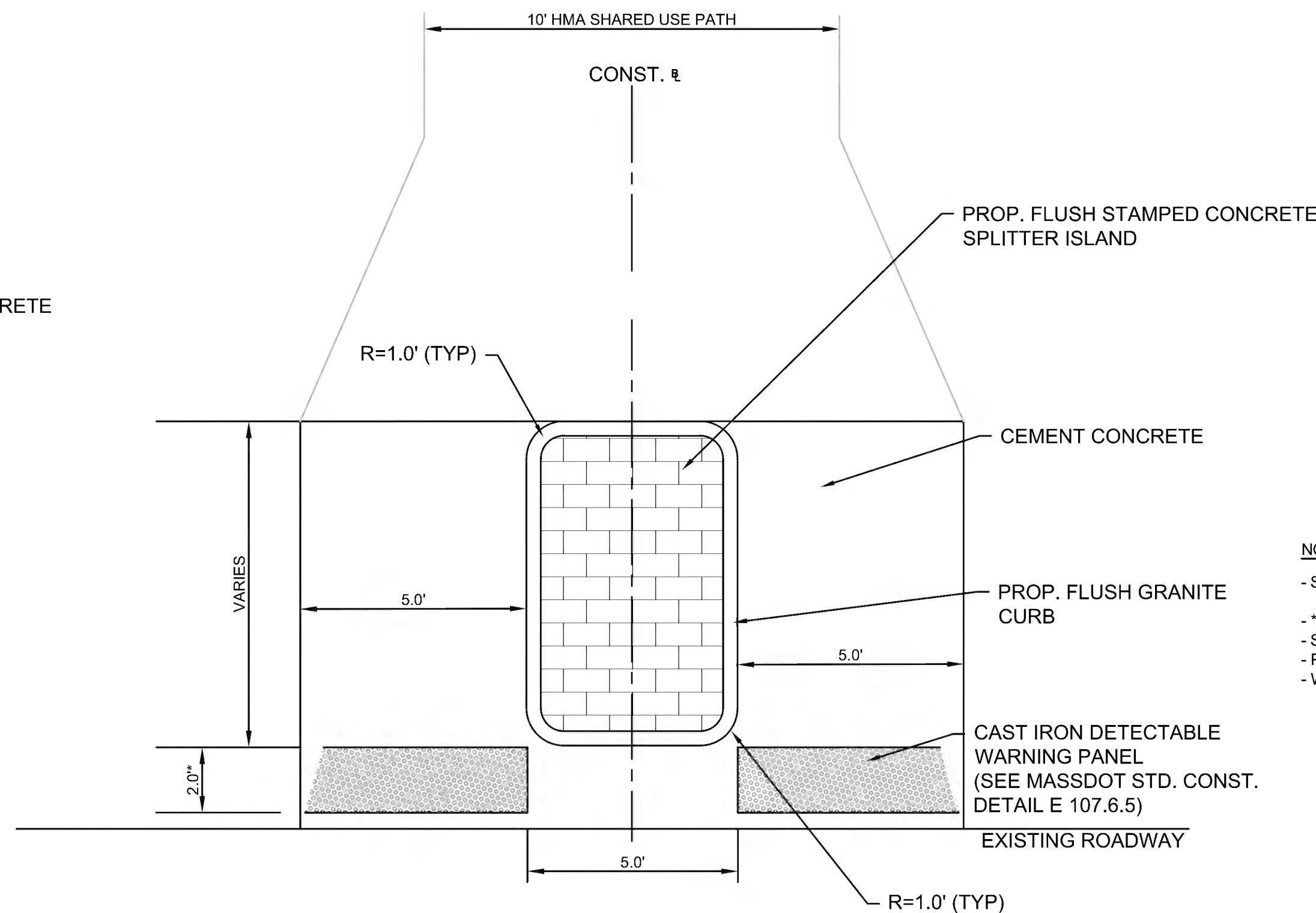




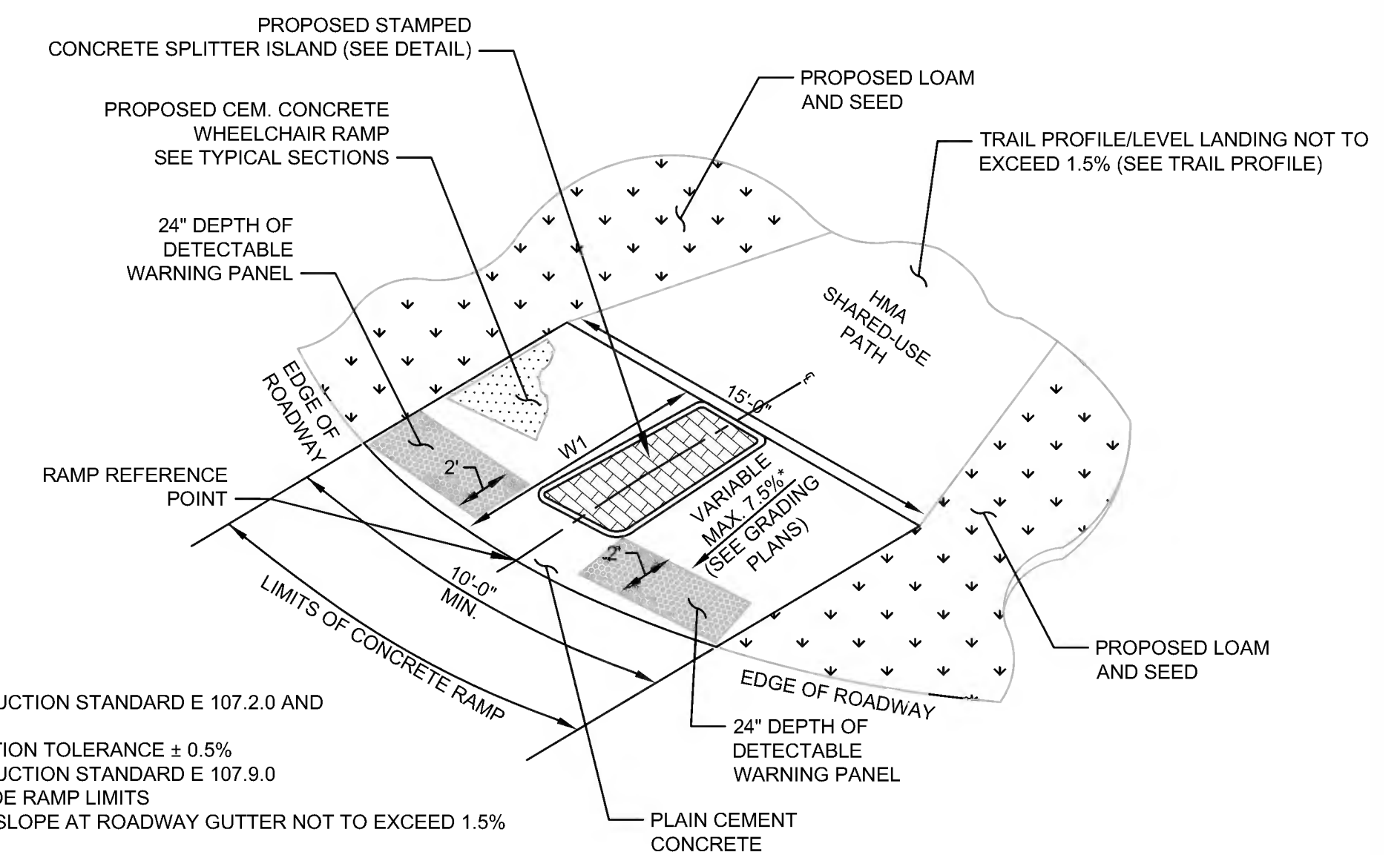
- NOTES:  
 1. ALL RAMP ARE TO BE CONSTRUCTED WITH 4" THICKNESS OF CEMENT CONCRETE.  
 2. DETECTABLE WARNING PANELS SHALL BE PLASTIC - COLORED BRICK RED.



**CEMENT CONCRETE RAIL TRAIL ENTRANCE WITH SPLITTER ISLAND**  
N.T.S.



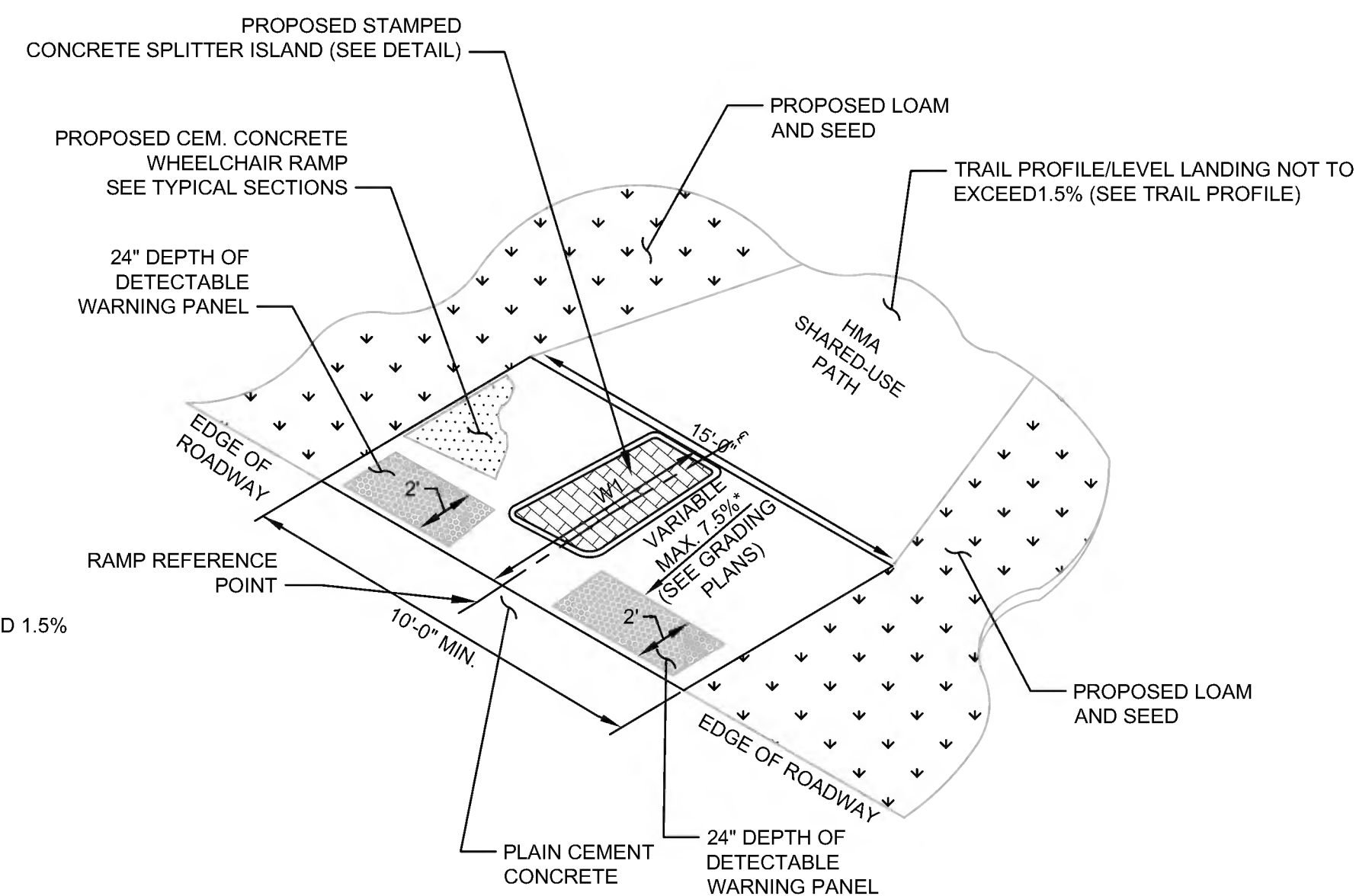
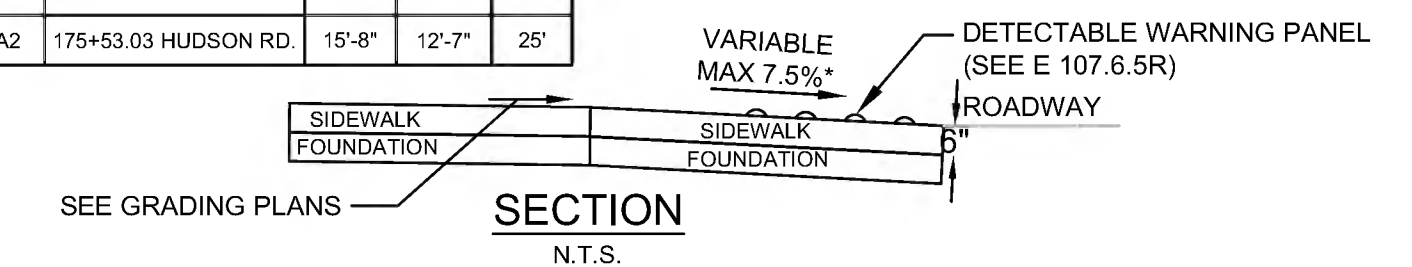
**CEMENT CONCRETE RAIL TRAIL ENTRANCE WITH SPLITTER ISLAND**  
N.T.S.



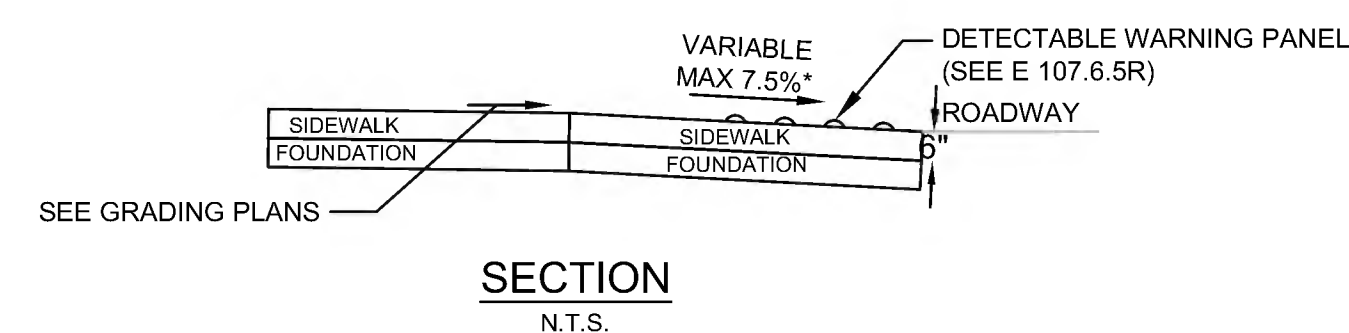
- NOTES:  
 - SEE CONSTRUCTION STANDARD E 107.2.0 AND E 107.6.5  
 - \* CONSTRUCTION TOLERANCE ± 0.5%  
 - \*\* CONSTRUCTION STANDARD E 107.9.0  
 - PC/PT OUTSIDE RAMP LIMITS  
 - WCR CROSS SLOPE AT ROADWAY GUTTER NOT TO EXCEED 1.5%

**TYPE A SHARED USE PATH  
ENTRANCE/EXIT RAMP ON CORNER RADIUS**  
N.T.S.

WCR#	RAMP REFERENCE POINT	WIDTH OF RAMP ENTRANCE (10'-0" MIN.)	LENGTH OF PRIMARY RAMP (W1)	CORNER RADIUS
A1	108+59.82 UNION AVE	17'-1"	12'-9"	20'
A2	175+53.03 HUDSON RD	15'-8"	12'-7"	25'



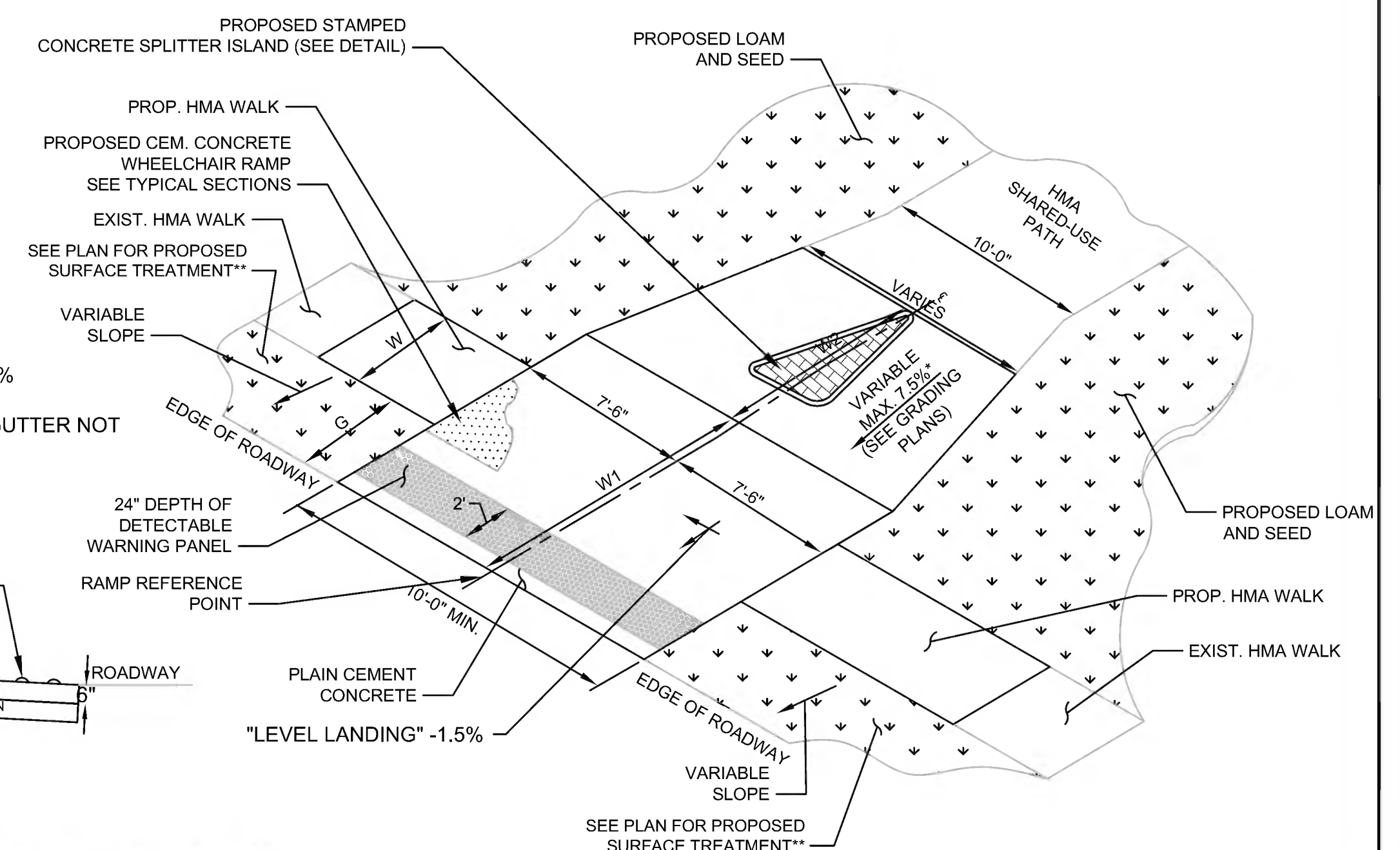
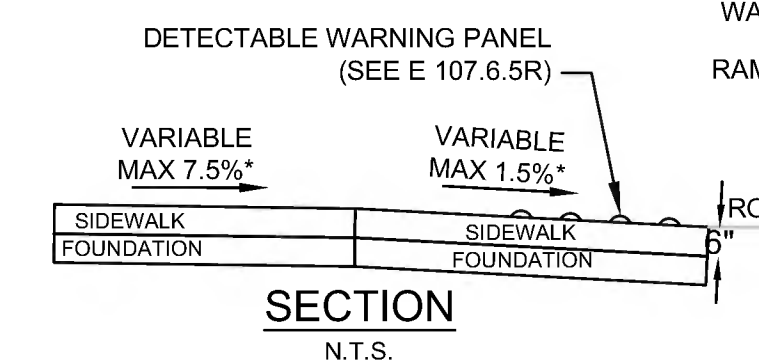
**TYPE B SHARED USE PATH  
ENTRANCE/EXIT RAMP**  
N.T.S.



- NOTES:  
 - SEE CONSTRUCTION STANDARD E 107.2.0 AND E 107.6.5  
 - \* CONSTRUCTION TOLERANCE ± 0.5%  
 - \*\* CONSTRUCTION STANDARD E 107.9.0  
 - PC/PT OUTSIDE RAMP LIMITS  
 - WCR CROSS SLOPE AT ROADWAY GUTTER NOT TO EXCEED 1.5%

WCR#	RAMP REFERENCE POINT	WIDTH OF RAMP ENTRANCE (10'-0" MIN.)	LENGTH OF PRIMARY RAMP (W1)
B1	108+83.74 UNION AVE.	16'-5"	12'-7"
B2	115+96.13 CODJER LN.	15'-10"	12'-8"
B3	116+20.92 CODJER LN.	15'-1"	12'-7"
B4	142+82.00 OLD LANCASTER RD.	16'-2"	12'-7"
B5	215+94.04 MORSE RD.	16'-0"	12'-7"
B6	274+94.44 HAYNES RD.	15'-0"	12'-3"
B7	275+15.00 HAYNES RD.	15'-0"	12'-9"
B8	307+75.00 NORTH RD.	15'-7"	12'-7"

- NOTES:  
 - SEE CONSTRUCTION STANDARD E 107.6.9 AND E 107.6.5  
 - \* CONSTRUCTION TOLERANCE ± 0.5%  
 - \*\* NON-WALKING SURFACE  
 - WCR CROSS SLOPE AT ROADWAY GUTTER NOT TO EXCEED 1.5%



**TYPE C SHARED USE PATH  
ENTRANCE/EXIT RAMP**  
N.T.S.

WCR#	RAMP REFERENCE POINT	WIDTH OF RAMP ENTRANCE (W)	WIDTH OF BUFFER STRIP (S)	WIDTH OF RAMP (10'-0" MIN.)	LENGTH OF PRIMARY RAMP (W1)	LENGTH OF SECONDARY RAMP (W2)
C1	143+04.71 OLD LANCASTER RD.	4'-6"	4'-7"	15'-00"	11'-00"	10'-00"
C2	215+73.57 MORSE RD.	5'-0"	5'-6"	15'-11"	15'-6"	10'-00"
C3	307+48.47 NORTH RD.	8'-0"	4'-4"	15'-6"	19'-0"	10'-0"

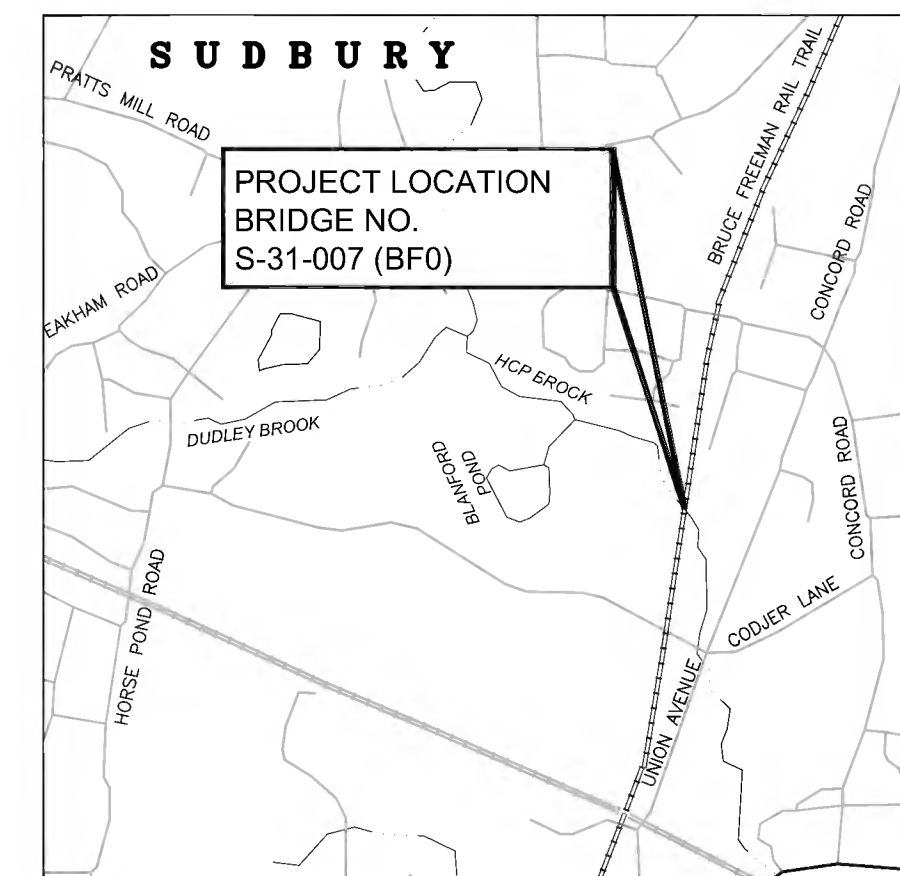




**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL OVER HOP BROOK**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	223	319
PROJECT FILE NO.		608164	

**KEY PLAN & PROFILE**



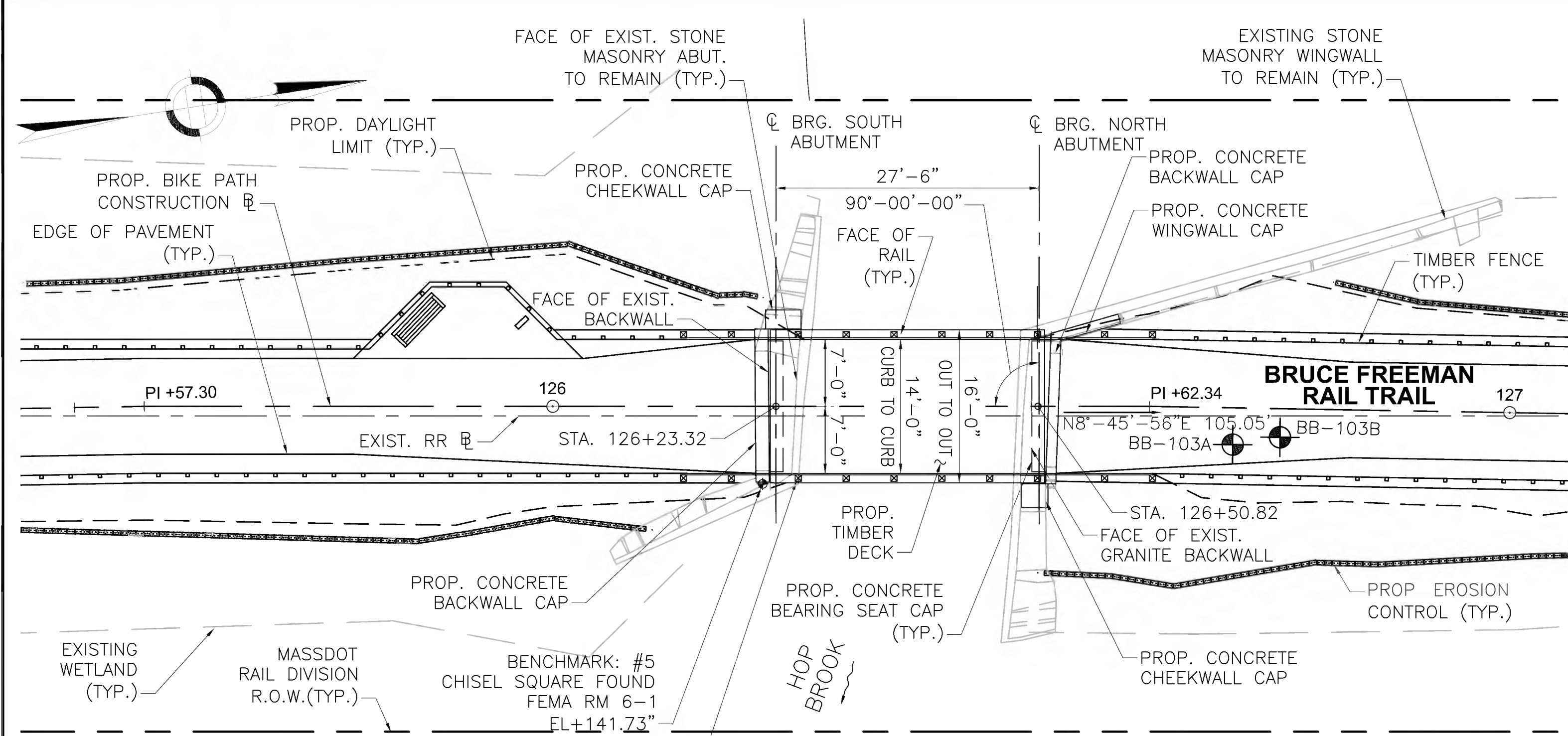
**LOCUS PLAN**  
SCALE: 1" = 1200'

**ESTIMATED QUANTITIES:**  
(NOT GUARANTEED)

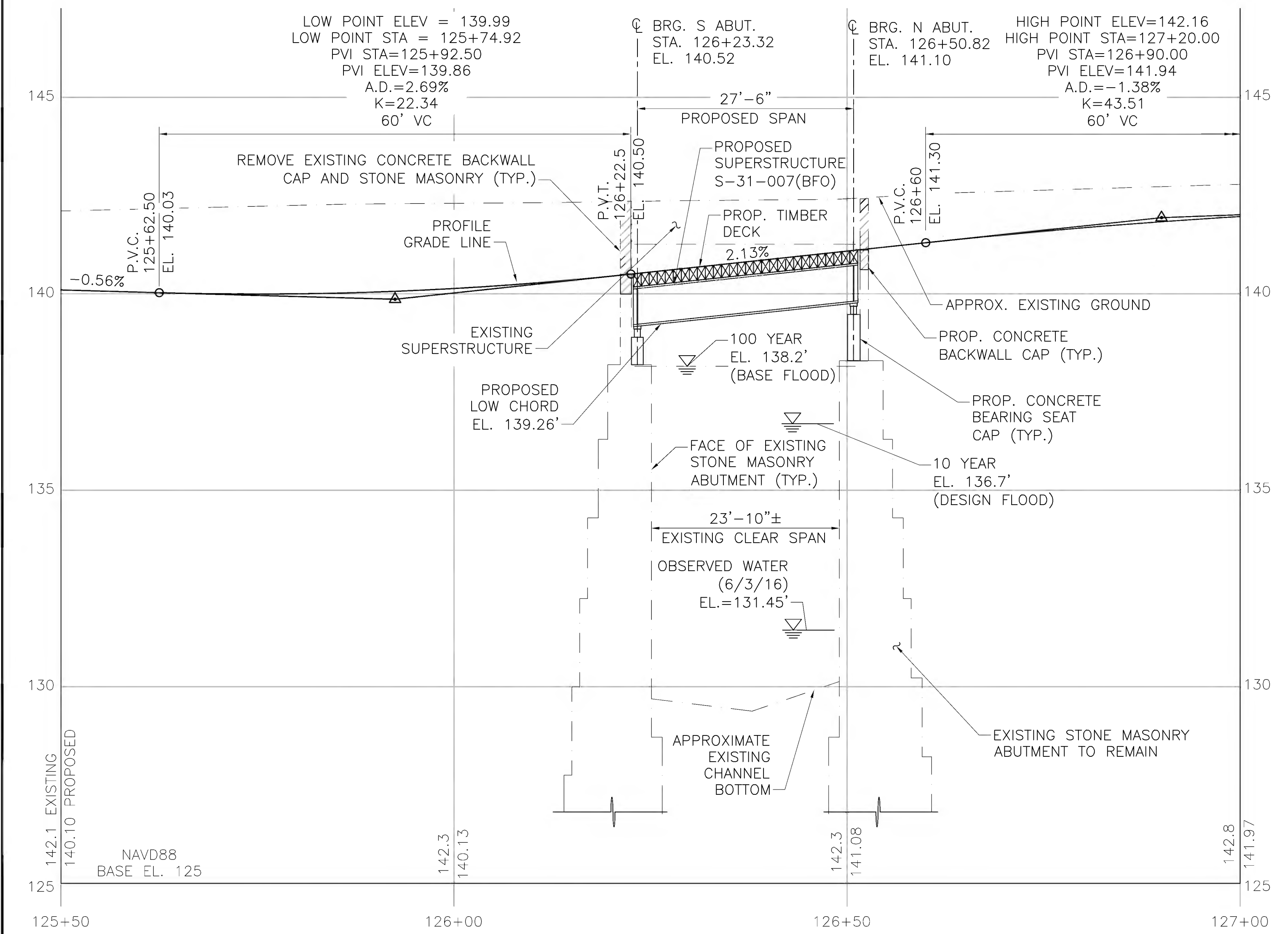
ITEM NO.:	ITEM:	QUANTITY:
114.1	DEMOLITION OF SUPERSTRUCTURE OF BRIDGE NO. S-31-007	1 LS
127.1	REINFORCED CONCRETE EXCAVATION	3 CY
140.	BRIDGE EXCAVATION	5 CY
144.	CLASS B ROCK EXCAVATION	5 CY
151.2	GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES	2 CY
482.20	HOT POURED JOINT SEALER	29 FT
690.	STONE MASONRY WALL REMOVED AND REBUILT IN CEMENT MORTAR	6 CY
690.91	MASONRY REPOINTING	65 SY
991.1	CONTROL OF WATER - STRUCTURE NO. S-31-007	1 LS
995.	BRIDGE SUPERSTRUCTURE, BRIDGE NO. S-31-007	1 LS

**INDEX**

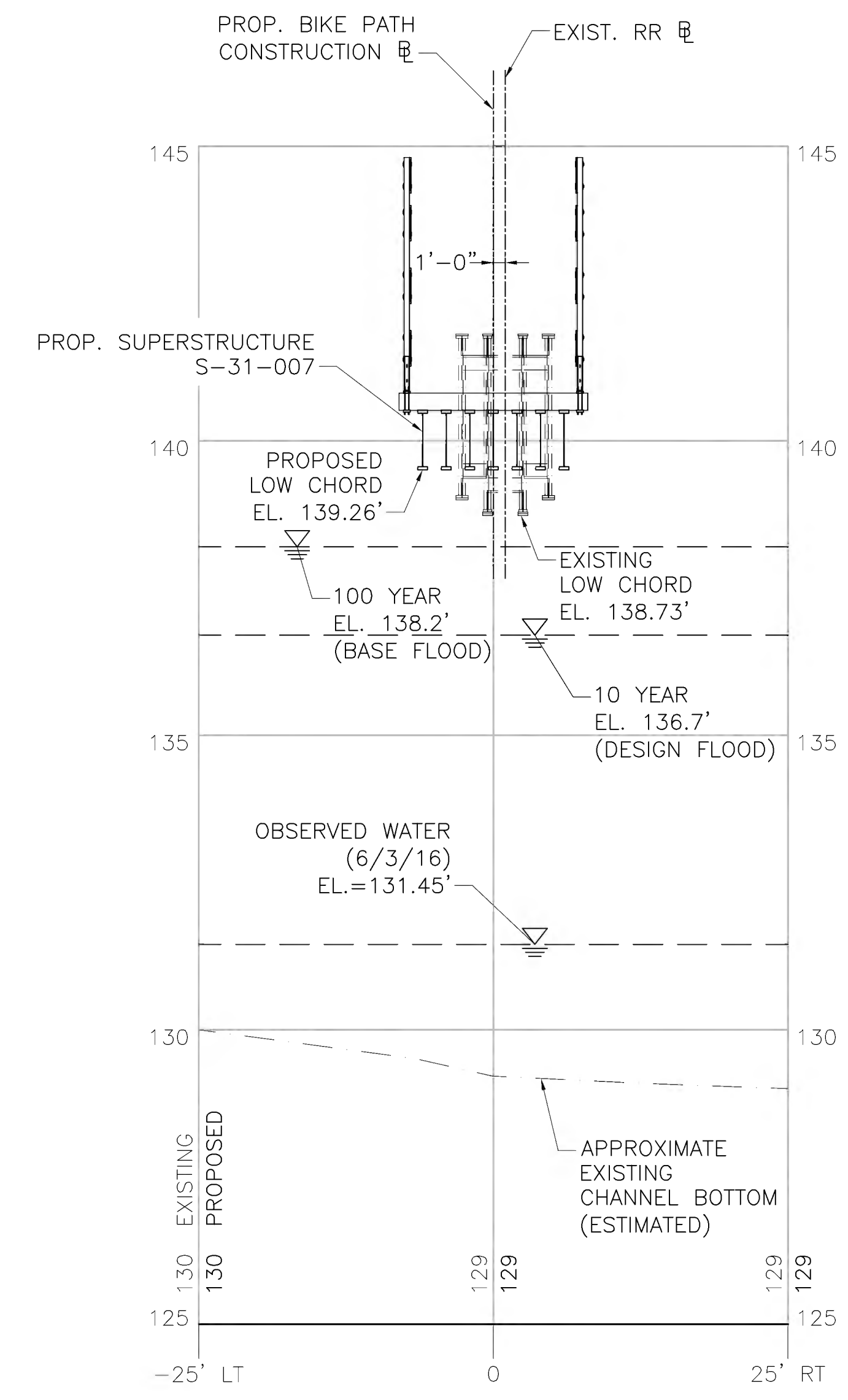
SHEET NO.	DESCRIPTION
1	KEY PLAN AND PROFILE
2	GENERAL NOTES
3	BORING LOGS
4	GENERAL PLAN AND ELEVATION
5	ABUTMENT REMOVAL PLANS AND ELEVATIONS
6	SOUTH ABUTMENT PLAN AND ELEVATION
7	NORTH ABUTMENT PLAN AND ELEVATION
8	SUBSTRUCTURE DETAILS
9	BEARING DETAILS
10	FRAMING PLAN AND STRUCTURAL STEEL DETAILS
11	DECK DETAILS AND TYPICAL SECTION
12	TIMBER BRIDGE RAIL DETAILS



**KEY PLAN**  
SCALE: 1" = 10'-0"



**PROFILE ALONG BIKE PATH**  
HORIZONTAL SCALE: 1" = 10'-0"  
VERTICAL SCALE: 1" = 2'-0"



**PROFILE ALONG HOP BROOK**  
HORIZONTAL SCALE: 1" = 10'-0"  
VERTICAL SCALE: 1" = 2'-0"

JUNE 27, 2022 ISSUED FOR CONSTRUCTION

**PROPOSED SUPERSTRUCTURE REPLACEMENT SUDBURY**

BRUCE FREEMAN RAIL TRAIL OVER HOP BROOK

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION  
10 PARK PLAZA BOSTON, MASS

**FUSS & O'NEILL**  
1550 MAIN STREET, SUITE 400  
SPRINGFIELD, MA 01103  
413.452.0445  
www.fando.com

TITLE: \_\_\_\_\_ CHIEF ENGINEER

608164\_BR(S-31-007)(FIRST SHEET).DWG Plotted on 7-Jul-2022 4:23 PM Final Structural Submittal (SF) 27-June-2022

**SUDBURY  
BRUCE FREEMAN RAIL TRAIL OVER HOP BROOK**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	224	319
PROJECT FILE NO.		608164	

**GENERAL NOTES**

**GENERAL NOTES:**

**DESIGN:**

IN ACCORDANCE WITH THE 2020 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS LRFD BRIDGE DESIGN SPECIFICATIONS WITH CURRENT INTERIM SPECIFICATIONS THROUGH 2021 AND THE 2009 LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES FOR H-10 VEHICULAR AND 90 PSF PEDESTRIAN LOADINGS.

**MASSDOT BENCH MARK:**

BM #5 CHISEL SQUARE FOUND  
FEMA RM 6-1  
ELEV. = 141.73'

ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988.

**DATE:**

TO BE PLACED ON THE FACE OF THE NORTHEAST AND SOUTHWEST PROPOSED CONCRETE CHEEKWALL CAPS. A DETAIL SHOWING SIZE AND CHARACTER OF NUMERALS WILL BE FURNISHED. THE DATE USED SHALL BE THE LATEST YEAR OF CONTRACT COMPLETION AS OF THE DATE THE FIRST CONCRETE CHEEKWALL CAP IS CONSTRUCTED. BOTH CONCRETE CHEEKWALL CAPS SHALL FEATURE THE SAME DATE.

**SURVEY NOTEBOOKS:**

SURVEY PERFORMED BY VANASSE HANGEN BRUSTLIN, INC FIELD NOTEBOOKS SHALL BE OBTAINED FROM FUSS AND O'NEILL, INC. SPRINGFIELD, MA.

**SCALES:**

SCALES NOTED ON THE PLANS ARE NOT APPLICABLE TO REDUCED SIZE PRINTS. DIVIDE SCALES BY 2 FOR HALF-SIZE PRINTS (A3).

**UNSUITABLE MATERIAL:**

ALL UNSUITABLE MATERIAL SHALL BE REMOVED WITHIN THE LIMITS OF THE OF THE PROPOSED STRUCTURE, AS DIRECTED BY THE ENGINEER.

**DIMENSIONS:**

ALL DIMENSIONS SHOWN ON PLANS ARE FOR STRUCTURES AT 68° F, UNLESS OTHERWISE NOTED.

**EXISTING CONSTRUCTION:**

DIMENSIONS SHOWN ARE TAKEN FROM SURVEY, VARIOUS FIELD MEASUREMENTS, AND GEOTECHNICAL EXPLORATION AND ARE NOT GUARANTEED. THE CONTRACTOR SHALL DETERMINE AND ESTABLISH ALL DIMENSIONS AND DETAILS NECESSARY FOR COMPLETION OF ALL WORK BY FIELD MEASUREMENT AND SURVEY. THE CONTRACTOR SHALL BE RESPONSIBLE AND NOT ORDER ANY MATERIAL OR COMMENCE ANY FABRICATION UNTIL HE HAS MADE THE REQUIRED MEASUREMENTS ON THE ACTUAL STRUCTURE AND THE EXTENT OF THE PROPOSED WORK HAS BEEN APPROVED BY THE ENGINEER. EXISTING BRIDGE PLANS ARE NOT AVAILABLE FOR REFERENCE.

**TIMBER:**

ALL STRUCTURAL TIMBER FOR DECKING SHALL BE PRESSURE TREATED MIXED SOUTHERN PINE GRADE 1 OR APPROVED EQUAL.

**CONCRETE:**

4,000 PSI, 3/4 INCH, 610 CEMENT CONCRETE SHALL BE PROVIDED FOR THE BEARING SEATS, WINGWALL CAPS, BACKWALL RESTORATION, AND CHEEK WALLS.

4,000 PSI 1 1/2 INCH, 565 CEMENT CONCRETE SHALL BE PROVIDED FOR CONCRETE ENCASUREMENT OF THE FIRST RAIL POST OFF THE BRIDGE IF MINIMUM EMBEDMENT OF POST CANNOT BE MET.

**REINFORCEMENT:**

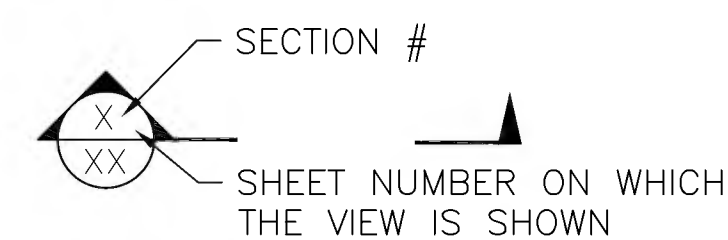
REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 31 GRADE 60. UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DRAWINGS, ALL BARS SHALL BE LAPPED AS FOLLOWS:

MODIFICATION CONDITION	#4 BARS	#5 BARS	#6 BARS
1. NONE	16"	19"	23"
2. 12" OF CONCRETE BELOW BAR	20"	25"	30"
3. EPOXY COATED BARS, COVER < 3d <sub>b</sub> , OR CLEAR SPACING < 6d <sub>b</sub>	23"	29"	34"
4. COATED BARS, ALL OTHER CASES	18"	23"	27"
5. CONDITION 2. AND 3.	26"	32"	39"
6. CONDITION 2. AND 4.	24"	30"	36"

ALL OTHER BARS SHOULD BE LAPPED AS SHOWN ON THE CONSTRUCTION DRAWINGS.

ALL REINFORCEMENT IN CONCRETE BACKWALL, BEARING SEAT, CHEEKWALL, AND WINGWALL CAPS SHALL BE EPOXY COATED.

**SECTION MARK:**



TRAFFIC DATA		
	ROADWAY OVER	ROADWAY UNDER
DESIGN YEAR	N/A	
AVERAGE DAILY TRAFFIC - PRESENT	N/A	
AVERAGE DAILY TRAFFIC - DESIGN YEAR	N/A	
DESIGN HOURLY VOLUME	N/A	
DIRECTIONAL DISTRIBUTION	N/A	
TRUCK PERCENTAGE - AVERAGE DAY	N/A	
TRUCK PERCENTAGE - PEAK HOUR	N/A	
DESIGN SPEED	18 MPH	
DIRECTIONAL DESIGN HOURLY VOLUME	N/A	

SEISMIC DESIGN CRITERIA	
DESIGN RETURN PERIOD:	1,000
DESIGN SPECTRA	
As	0.11
SDs	0.23
SD1	0.09
SITE CLASS	D
SEISMIC DESIGN CATEGORY (SDC)	A

HYDRAULIC DESIGN DATA	
DRAINAGE AREA (SQ. MILES)	14.7
DESIGN FLOOD DISCHARGE (C.F.S.)	452
DESIGN FLOOD FREQUENCY (YEARS)	10
DESIGN FLOOD VELOCITY (F.P.S.)	2.66
DESIGN FLOOD ELEVATION (FEET, NAVD)	136.7

BASE (100-YEAR) FLOOD DATA	
BASE FLOOD DISCHARGE (C.F.S.)	881
BASE FLOOD ELEVATION (FEET, NAVD)	138.2

DESIGN AND CHECK SCOUR DATA	
DESIGN SCOUR FLOOD EVENT RETURN FREQUENCY (YEARS)	25
DESIGN FLOOD ABUTMENT SCOUR DEPTH (FEET)	N/A
DESIGN FLOOD PIER SCOUR DEPTH (FEET)	N/A
CHECK SCOUR FLOOD EVENT RETURN FREQUENCY (YEARS)	50
CHECK FLOOD ABUTMENT SCOUR DEPTH (FEET)	N/A
CHECK FLOOD PIER SCOUR DEPTH (FEET)	N/A

FLOOD OF RECORD	
DISCHARGE (C.F.S.)	N/A
FREQUENCY (IF KNOWN, YEARS)	N/A
MAXIMUM ELEVATION (FEET, NAVD)	N/A
DATE (MM/YYYY)	N/A
HISTORY OF ICE FLOES	N/A
EVIDENCE OF SCOUR AND EROSION	N/A

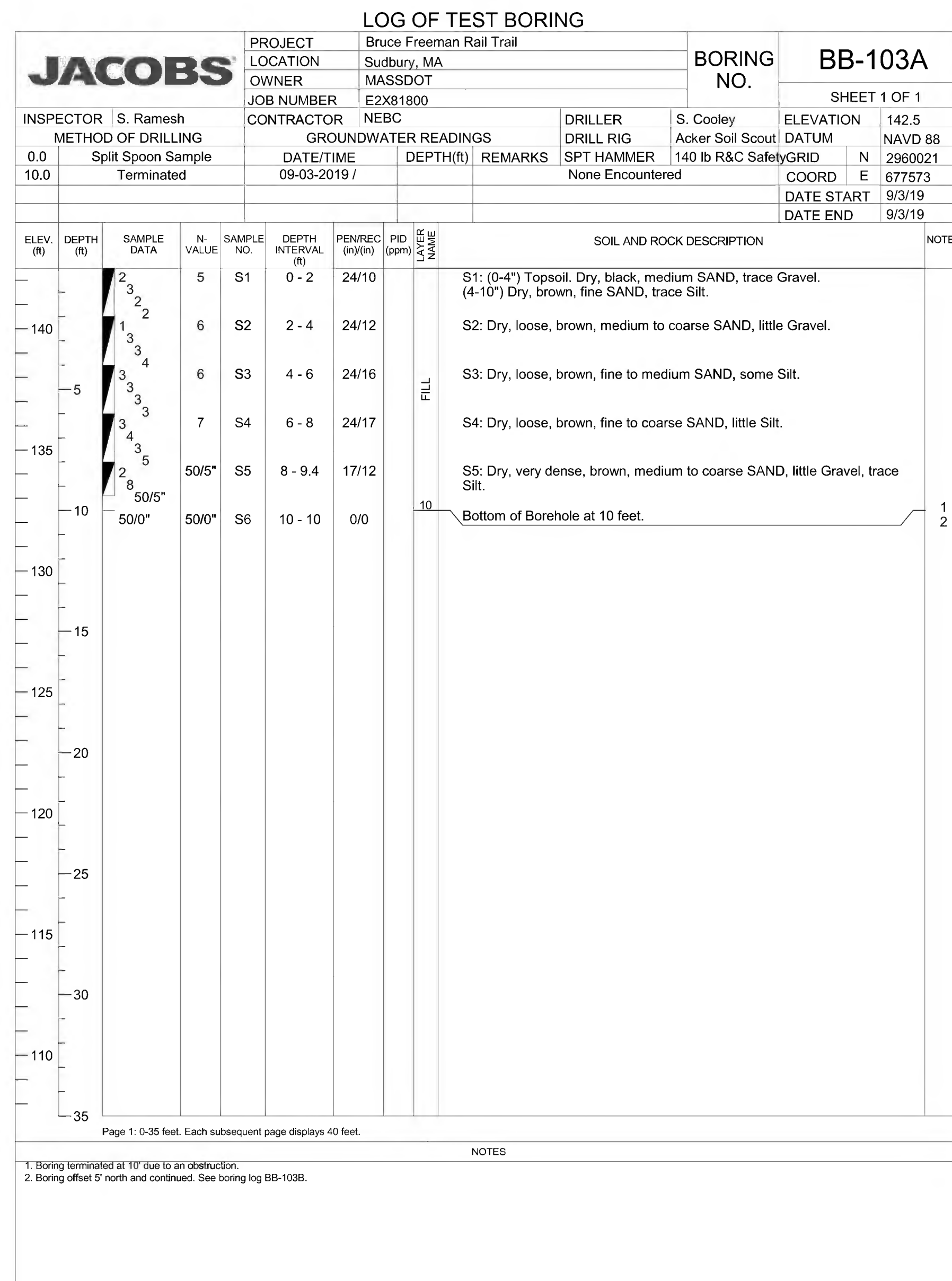
JUNE 27, 2022	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	



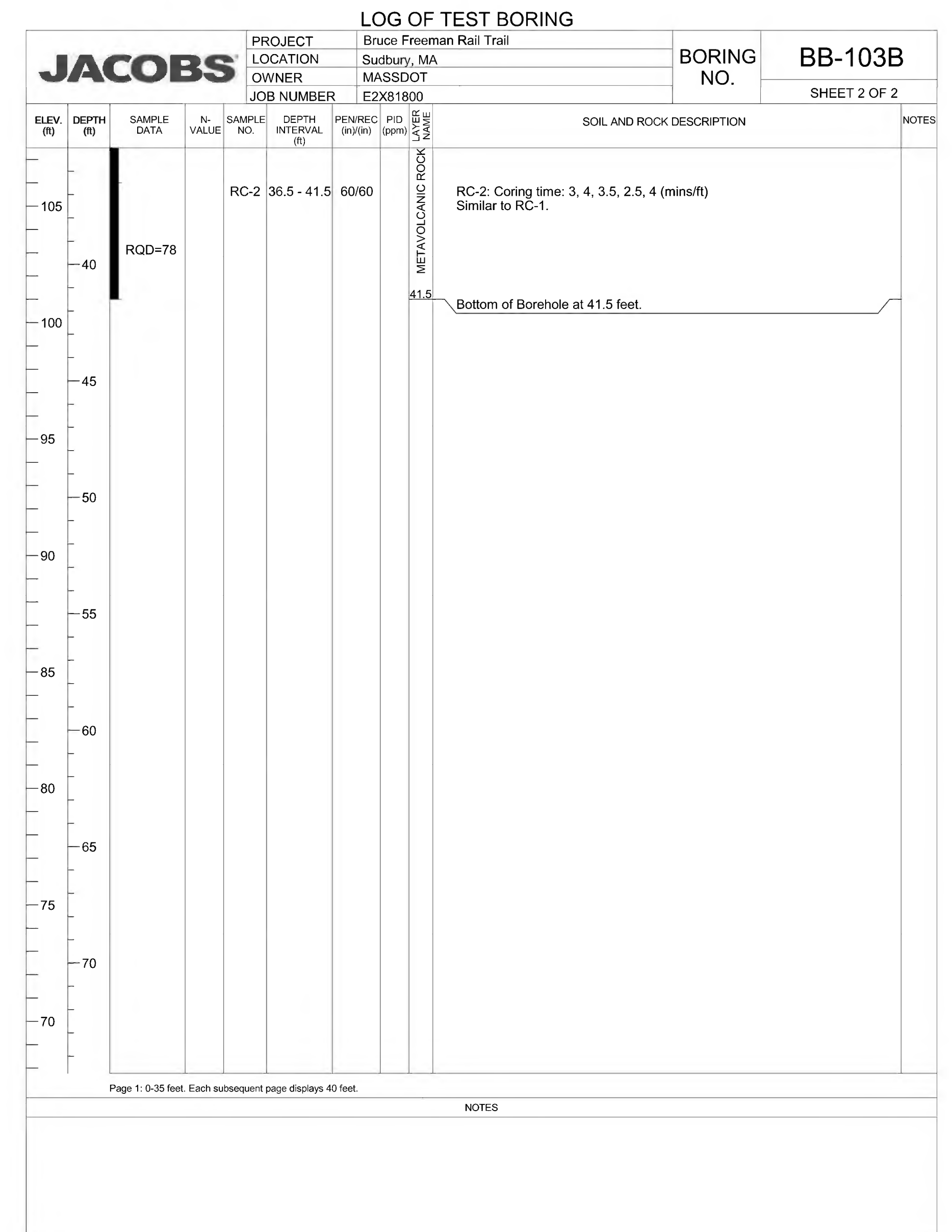
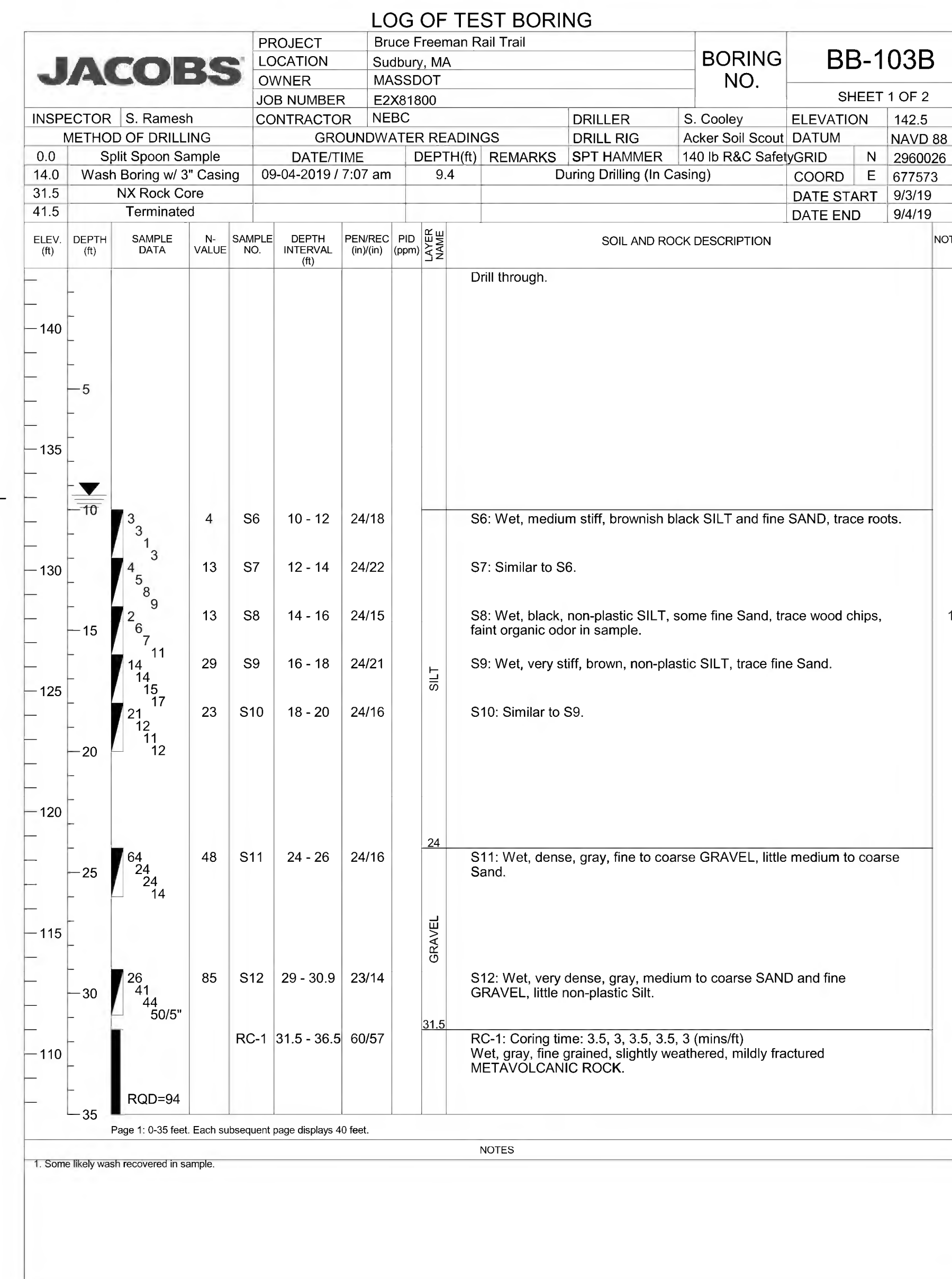
**SUDBURY  
BRUCE FREEMAN RAIL TRAIL OVER HOP BROOK**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	225	319
PROJECT FILE NO.		608164	

**BORING LOGS**



▽ 133.1



**BORING NOTES:**

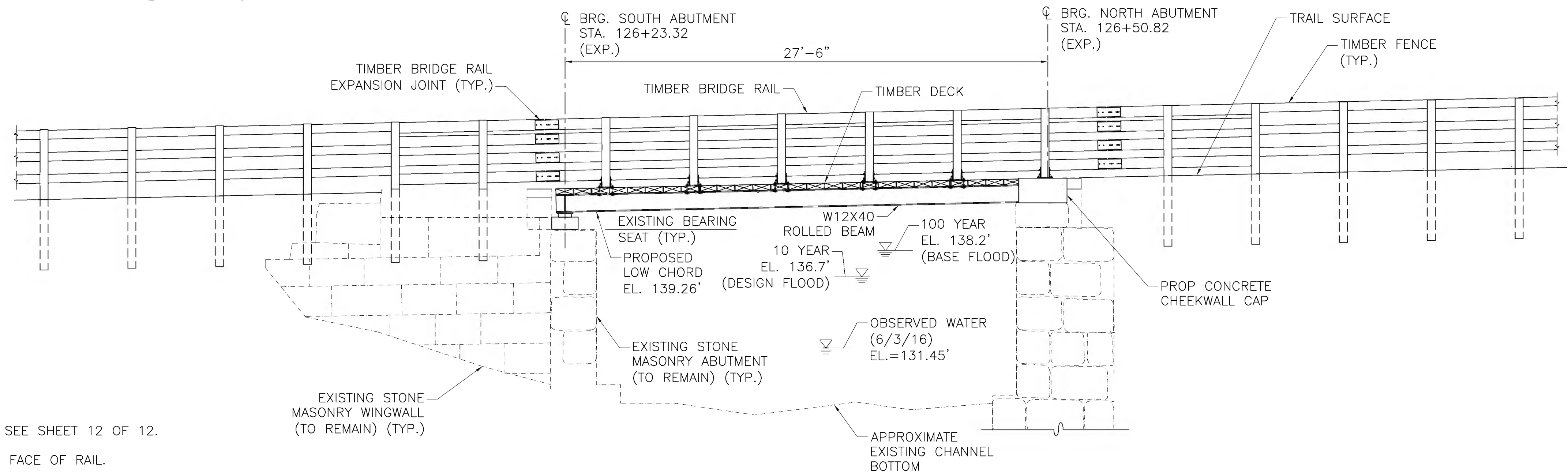
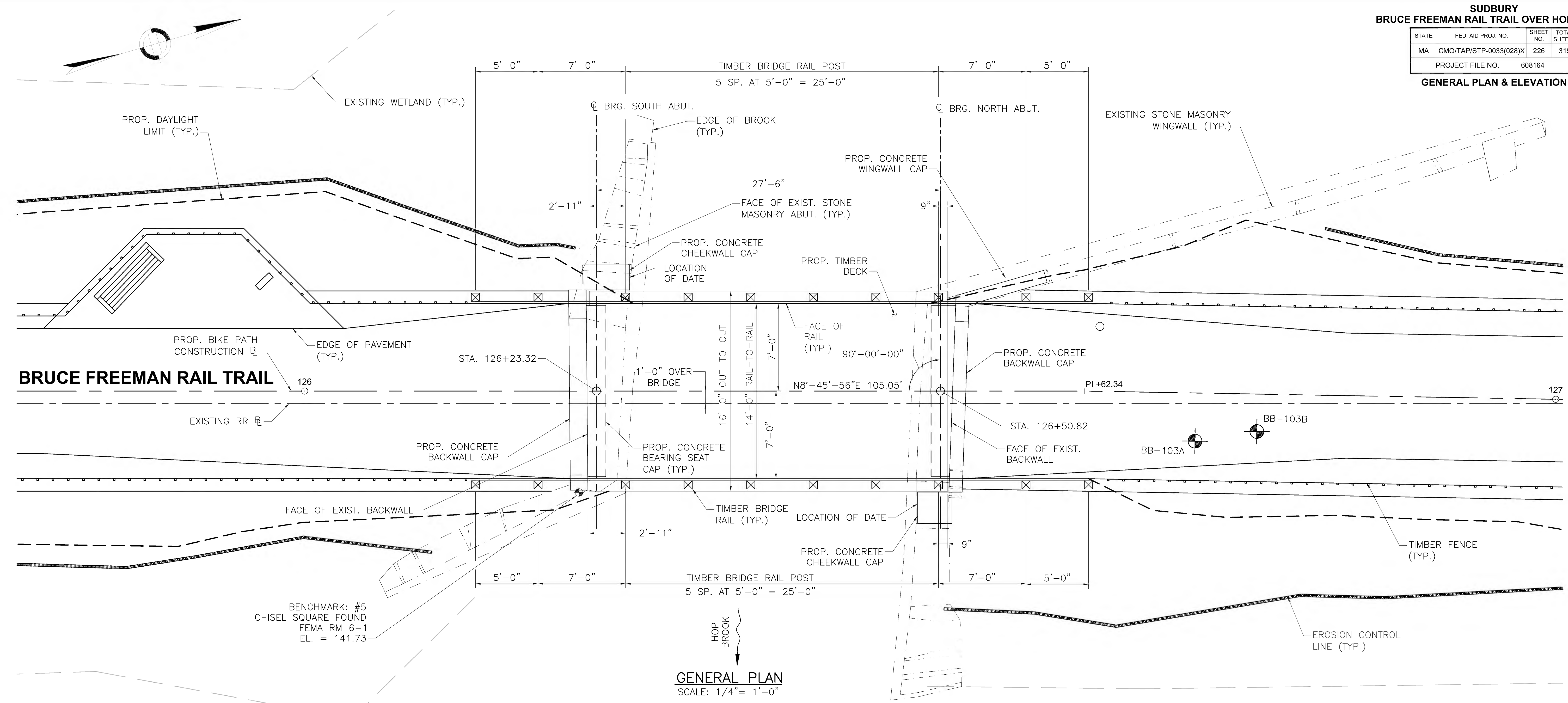
- LOCATION OF BORINGS SHOWN ON THE PLANS THUS: BB-#
- BORINGS ARE TAKEN FOR PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
- WATER LEVELS SHOWN ON THE BORING LOGS WERE OBSERVED AT THE TIME OF TAKING BORINGS AND DO NOT NECESSARILY SHOW THE TRUE GROUND WATER LEVEL.
- FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 1 1/8" I.D. SPLIT SPOON SAMPLER 6" USING A 140 POUND WEIGHT FALLING 30".
- BORING SAMPLES ARE STORED AT A STORAGE FACILITY LOCATED ON ROUTE 114 (219 WINTHRUP AVE.) IN LAWRENCE, MA. THE CONTRACTOR MAY EXAMINE THE SOIL AND ROCK SAMPLES BY CONTACTING THE MASSDOT GEOTECHNICAL SECTION AT 10 PARK PLAZA, BOSTON, MA.
- ALL BORINGS WERE MADE IN SEPTEMBER 2019.
- BORINGS WERE MADE BY NEW ENGLAND BORING CONTRACTOR, INC., P.O. BOX 165, DERRY, NH 03038.
- THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.

August 6, 2022	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT	
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER	
USE ONLY PRINTS OF LATEST DATE	

608164\_BRS(S-31-007)(BORINGS).DWG 6-August-2022 12:04 PM Final Structural Submittal (SF)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	226	319
PROJECT FILE NO.		608164	

GENERAL PLAN & ELEVATION



- NOTES:**
- FOR TIMBER BRIDGE RAIL DETAILS, SEE SHEET 12 OF 12.
  - RAIL POSTS ARE MEASURED ALONG FACE OF RAIL.

**NOTE:**  
DECK END PLATE NOT SHOWN FOR CLARITY. SEE SHEET 11 FOR PLATE DETAILS.

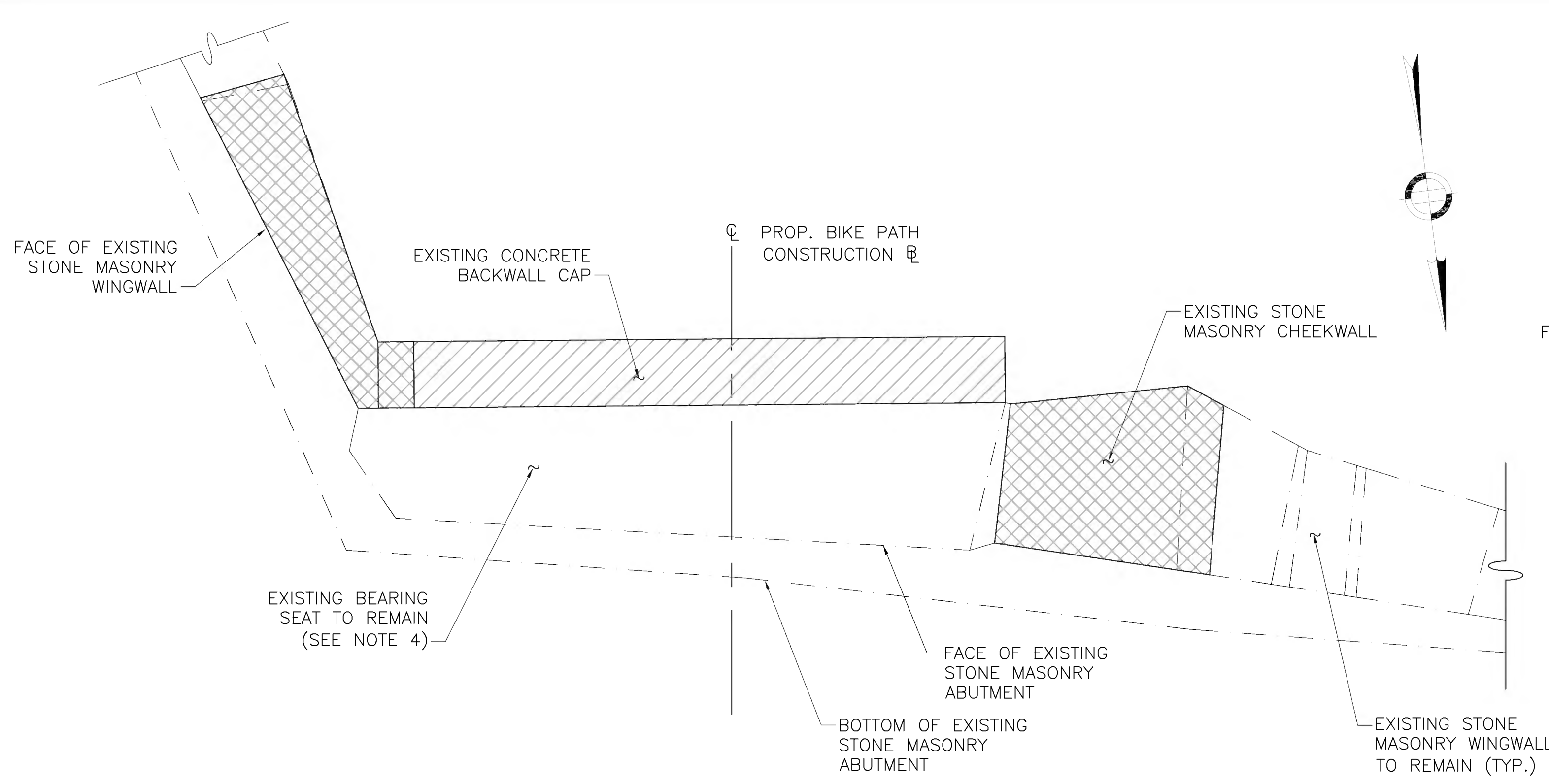
DATE	DESCRIPTION
JUNE 27, 2022	ISSUED FOR CONSTRUCTION
	USE ONLY PRINTS OF LATEST DATE

608164\_BRF(S-31-007)GENPLAN.DWG Plotted on 6-Jul-2022 11:53 AM Final Structural Submittal (SF) 27-June-2022

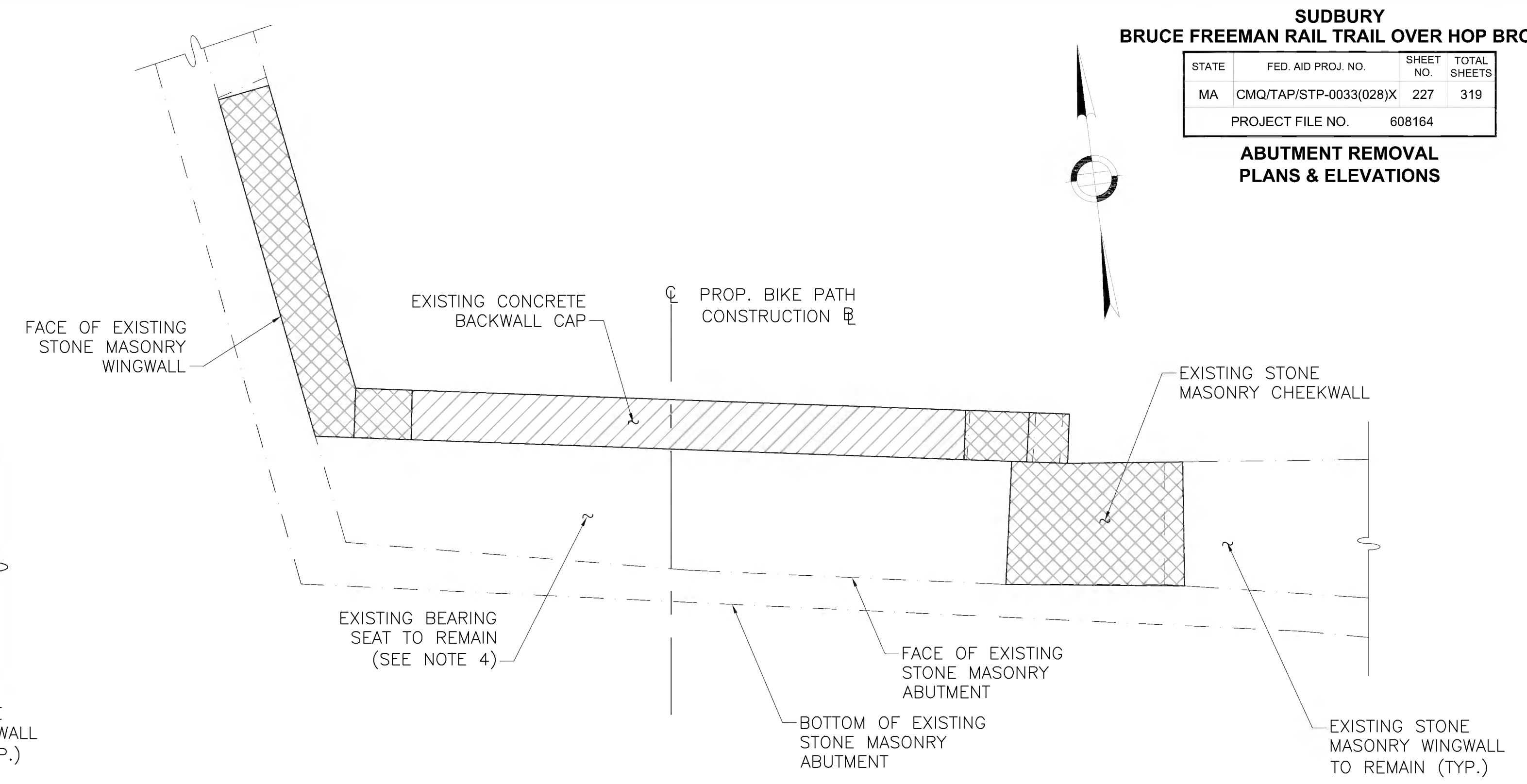


STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	227	319
PROJECT FILE NO.		608164	

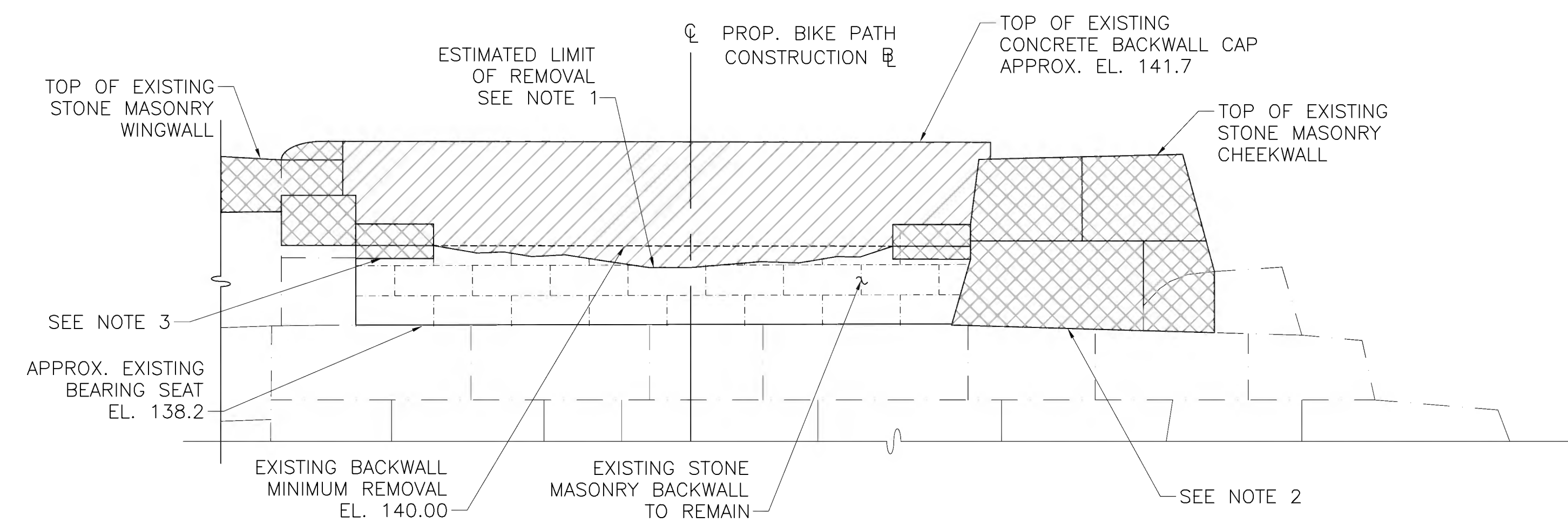
**ABUTMENT REMOVAL  
PLANS & ELEVATIONS**



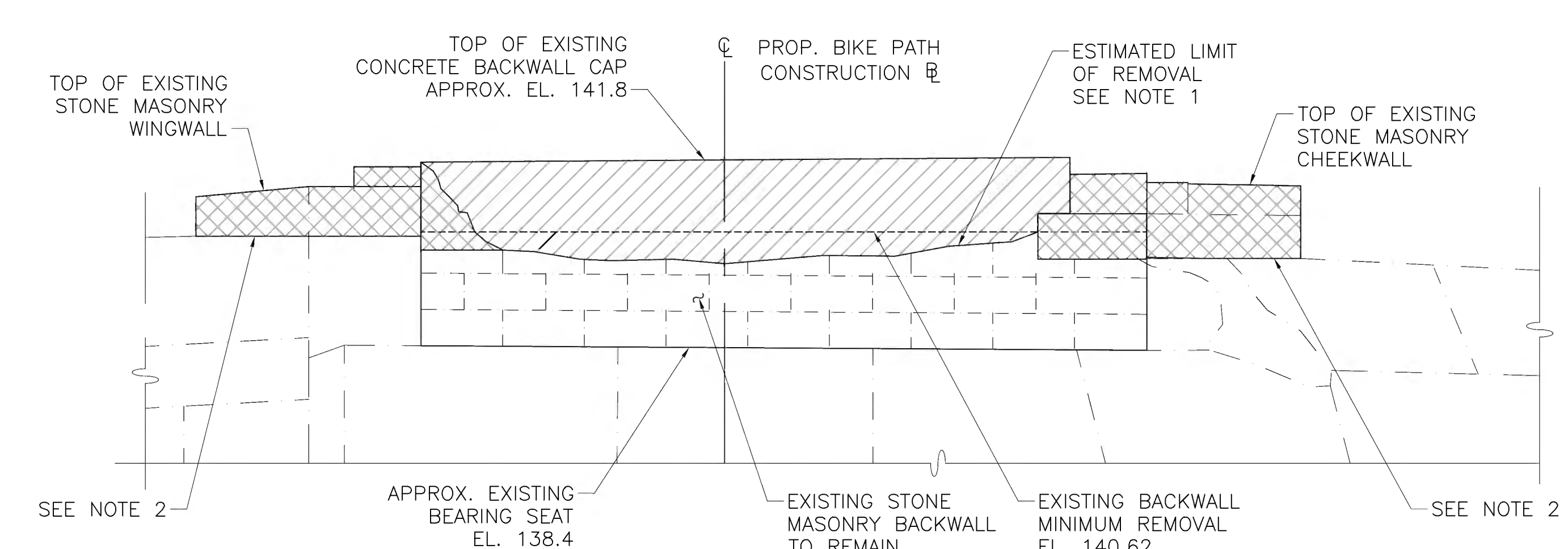
**SOUTH ABUTMENT REMOVAL PLAN**  
SCALE: 1/2"=1'-0"



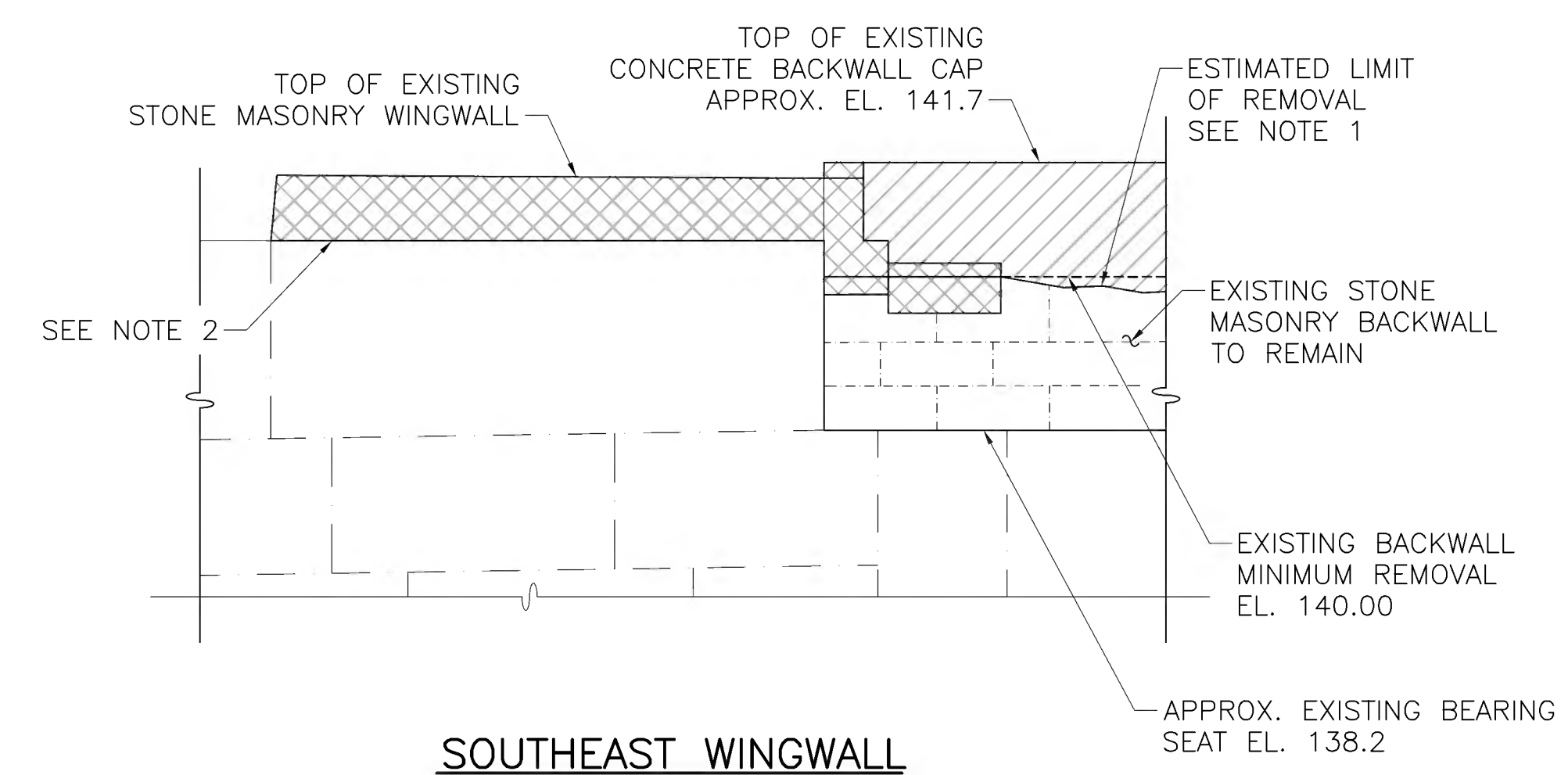
**NORTH ABUTMENT REMOVAL PLAN**  
SCALE: 1/2"=1'-0"



**SOUTH ABUTMENT AND SOUTHWEST WINGWALL REMOVAL ELEVATION**  
SCALE: 1/2"=1'-0"



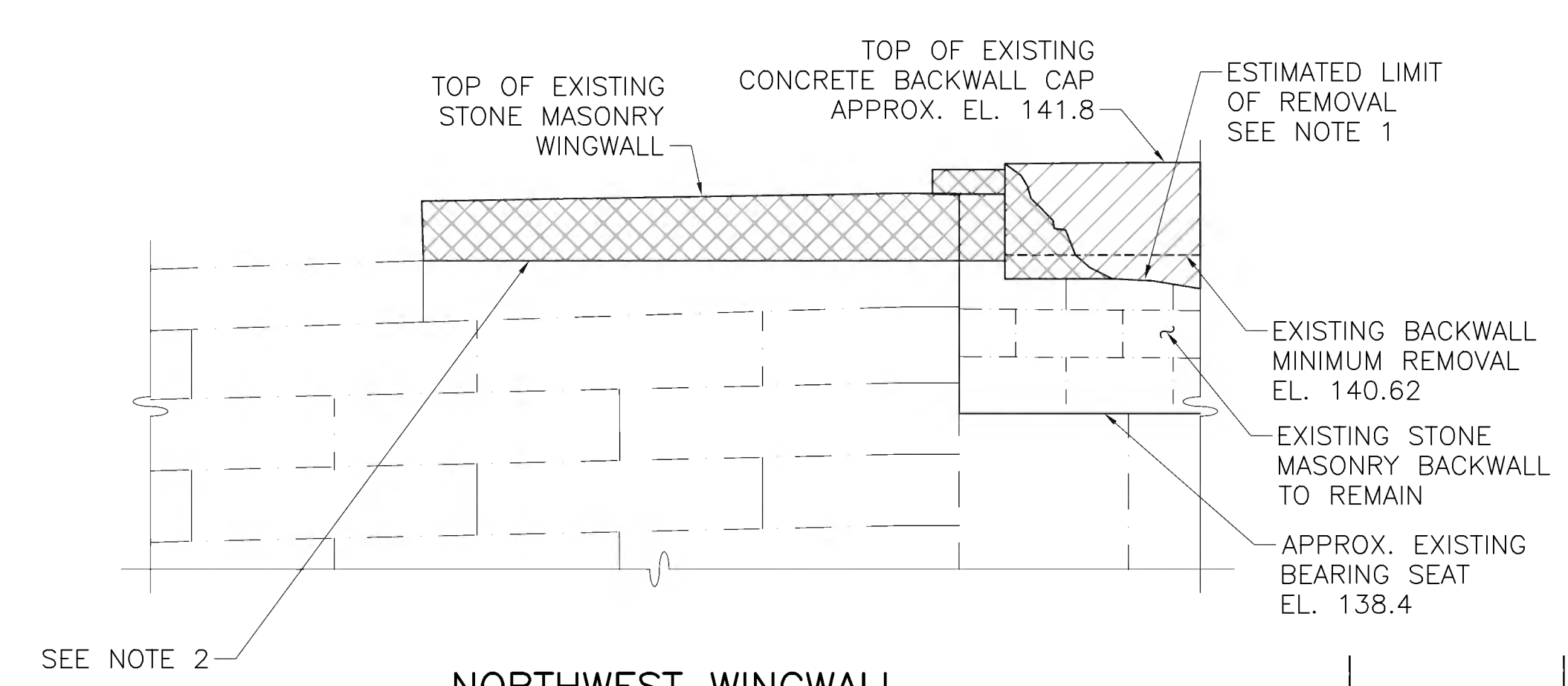
**NORTH ABUTMENT AND NORTHEAST WINGWALL REMOVAL ELEVATION**  
SCALE: 1/2"=1'-0"



**SOUTHEAST WINGWALL  
REMOVAL ELEVATION**  
SCALE: 1/2"=1'-0"

**EXISTING SUBSTRUCTURE REMOVAL NOTES:**

1. BOTTOM OF EXISTING CONCRETE BACKWALL CAP VARIES. REMOVAL LIMITS SHALL EXTEND TO AT LEAST THE MINIMUM REMOVAL ELEVATION AS SHOWN ON THIS SHEET. FINAL REMOVAL LIMITS SHALL BE DETERMINED BY THE ENGINEER. PAYMENT FOR EXISTING CONCRETE BACKWALL REMOVAL SHALL BE INCLUDED IN ITEM 127.1, "REINFORCED CONCRETE EXCAVATION".
2. FINAL EXISTING STONE MASONRY CHEEKWALL AND WINGWALL REMOVAL LIMITS SHALL BE DETERMINED BY THE ENGINEER. PAYMENT FOR EXISTING STONE MASONRY REMOVAL, INCLUDING STONE MASONRY PORTIONS OF THE EXISTING ABUTMENT BACKWALLS, SHALL BE INCLUDED UNDER ITEM 144, "CLASS B ROCK EXCAVATION".
3. WHEN THE HORIZONTAL JOINT IN THE STONE FALLS BELOW THE MINIMUM REMOVAL ELEVATION, THE STONES OR PORTIONS OF STONES SHALL BE REMOVED BY MECHANICAL METHODS. WITH APPROVAL OF THE ENGINEER, THE ENTIRE STONE SHALL BE REMOVED AND REPLACED WITH 4,000 PSI, 3/4 INCH, 610 CEMENT CONCRETE IN LIEU OF MECHANICAL METHODS.
4. THE EXISTING ABUTMENT BEARING SEATS SHALL BE BLAST CLEANED OF EFFLORESCENCE AND DEBRIS AS DIRECTED BY THE ENGINEER. PAYMENT SHALL BE INCIDENTAL TO ITEM 995.



**NORTHWEST WINGWALL  
REMOVAL ELEVATION**  
SCALE: 1/2"=1'-0"

**LEGEND**

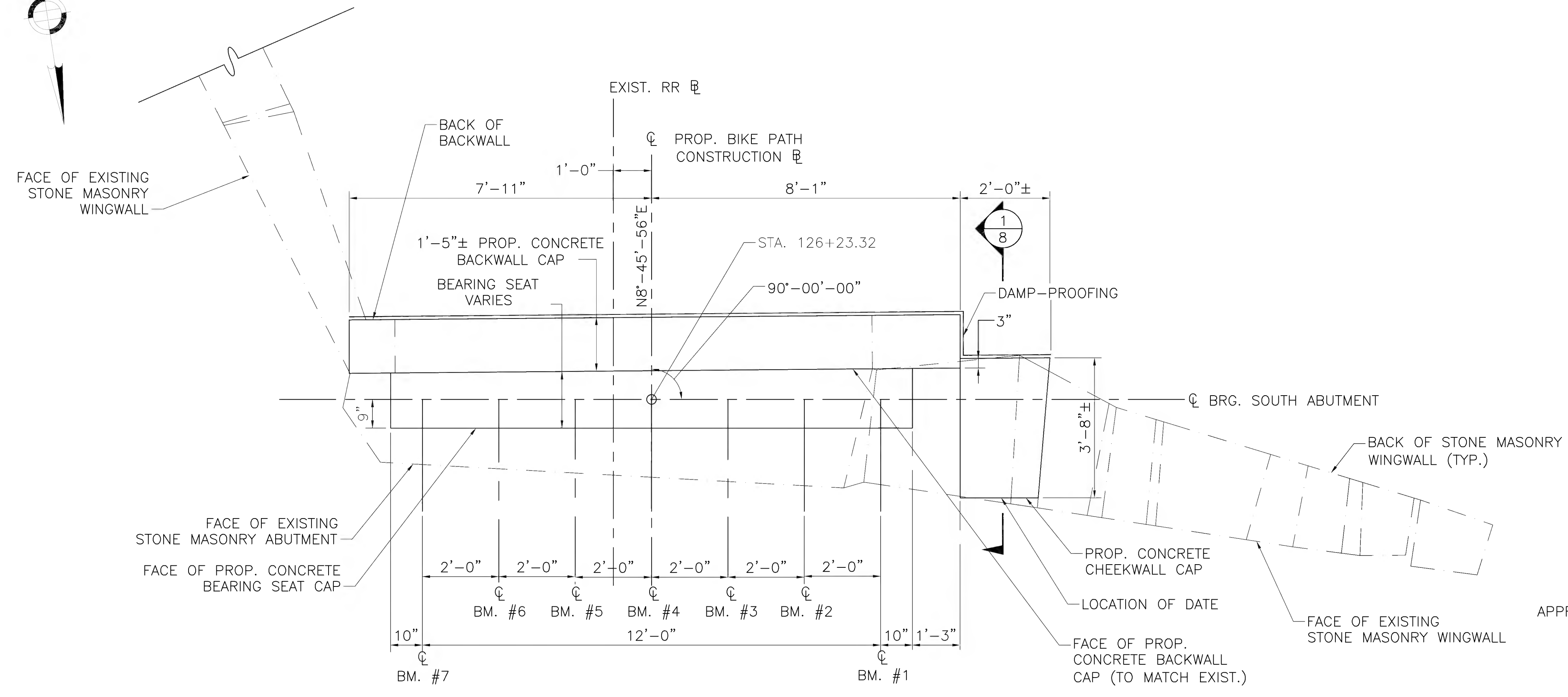
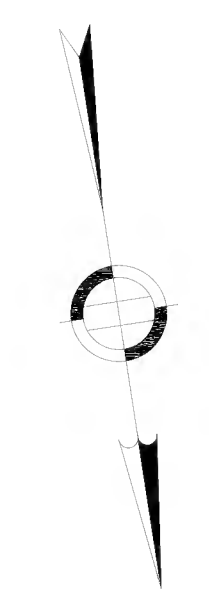
	CONCRETE REMOVAL LIMITS
	MASONRY REMOVAL LIMITS

JUNE 27, 2022	ISSUED FOR CONSTRUCTION
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USE ONLY PRINTS OF LATEST DATE	

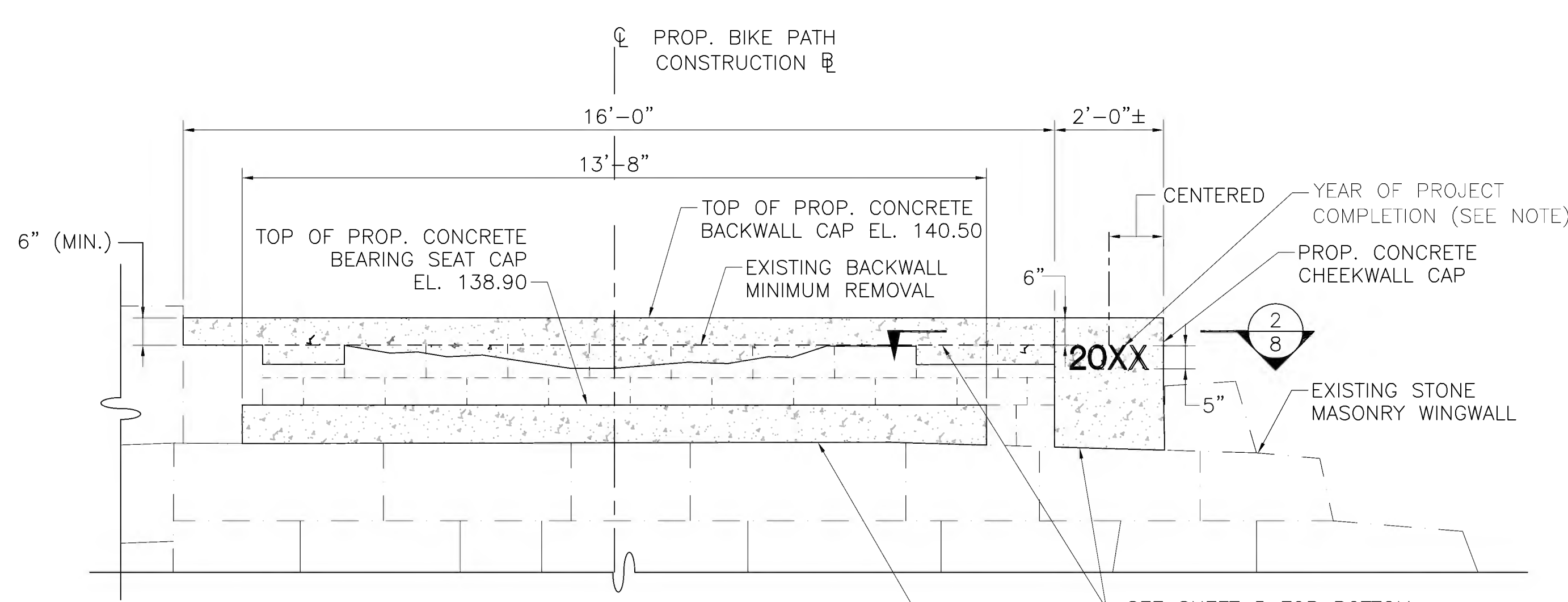
608164\_BRF(S-31-007)REMOVAL.DWG Plotted on 6-Jul-2022 11:54 AM Final Structural Submittal (SF) 27-June-2022

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	228	319
PROJECT FILE NO.		608164	

**SOUTH ABUTMENT PLAN & ELEVATION**



**SOUTH ABUTMENT PLAN**  
SCALE: 1/2"=1'-0"

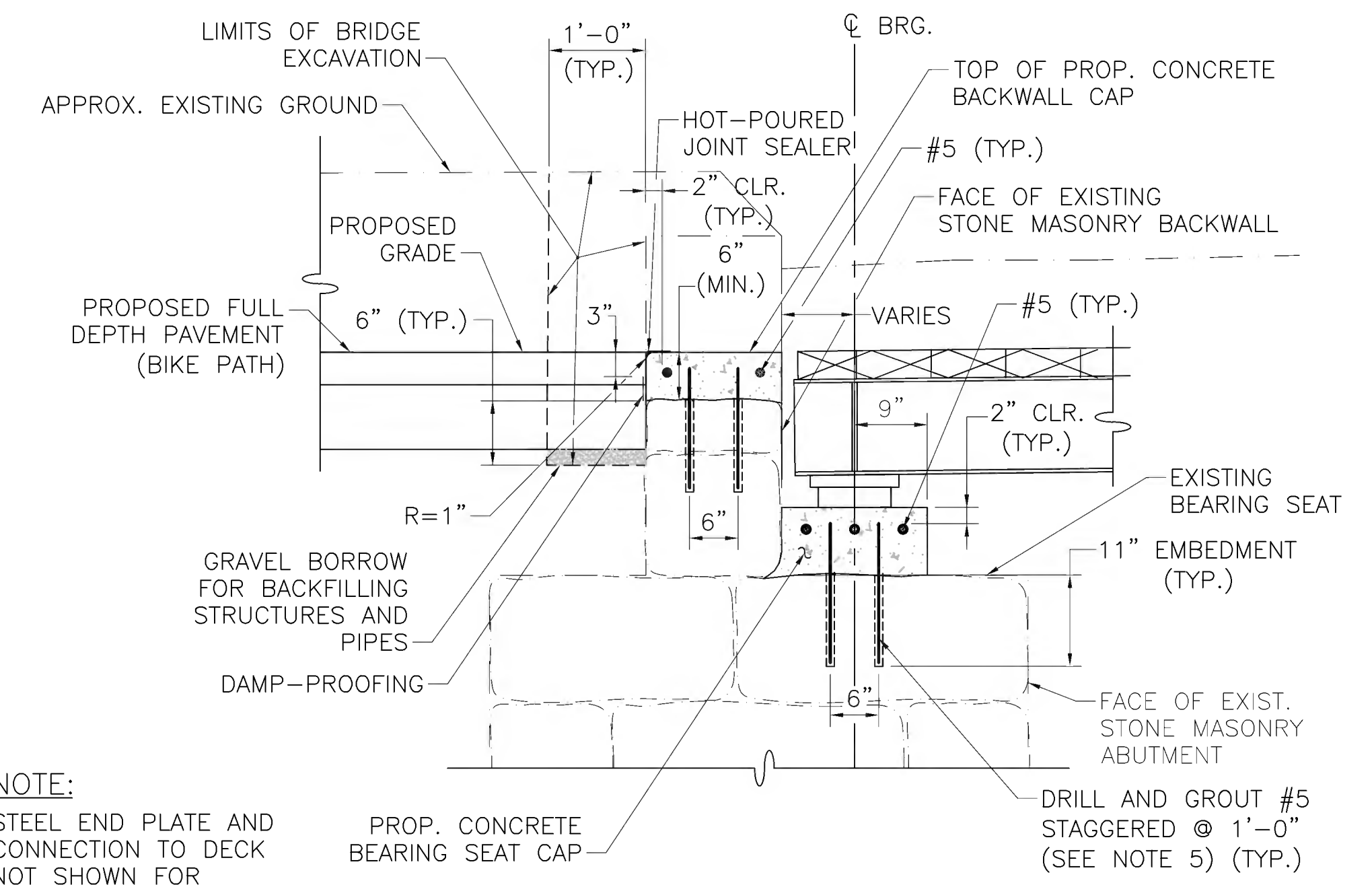


**SOUTH ABUTMENT AND SOUTHWEST WINGWALL ELEVATION**  
SCALE: 1/2"=1'-0"

**NOTE:**  
USE LATEST CONTRACT COMPLETION YEAR IN EFFECT WHEN THE FIRST CONCRETE CHEEKWALL CAP IS CAST. USE THE YEAR FOR BOTH CONCRETE CHEEKWALL CAPS.

**NOTES:**

1. BEARING SEAT ELEVATION IS GIVEN AT  $\bar{C}$  BEARING.
2. BACKWALL ELEVATION IS GIVEN AT FACE OF BACKWALL.
3. SEE SHEET 8 FOR EXISTING ABUTMENT REPAIR NOTES.
4. SEE SHEET 8 FOR REINFORCING IN PROPOSED CHEEKWALL CAPS.
5. USE APPROVED NON-SHRINK GROUT WITH MINIMUM COMPRESSIVE STRENGTH  $F'_c$  OF 6,200 PSI. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS UNDER ITEM 995.
6. ALL CONCRETE SHALL BE 4000 PSI, 3/4 INCH, 610 CEMENT CONCRETE.



**NOTE:**  
STEEL END PLATE AND CONNECTION TO DECK NOT SHOWN FOR CLARITY. SEE SHEET 11.

**TYPICAL ABUTMENT SECTION**  
SCALE: 3/4"=1'-0"

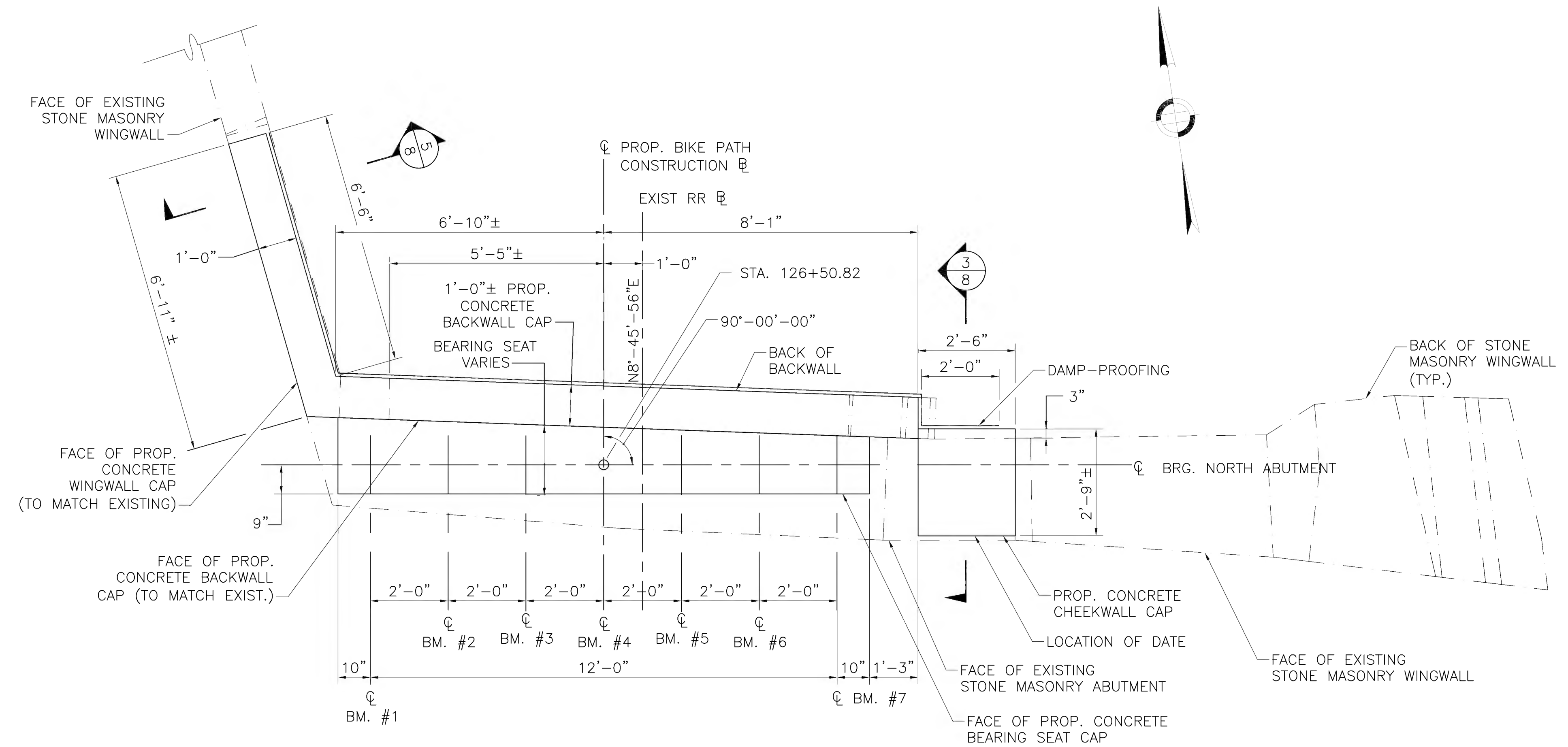
JUNE 27, 2022	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
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608164\_BRT(S-31-007)(SOUTH ABUT).DWG Plotted on 6-Jul-2022 11:54 AM Final Structural Submittal (SF) 27-June-2022



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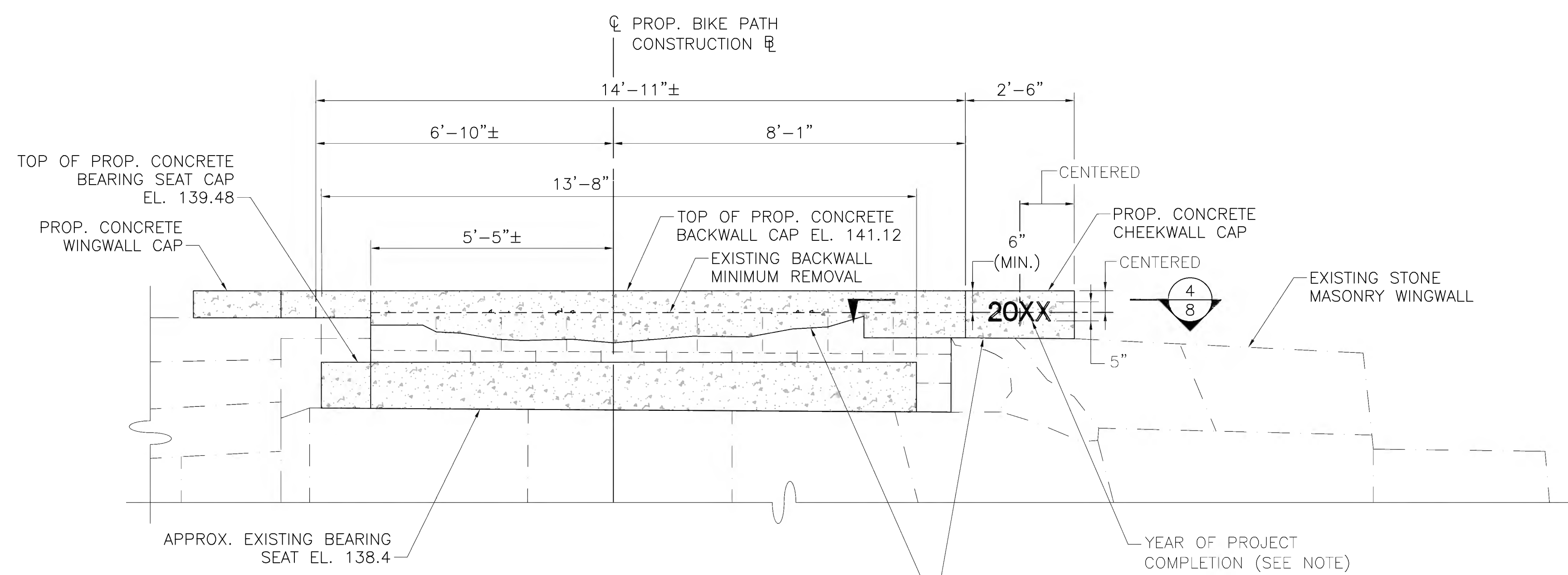
**NORTH ABUTMENT PLAN & ELEVATION**



**NORTH ABUTMENT PLAN**  
SCALE: 1/2"=1'-0"

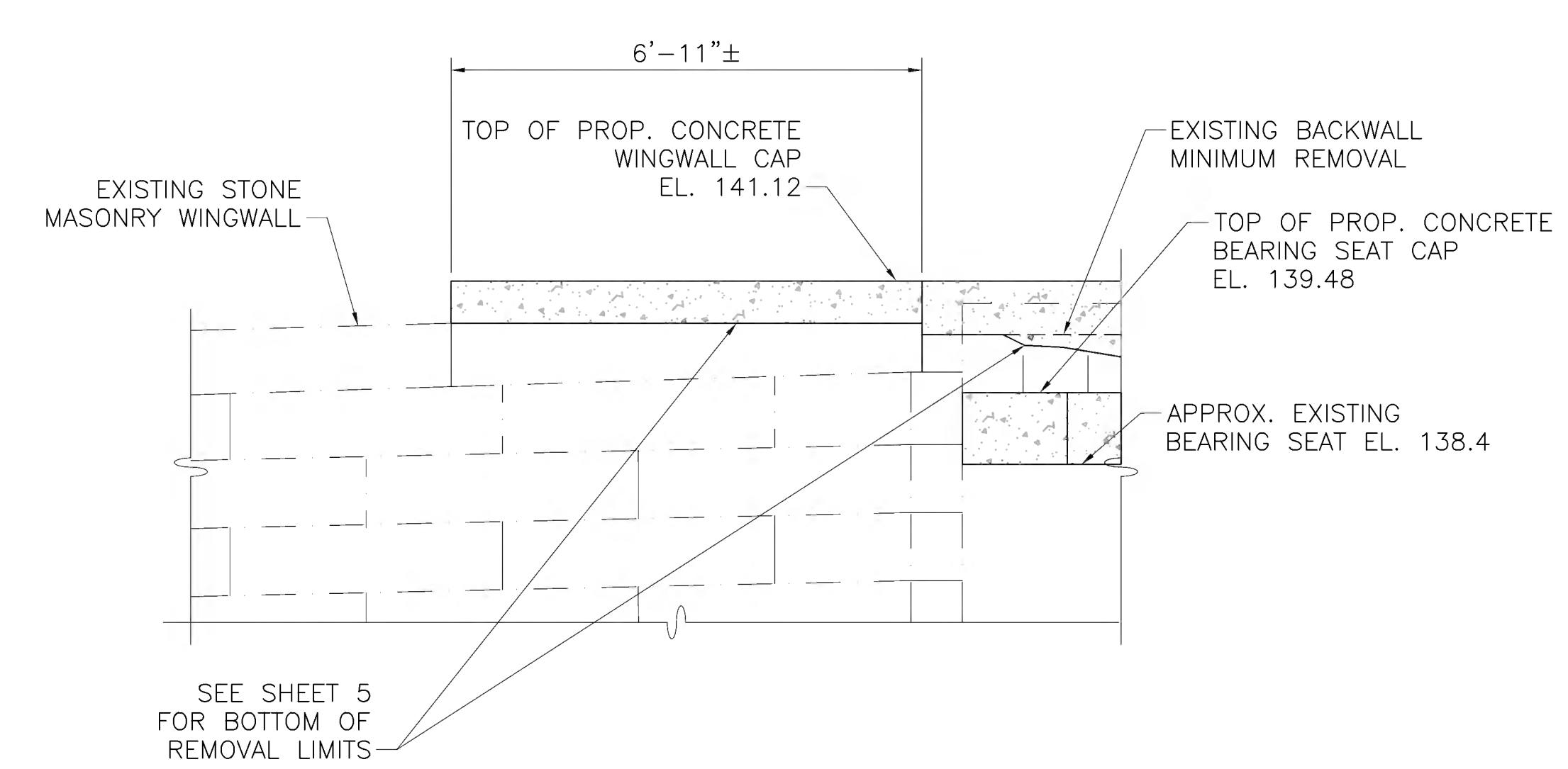
**NOTES:**

1. BEARING SEAT ELEVATION IS GIVEN AT  $\bar{C}$  BEARING.
2. BACKWALL ELEVATION IS GIVEN AT FACE OF BACKWALL.
3. SEE SHEET 8 FOR EXISTING ABUTMENT REPAIR NOTES.
4. SEE SHEET 8 FOR REINFORCING IN PROPOSED CHEEKWALL CAPS
5. USE APPROVED NON-SHRINK GROUT WITH MINIMUM COMPRESSIVE STRENGTH  $F'_c$  OF 6,200 PSI. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS UNDER ITEM 995.
6. SEE SHEET 6 FOR TYPICAL ABUTMENT SECTION.
7. ALL CONCRETE SHALL BE 4000 PSI,  $\frac{3}{4}$  INCH, 610 CEMENT CONCRETE.



**NORTH ABUTMENT AND  
NORTHEAST WINGWALL ELEVATION**  
SCALE: 1/2"=1'-0"

**NOTE:**  
USE LATEST CONTRACT COMPLETION YEAR IN EFFECT WHEN THE FIRST CONCRETE CHEEKWALL CAP IS CAST. USE THIS YEAR FOR BOTH CONCRETE CHEEKWALL CAPS.



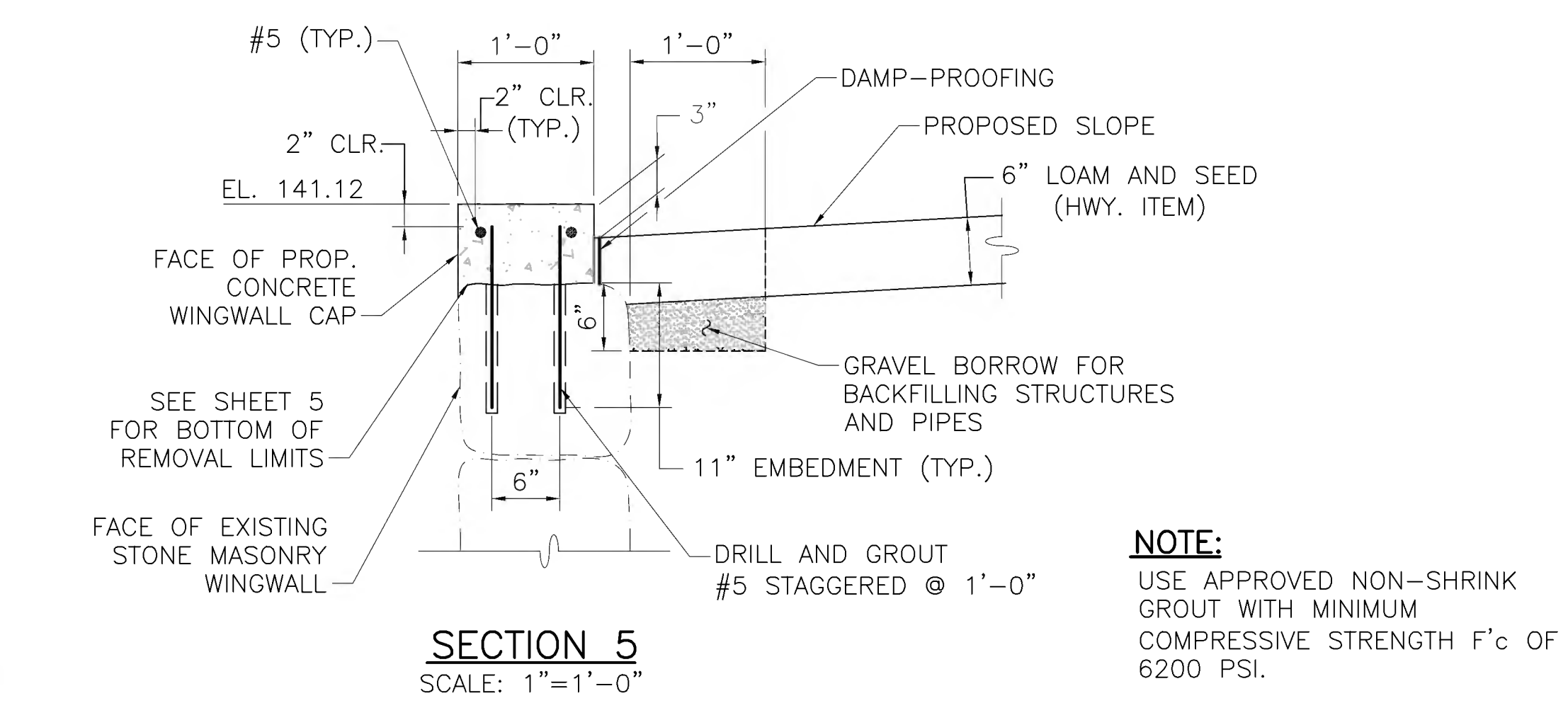
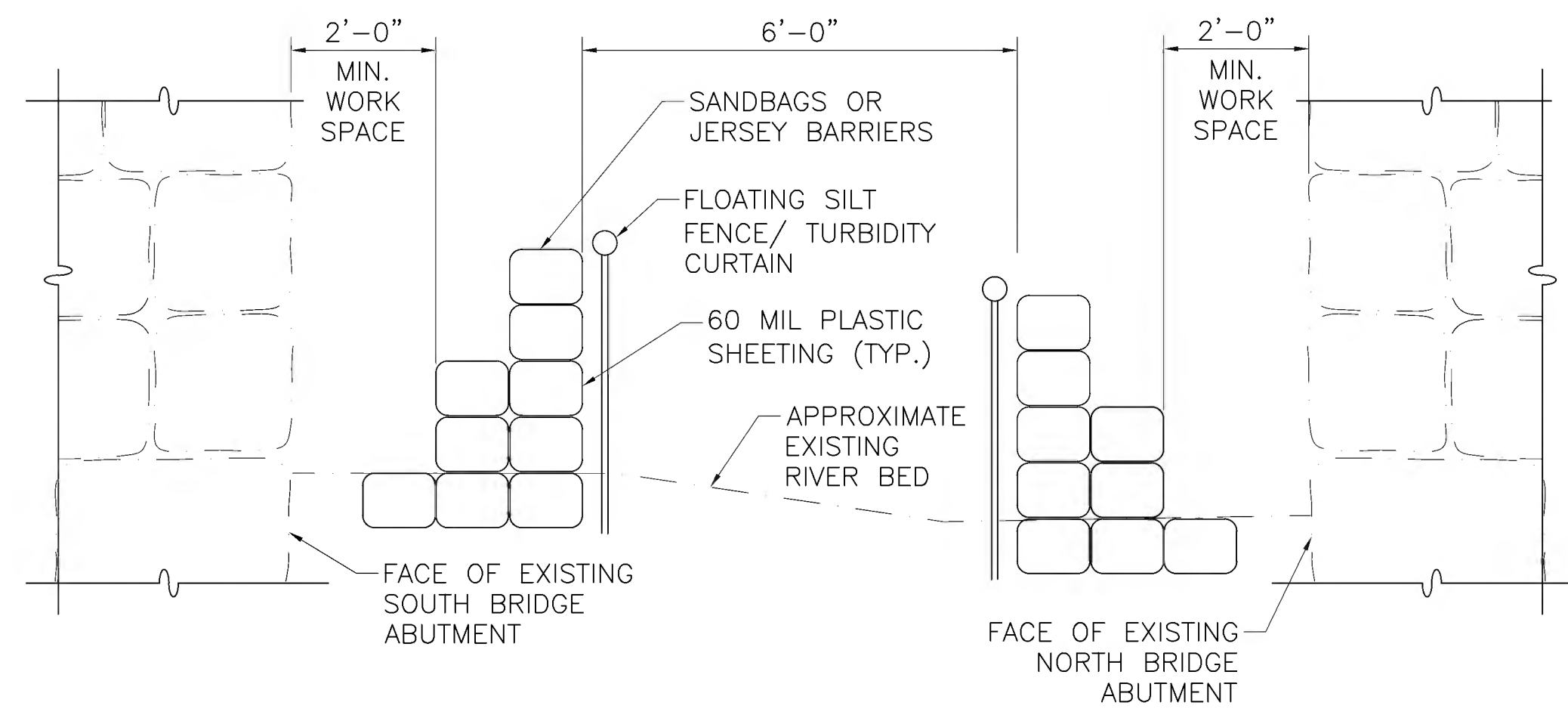
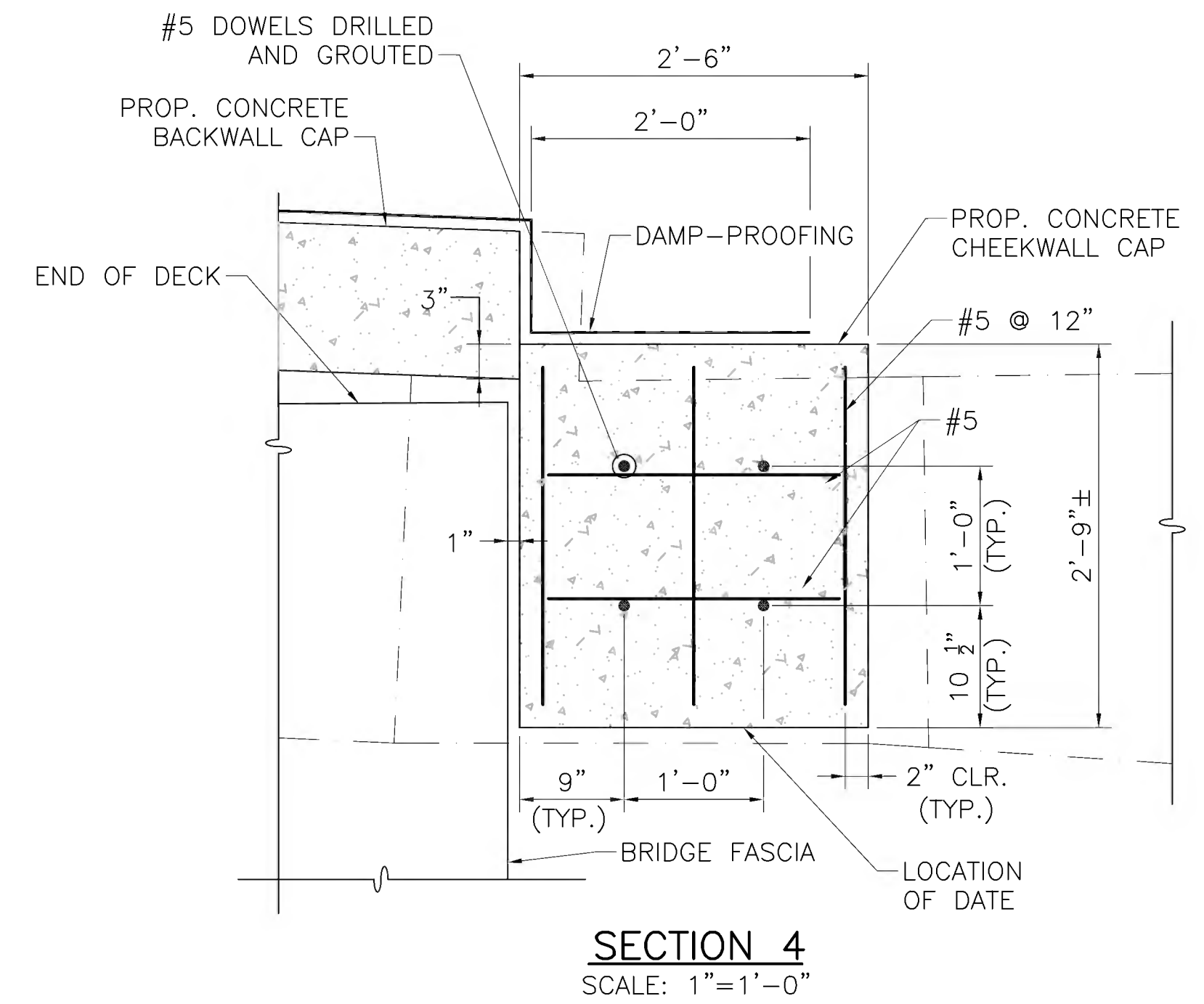
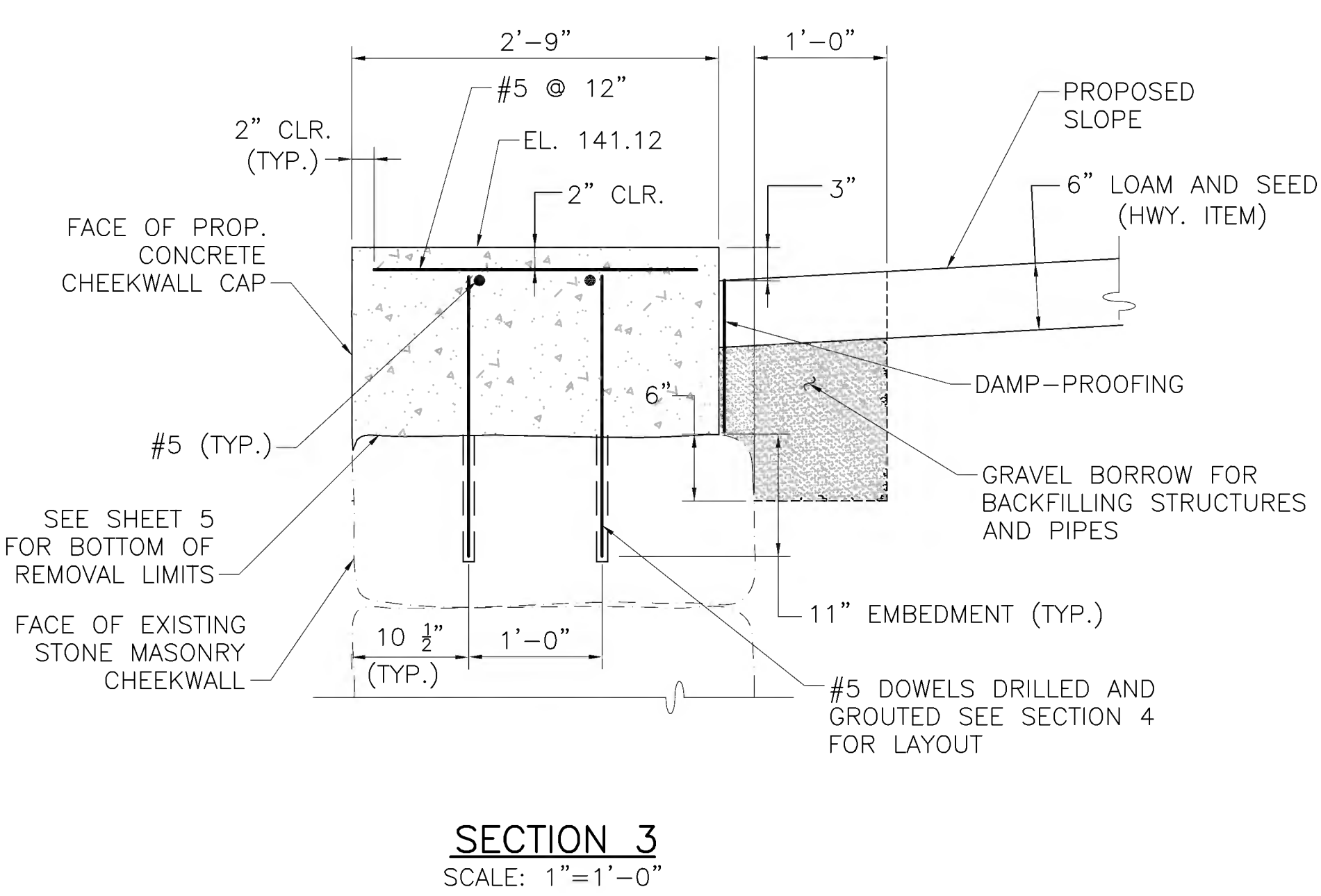
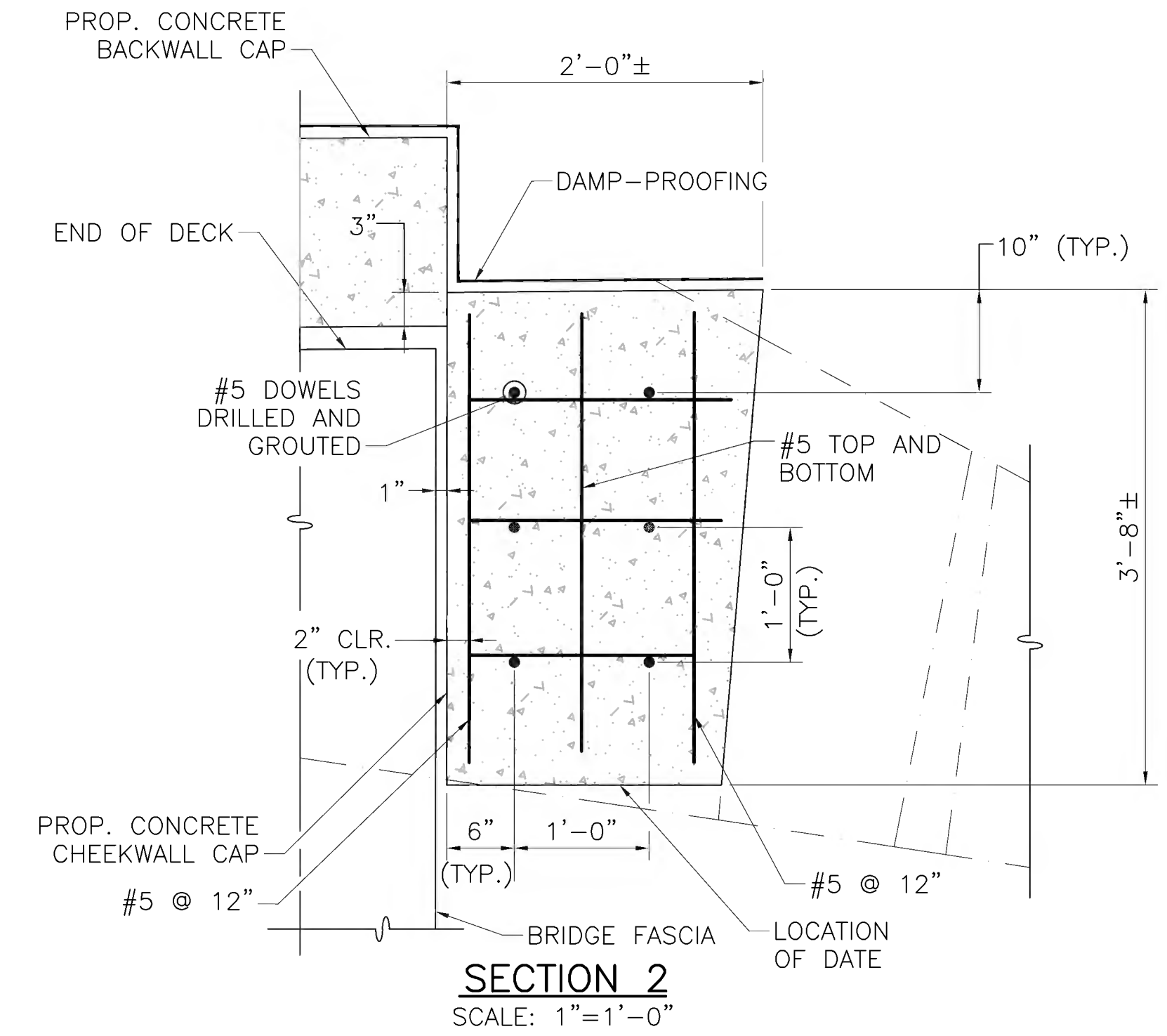
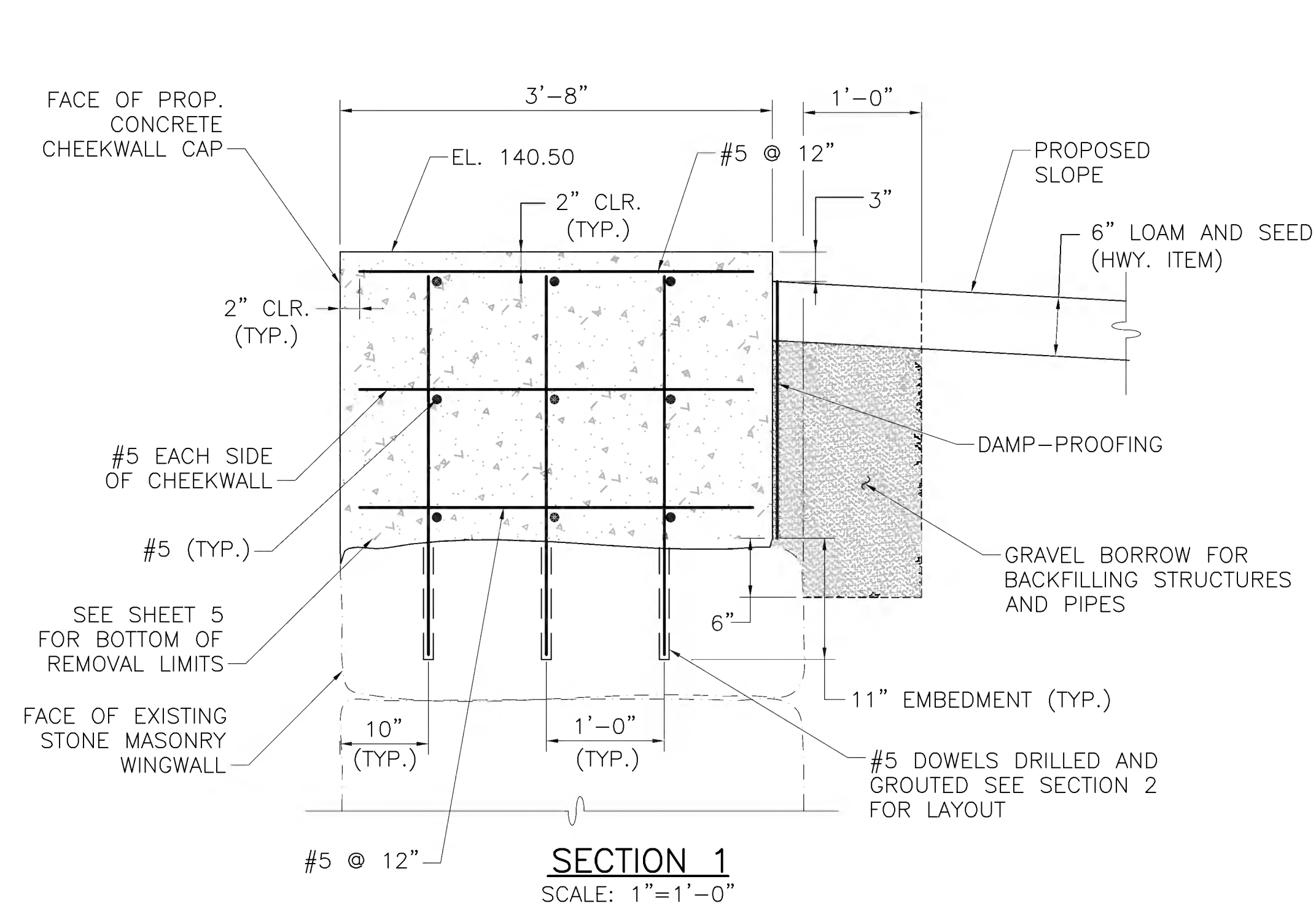
**NORTHWEST WINGWALL ELEVATION**  
SCALE: 1/2"=1'-0"

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608164\_BRF(S-31-007)(NORTH ABUT).DWG Plotted on 6-Jul-2022 11:55 AM Final Structural Submittal (SF) 27-June-2022

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**SUBSTRUCTURE DETAILS**



**NOTE:**  
USE APPROVED NON-SHRINK GROUT WITH MINIMUM COMPRESSIVE STRENGTH F'c OF 6200 PSI.

**EXISTING ABUTMENT REPAIR NOTES:**

1. THE NORTH EXISTING STONE MASONRY ABUTMENT HAS A MISSING STONE IN THE FACE. THE CONTRACTOR SHALL REBUILD ANY COLLAPSED PORTIONS OF THE EXISTING WALL ALONG THE LENGTH OF THE ABUTMENT AND WINGWALLS BELOW THE LIMITS OF REMOVAL. THE COST TO REBUILD THE WALL AS REQUIRED SHALL BE INCLUDED IN ITEM 690, "STONE MASONRY WALL REMOVED AND REBUILT IN CEMENT MORTAR".
2. REPOINTING OF THE EXISTING STONE MASONRY ABUTMENTS SHALL BE REQUIRED PRIOR TO SUPERSTRUCTURE WORK. MASONRY REPOINTING AREAS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER. THE COST TO REPOINT SHALL BE INCLUDED IN ITEM 690.91, "MASONRY REPOINTING".
3. ANY WATER CONTROL REQUIRED TO REMOVE, REPAIR, REBUILD, OR REPOINT THE EXISTING ABUTMENTS SHALL BE INCLUDED UNDER ITEM 991.1, "CONTROL OF WATER".
4. THE CONFIGURATION OF THE EXISTING ABUTMENT STONE WALLS AND THE ELEVATION OF THE BOTTOM OF THE EXISTING ABUTMENTS SHOWN ON THE PLANS ARE APPROXIMATE.

**NOTES:**

1. WORK IN THE WATER SHALL BE PERFORMED DURING LOW FLOW SEASON AS DEFINED IN THE SPECIAL PROVISION FOR ITEM 991.1 AND THE FLOW SHALL BE MAINTAINED THROUGH THE USE OF TEMPORARY WATER CONTROL.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SIZING THE BARRIER TO HANDLE THE RIVER FLOW. THE BARRIER SHALL BE OF ADEQUATE SIZE TO DELIVER THE WATER AT THE DISCHARGE END TO THE RIVER WITHOUT DISTURBING THE EXISTING BANKS OR RIVERBED FLOW. THE BARRIER HEIGHT SHALL BE SIZED TO MAINTAIN 1' OF FREEBOARD OVER THE 10-YEAR FLOOD.
3. IN THE EVENT OF HIGH FLOW RATES, THE CONTRACTOR SHALL BE RESPONSIBLE TO DEVELOP AND IMPLEMENT A REASONABLE MEANS NECESSARY TO HANDLE THE ADDITIONAL FLOWS TO PROTECT THE SURROUNDING AREA, AS APPROVED BY THE ENGINEER AND SHALL BE INCIDENTAL TO ITEM 991.1 "CONTROL OF WATER - STRUCTURE NO. S-31-007".

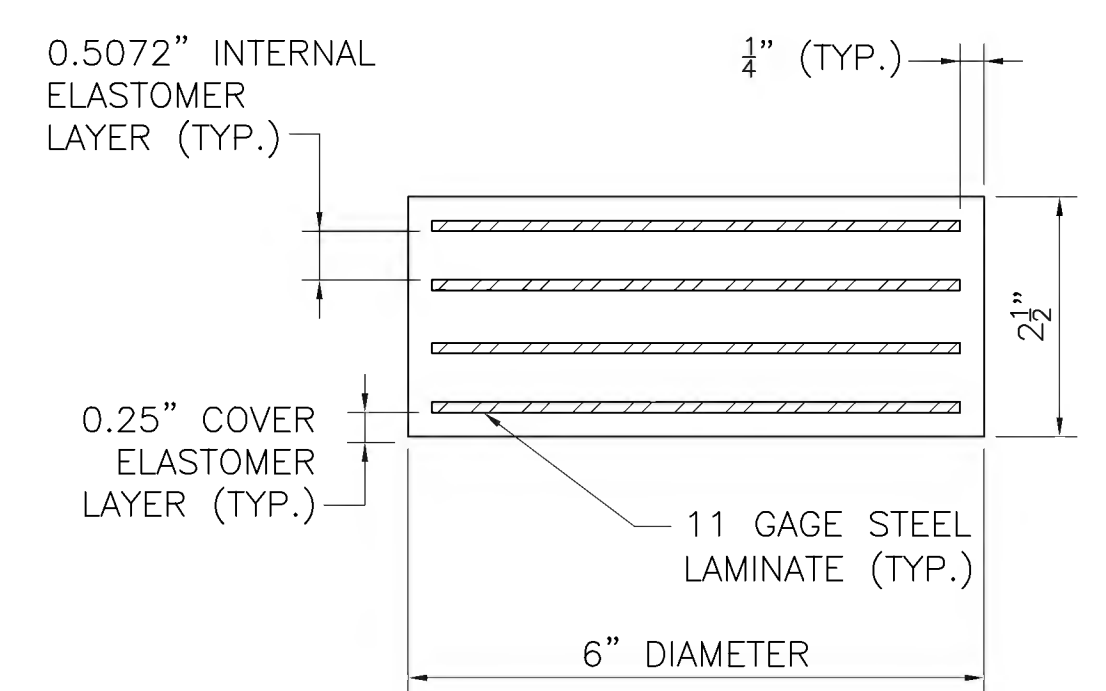
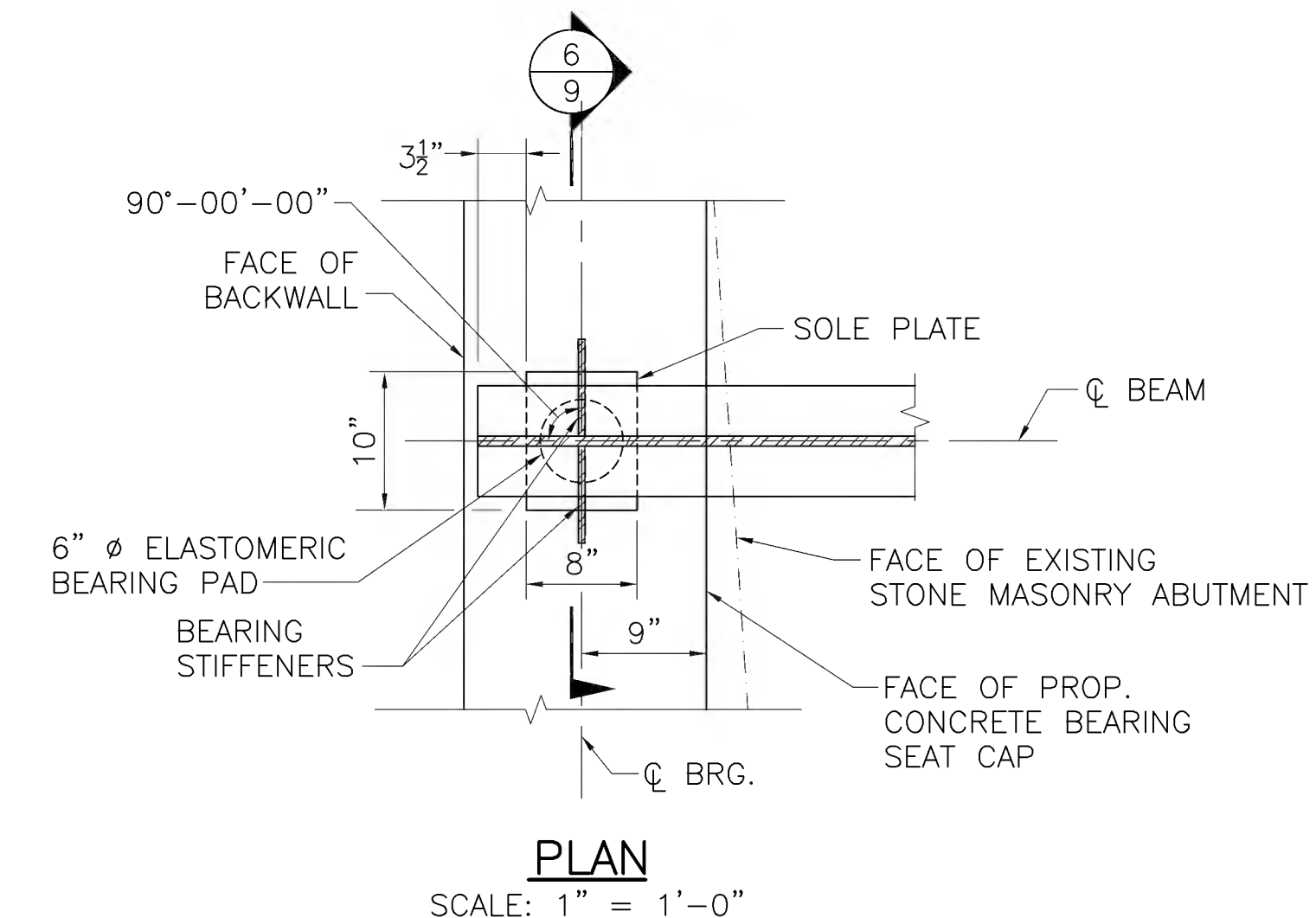
JUNE 27, 2022	ISSUED FOR CONSTRUCTION
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608164-BRCS-31-007(ABUT DETAILS).DWG Plotted on 6-Jul-2022 11:55 AM Final Structural Submittal (SF) 27-June-2022



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MA	CMQ/TAP/STP-0033(028)X	231	319
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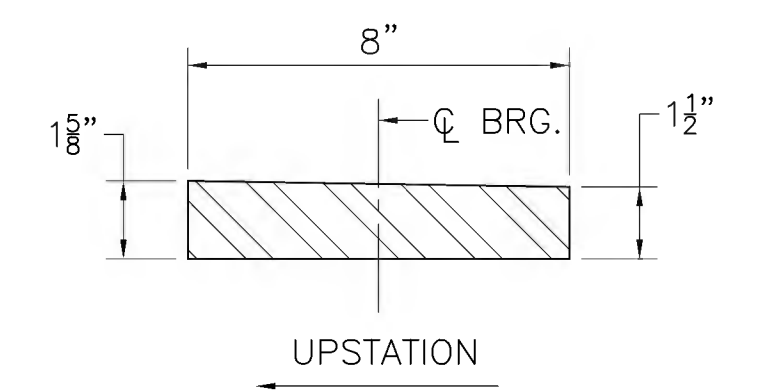
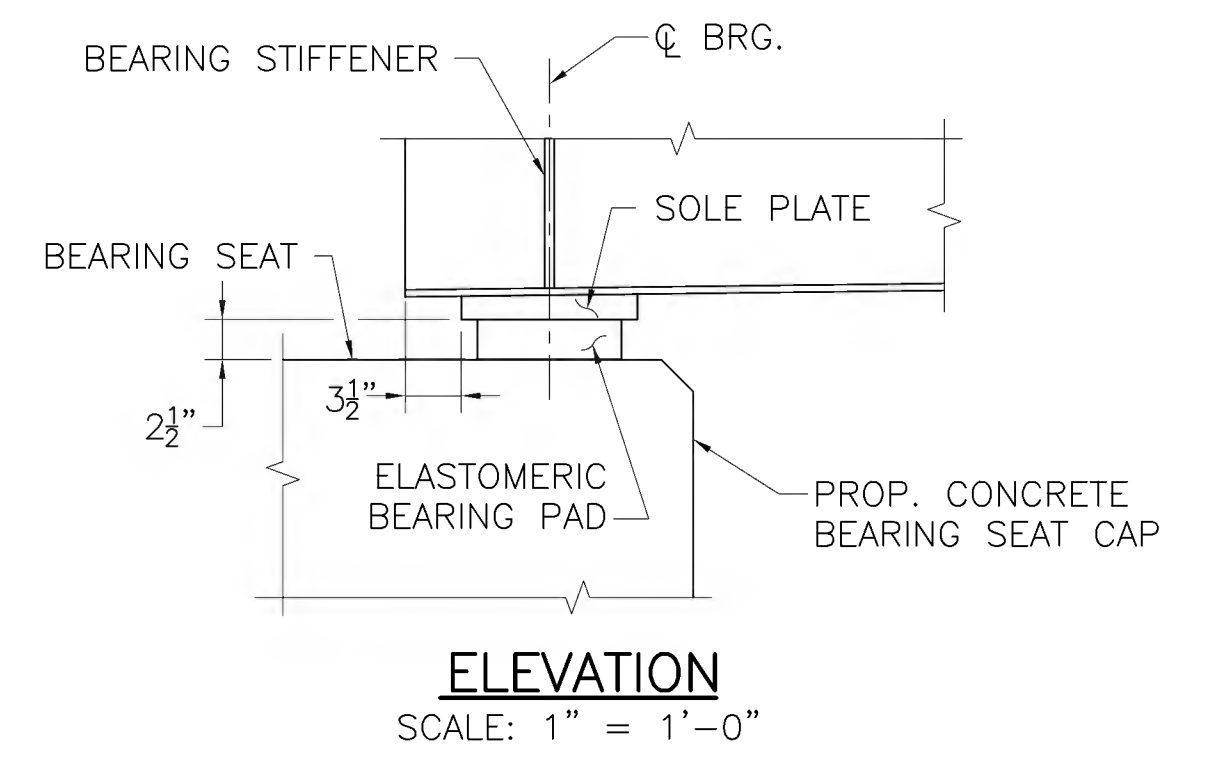
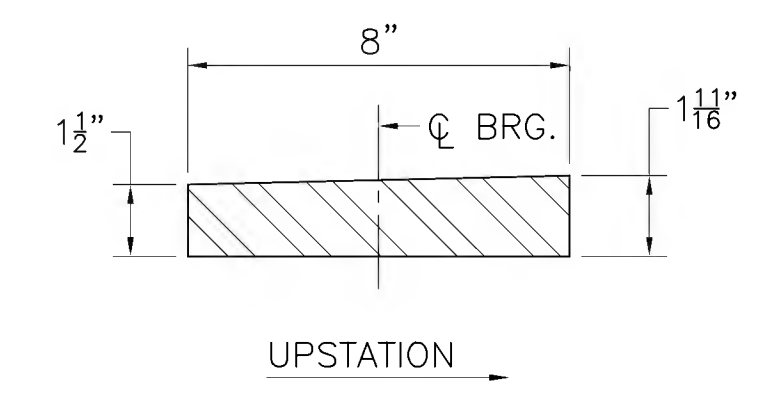
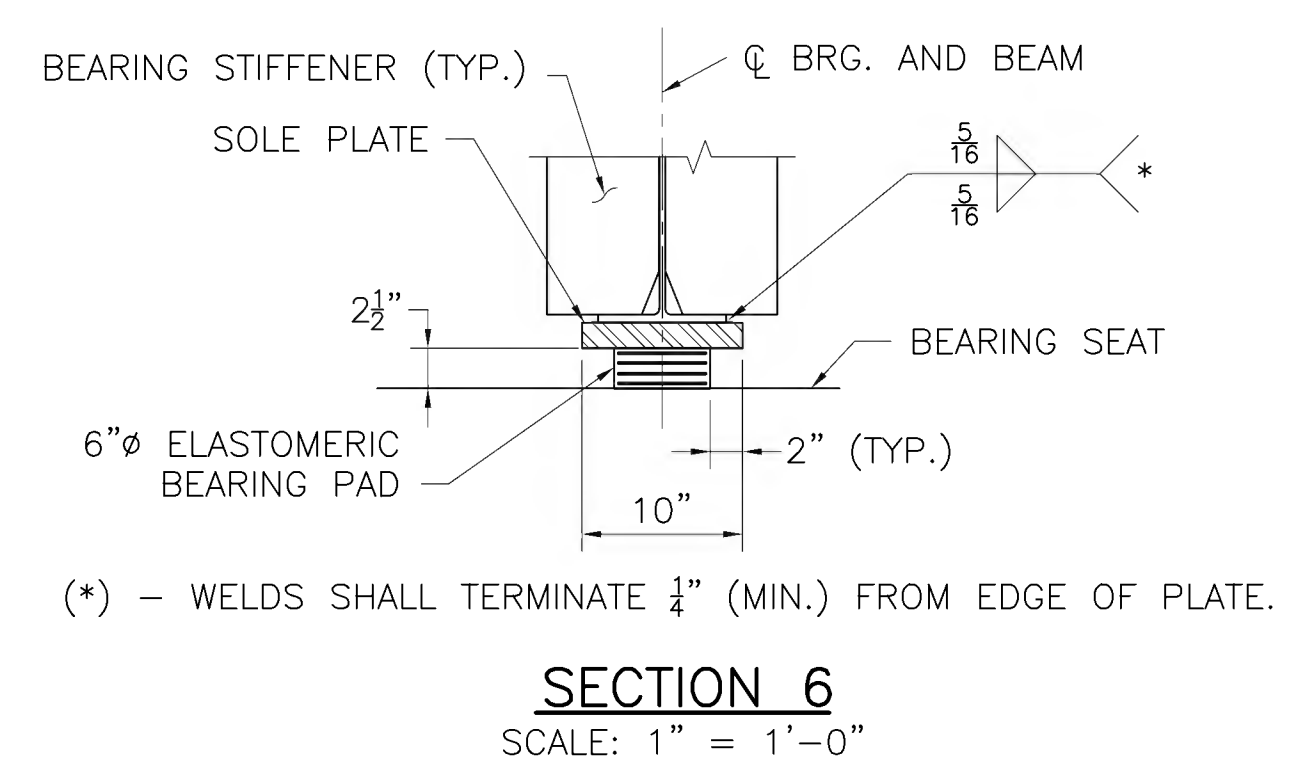
BEARING DETAILS



- NOTES:**
- ELASTOMER SHALL HAVE A SHEAR MODULUS OF 0.160 KSI.
  - STEEL LAMINATES SHALL CONFORM TO ASTM A 1011 GRADE 36.
  - THE COMPRESSIVE DESIGN LOAD ON THE BEARING PAD IS 8 KIPS. THE COMPRESSIVE DESIGN STRESS IS THE RESULT OF DIVIDING THE COMPRESSIVE DESIGN LOAD BY THE AREA OF THE PAD AND IS EQUAL TO 0.28 KSI.
  - ELASTOMERIC BEARING PAD SHALL NOT BE VULCANIZED TO THE SOLE PLATE.
  - ELASTOMER SHALL HAVE A HARDNESS OF 60 DUROMETER.

**ELASTOMERIC BEARING PAD**  
6" = 1'-0"

- BEARING NOTES:**
- STEEL SOLE PLATES SHALL CONFORM TO AASHTO M 270 GRADE 36 AND SHALL BE HOT-DIP GALVANIZED.
  - CENTER THE ELASTOMERIC PAD UNDER THE SOLE PLATE DURING BEAM ERECTION.
  - BEAMS SHALL BE ERECTED WHEN THE AMBIENT TEMPERATURE IS BETWEEN 50 °F AND 77 °F. IF BEAMS ARE ERECTED AT OTHER AMBIENT TEMPERATURES, THEY WILL HAVE TO BE JACKED AND THE ELASTOMERIC BEARINGS RECENTERED WHEN THE TEMPERATURE RETURNS TO THAT RANGE.



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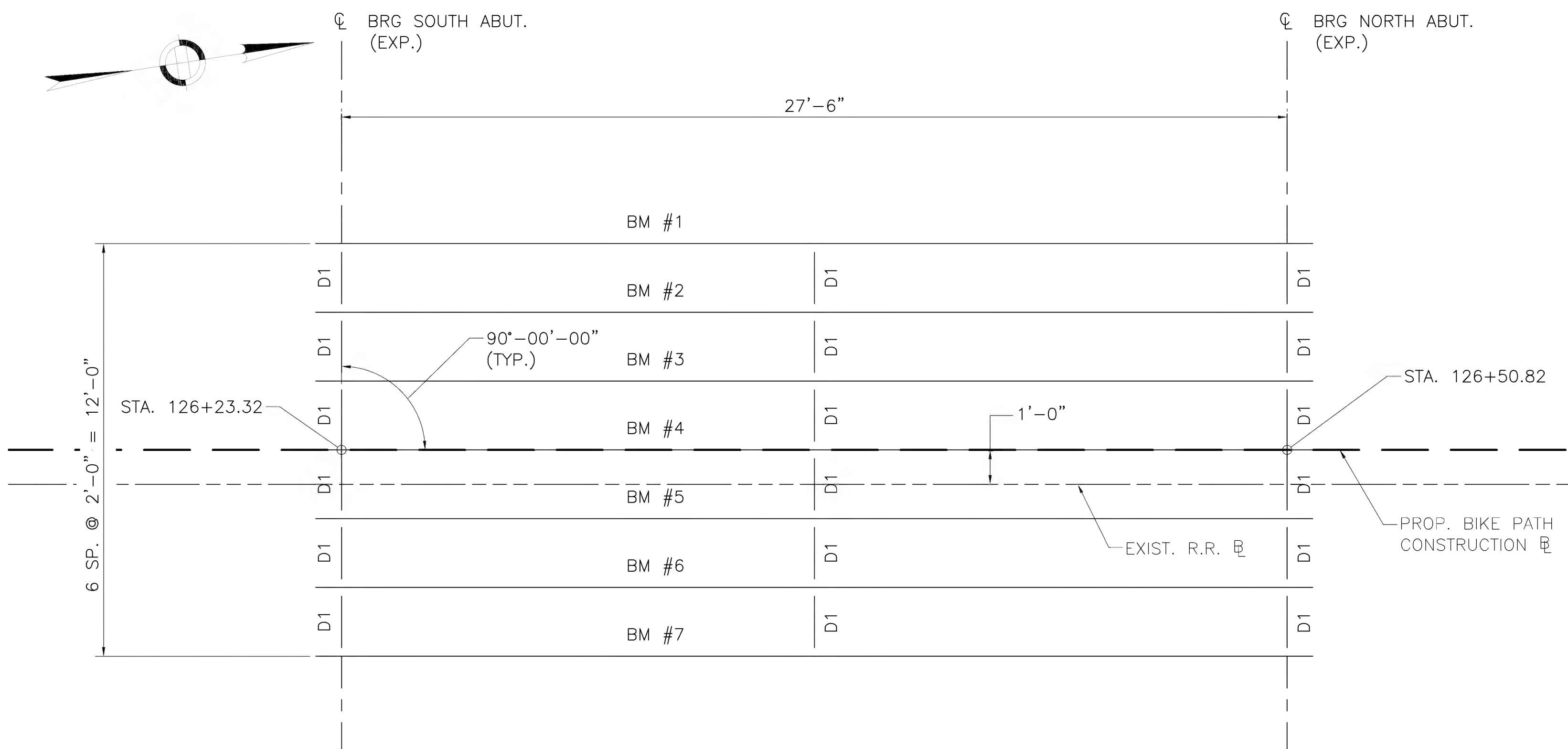
608164\_BRI(S-31-007)BEARINGS.DWG Plotted on 6-Jul-2022 11:55 AM Final Structural Submittal (SF) 27-June-2022

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	232	319
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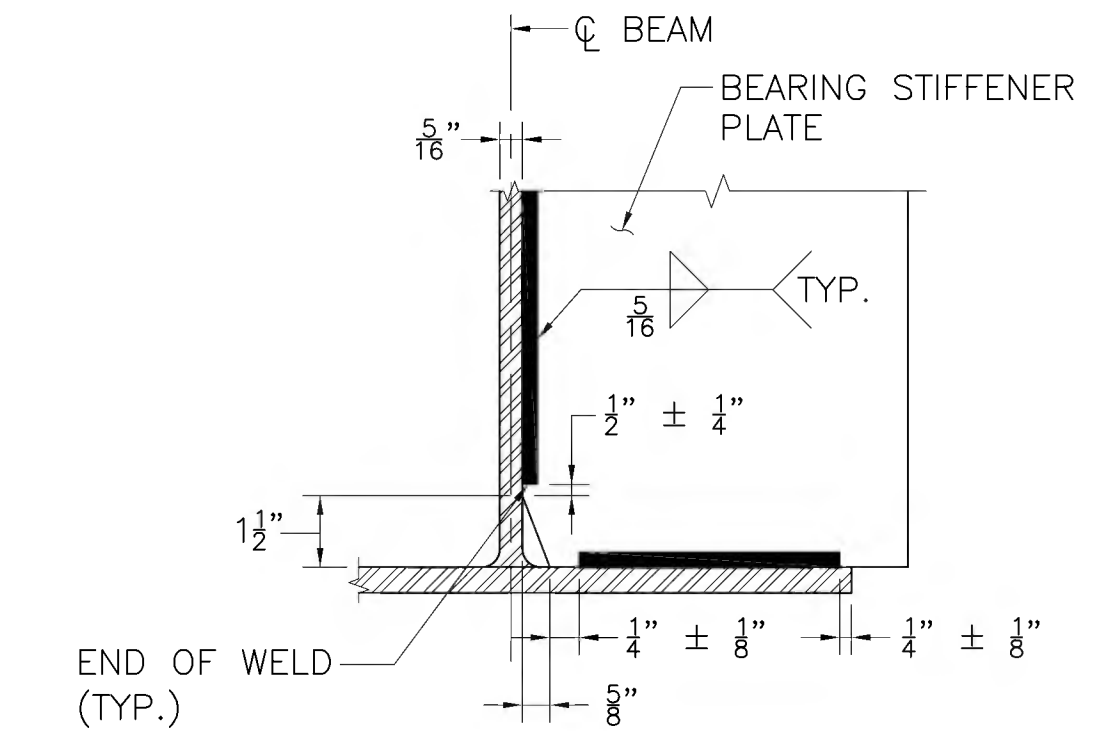
**FRAMING PLAN & STRUCTURAL STEEL DETAILS**

**NOTES:**

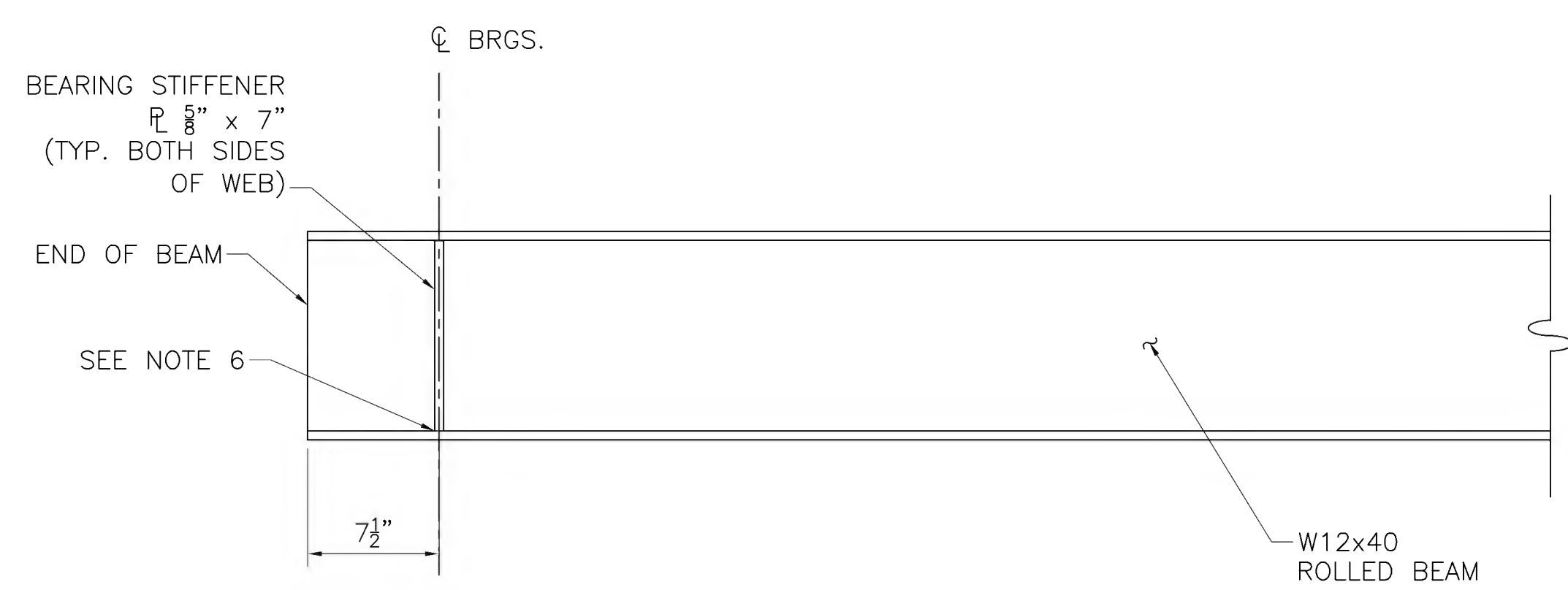
- D1 = C9x15 (TYPICAL DIAPHRAGM)
- THE MAIN LOAD CARRYING MEMBERS ARE BM #1 THROUGH BM #7. ALL BEAMS SHALL BE W12x40.
- ALL STEEL SHALL CONFORM TO AASHTO M270 GRADE 50 HOT-DIP GALVANIZED.
- ALL BEARING STIFFENERS SHALL BE PLUMB.
- ENDS OF BEAMS SHALL BE FABRICATED SO THAT UNDER FULL DEAD LOAD THE ENDS OF THE BEAMS WILL PLUMB.
- BEARING STIFFENER PLATES AT BOTTOM FLANGE SHALL BE MILLED FOR TIGHT FIT AND WELDED WITH  $\frac{5}{16}$ " FILLET WELDS, BOTH SIDES OF PLATE.



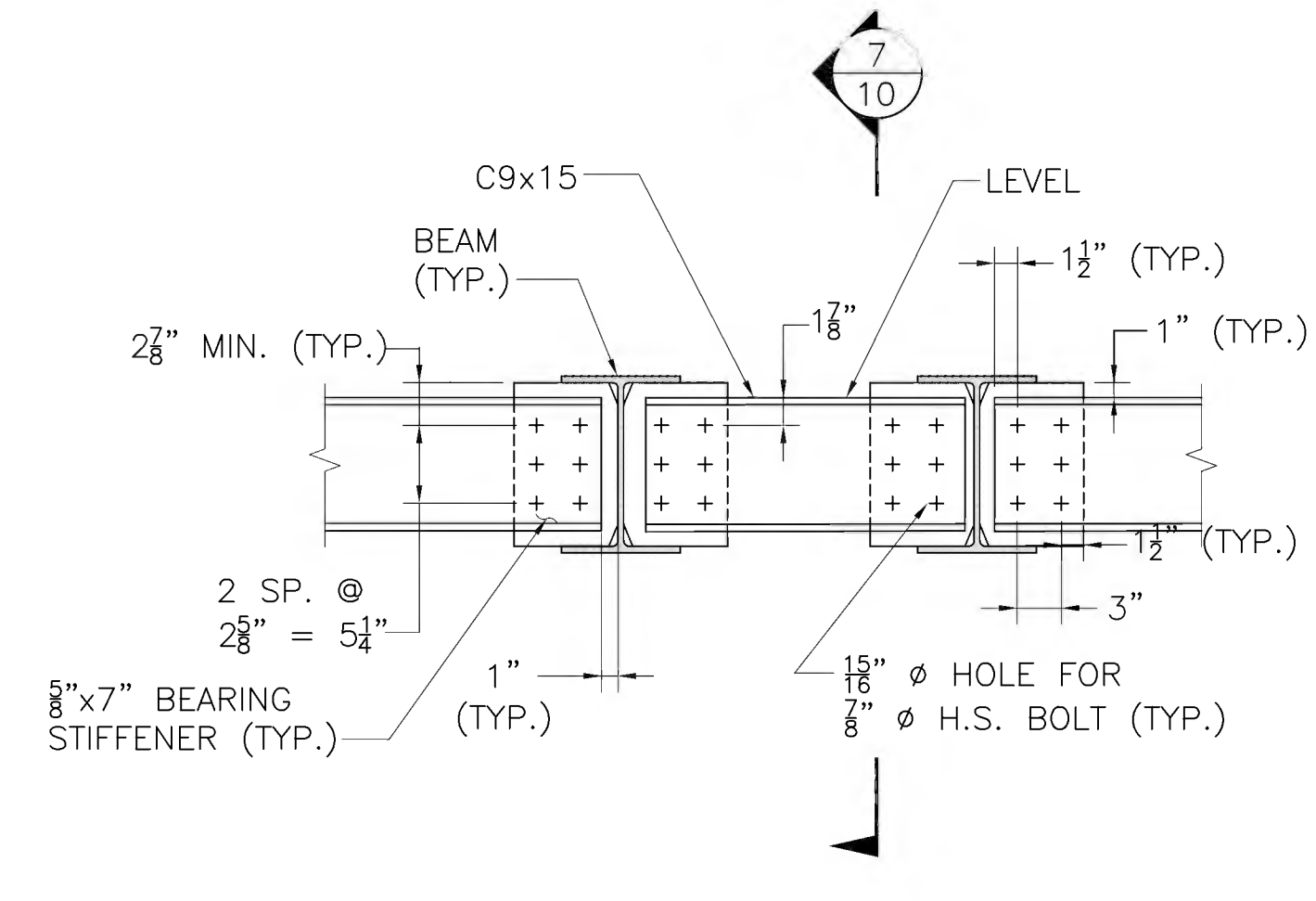
**FRAMING PLAN**  
SCALE:  $\frac{3}{8}$ " = 1'-0"



**CLIP DETAIL**  
NOT TO SCALE



**BEAM ELEVATION**  
SCALE:  $1\frac{1}{2}$ " = 1'-0"

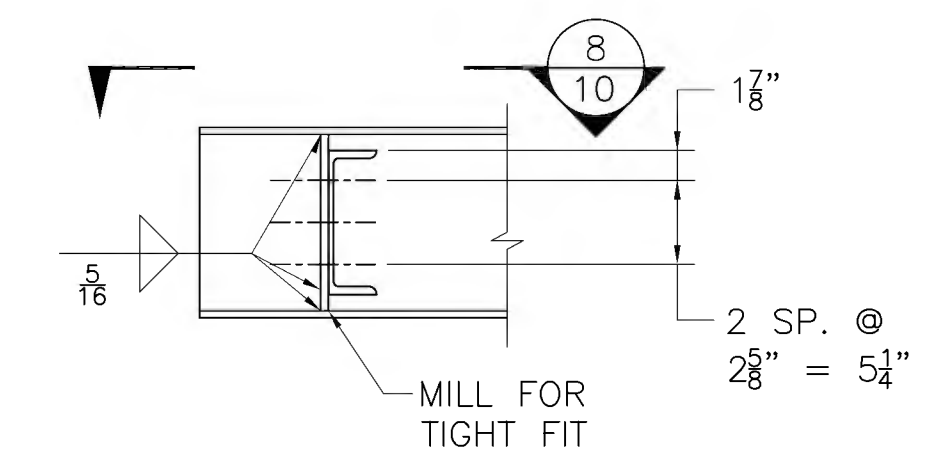


**ELEVATION VIEW**

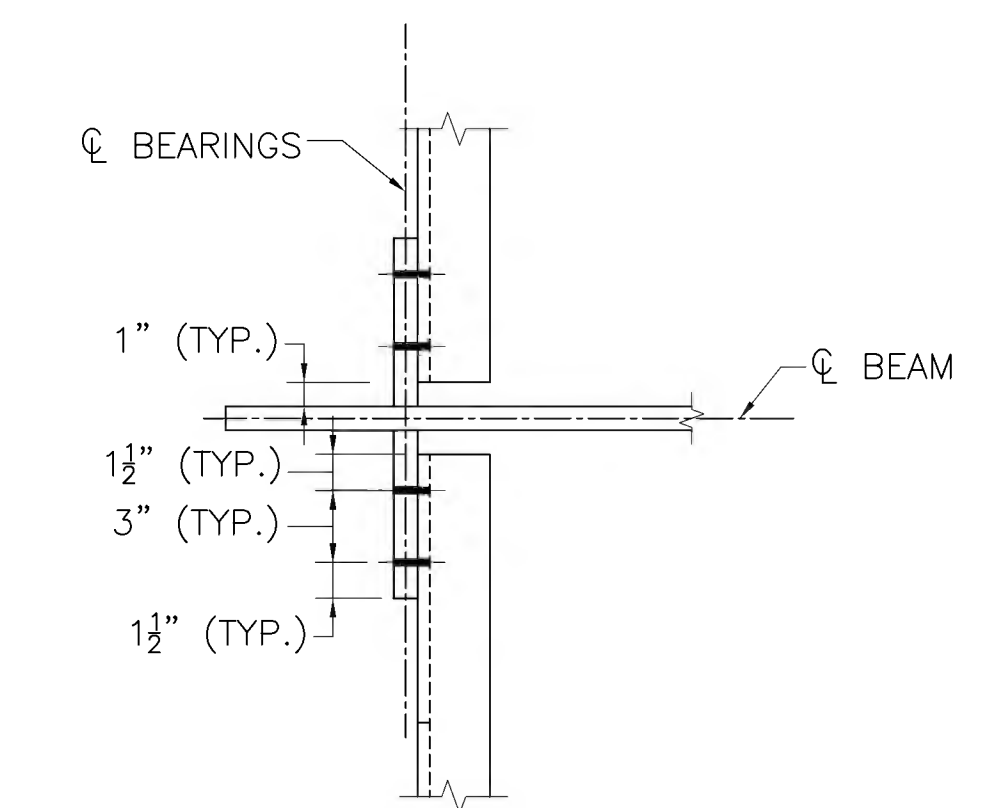
**NOTE:**

SEE CLIP DETAIL ON THIS SHEET.

**DIAPHRAGM D1**  
SCALE: 1" = 1'-0"



**SECTION 7**



**SECTION 8**  
SCALE:  $1\frac{1}{2}$ " = 1'-0"

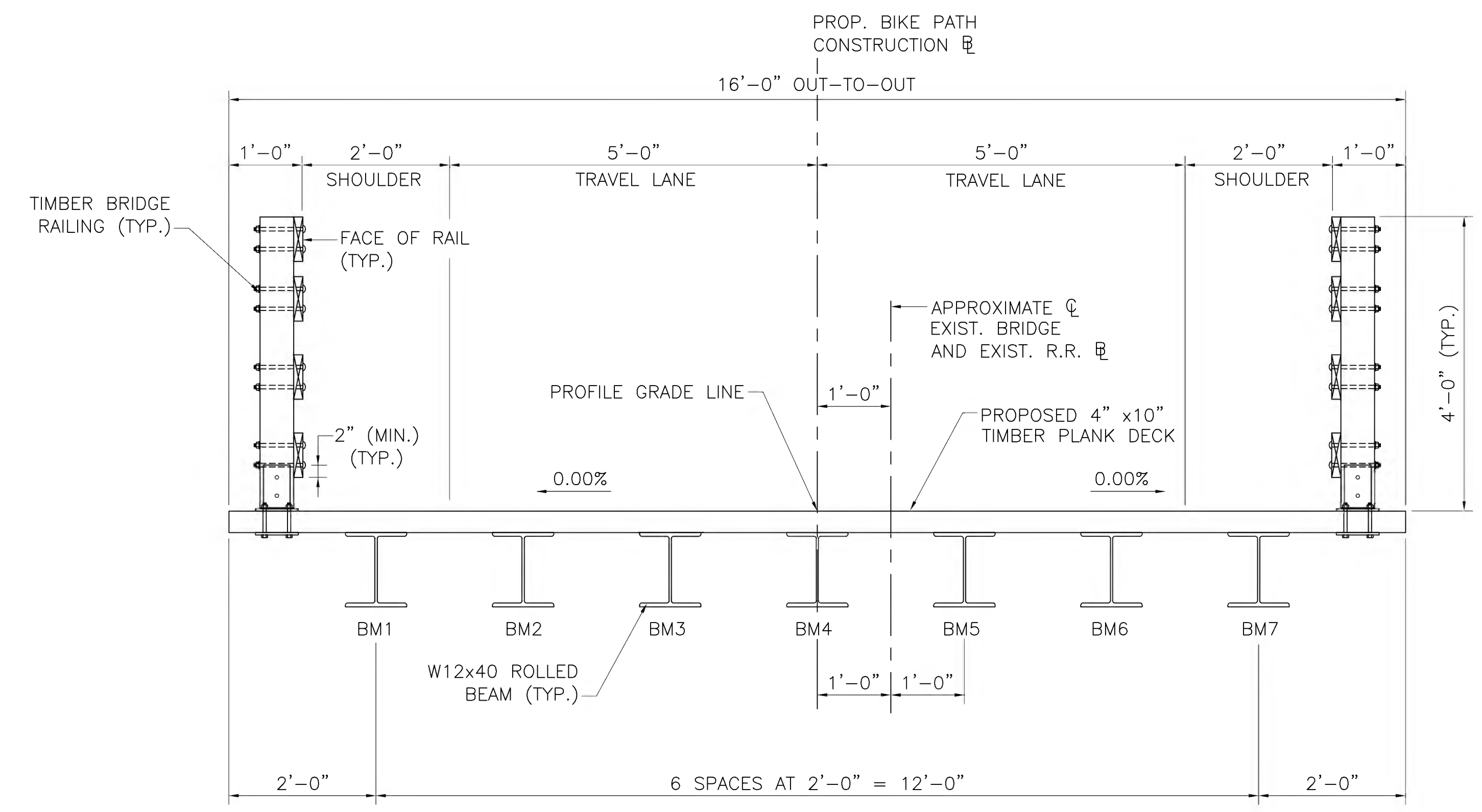
	CAMBER TABLE (INCHES)										
	SPAN NO. 1										
	S. ABUT.	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	N. ABUT.
STEEL DL DEFLECTION	0.00	0.02	0.03	0.05	0.06	0.06	0.06	0.05	0.03	0.02	0.00
NONCOMP. DEFLECTION	0.00	0.03	0.05	0.06	0.07	0.07	0.07	0.06	0.05	0.03	0.00
ADDITIONAL CAMBER	0.00	0.07	0.14	0.21	0.28	0.34	0.28	0.21	0.14	0.07	0.00
TOTAL CAMBER	0.00	0.12	0.22	0.32	0.41	0.47	0.41	0.32	0.22	0.12	0.00

JUNE 27, 2022	ISSUED FOR CONSTRUCTION
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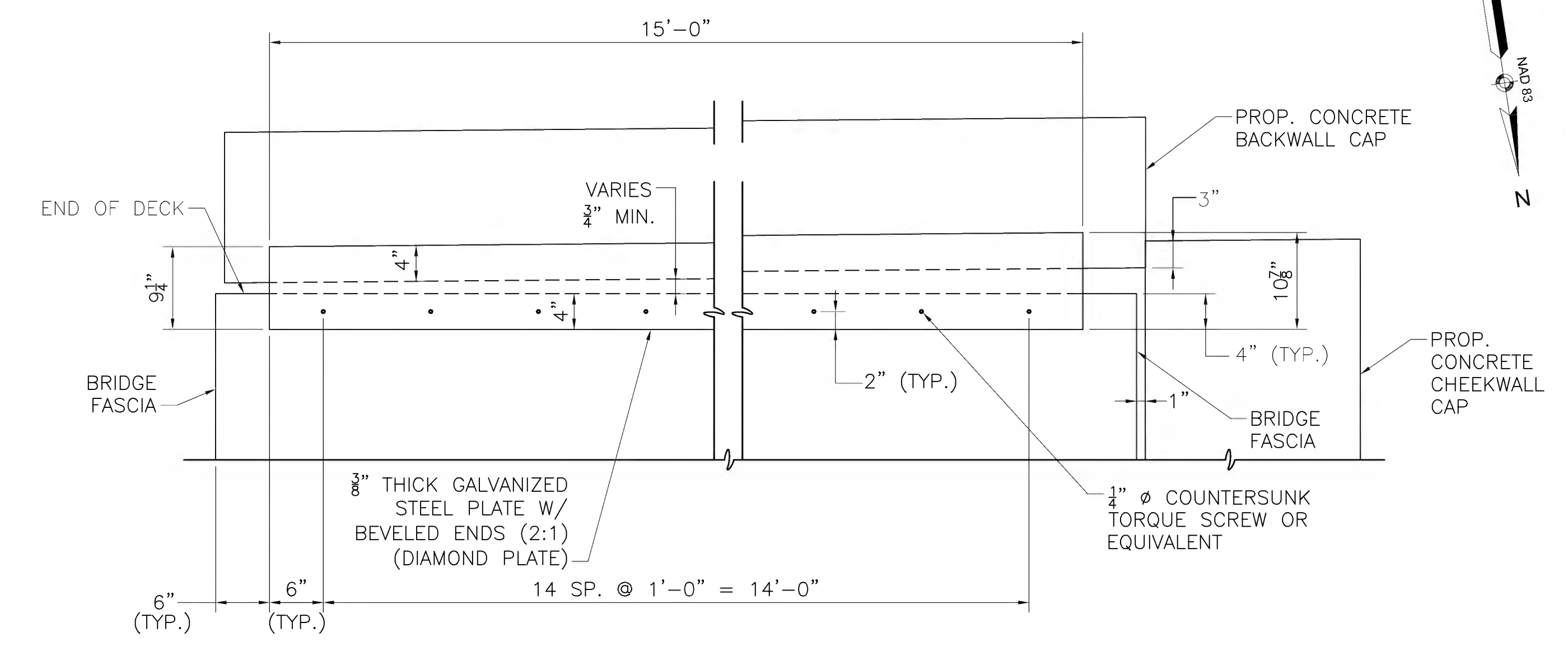


STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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DECK DETAILS & TYPICAL SECTION

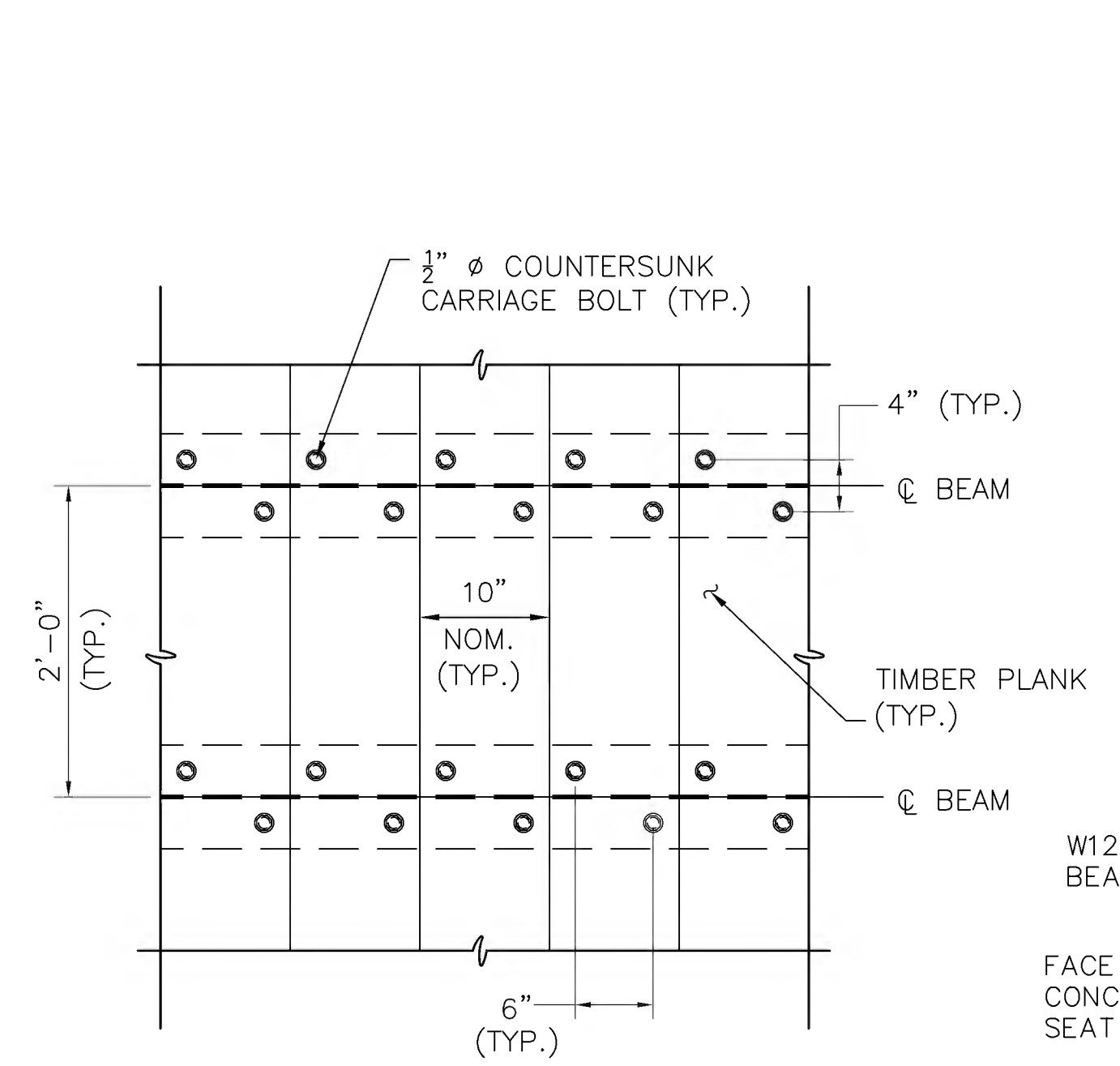


TYPICAL BRIDGE SECTION  
SCALE: 3/4" = 1'-0"



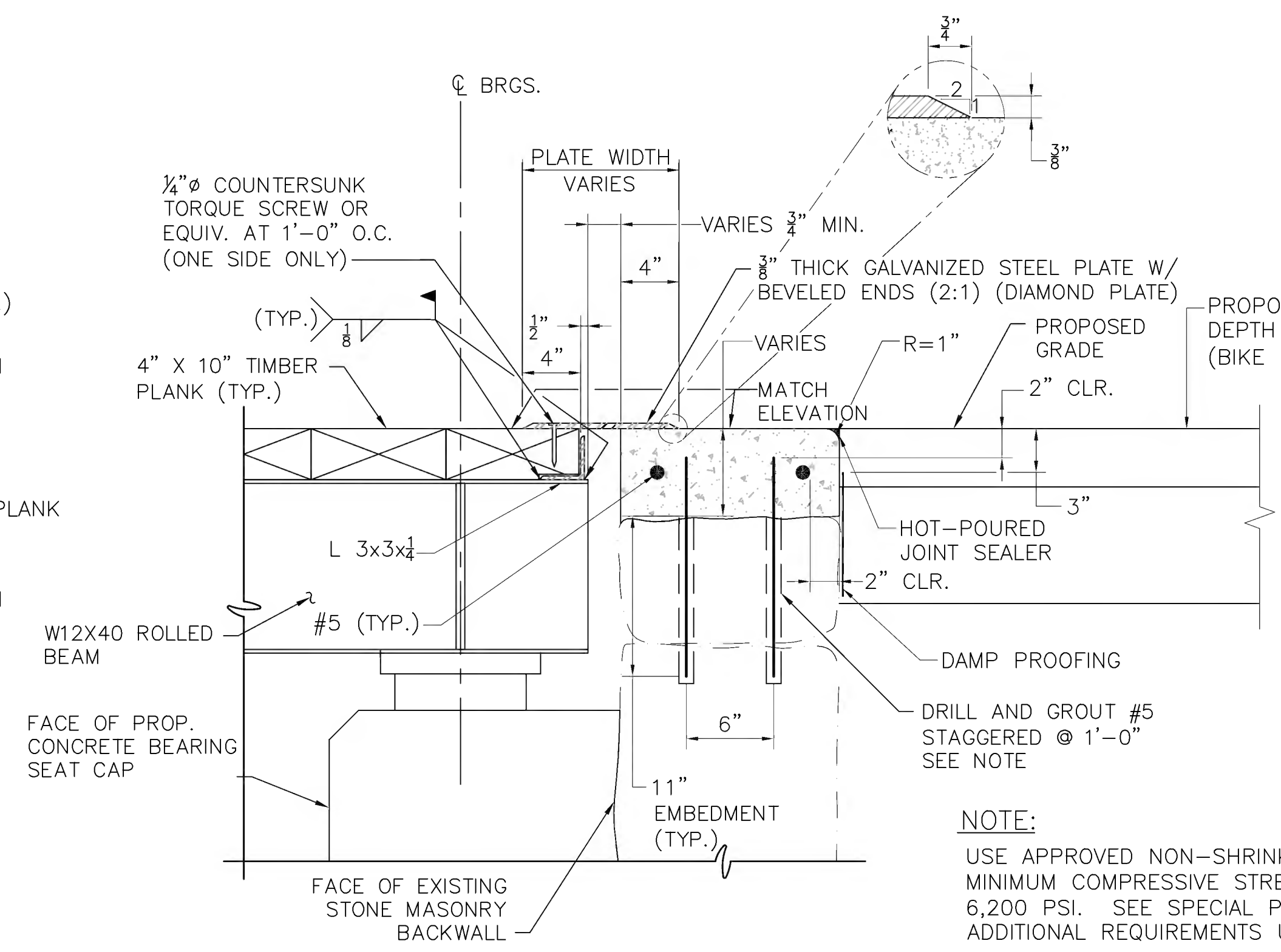
SOUTH DECK END PLATE DETAIL  
SCALE: 1" = 1'-0"

NOTE:  
BEAMS AND BEARING SEAT NOT SHOWN FOR CLARITY.



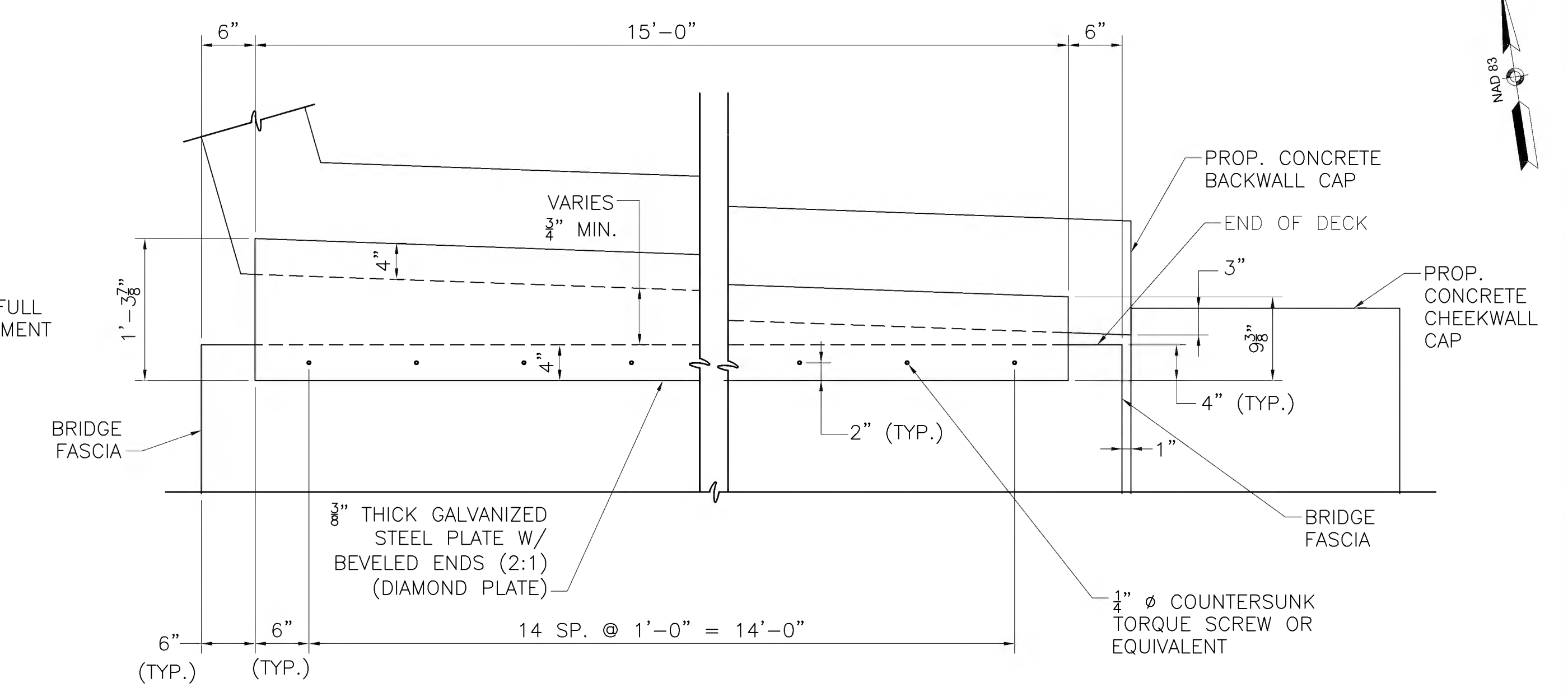
DECK CONNECTION DETAIL  
SCALE: 1" = 1'-0"

NOTE:  
CONNECTION SHOULD BE CENTERED ON PLANKS AND BEAMS.



TYPICAL ABUTMENT END DETAIL  
SCALE: 1 1/2" = 1'-0"

NOTE:  
USE APPROVED NON-SHRINK GROUT WITH MINIMUM COMPRESSIVE STRENGTH F'c OF 6,200 PSI. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS UNDER ITEM 995



NORTH DECK END PLATE DETAIL  
SCALE: 1" = 1'-0"

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USE ONLY PRINTS OF LATEST DATE	

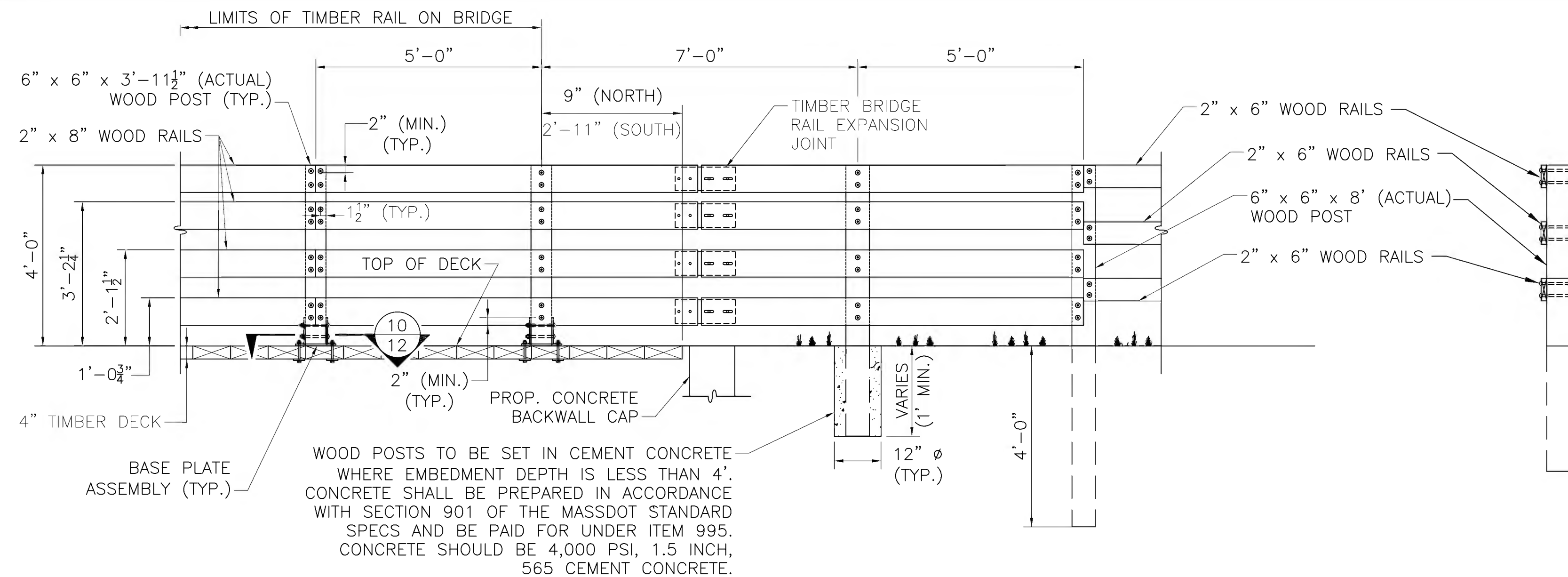
608164\_BR13(S-31-007)DECK DETAILS.DWG Plotted on 6-Jul-2022 11:57 AM Final Structural Submittal (SF) 27-June-2022

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	234	319
PROJECT FILE NO.		608164	

**TIMBER BRIDGE RAIL DETAILS**

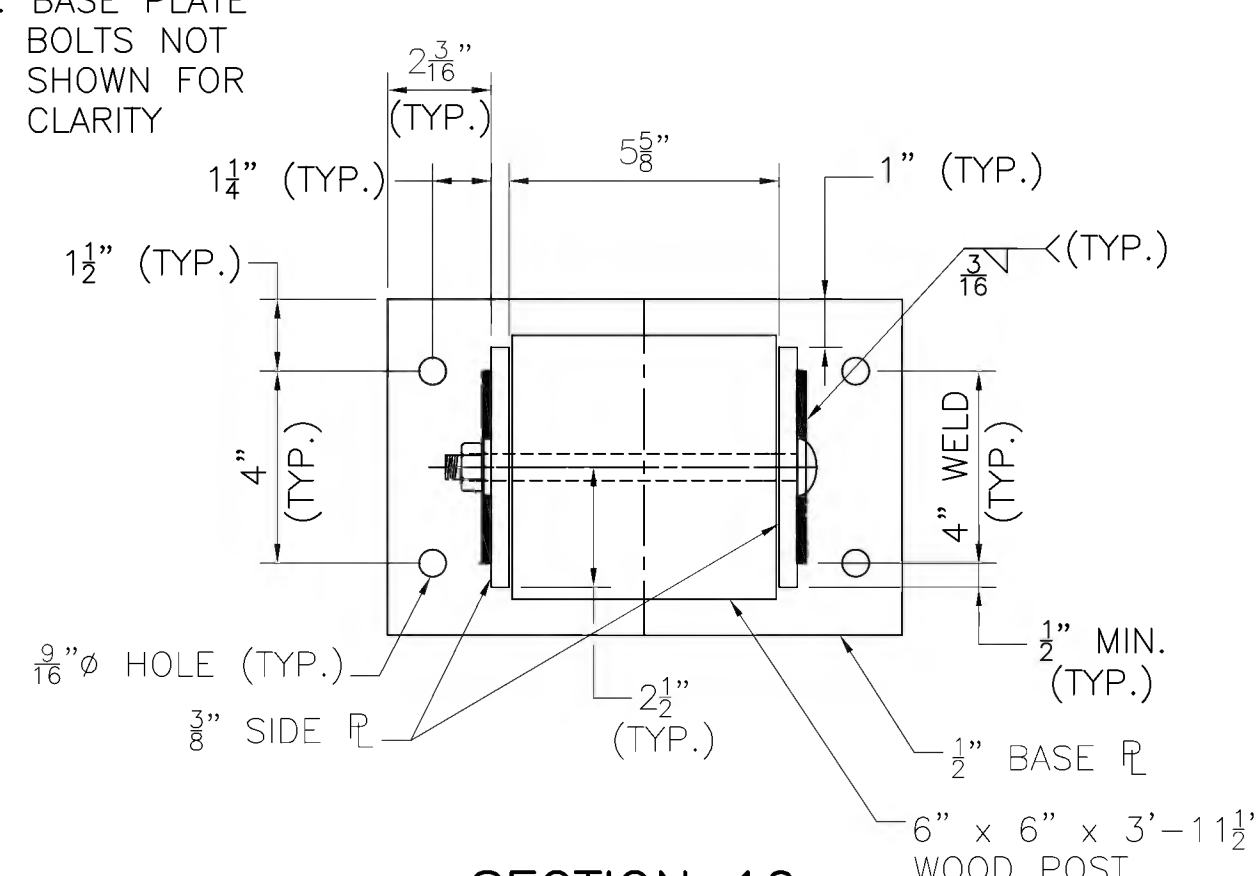
**RAILING NOTES:**

- RAIL CONNECTION PLATES AND RAIL EXPANSION JOINT PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M270 GRADE 50.
- ALL STEEL PLATES AND FASTENERS SHALL BE GALVANIZED.
- THE NUT SECURING THE POST BASE PLATE TO THE TIMBER DECK SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL  $\frac{1}{8}$  TURN AFTER STEEL IS IN PLACE.
- CONNECTION BOLTS SHALL BE ASTM A325 TYPE 1.
- THRU BOLTS USED TO CONNECT BASE PLATE TO TIMBER DECK SHALL NOT FALL WITHIN 2" OF EDGE OF PLANK. ADJUST RAIL SPACING TO BE NOT MORE THAN 5'-0" SPACING ON BRIDGE TO ACCOMMODATE 2" EDGE DISTANCE LIMIT. HOLD 7' SPACING BETWEEN LAST POST ON THE BRIDGE AND FIRST POST OFF THE BRIDGE.
- ALL WOOD RAILS SHALL BE CONNECTED TO A MINIMUM OF TWO WOOD POSTS.
- BOLTS IN SLOTTED HOLES SHALL UTILIZE LOCK NUTS AND BE FINGER TIGHT TO ALLOW MOVEMENT BETWEEN STEEL PLATE AND TIMBER RAIL.
- SEE TIMBER RAIL FENCE DETAILS ON SHEET 209 FOR ADDITIONAL INFORMATION.
- ALL DIMENSIONS OF TIMBER ELEMENTS ARE NOMINAL UNLESS OTHERWISE NOTED.

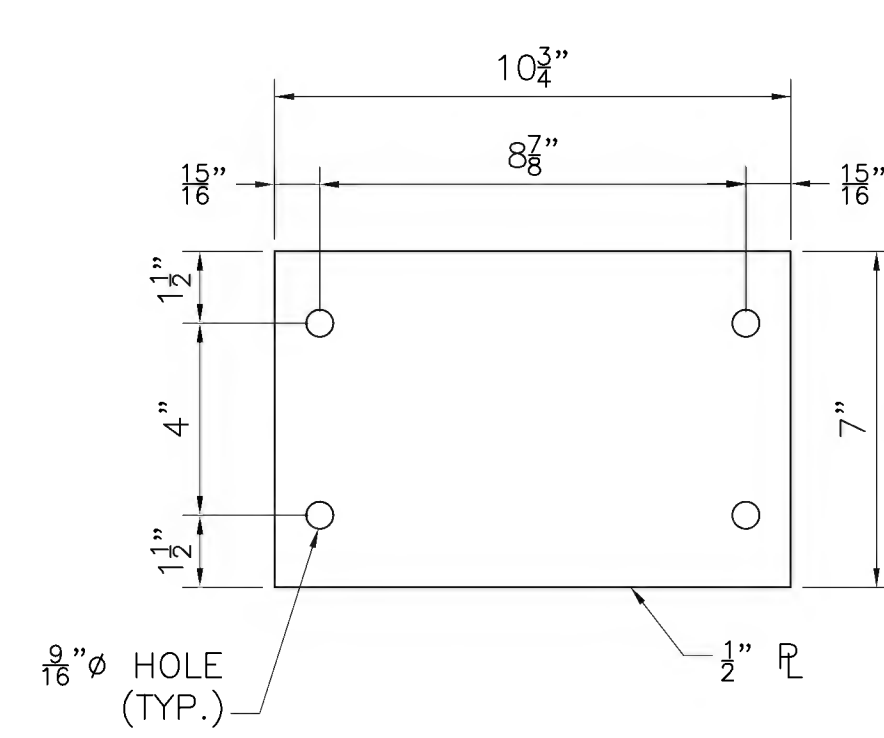


**TIMBER BRIDGE RAIL ELEVATION**  
SCALE: 1/2"=1'-0"

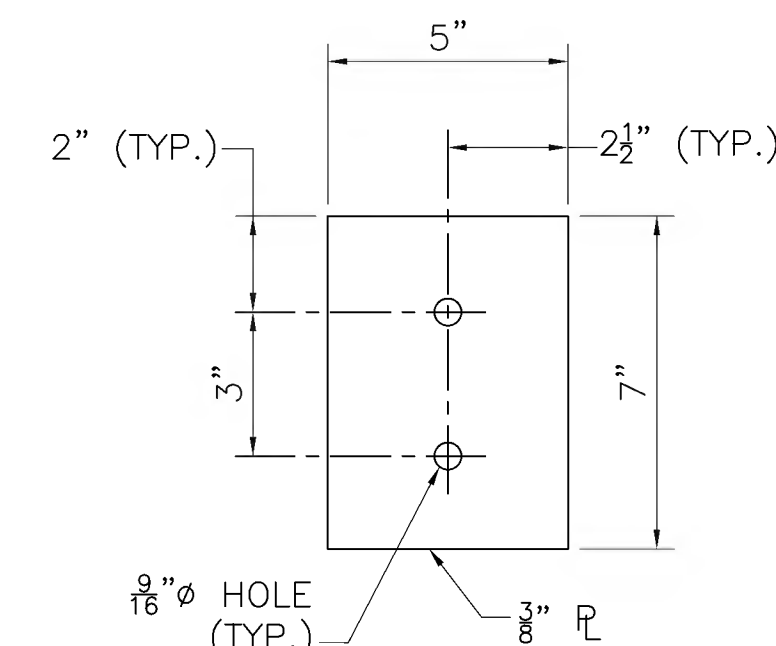
NOTE: BASE PLATE BOLTS NOT SHOWN FOR CLARITY



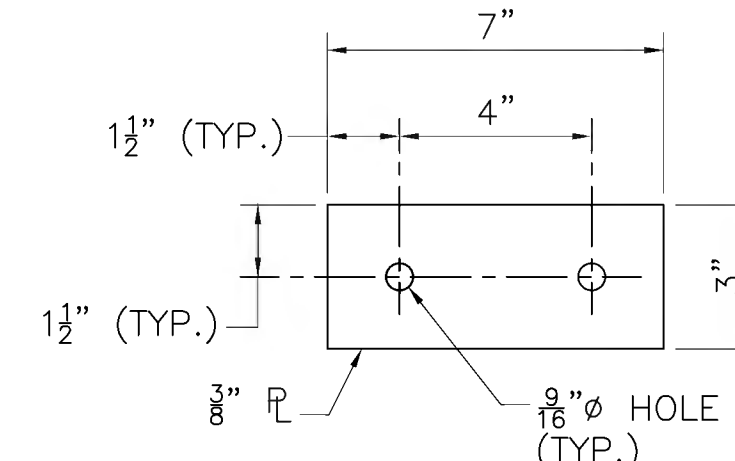
**SECTION 10**  
SCALE: 3"=1'-0"



**BASE PLATE**  
SCALE: 3"=1'-0"

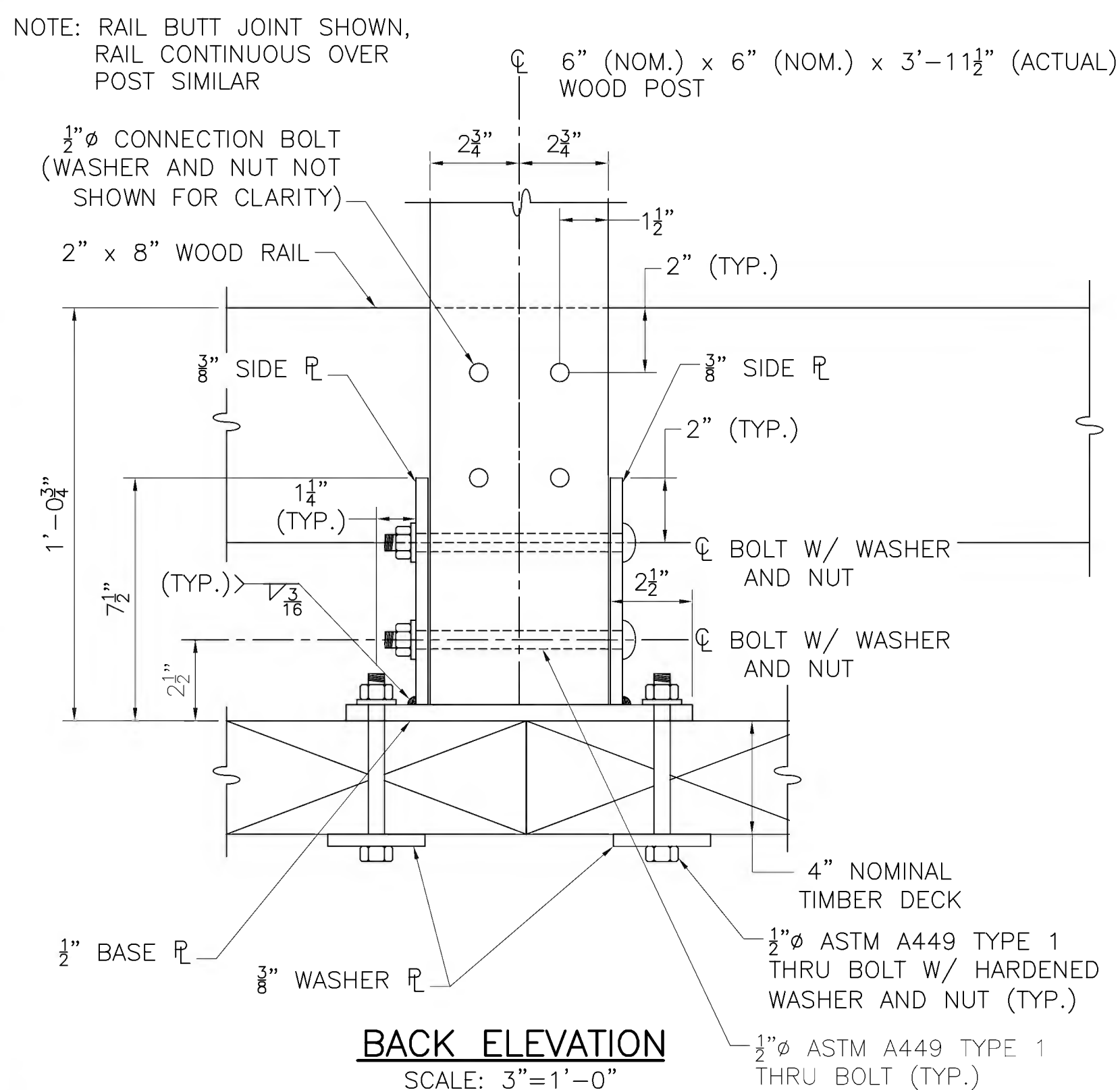


**SIDE PLATE**  
SCALE: 3"=1'-0"

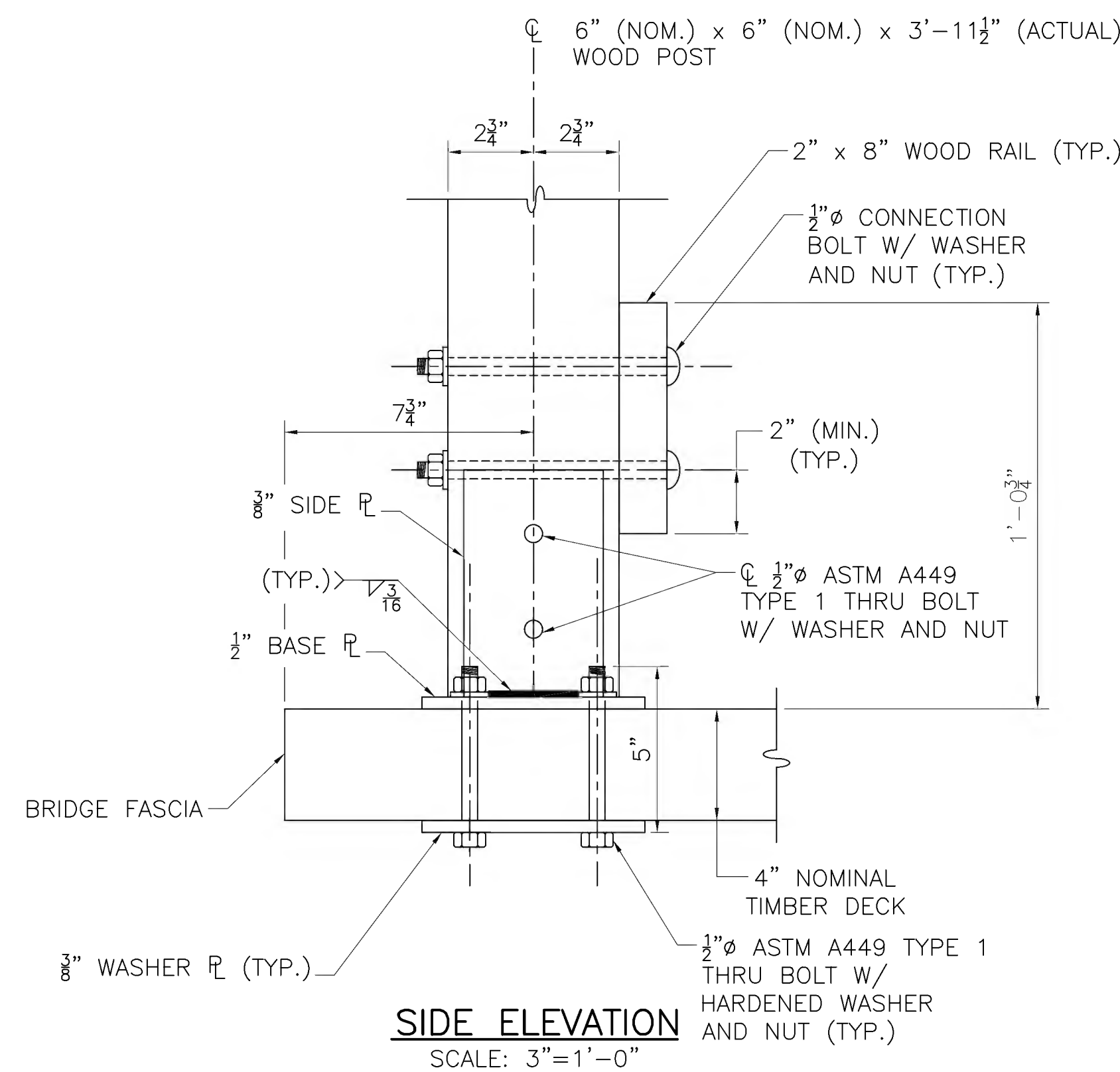


**WASHER PLATE**  
SCALE: 3"=1'-0"

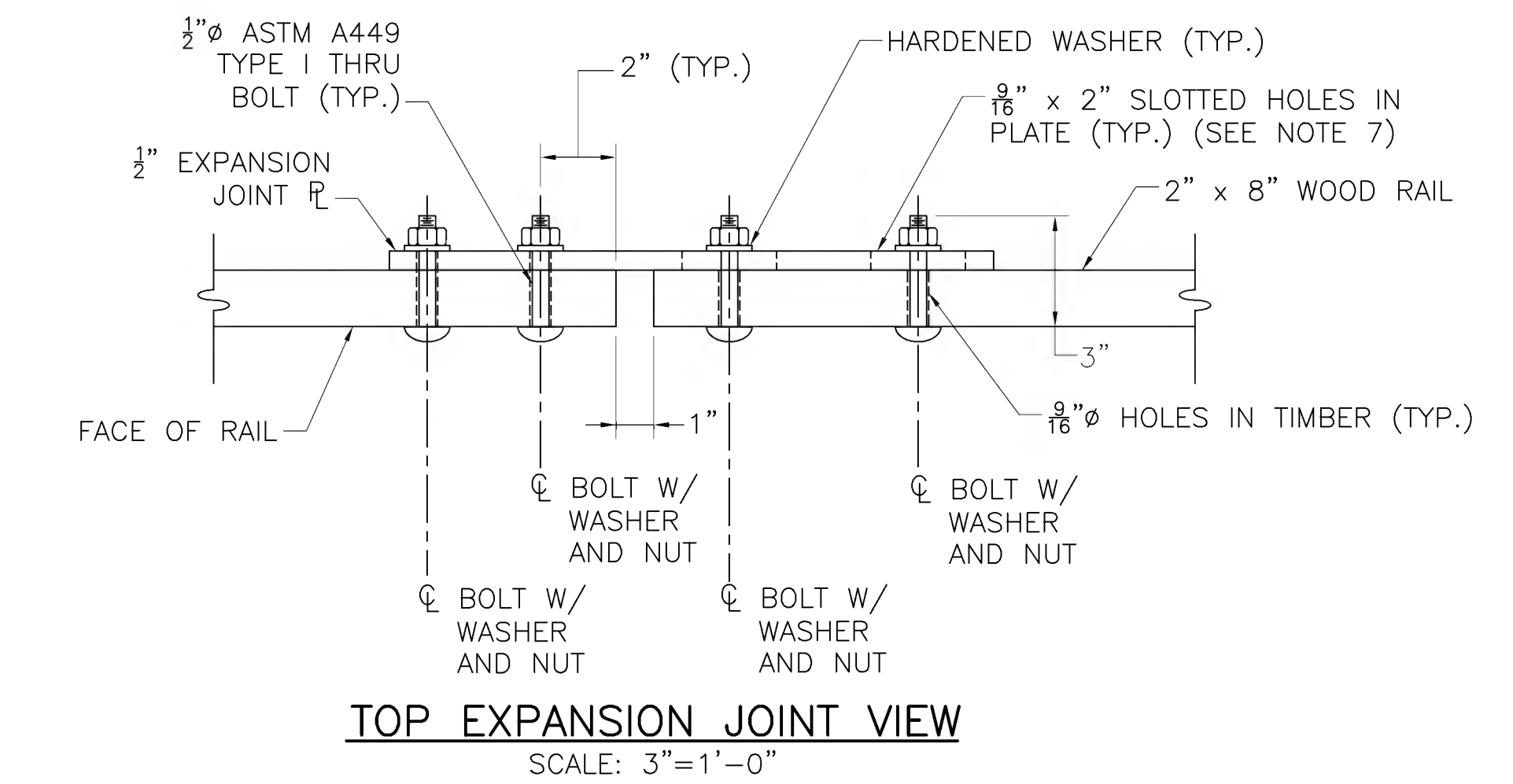
NOTE: RAIL BUTT JOINT SHOWN, RAIL CONTINUOUS OVER POST SIMILAR



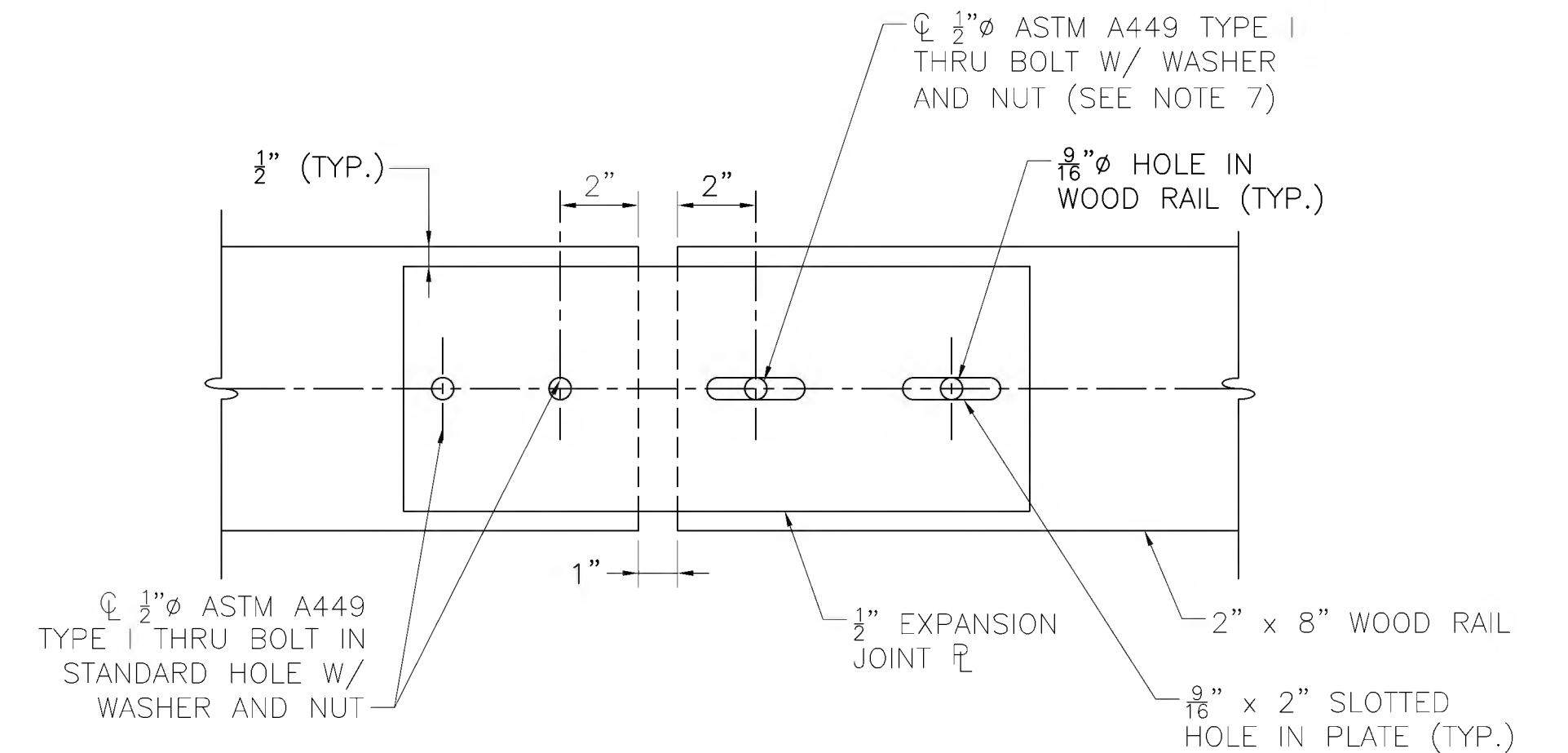
**BACK ELEVATION**  
SCALE: 3"=1'-0"



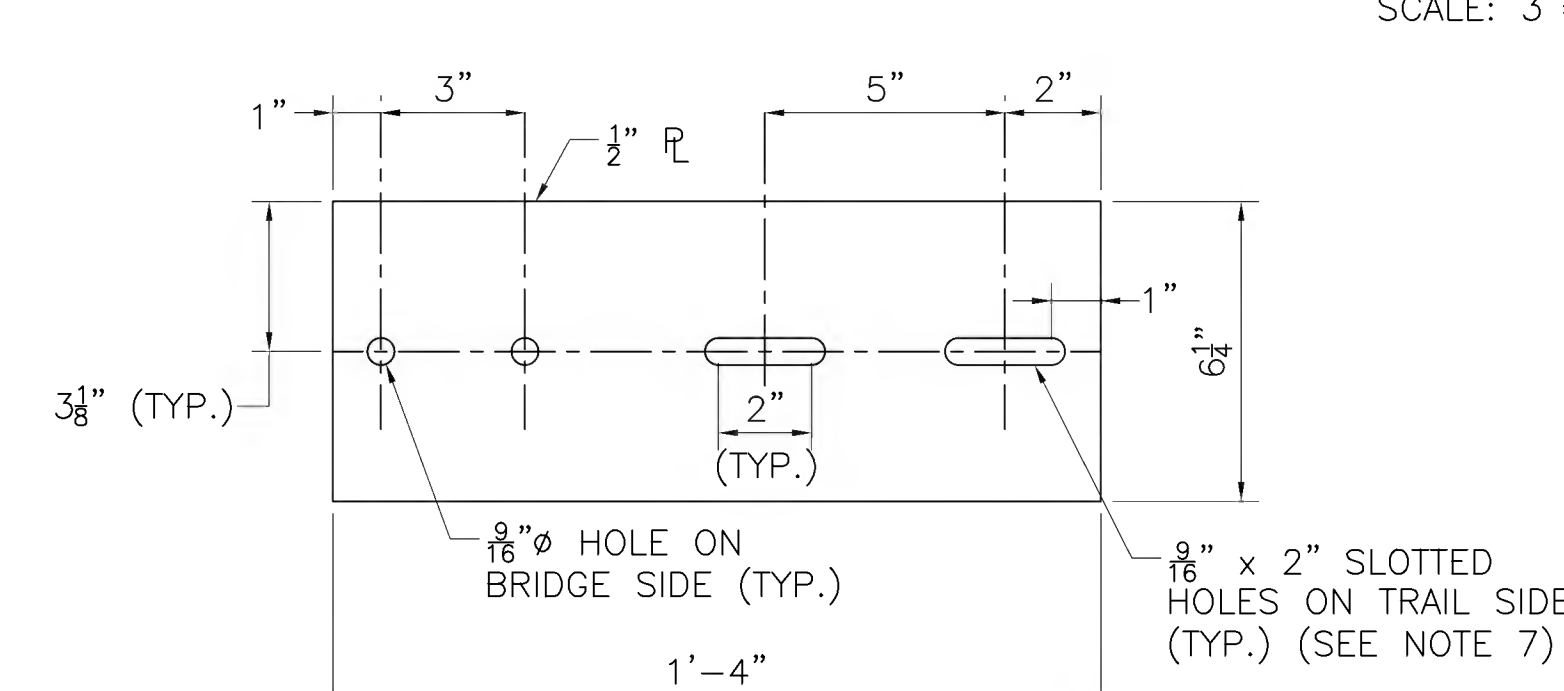
**SIDE ELEVATION**  
SCALE: 3"=1'-0"



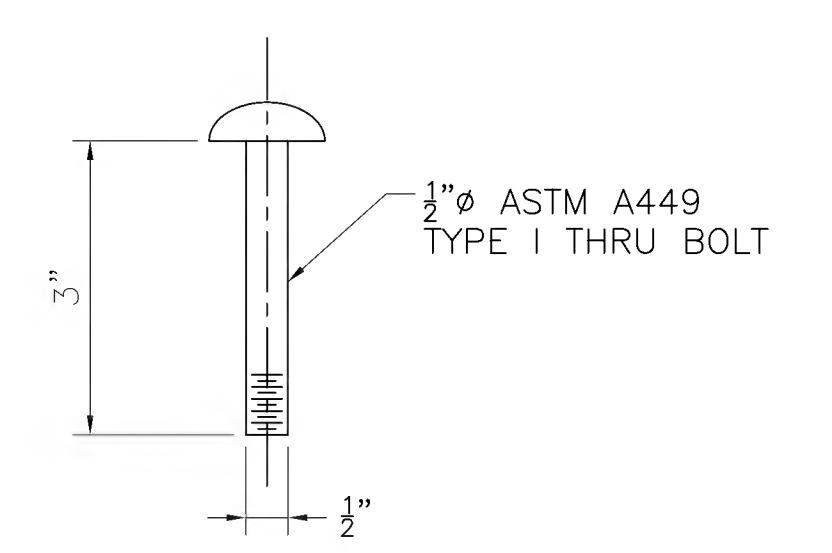
**TOP EXPANSION JOINT VIEW**  
SCALE: 3"=1'-0"



**BACK EXPANSION JOINT ELEVATION**  
SCALE: 3"=1'-0"



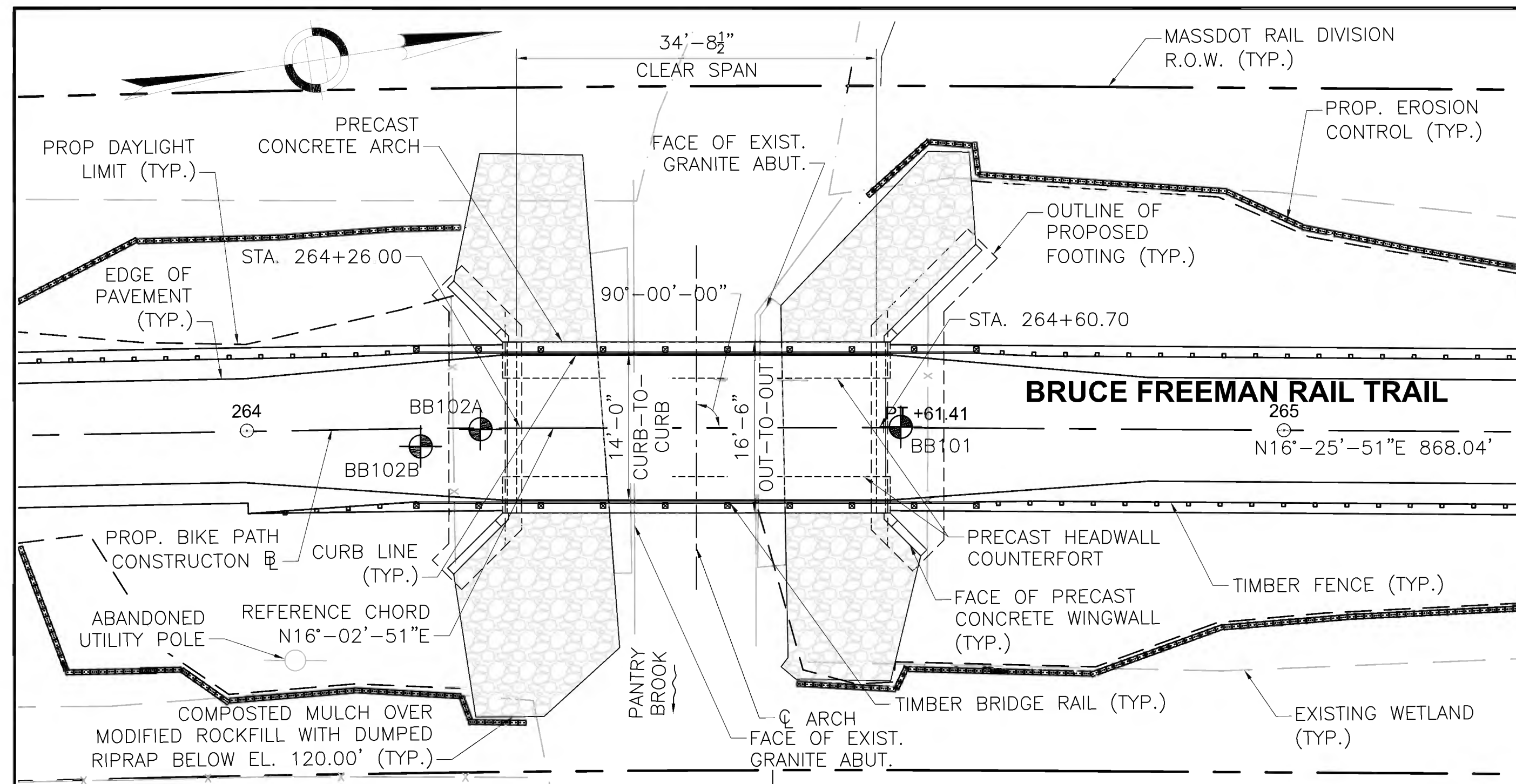
**EXPANSION JOINT PLATE**  
SCALE: 3"=1'-0"



**EXPANSION JOINT BOLTS**  
SCALE: 6"=1'-0"

JUNE 27, 2022	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

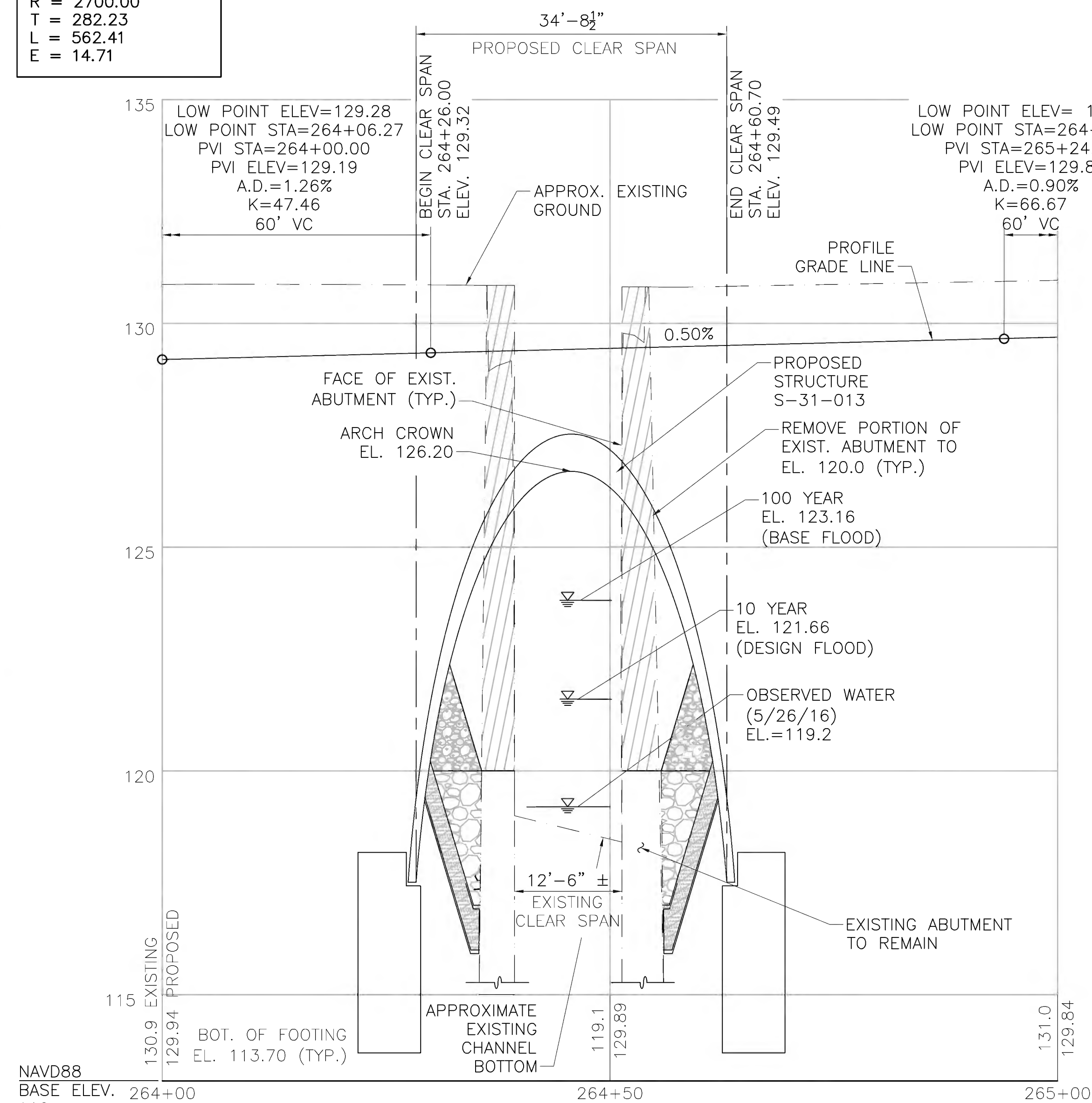




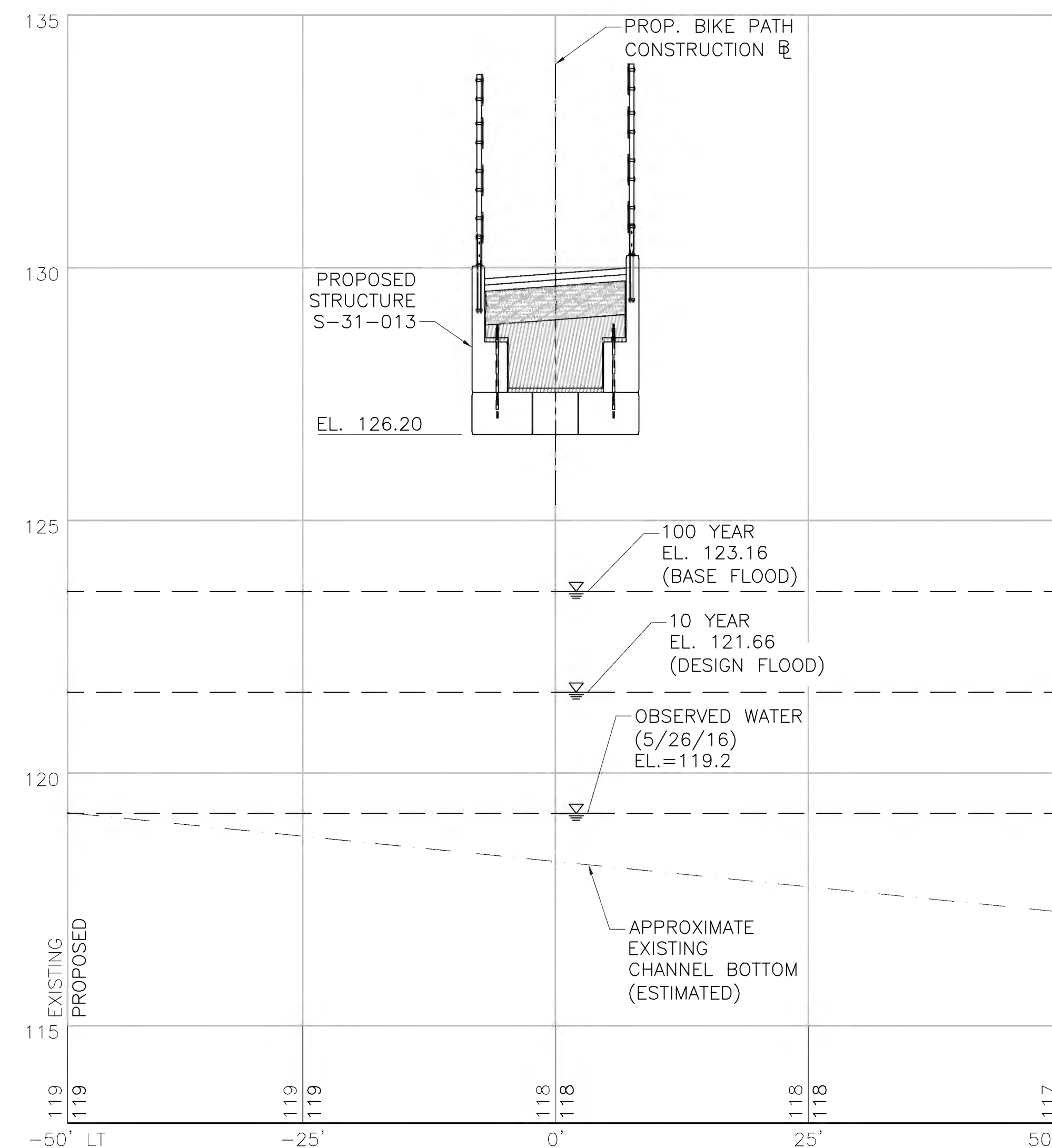
**KEY PLAN**  
SCALE: 1" = 10'-0"

**CURVE DATA**

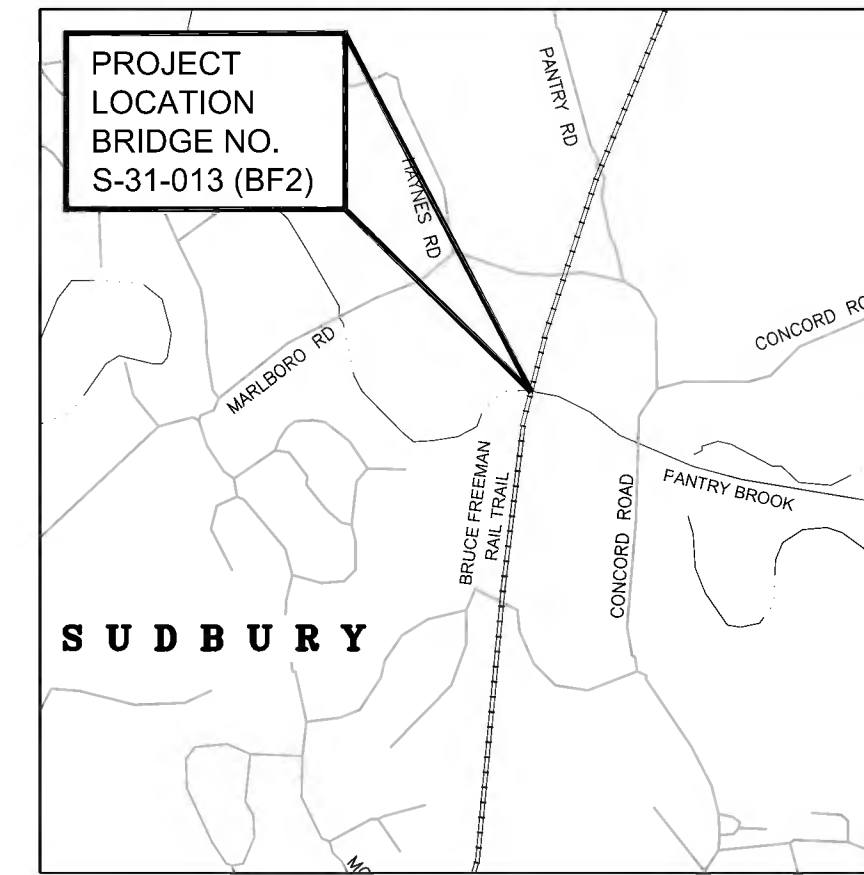
PI = 261+81.23
Δ = 11'-56"-04.85"
R = 2700.00
T = 282.23
L = 562.41
E = 14.71



**PROFILE ALONG BIKE PATH**  
HORIZONTAL SCALE: 1" = 10'-0"  
VERTICAL SCALE: 1" = 2'-0"



**PROFILE ALONG PANTRY BROOK**  
HORIZONTAL SCALE: 1" = 10'-0"  
VERTICAL SCALE: 1" = 2'-0"



**LOCUS PLAN**  
SCALE: 1" = 1200'

**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL OVER PANTRY BROOK**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/PAP/STP-0033(028)X	235	319
PROJECT FILE NO.		608164	

**KEY PLAN & PROFILE**

**ESTIMATED QUANTITIES:**  
(NOT GUARANTEED)

ITEM NO.:	ITEM:	QUANTITY:	
114.2	DEMOLITION OF SUPERSTRUCTURE OF BRIDGE NO. S-31-013	1	LS
140.	BRIDGE EXCAVATION	360	CY
143.	CHANNEL EXCAVATION	255	CY
151.2	GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES	270	CY
156.	CRUSHED STONE	85	TON
156.1	CRUSHED STONE FOR BRIDGE FOUNDATIONS	55	TON
665.	CHAIN LINK FENCE REMOVED AND STACKED	55	FT
690.	STONE MASONRY WALL REMOVED AND REBUILT IN CEMENT MORTAR	10	CY
690.91	MASONRY REPOINTING	10	SY
690.92	MASONRY REMOVED AND STOCKPILED	1	LS
698.4	GEOTEXTILE FABRIC FOR PERMANENT EROSION CONTROL	215	SY
707.4	PANTRY BROOK BLOCKS REMOVED AND RELOCATED	1	LS
767.78	COMPOSTED MULCH OVER MODIFIED ROCK	120	SY
983.	DUMPED RIPRAP	60	TON
986.	MODIFIED ROCKFILL	145	TON
991.2	CONTROL OF WATER - STRUCTURE NO. S-31-013	1	LS
995.01	BRIDGE STRUCTURE, BRIDGE NO. S-31-013	1	LS

**INDEX**

SHEET NO.	DESCRIPTION
1	KEY PLAN AND PROFILE
2	GENERAL NOTES
3-4	BORING LOGS
5	GENERAL PLAN AND ELEVATION
6	EARTHWORK DETAILS
7	TYPICAL SECTIONS AND ELEVATIONS
8	FOUNDATION PLAN AND DETAILS
9	PRECAST ARCH DETAILS AND NOTES
10	TIMBER BRIDGE RAIL DETAILS

August 6, 2022 ISSUED FOR CONSTRUCTION

**PROPOSED SUPERSTRUCTURE REPLACEMENT SUDBURY**

BRUCE FREEMAN RAIL TRAIL OVER PANTRY BROOK

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION  
10 PARK PLAZA BOSTON, MASS

STATE BRIDGE ENGINEER CHIEF ENGINEER

**SUDBURY  
BRUCE FREEMAN RAIL TRAIL OVER PANTRY BROOK**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	236	319
PROJECT FILE NO.		608164	

**GENERAL NOTES**

**GENERAL NOTES:**

**DESIGN:**

IN ACCORDANCE WITH THE 2020 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS LRFD BRIDGE DESIGN SPECIFICATIONS WITH CURRENT INTERIM SPECIFICATIONS THROUGH 2021 AND THE 2009 LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES FOR H-10 VEHICULAR AND 90 PSF PEDESTRIAN LOADINGS.

**MASSDOT BENCH MARK:**

BM #37 LAG SCREW SET 2' UP 7" PINE  
ELEV. = 133.50'

ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988.

**DATE:**

TO BE PLACED ON THE UPSTREAM AND DOWNSTREAM HEADWALL FACES. A DETAIL SHOWING SIZE AND CHARACTER OF NUMERALS WILL BE FURNISHED. THE DATE USED SHALL BE THE LATEST YEAR OF CONTRACT COMPLETION AS OF THE DATE THE FIRST HEADWALL IS CONSTRUCTED. BOTH HEADWALLS SHALL FEATURE THE SAME DATE.

**SURVEY NOTEBOOKS:**

SURVEY PERFORMED BY VANASSE HANGEN BRUSTLIN, INC. FIELD NOTEBOOKS SHALL BE OBTAINED FROM FUSS AND O'NEILL, INC., SPRINGFIELD, MA.

**SCALES:**

SCALES NOTED ON THE PLANS ARE NOT APPLICABLE TO REDUCED SIZE PRINTS. DIVIDE SCALES BY 2 FOR HALF-SIZE PRINTS (A3).

**FOUNDATIONS:**

FOUNDATIONS MAY BE ALTERED, IF NECESSARY, TO SUIT CONDITIONS ENCOUNTERED DURING CONSTRUCTION, WITH THE APPROVAL OF THE ENGINEER.

**UNSUITABLE MATERIAL:**

ALL UNSUITABLE MATERIAL SHALL BE REMOVED WITHIN THE LIMITS OF THE FOUNDATIONS OF THE STRUCTURE, AS DIRECTED BY THE ENGINEER.

**EXISTING CONSTRUCTION:**

DIMENSIONS SHOWN ARE TAKEN FROM SURVEY, VARIOUS FIELD MEASUREMENTS, AND GEOTECHNICAL EXPLORATION AND ARE NOT GUARANTEED. THE CONTRACTOR SHALL DETERMINE AND ESTABLISH ALL DIMENSIONS AND DETAILS NECESSARY FOR COMPLETION OF ALL WORK BY FIELD MEASUREMENT AND SURVEY. THE CONTRACTOR SHALL BE RESPONSIBLE AND NOT ORDER ANY MATERIAL OR COMMENCE ANY FABRICATION UNTIL HE HAS MADE THE REQUIRED MEASUREMENTS ON THE ACTUAL STRUCTURE AND THE EXTENT OF THE PROPOSED WORK HAS BEEN APPROVED BY THE ENGINEER. EXISTING BRIDGE PLANS ARE NOT AVAILABLE FOR REFERENCE.

**CONCRETE:**

5,000 PSI, 3/4 INCH, 685 HP CEMENT CONCRETE SHALL BE PROVIDED FOR ALL CONCRETE INCLUDING ARCH, HEADWALLS, WINGWALLS, AND FOOTINGS.

**REINFORCEMENT:**

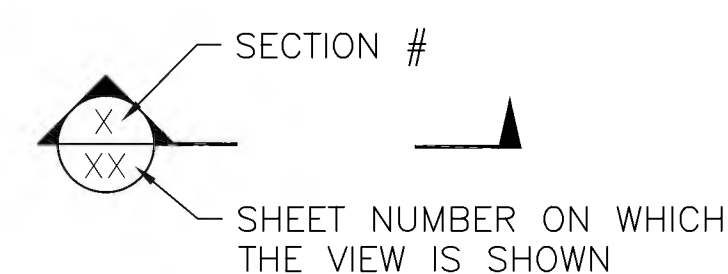
REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 31 GRADE 60. UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DRAWINGS, ALL BARS SHALL BE LAPPED AS FOLLOWS:

MODIFICATION CONDITION	#4 BARS	#5 BARS	#6 BARS
1. NONE	16"	19"	23"
2. 12" OF CONCRETE BELOW BAR	20"	25"	30"
3. EPOXY COATED BARS, COVER < 3d <sub>b</sub> , OR CLEAR SPACING < 6d <sub>b</sub>	23"	29"	34"
4. COATED BARS, ALL OTHER CASES	18"	23"	27"
5. CONDITION 2. AND 3.	26"	32"	39"
6. CONDITION 2. AND 4.	24"	30"	36"

ALL OTHER BARS SHOULD BE LAPPED AS SHOWN ON THE CONSTRUCTION DRAWINGS.

ALL REINFORCEMENT SHALL BE EPOXY COATED.

**SECTION MARK:**



TRAFFIC DATA		
	ROADWAY OVER	ROADWAY UNDER
DESIGN YEAR	N/A	
AVERAGE DAILY TRAFFIC - PRESENT	N/A	
AVERAGE DAILY TRAFFIC - DESIGN YEAR	N/A	
DESIGN HOURLY VOLUME	N/A	
DIRECTIONAL DISTRIBUTION	N/A	
TRUCK PERCENTAGE - AVERAGE DAY	N/A	
TRUCK PERCENTAGE - PEAK HOUR	N/A	
DESIGN SPEED	18 MPH	
DIRECTIONAL DESIGN HOURLY VOLUME	N/A	

SEISMIC DESIGN CRITERIA	
DESIGN RETURN PERIOD:	1,000
DESIGN SPECTRA	
A <sub>s</sub>	0.11
S <sub>Ds</sub>	0.23
S <sub>D1</sub>	0.09
SITE CLASS	D
SEISMIC DESIGN CATEGORY (SDC)	A

HYDRAULIC DESIGN DATA	
DRAINAGE AREA (SQ. MILES)	2.5
DESIGN FLOOD DISCHARGE (C.F.S)	155
DESIGN FLOOD FREQUENCY (YEARS)	10
DESIGN FLOOD VELOCITY (F.P.S)	2.88
DESIGN FLOOD ELEVATION (FEET, NAVD)	121.66

BASE (100-YEAR) FLOOD DATA	
BASE FLOOD DISCHARGE (C.F.S)	240
BASE FLOOD ELEVATION (FEET, NAVD)	123.16

DESIGN AND CHECK SCOUR DATA	
DESIGN SCOUR FLOOD EVENT RETURN FREQUENCY (YEARS)	25
DESIGN FLOOD ABUTMENT SCOUR DEPTH (FEET)	0.6
DESIGN FLOOD PIER SCOUR DEPTH (FEET)	N/A
CHECK SCOUR FLOOD EVENT RETURN FREQUENCY (YEARS)	50
CHECK FLOOD ABUTMENT SCOUR DEPTH (FEET)	0.7
CHECK FLOOD PIER SCOUR DEPTH (FEET)	N/A

FLOOD OF RECORD	
DISCHARGE (C.F.S.)	N/A
FREQUENCY (IF KNOWN, YEARS)	N/A
MAXIMUM ELEVATION (FEET, NAVD)	N/A
DATE (MM/YYYY)	N/A
HISTORY OF ICE FLOES	N/A
EVIDENCE OF SCOUR AND EROSION	YES

August 6, 2022	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
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AUTHORIZED SIGNATORY:	STATE BRIDGE ENGINEER
USE ONLY PRINTS OF LATEST DATE	



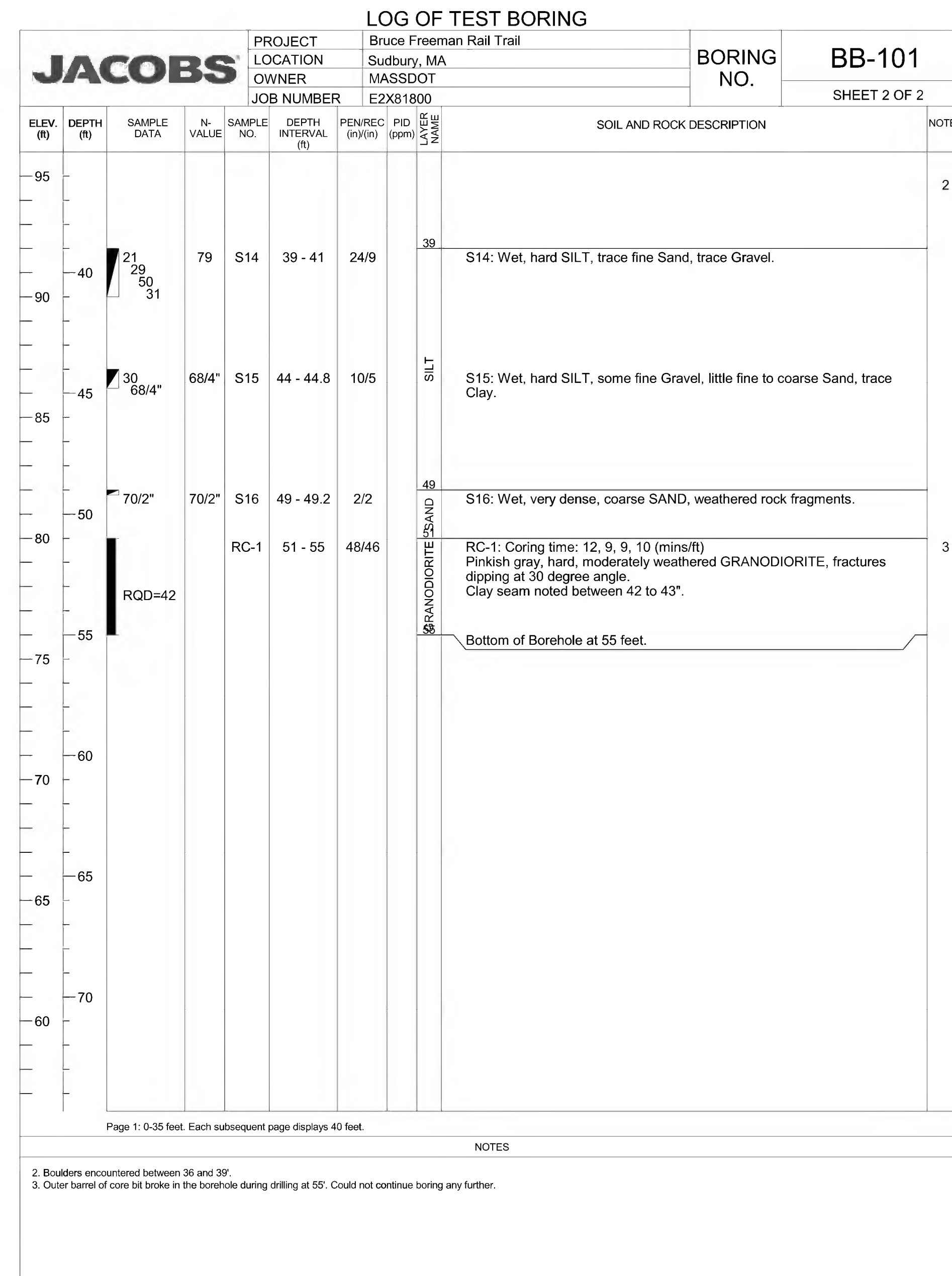
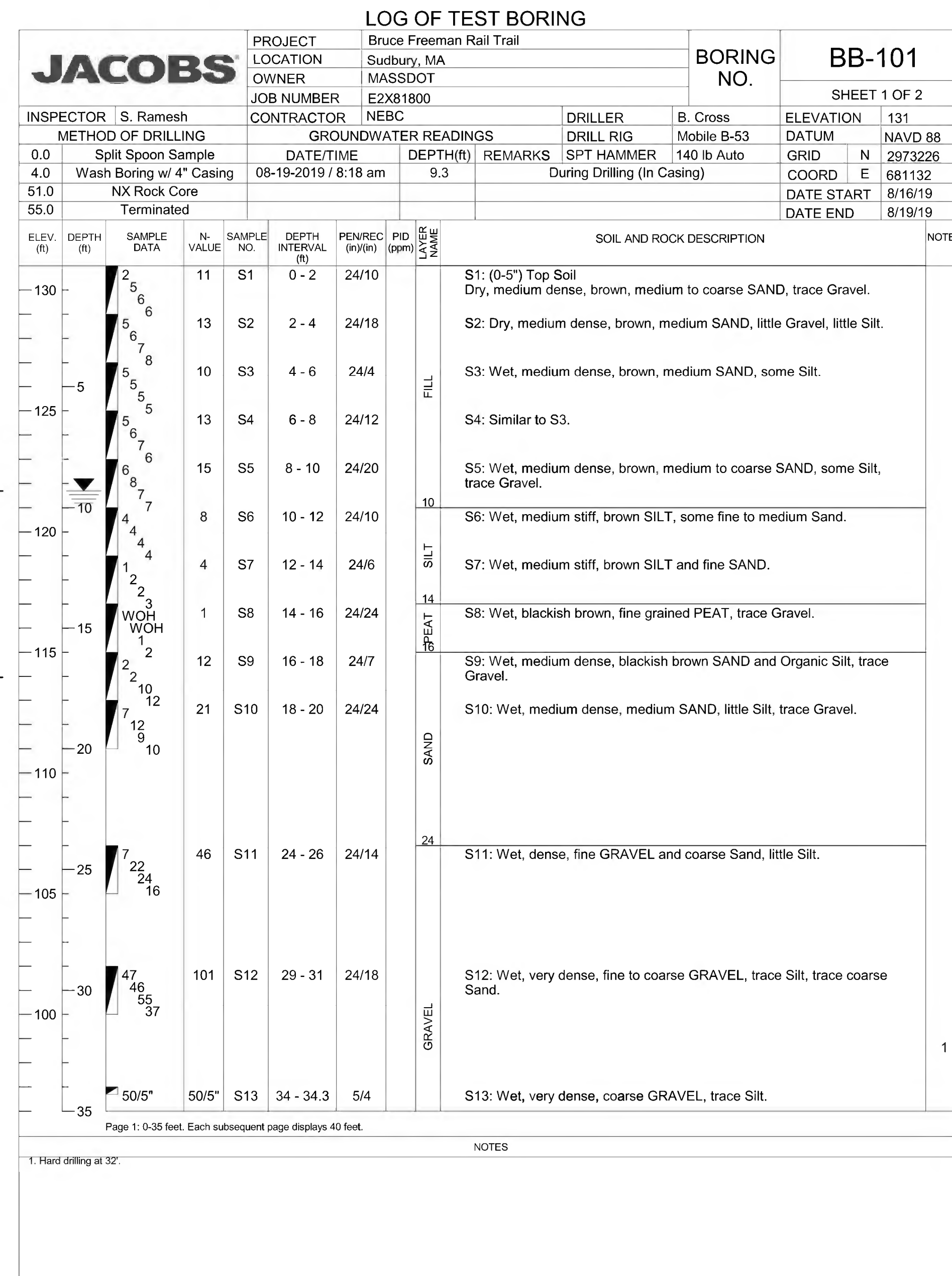
**SUDBURY  
BRUCE FREEMAN RAIL TRAIL OVER PANTRY BROOK**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	237	319
PROJECT FILE NO.		608164	

**BORING LOGS**

**BORING NOTES:**

1. LOCATION OF BORINGS SHOWN ON THE PLANS THUS: BB-#
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 WERE OBSERVED AT THE TIME OF TAKING BORINGS AND DO NOT NECESSARILY SHOW THE TRUE GROUND WATER LEVEL.
4. FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 1 1/8" I.D. SPLIT SPOON SAMPLER 6" USING A 140 POUND WEIGHT FALLING 30".
5. BORING SAMPLES ARE STORED AT A STORAGE FACILITY LOCATED ON ROUTE 114 (219 WINTHROP AVE.) IN LAWRENCE, MA. THE CONTRACTOR MAY EXAMINE THE SOIL AND ROCK SAMPLES BY CONTRACTING THE MASSDOT GEOTECHNICAL SECTION AT 10 PARK PLAZA, BOSTON, MA.
6. ALL BORINGS WERE MADE IN AUGUST 2019.
7. BORINGS WERE MADE BY NEW ENGLAND BORING CONTRACTOR, INC., P.O. BOX 165, DERRY, NH 03038.
8. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.



▽ 121.7

BOT. OF FTG.  
EL. 113.70

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**SUDBURY  
BRUCE FREEMAN RAIL TRAIL OVER PANTRY BROOK**

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**BORING LOGS**

**BORING NOTES:**

SEE SHEET 3 FOR BORING NOTES.

**LOG OF TEST BORING**

<b>JACOBS</b>		PROJECT Bruce Freeman Rail Trail	BORING NO. <b>BB-102A</b>
LOCATION Sudbury, MA		SHEET 1 OF 1	
OWNER MASSDOT		ELEVATION 131	
JOB NUMBER E2X81800		DATE 8/20/19	
INSPECTOR S. Ramesh	CONTRACTOR NEBC	DRILLER B. Cross	ELEVATION 131
METHOD OF DRILLING Split Spoon Sample		DRILL RIG Mobile B-53	DATUM NAVD 88
DATE/TIME 08-20-2019 / 1:36 pm		SPT HAMMER 140 lb Auto	GRID N 2973187
DEPTH(R) 11.5		REMARKS Upon Completion (Casing pulled)	COORD E 681121
DATE START 8/20/19		DATE END 8/20/19	

ELEV. (ft)	DEPTH (ft)	SAMPLE DATA	N-VALUE	SAMPLE NO.	DEPTH INTERVAL (ft)	PEN/REC (in/ft)	PID (ppm)	LAYER NAME	SOIL AND ROCK DESCRIPTION	NOTES
130	2	4		10	0-2	24/17		FILL	S1: (0-12") Dry, black, medium SAND, trace Gravel, roots (topsoil). (12-17") Dry, brown, fine to medium SAND, trace Silt.	
125	4	7		11	2-4	24/15			S2: Dry, medium dense, brown, fine to medium SAND, little Silt, trace Gravel.	
120	6	5		6	4-6	24/9			S3: Wet, loose, brown, fine SAND, some Silt, trace Gravel.	
115	11	3		11	6-8	24/10			S4: Wet, medium dense, brown, fine SAND and SILT.	
110	12	6		12	8-10	24/5			S5: Wet, medium dense, fine to coarse SAND, some Silt, trace Gravel.	
105	10	3		4	10-12	24/4		10	S6: Wet, medium stiff, brown, SILT, some fine to medium Sand, trace Clay, trace Gravel.	
100	5	1		5	12-14	24/23		PEAT	S7: Wet, blackish brown, fine grained PEAT.	
95	19	8		19	14-16	24/19			S8: Wet, medium dense, brownish gray, medium to coarse SAND, some Silt.	
90	41	11		19	16-18	24/15			S9: Wet, dense, brown, medium to coarse SAND, trace Silt, trace fine Gravel.	
85	29	16		19	18-20	24/19		SAND	S10: Wet, medium dense, grayish brown, medium to coarse SAND, little Silt.	
80	33	15		19	24-26	24/5		24	S11: Wet, hard, gray SILT, little fine Sand, little fine Gravel.	1
75									Bottom of Borehole at 26 feet.	2

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

1. Boring terminated at 26' due to an obstruction.  
2. Boring offset 6' south and continued. See boring log BB-102B.

**LOG OF TEST BORING**

<b>JACOBS</b>		PROJECT Bruce Freeman Rail Trail	BORING NO. <b>BB-102B</b>
LOCATION Sudbury, MA		SHEET 1 OF 2	
OWNER MASSDOT		ELEVATION 131	
JOB NUMBER E2X81800		DATE 8/23/19	
INSPECTOR S. Ramesh	CONTRACTOR NEBC	DRILLER B. Cross	ELEVATION 131
METHOD OF DRILLING Wash Boring w/ 3" Casing		DRILL RIG Mobile B-53	DATUM NAVD 88
DATE/TIME 08-21-2019 / 8:34 am		SPT HAMMER 140 lb Auto	GRID N 2973181
DEPTH(R) 10.8		REMARKS During Drilling (In Casing)	COORD E 681121
DATE START 08-22-2019 / 9:02 am		DATE END 8/21/19	
DATE END 8/23/19			

ELEV. (ft)	DEPTH (ft)	SAMPLE DATA	N-VALUE	SAMPLE NO.	DEPTH INTERVAL (ft)	PEN/REC (in/ft)	PID (ppm)	LAYER NAME	SOIL AND ROCK DESCRIPTION	NOTES
130									Drill through.	
125	5									
120	10									
115	15									
110	20									
105	25									
100	30	55/4"	55/4"	12	29.5 - 29.8	4/3			S12: Wet, very dense, gray, fine to coarse GRAVEL, trace coarse Sand.	
95	35	24	52	13	34 - 36	24/10			S13: Wet, very dense, gray GRAVEL and SAND, little Silt.	

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

**LOG OF TEST BORING**

<b>JACOBS</b>		PROJECT Bruce Freeman Rail Trail	BORING NO. <b>BB-102B</b>
LOCATION Sudbury, MA		SHEET 2 OF 2	
OWNER MASSDOT		ELEVATION 131	
JOB NUMBER E2X81800		DATE 8/23/19	
INSPECTOR S. Ramesh	CONTRACTOR NEBC	DRILLER B. Cross	ELEVATION 131
METHOD OF DRILLING Wash Boring w/ 4" Casing		DRILL RIG Mobile B-53	DATUM NAVD 88
DATE/TIME 08-22-2019 / 9:02 am		SPT HAMMER 140 lb Auto	GRID N 2973181
DEPTH(R) 11.8		REMARKS During Drilling (In Casing)	COORD E 681121
DATE START 08-23-2019 / 9:06 am		DATE END 8/23/19	

ELEV. (ft)	DEPTH (ft)	SAMPLE DATA	N-VALUE	SAMPLE NO.	DEPTH INTERVAL (ft)	PEN/REC (in/ft)	PID (ppm)	LAYER NAME	SOIL AND ROCK DESCRIPTION	NOTES
95	31	21						GRAVEL	S14: Wet, very dense, gray, fine to coarse GRAVEL, little coarse Sand, trace Silt.	
90	40	53/4"	53/4"	S14	39 - 39.8	10/5				
85	45	18	25	34	44 - 46	24/21			S15: Wet, hard, gray SILT, some Clay, trace fine Sand, trace Gravel.	
80	50	16	37	45	49 - 50.8	22/22			S16: Wet, hard, gray SILT, some Clay, trace fine to coarse Sand, little Gravel.	
75	55				52 - 55.8	46/46			RC-1: Coring time: 4.5, 5, 4.5, 11 (mins/ft) Wet, gray, pink grained, moderately to severely weathered, coarse grained GRANODIORITE.	
70	60				55.8 - 60.8	60/60			RC-2: Coring time: 6, 5, 3.5, 2.5, 2 (mins/ft) Similar to RC-1.	
65	65				60.8 - 62.8	24/24			RC-3: Coring time: 2, 3.5 (mins/ft) Similar to RC-1.	
60	70								Bottom of Borehole at 62.8 feet.	

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

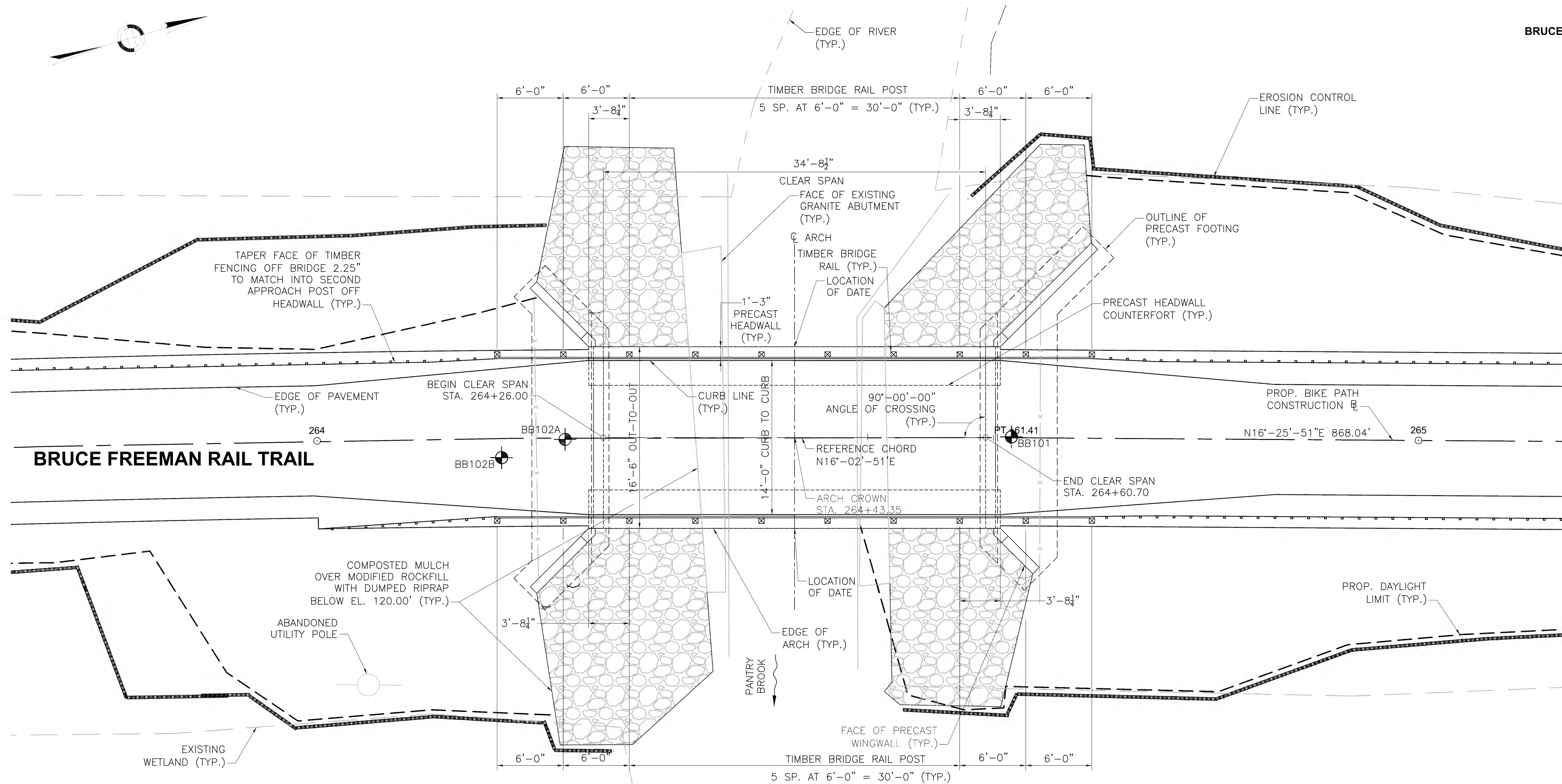
August 6, 2022	ISSUED FOR CONSTRUCTION
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**SUDBURY  
BRUCE FREEMAN RAIL TRAIL OVER PANTRY BROOK**

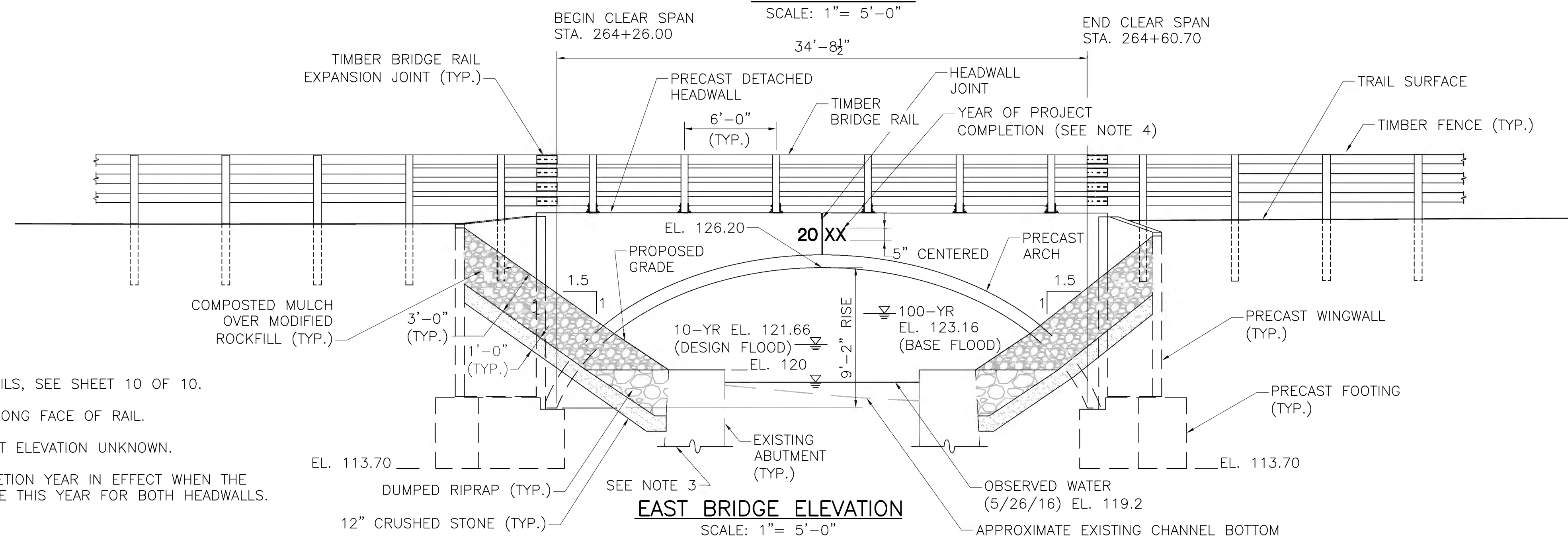
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	239	319
PROJECT FILE NO.		608164	

**GENERAL PLAN & ELEVATION**



**GENERAL PLAN**

SCALE: 1" = 5'-0"



**EAST BRIDGE ELEVATION**

SCALE: 1" = 5'-0"

**NOTES:**

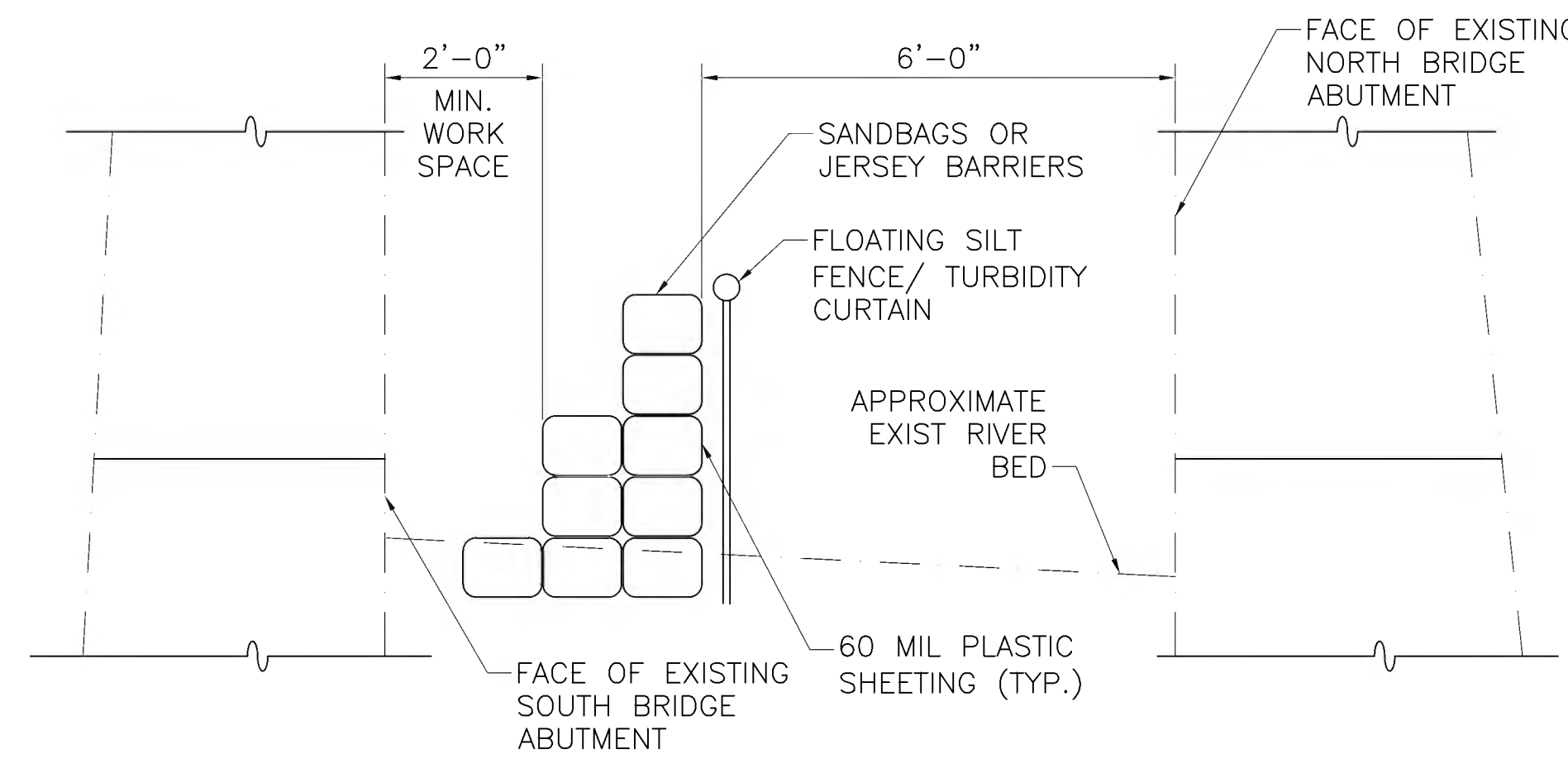
1. FOR TIMBER BRIDGE RAIL DETAILS, SEE SHEET 10 OF 10.
2. RAIL POSTS ARE MEASURED ALONG FACE OF RAIL.
3. BOTTOM OF EXISTING ABUTMENT ELEVATION UNKNOWN.
4. USE LATEST CONTRACT COMPLETION YEAR IN EFFECT WHEN THE FIRST HEADWALL IS CAST. USE THIS YEAR FOR BOTH HEADWALLS.

DATE	DESCRIPTION
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**EXISTING ABUTMENT REPAIR NOTES:**

1. REMOVE TOPS OF EXISTING STONE MASONRY ABUTMENTS TO ELEVATION 120' OR TO THE NEAREST LONGITUDINAL JOINT, PROVIDED THE JOINT LIES ABOVE THE RIVERBED OR AS DIRECTED BY THE ENGINEER. THE COST TO REMOVE THE EXISTING STONES SHALL BE INCLUDED IN ITEM 690.92, "MASONRY REMOVED AND STOCKPILED". SEVEN (7) OF THESE GRANITE BLOCKS SHALL BE SET ASIDE FOR RE-USE AS BENCHES AND HISTORIC DISPLAY ALONG THE TRAIL. REMOVAL AND RESETTING OF THESE 7 BLOCKS SHALL BE PAID FOR SEPARATELY UNDER ITEM 707.4, "PANTRY BROOK BLOCKS REMOVED AND RELOCATED". SEE SPECIAL PROVISIONS. ALL REMAINING STONES ARE TO BE DELIVERED TO THE TOWN OF SUDBURY PUBLIC WORKS DIVISION.
2. THE SOUTH EXISTING STONE MASONRY ABUTMENT HAS PARTIALLY COLLAPSED. THE CONTRACTOR SHALL REBUILD ANY COLLAPSED PORTIONS OF THE EXISTING WALL ALONG THE LENGTH OF THE ABUTMENT AND WINGWALLS BELOW THE LIMITS OF REMOVAL. THE COST TO REBUILD THE WALL AS REQUIRED SHALL BE INCLUDED IN ITEM 690, "STONE MASONRY WALL REMOVED AND REBUILT IN CEMENT MORTAR".
3. REPOINTING OF THE EXISTING STONE MASONRY ABUTMENTS SHALL BE REQUIRED AFTER THE TOP OF THE EXISTING ABUTMENTS HAVE BEEN REMOVED BUT PRIOR TO EXCAVATION OPERATIONS. THE COST TO REPOINT SHALL BE INCLUDED IN ITEM 690.91, "MASONRY REPOINTING".
4. ANY WATER CONTROL REQUIRED TO REMOVE, REPAIR, REBUILD, SHORE, OR REPOINT THE EXISTING ABUTMENTS SHALL BE INCLUDED UNDER ITEM 991.2, "CONTROL OF WATER - STRUCTURE NO. S-31-013".
5. THE CONFIGURATION OF THE EXISTING ABUTMENT STONE WALLS AND THE ELEVATION OF THE BOTTOM OF THE EXISTING ABUTMENTS SHOWN ON THE PLANS ARE APPROXIMATE. THE CONTRACTOR SHALL ENSURE THE EXISTING ABUTMENT STONE WALLS ARE NOT UNDERMINED OR IN ANY WAY COMPROMISED DURING EXCAVATION OPERATIONS. TEMPORARY SHORING OF THE EXISTING ABUTMENT WALLS MAY BE REQUIRED TO COMPLETE EXCAVATION OPERATIONS. THE COST FOR TEMPORARY SHORING SHALL BE INCLUDED IN ITEM 995.01, "BRIDGE STRUCTURE, BRIDGE NO. S-31-013".



**SUGGESTED WATER CONTROL PLAN**  
SCALE: 1"=1'-0"

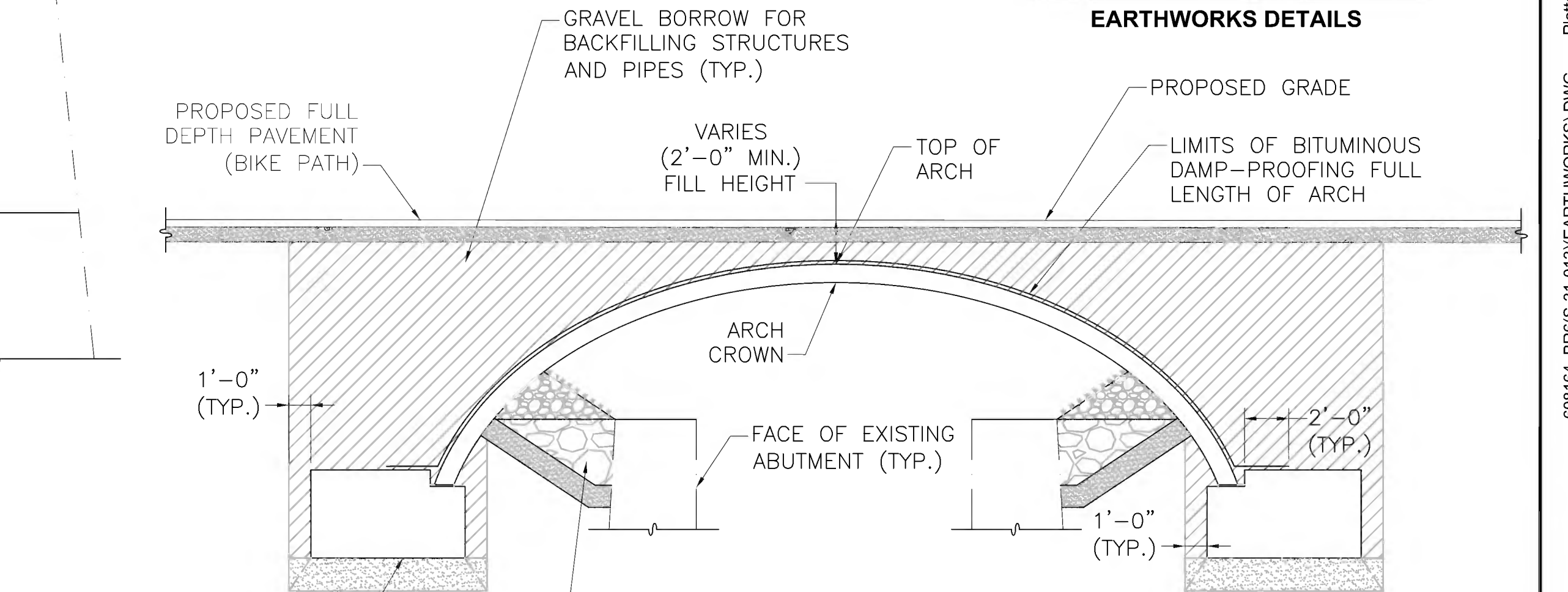
**NOTES:**

1. WORK IN THE WATER SHALL BE PERFORMED DURING LOW FLOW SEASON AS DEFINED IN THE SPECIAL PROVISION FOR ITEM 991.2 AND THE FLOW SHALL BE MAINTAINED THROUGH THE USE OF TEMPORARY WATER CONTROL.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SIZING THE BARRIER TO HANDLE THE RIVER FLOW. THE BARRIER SHALL BE OF ADEQUATE SIZE TO DELIVER THE WATER AT THE DISCHARGE END TO THE RIVER WITHOUT DISTURBING THE EXISTING BANKS OR RIVERBED FLOW. THE BARRIER HEIGHT SHALL BE SIZED TO MAINTAIN 1' OF FREEBOARD OVER THE 10-YEAR FLOOD.
3. IN THE EVENT OF HIGH FLOW RATES, THE CONTRACTOR SHALL BE RESPONSIBLE TO DEVELOP AND IMPLEMENT A REASONABLE MEANS NECESSARY TO HANDLE THE ADDITIONAL FLOWS TO PROTECT THE SURROUNDING AREA, AS APPROVED BY THE ENGINEER AND SHALL BE INCIDENTAL TO ITEM 991.2, "CONTROL OF WATER - STRUCTURE NO. S-31-013".
4. WATER CONTROL SHALL BE PHASED. EXISTING CLEAR SPAN IS NOT SUFFICIENT TO ACCOMMODATE SAND BAGS IN FRONT OF BOTH ABUTMENTS SIMULTANEOUSLY WHILE ALLOWING ADEQUATE FLOW.

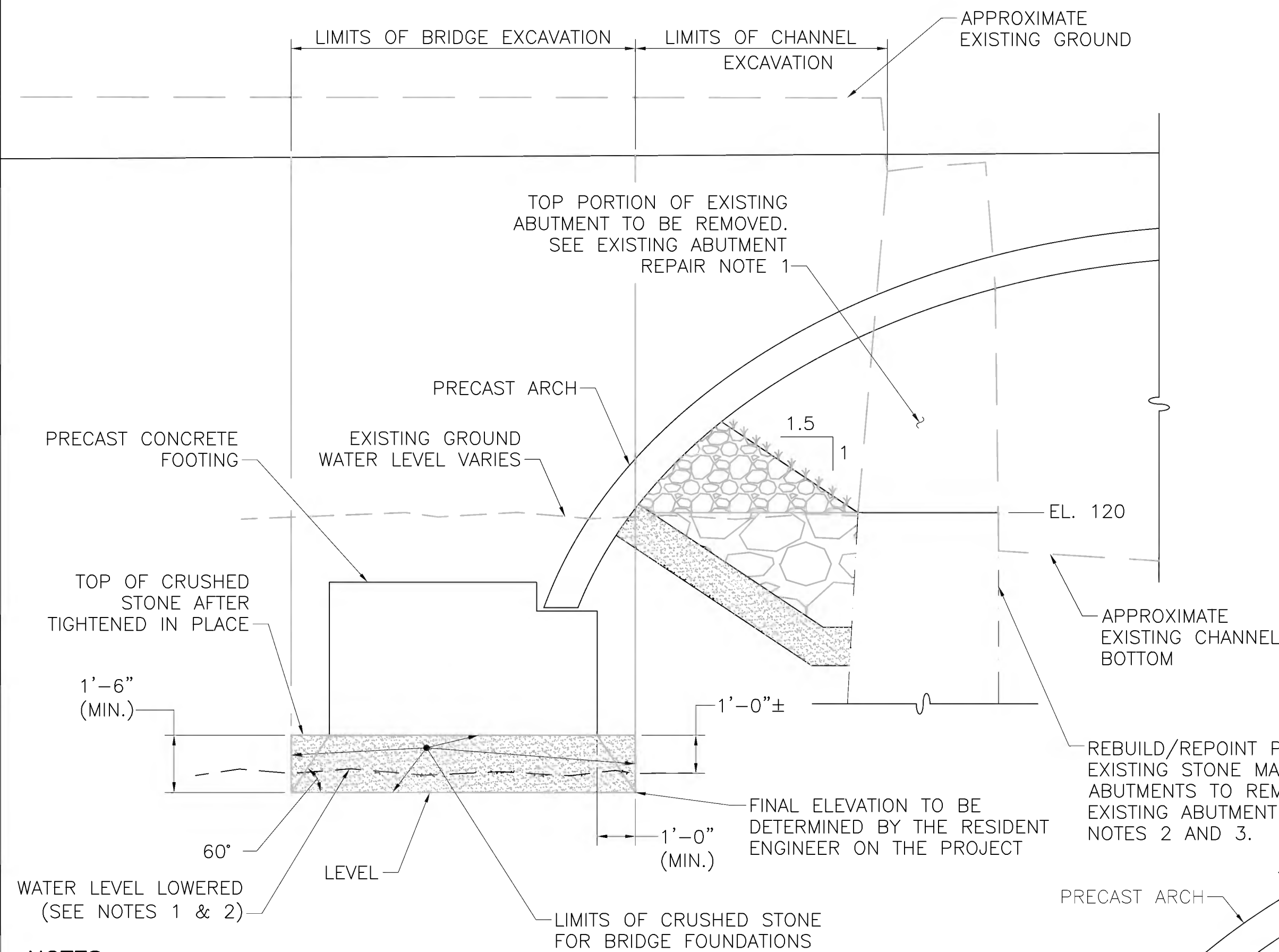
**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL OVER PANTRY BROOK**

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	240	319
PROJECT FILE NO.		608164	

**EARTHWORKS DETAILS**



**ARCH BACKFILL DETAIL**  
SCALE: 3/16"=1'-0"



**LIMITS OF CRUSHED STONE FOR BRIDGE FOUNDATIONS**  
SCALE: 3/8"=1'-0"

**NOTE:**

EXCAVATION BETWEEN THE BACK FACE OF THE EXISTING ABUTMENT TO THE VERTICAL LIMIT OF EXCAVATION FOR CRUSHED STONE FOR BRIDGE FOUNDATIONS AND DOWN TO THE BOTTOM OF CRUSHED STONE (M2.01.2) SHALL BE PAID FOR UNDER ITEM 143, "CHANNEL EXCAVATION".

**RIPRAP DETAIL**  
SCALE: 3/8"=1'-0"

**NOTES:**

1. 4" Ø WEEP HOLES 10'-0" O.C. LOCATED 12" ABOVE THE HEEL OF THE FOOTING SLOPING 1" PER FOOT TOWARDS THE FRONT FACE. PROVIDE 1 CUBIC YARD OF CRUSHED STONE AT EACH END OF WEEP HOLE. SEE SHEET 9 FOR WEEP HOLE LAYOUT.
2. SEE LIMITS OF CRUSHED STONE FOR BRIDGE FOUNDATIONS DETAIL FOR WINGWALL FOOTING REQUIREMENTS.
3. SEE RIPRAP DETAIL AND COMPOST AND SEED OVER MODIFIED ROCKFILL DETAIL ON SHEET 7 FOR ROCKFILL AT FACE OF WINGWALL REQUIREMENTS.
4. ALL PRECAST CONCRETE SHALL BE 5,000 PSI, 3/4 INCH, 685 HP CEMENT CONCRETE.
5. CONTRACTOR SHALL PROVIDE ANY REQUIRED LEVELING SCREWS OR SHIMS FOR ERECTION.

**WINGWALL BACKFILL DETAIL**  
SCALE: 1/2"=1'-0"

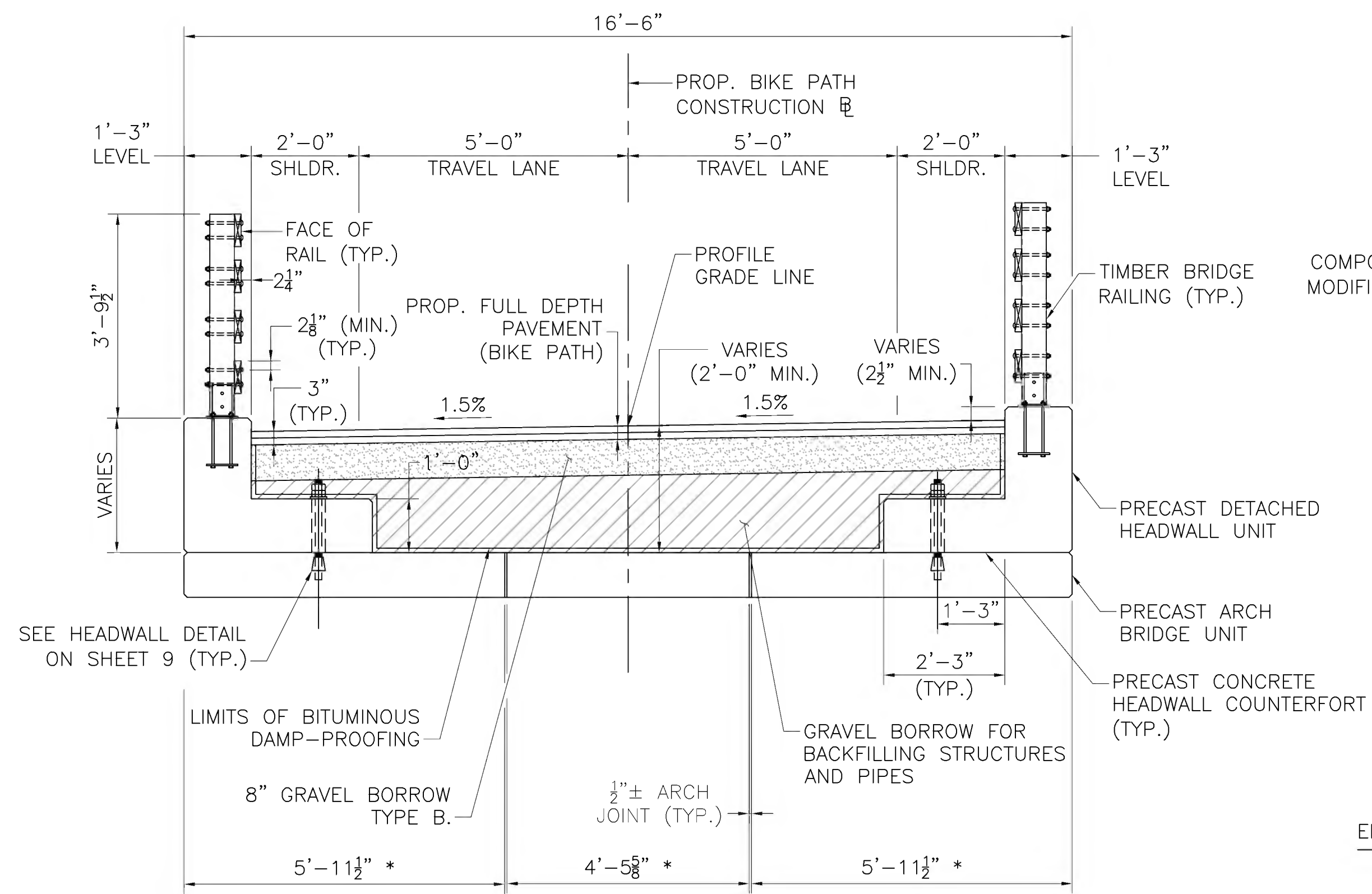
DATE	DESCRIPTION
August 6, 2022	ISSUED FOR CONSTRUCTION
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**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL OVER PANTRY BROOK**

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**TYPICAL SECTIONS & ELEVATIONS**

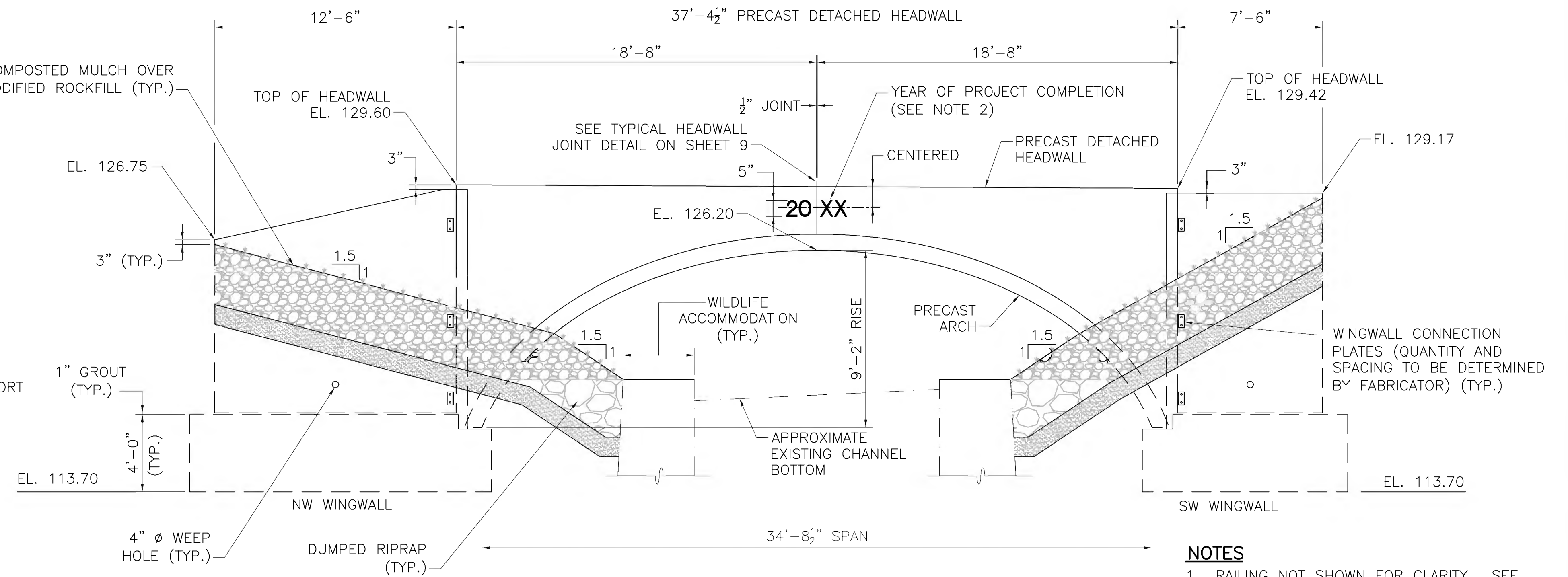


**TRANSVERSE SECTION**

SCALE: 1/2"=1'-0"

**NOTES**

1. DIMENSIONS MARKED BY \* MAY VARY AS REQUIRED BY PRECAST FABRICATOR

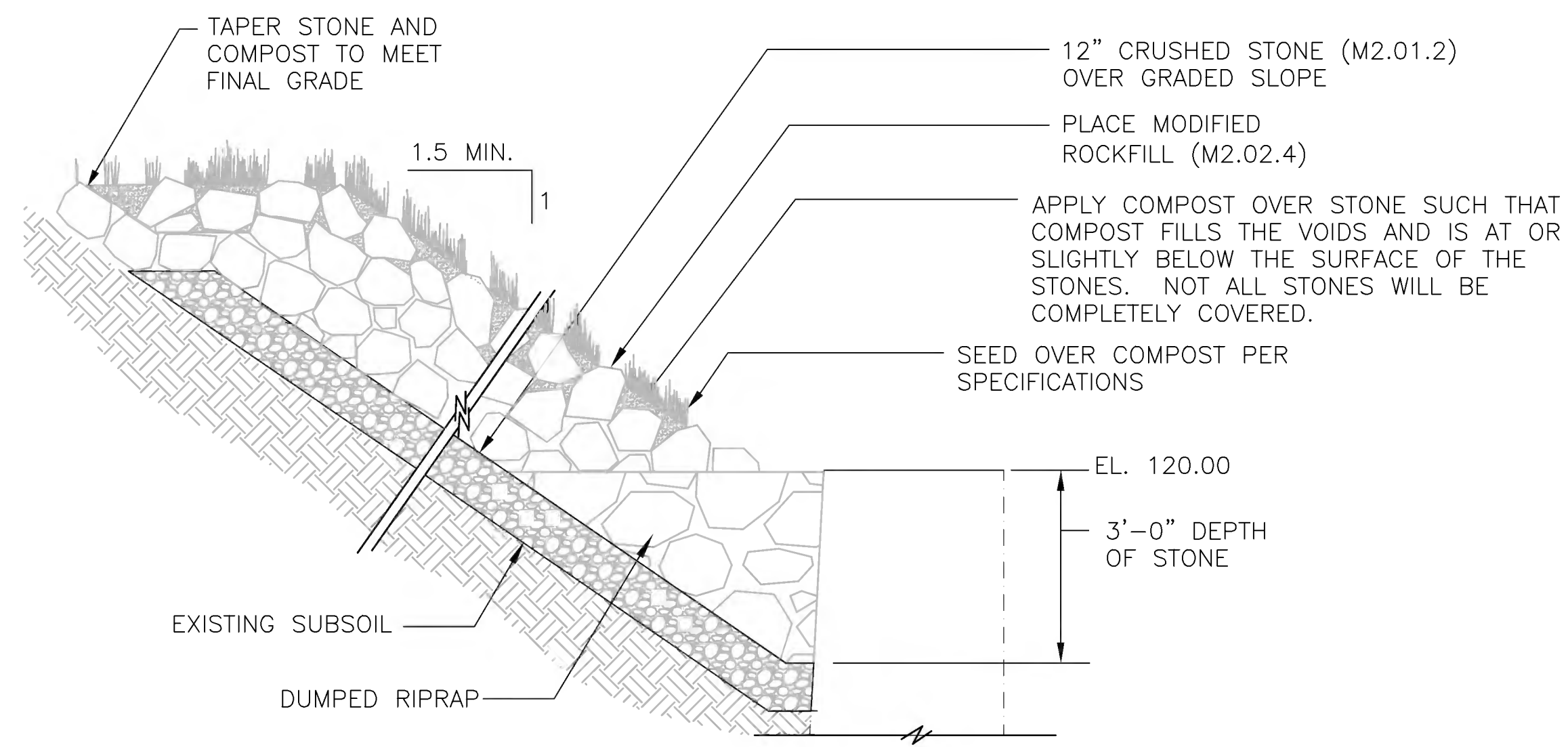


**UPSTREAM ELEVATION**

SCALE: 1/4"=1'-0"

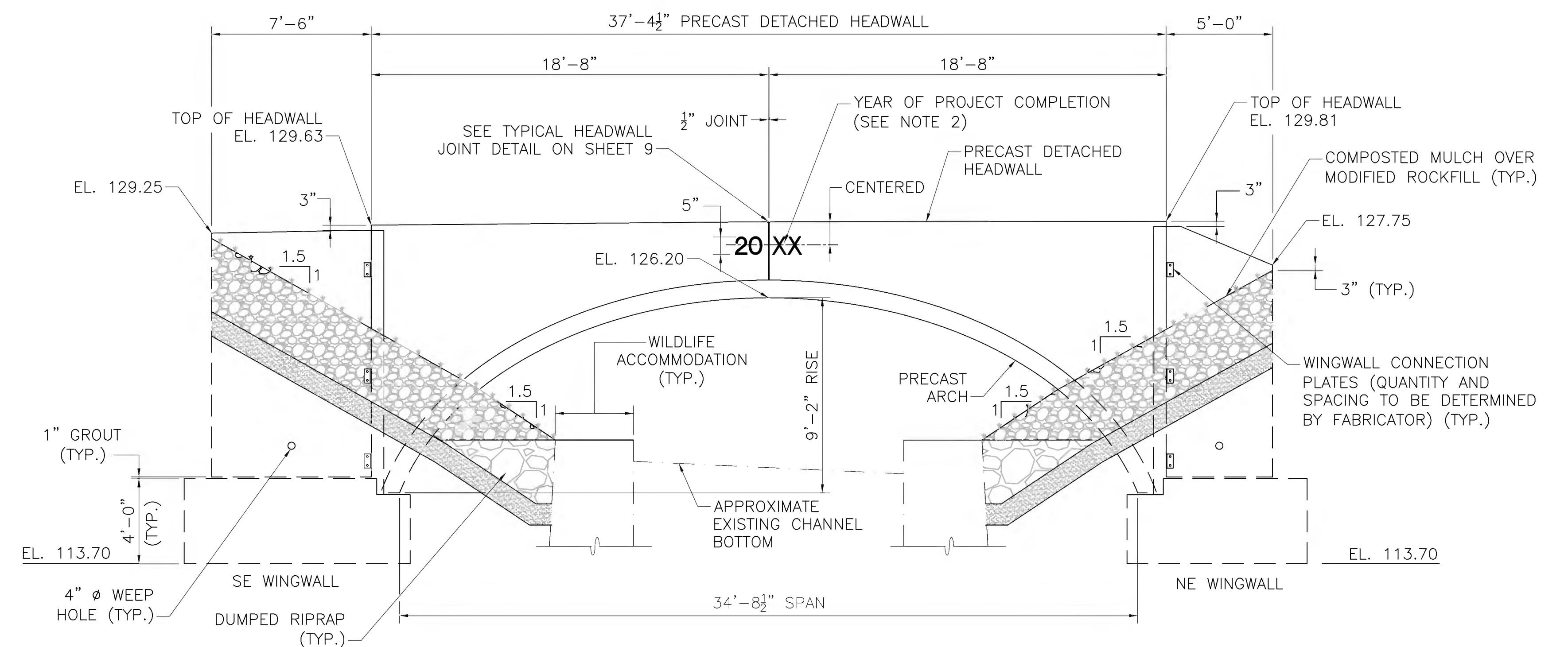
**NOTES**

1. RAILING NOT SHOWN FOR CLARITY. SEE GENERAL PLAN ON SHEET 5 FOR POST LOCATIONS.
2. USE LATEST CONTRACT COMPLETION YEAR IN EFFECT WHEN THE FIRST HEADWALL IS CAST. USE THIS YEAR FOR BOTH HEADWALLS.



**COMPOST AND SEED OVER MODIFIED ROCKFILL**

SCALE: 3/8"=1'-0"



**DOWNSTREAM ELEVATION**

SCALE: 1/4"=1'-0"

**NOTES**

1. RAILING NOT SHOWN FOR CLARITY. SEE GENERAL PLAN ON SHEET 5 FOR POST LOCATIONS.
2. USE LATEST CONTRACT COMPLETION YEAR IN EFFECT WHEN THE FIRST HEADWALL IS CAST. USE THIS YEAR FOR BOTH HEADWALLS.

**WINGWALL AND HEADWALL FORM LINER NOTES:**

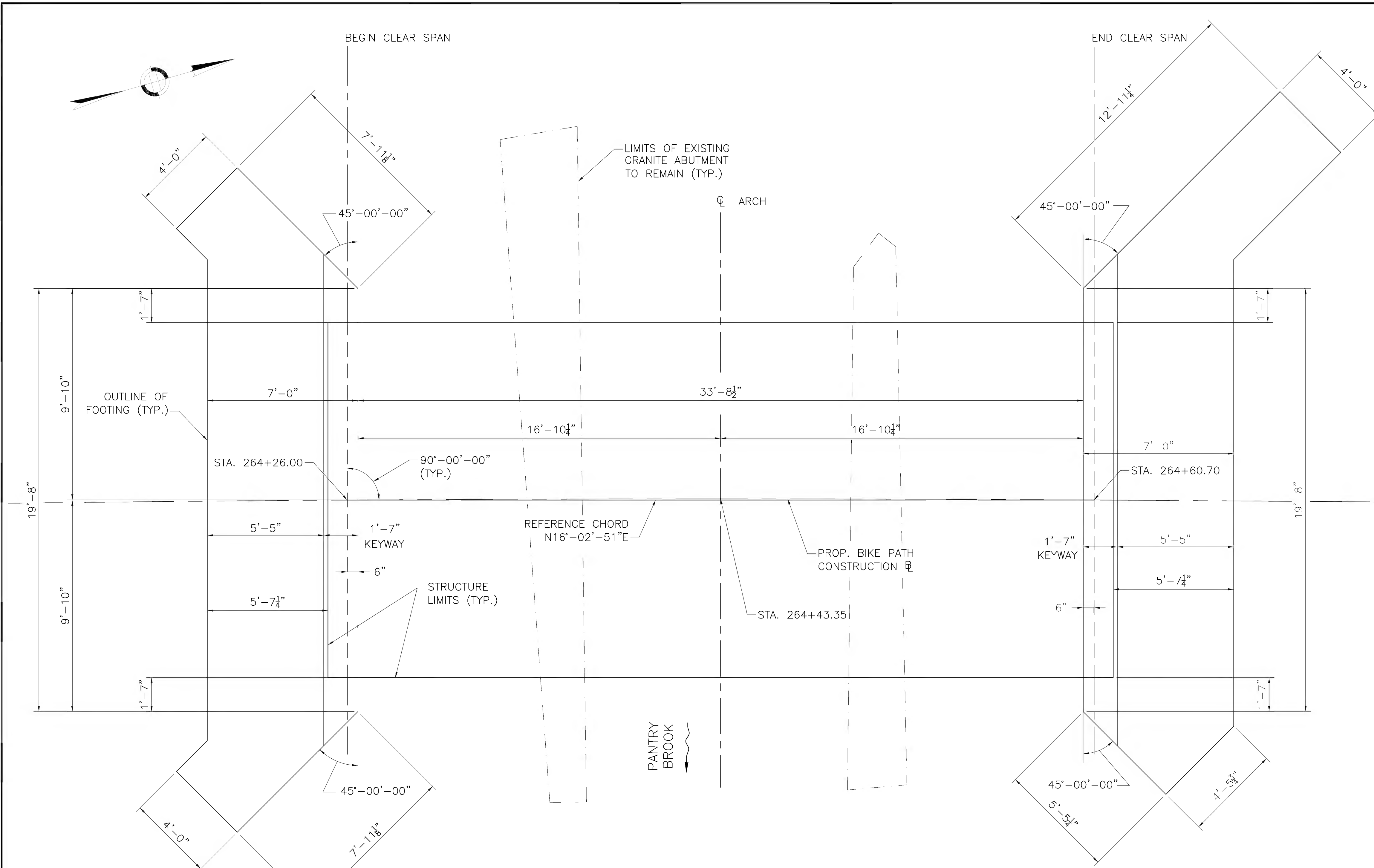
1. EXPOSED FACES OF HEADWALLS AND WINGWALLS SHALL HAVE A PATTERNED FORM LINER AND SHALL EXTEND A MINIMUM OF 1' BELOW THE PROPOSED GRADE AT THE FACE OF THE WALL.
2. THE FORM LINER PATTERN SHALL BE CUSTOMROCK #1302 - RANDOM RUNNING BOND STONE OR APPROVED EQUAL AND SHALL BE STAINED TO SIMULATE THE APPEARANCE OF THE EXISTING MASONRY ABUTMENTS. THE COST OF THE FORM LINER SHALL BE INCLUDED UNDER ITEM 995.01, "BRIDGE STRUCTURE BRIDGE, NO. S-31-013." SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.

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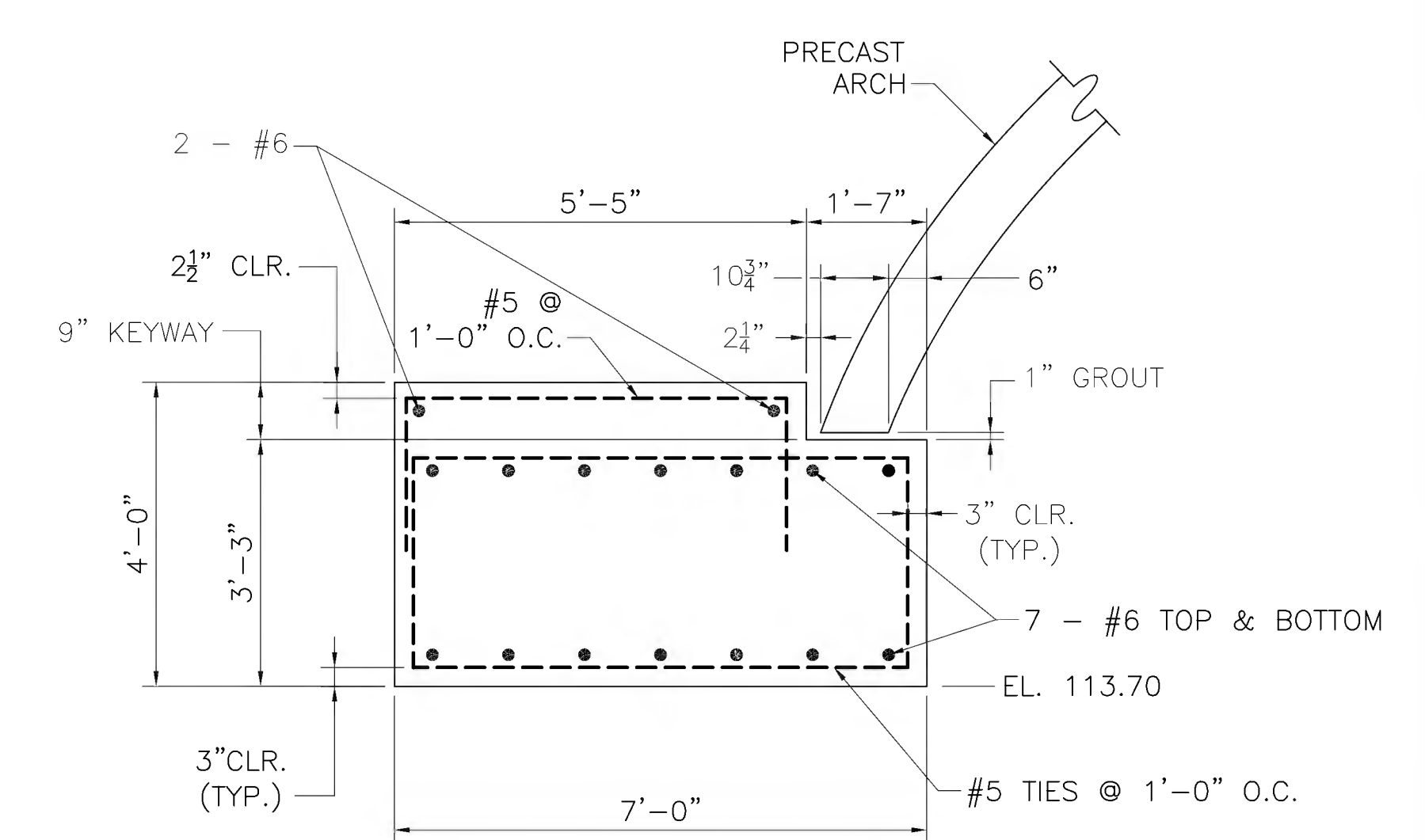
**SUDBURY**  
**BRUCE FREEMAN RAIL TRAIL OVER PANTRY BROOK**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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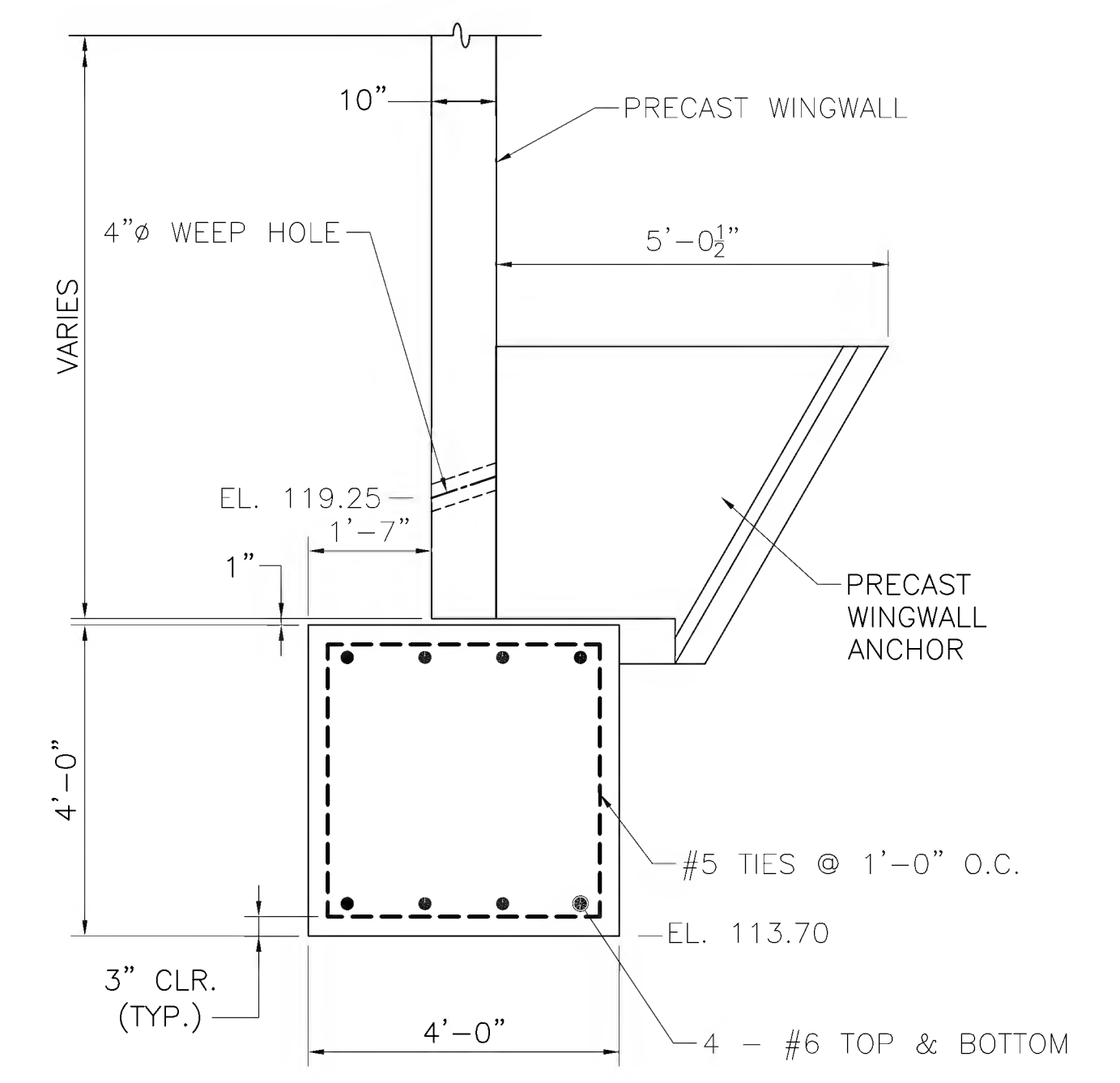
**FOUNDATION PLAN & DETAILS**



**FOUNDATION PLAN**  
SCALE: 3/8"=1'-0"

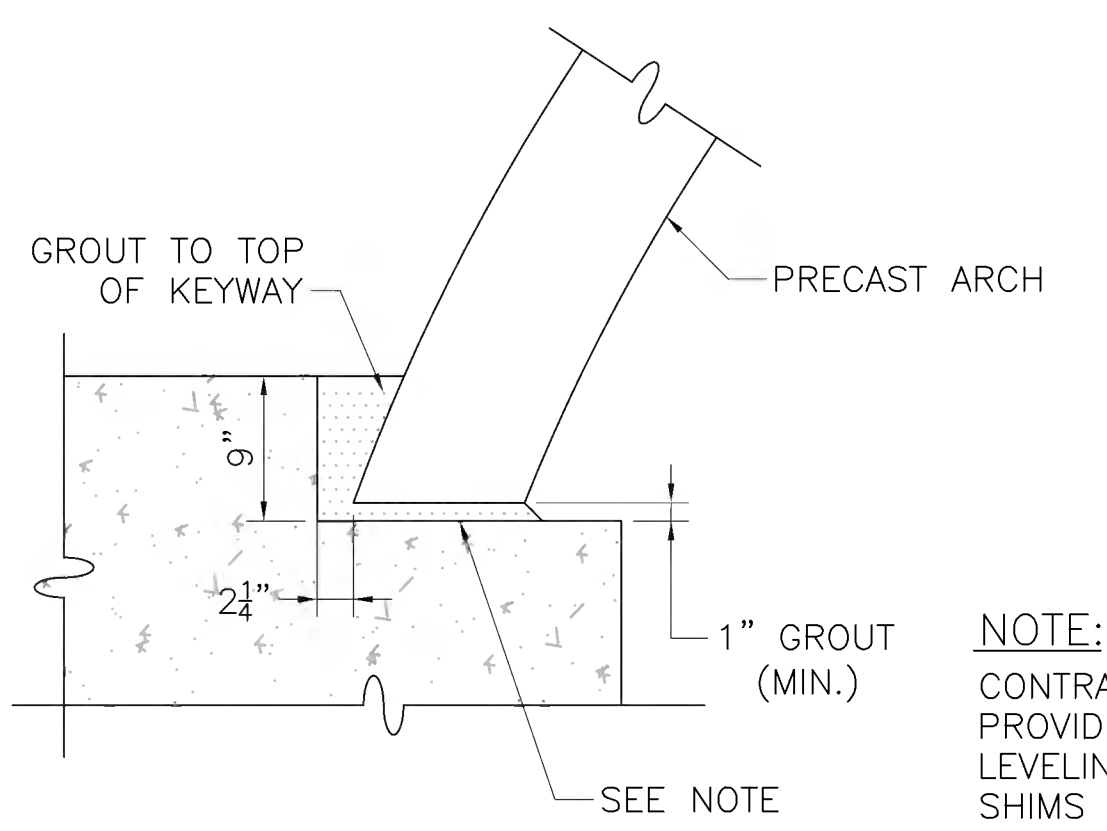


**PRECAST FOOTING SECTION**  
SCALE: 1/2"=1'-0"



**WINGWALL FOOTING SECTION**  
SCALE: 1/2"=1'-0"

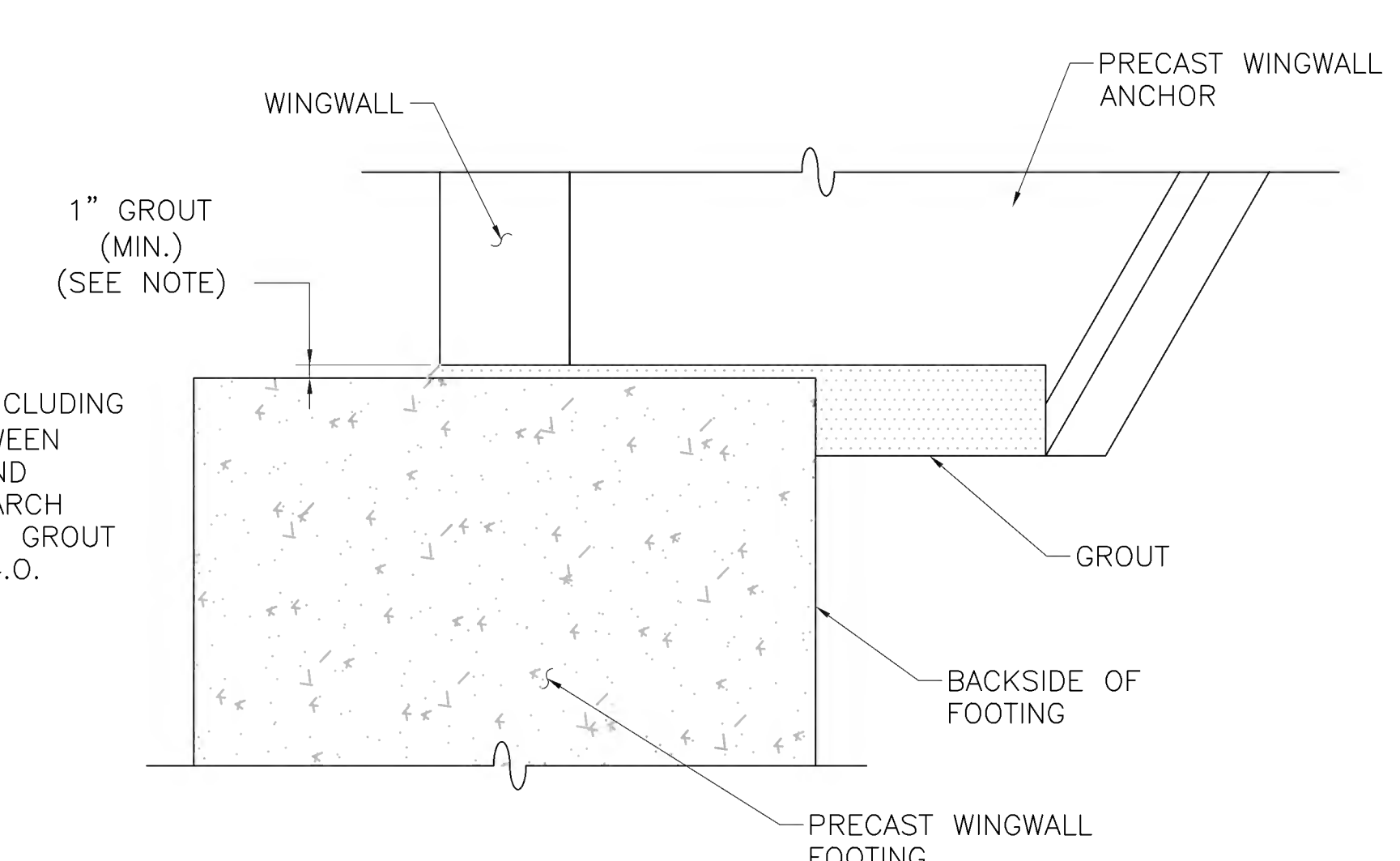
- NOTES:**
- THE PRECAST CONCRETE STRIP FOOTING IS PER CONTRACTOR DESIGN. THEREFORE, THE FACTORED BEARING PRESSURE WILL BE DETERMINED BY THE CONTRACTOR. SLIDING AND OVERTURNING OF THE PRECAST STRIP FOOTING SHALL ALSO BE CHECKED IN THE CONTRACTOR'S DESIGN USING THE INFORMATION PROVIDED IN THE GEOTECHNICAL REPORT.
  - FACTORED BEARING RESISTANCE:
- | FOOTING WIDTH (FT) | ECCENTRICITY (FT) | FACTORED BEARING RESISTANCE (KSF) |
|--------------------|-------------------|-----------------------------------|
| 4                  | 1.33              | 5.2                               |
| 6                  | 2.00              | 5.7                               |
| 8                  | 2.67              | 6.1                               |
- FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE AND A RESISTANCE FACTOR OF 0.45.



**ARCH TYPICAL KEY DETAIL**  
SCALE: 1"=1'-0"

**NOTE:**  
FILL ENTIRE KEYWAY INCLUDING NOMINAL 1" VOID BETWEEN BOTTOM OF KEYWAY AND BOTTOM OF PRECAST ARCH LEG WITH NON-SHRINK GROUT CONFORMING TO M4.04.0.

**NOTE:**  
CONTRACTOR SHALL PROVIDE ANY REQUIRED LEVELING SCREWS OR SHIMS FOR ERECTION.



**WINGWALL TYPICAL GROUT DETAIL**  
SCALE: 1"=1'-0"

- NOTES:**
- MINIMUM 1" NON-SHRINK GROUT CONFORMING TO M4.04.0 UNDER WINGWALL LEG AND ANCHOR STEM.
  - AREA BETWEEN WINGWALL FOOTING AND ANCHOR SHALL BE GROUTED SOLID BEFORE BACKFILL.

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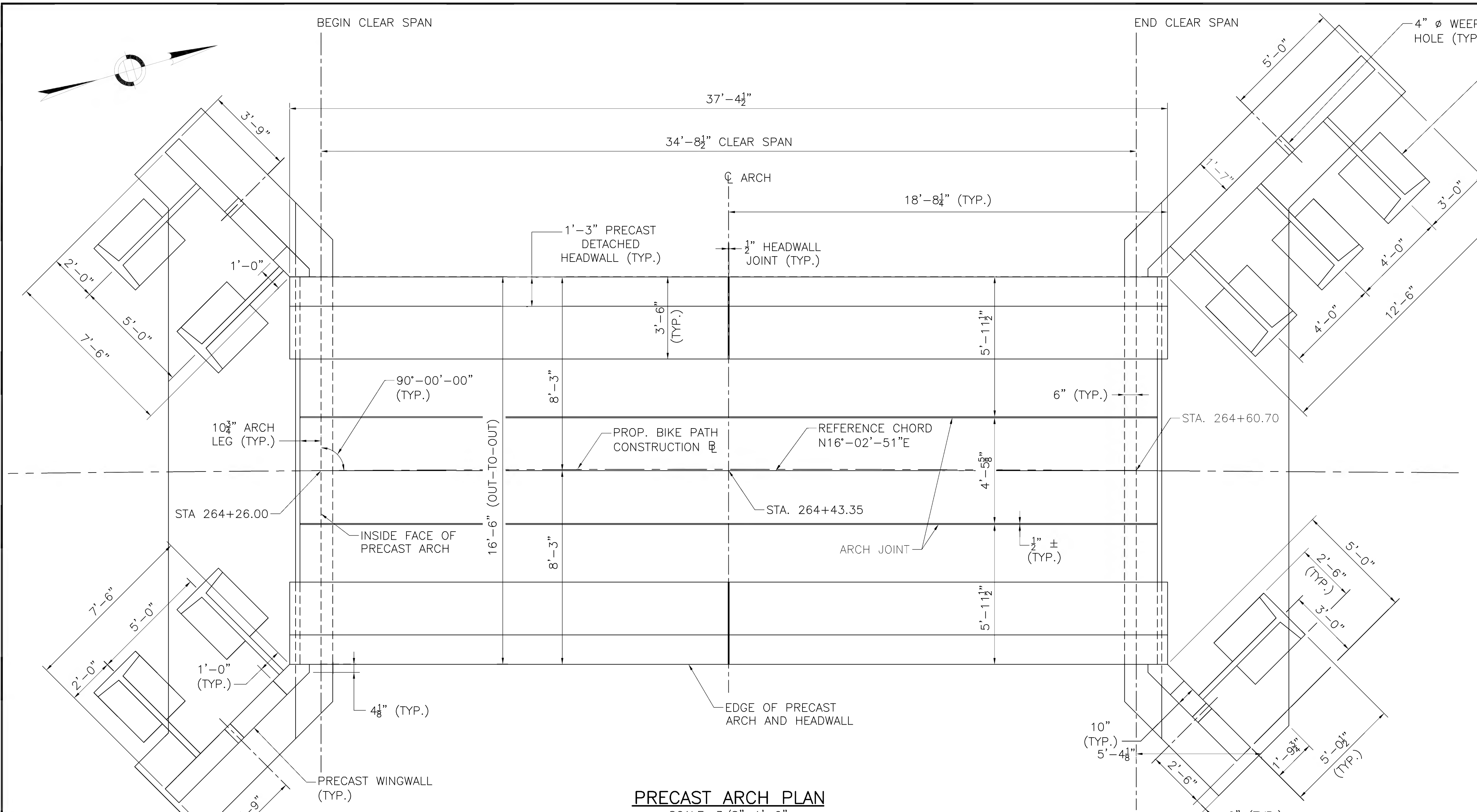
608164\_BRS(S-31-013)(FOUNDATION).DWG Plotted on 19-Jul-2022 8:28 AM 6-August-2022 Final Structural Submittal (SF)



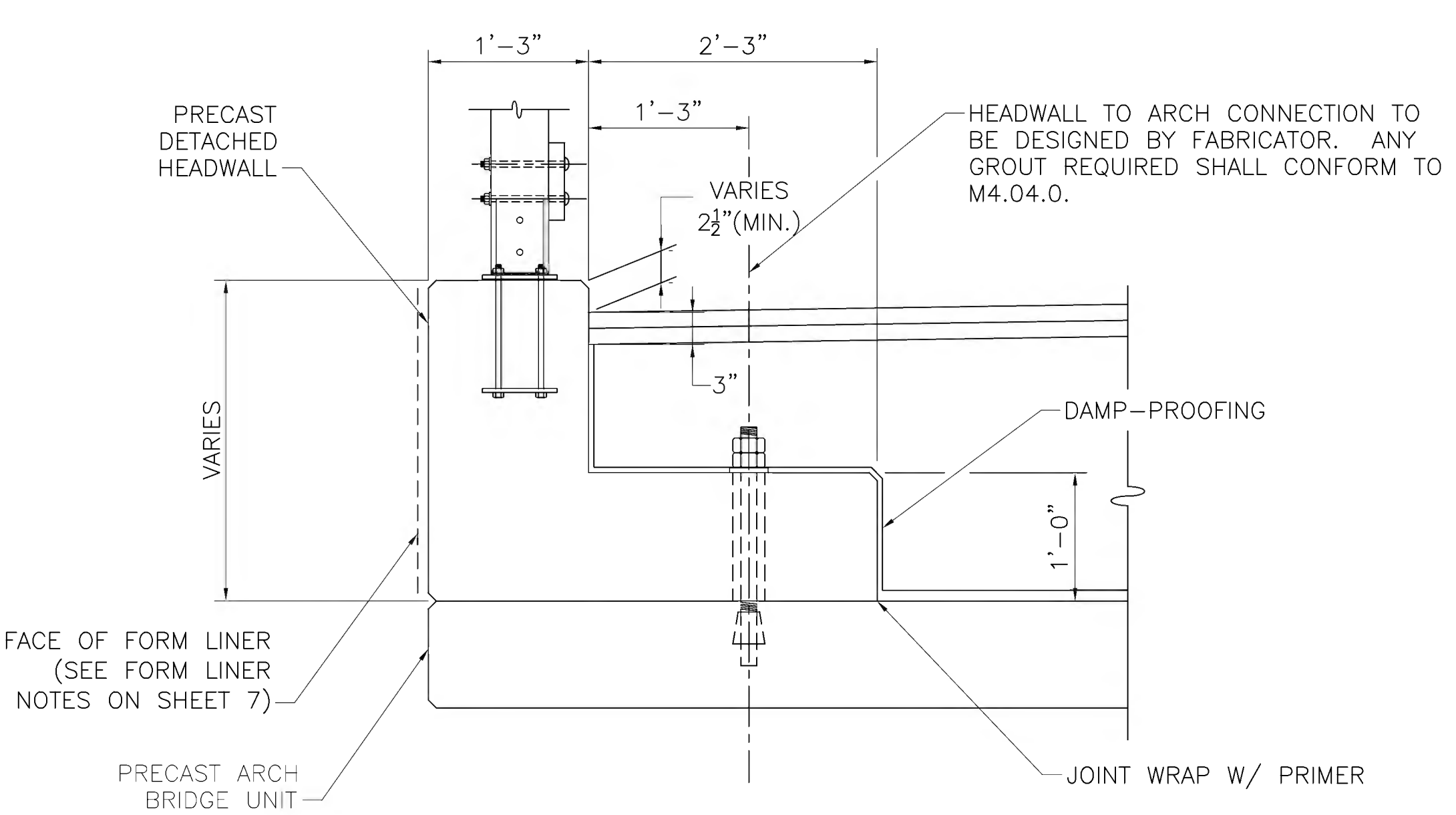
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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**PRECAST CONCRETE ELEMENT NOTES: PRECAST ARCH DETAILS & NOTES**

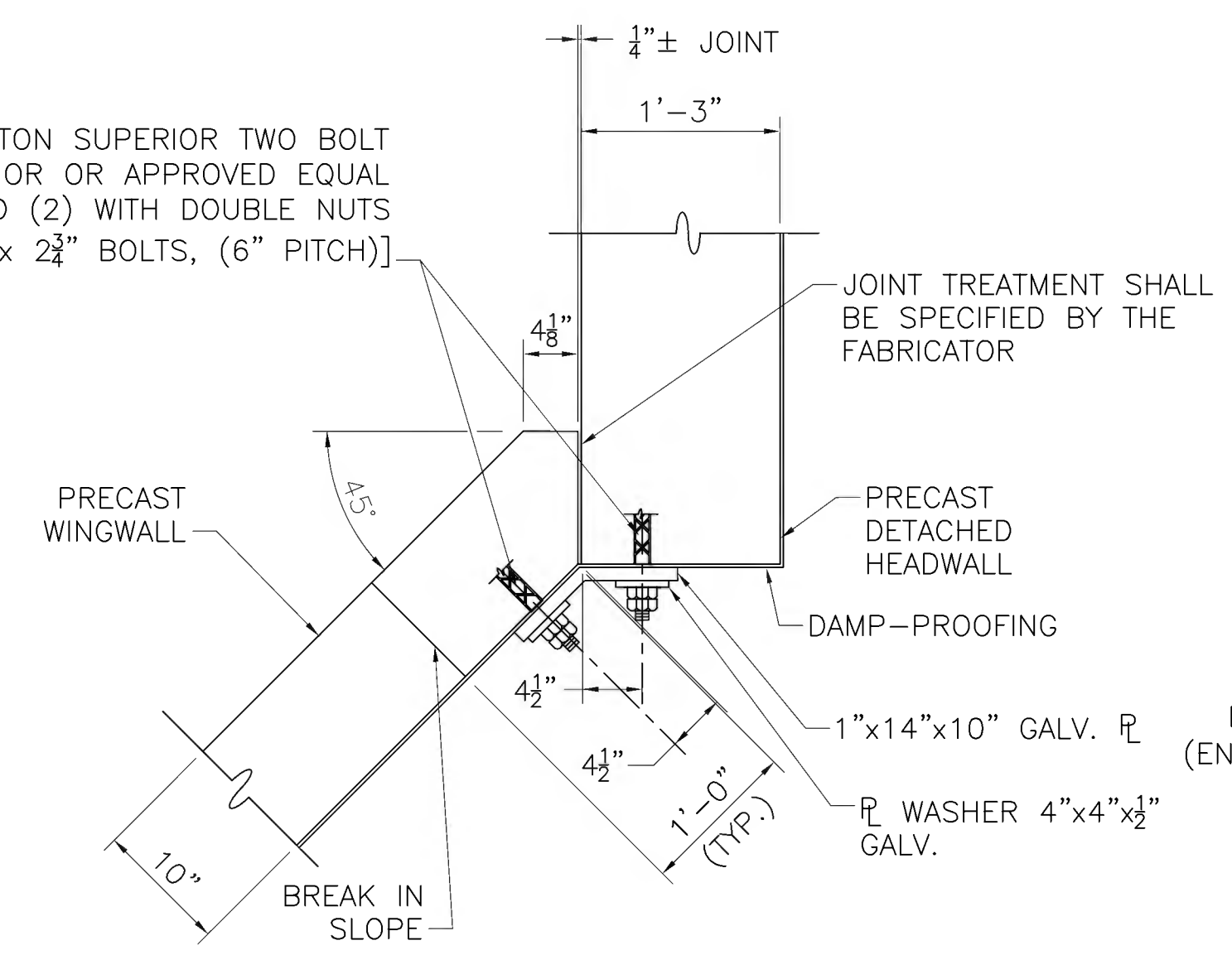
1. THE CONTRACTOR SHALL SUBMIT DESIGN CALCULATIONS FOR THE ARCH BRIDGE AND WINGWALL ELEMENTS, INCLUDING THE HEADWALL CONNECTION TO THE ARCH, THE ARCH AND WINGWALL FOOTINGS, AND THE WINGWALL ANCHORS IN ACCORDANCE WITH THE LATEST AASHTO LRFD DESIGN SPECIFICATIONS AND THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION'S LRFD BRIDGE DESIGN MANUAL FOR H10 TRUCK LOADING AND PEDESTRIAN LOADING FOR APPROVAL OF THE ENGINEER. THE DESIGN COMPUTATIONS SHALL CONSIDER ALL LOADINGS AS APPROPRIATE DURING FABRICATION, SHIPMENT, ERECTION, CONSTRUCTION, AND AFTER COMPLETION OF CONSTRUCTION BASED ON THESE CONSTRUCTION DRAWINGS. THE RAIL POST ANCHORAGE SPACING SHALL BE DETAILED ON SHOP DRAWINGS FOR REVIEW AND APPROVAL BY THE ENGINEER.
2. THE ARCH DIMENSIONS PROVIDED ARE SHOWN TO ESTABLISH THE SIZE OF THE PROPOSED OPENING OF 141 SQUARE FEET. THE WIDTHS AND THICKNESSES OF EACH ARCH UNIT MAY VARY DEPENDING UPON THE MANUFACTURER'S SPECIFICATIONS. AN ARCH TYPE STRUCTURE SHALL BE REQUIRED. THE CONTRACTOR, AT NO ADDITIONAL COMPENSATION, HAS THE OPTION TO PROPOSE AN ALTERNATE ARCH DESIGN WITH THE SAME OR LARGER OPENING AREA.
3. THE PRECAST FOOTING DESIGN DETAILED HEREIN WAS BASED ON THE GEOMETRY OF THE ARCH SHOWN. SEE FACTORED BEARING RESISTANCES BY SIZE ON SHEET 8. THE FABRICATOR SHALL PREPARE AND THE CONTRACTOR SHALL SUBMIT THE FINAL DESIGN OF THE FOOTING FOR APPROVAL BY THE ENGINEER.
4. THE CONTRACTOR, AT NO ADDITIONAL COMPENSATION, HAS THE OPTION TO PROVIDE CAST-IN-PLACE CONCRETE FOOTINGS, AND SHALL SUBMIT THE FINAL DESIGN OF THE CAST-IN-PLACE CONCRETE FOOTINGS.
5. THE PRECAST ELEMENTS ARE TO BE PARALLEL AND ALIGNED WITH THE REFERENCE LINE AS SHOWN ON THESE CONSTRUCTION DRAWINGS.
6. A MINIMUM OF 4 FEET COVER TO THE BOTTOM OF FOOTING SHALL BE PROVIDED.
7. THE FABRICATOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF LIFT HOOKS FOR ALL PRECAST ELEMENTS. PLANS PROVIDING SPACING AND LOCATION OF LIFTING DEVICES AND HANDLING STRESS CALCULATIONS SHALL BE PROVIDED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION OF THE PRECAST ELEMENTS.
8. SHOP DRAWINGS AND DESIGN CALCULATIONS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS.
9. PRECAST CONCRETE ELEMENTS SHALL CONFORM TO THE APPLICABLE PARTS OF SECTION 901 OF THE SPECIFICATIONS.
10. ALL TOLERANCES FOR JOINTS BETWEEN PRECAST ELEMENTS SHALL BE DETERMINED BY THE CONTRACTOR AND SHALL BE IN ACCORDANCE WITH PCI REQUIREMENTS.



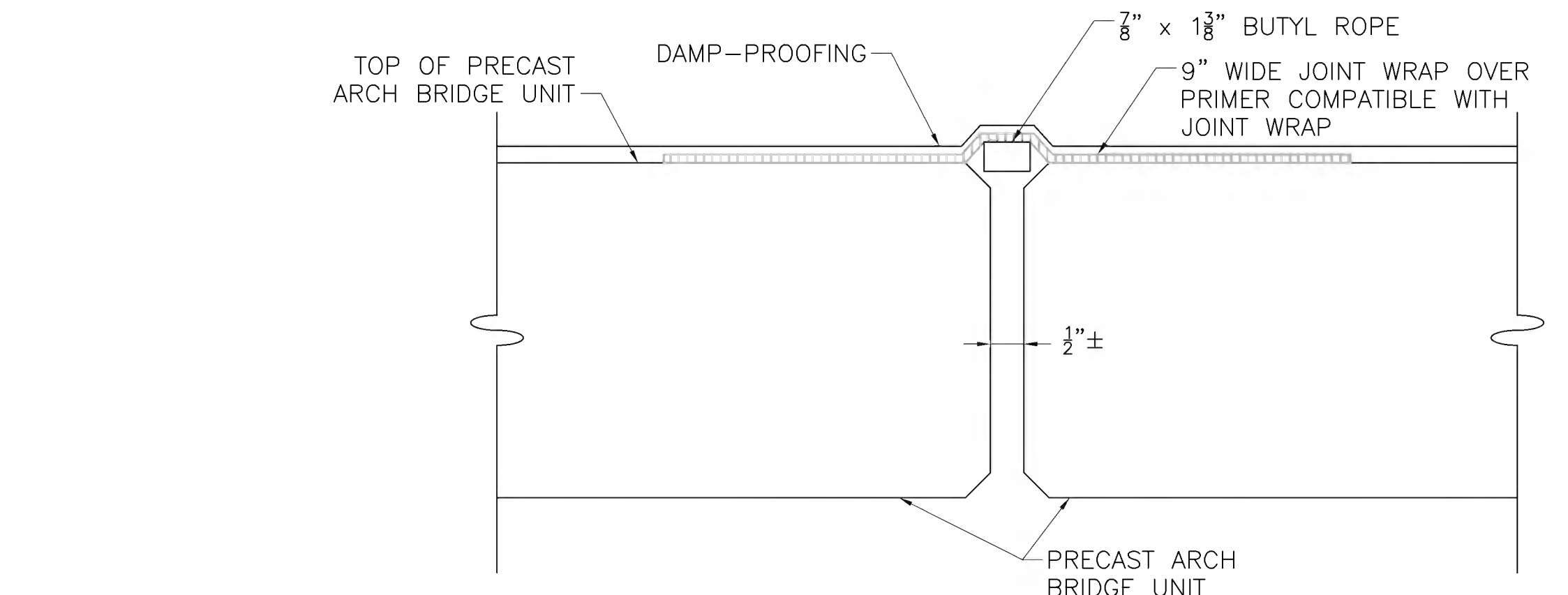
**PRECAST ARCH PLAN**  
SCALE: 3/8"=1'-0"



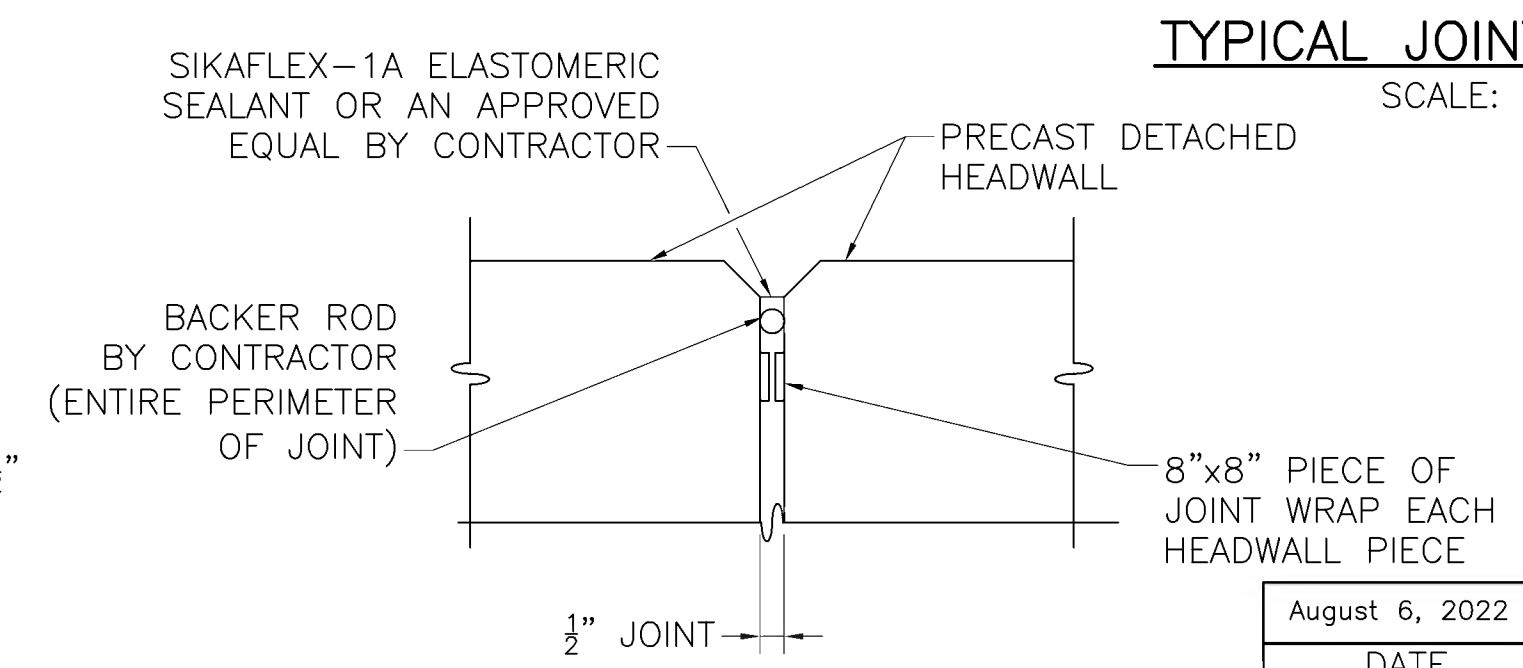
**HEADWALL DETAIL**  
SCALE: 1"=1'-0"



**WINGWALL TO HEADWALL JOINT DETAIL**  
SCALE: 1"=1'-0"



**TYPICAL JOINT SEAL DETAIL**  
SCALE: 3"=1'-0"



**TYPICAL HEADWALL JOINT DETAIL**  
SCALE: 1"=1'-0"

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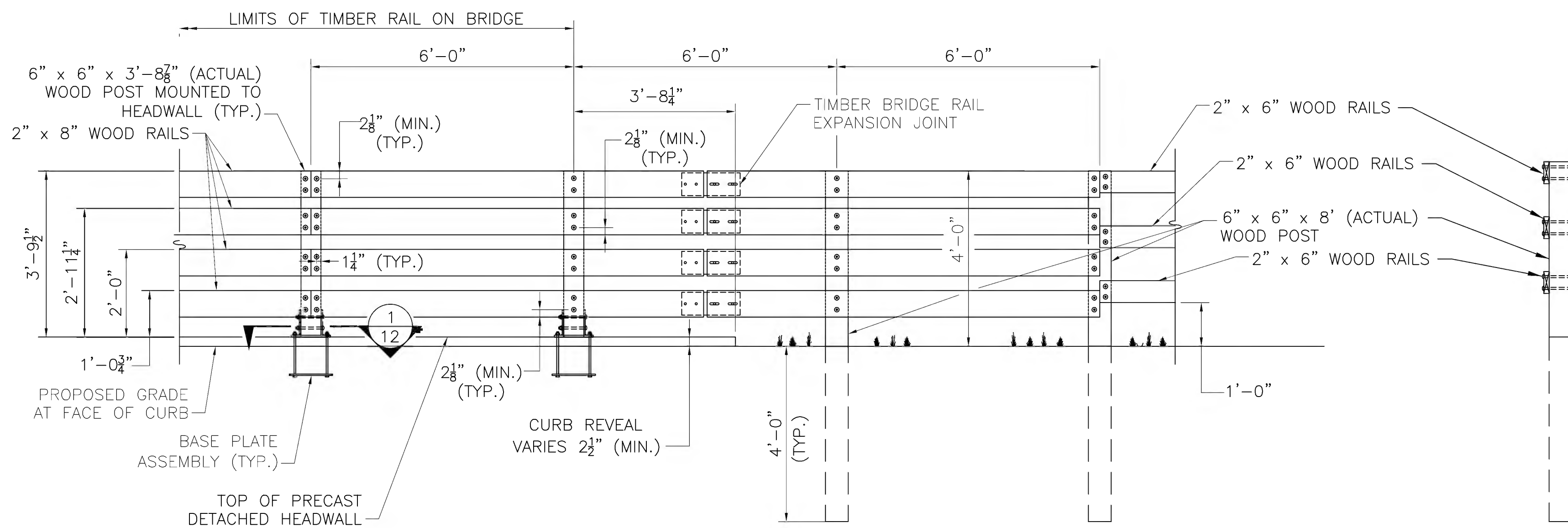
608164\_BRF(S-31-013)PRECAST.DWG Plotted on 19-Jul-2022 8:28 AM 6-August-2022 Final Structural Submittal (SF)

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**TIMBER BRIDGE RAIL DETAILS**

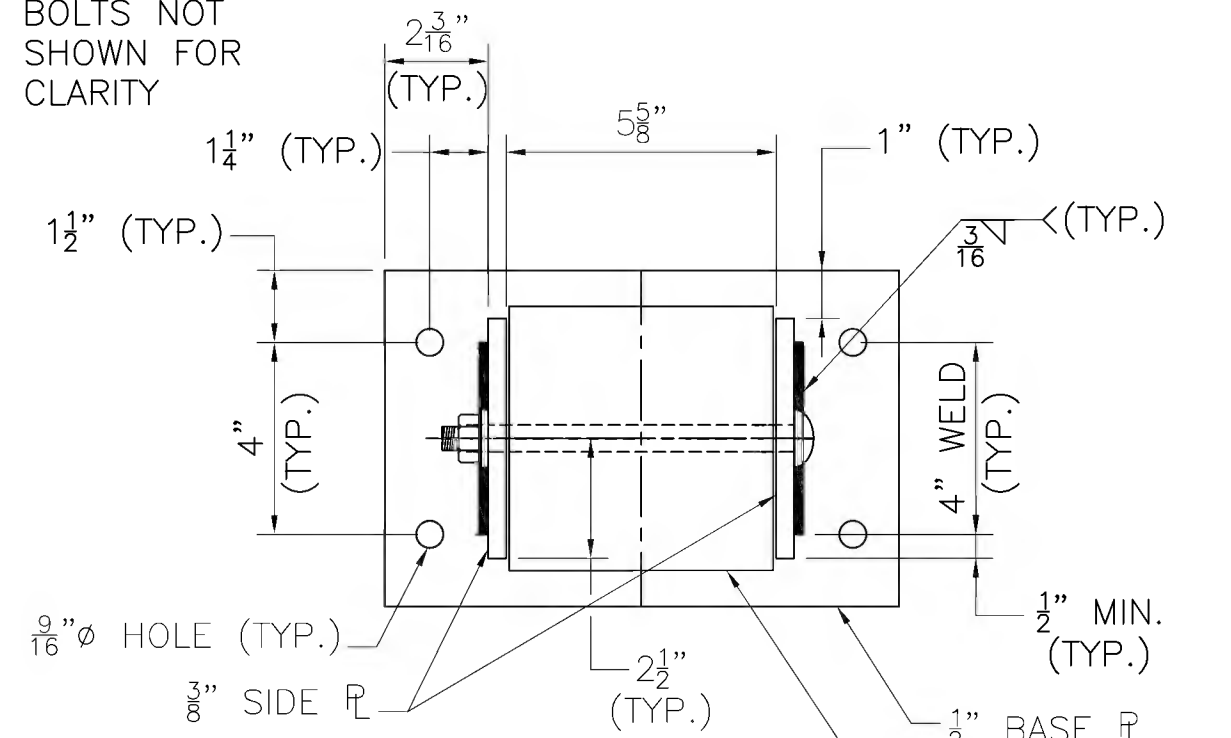
**RAILING NOTES:**

1. RAIL CONNECTION PLATES AND RAIL EXPANSION JOINT PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M270 GRADE 50.
2. ALL STEEL PLATES AND FASTENERS SHALL BE GALVANIZED.
3. THE NUT SECURING THE POST BASE PLATE TO THE HEADWALL SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN AFTER STEEL IS IN PLACE.
4. CONNECTION BOLTS SHALL BE ASTM A325 TYPE 1.
5. ALL WOOD RAILS SHALL BE CONNECTED TO A MINIMUM OF 2 WOOD POSTS.
6. BOLTS IN SLOTTED HOLES SHALL UTILIZE LOCK NUTS AND BE FINGER TIGHT TO ALLOW MOVEMENT BETWEEN STEEL PLATE AND TIMBER RAIL.
7. SEE TIMBER RAIL FENCE DETAILS ON SHEET 209 FOR ADDITIONAL INFORMATION.
8. ALL DIMENSIONS OF TIMBER ELEMENTS ARE NOMINAL UNLESS OTHERWISE NOTED.

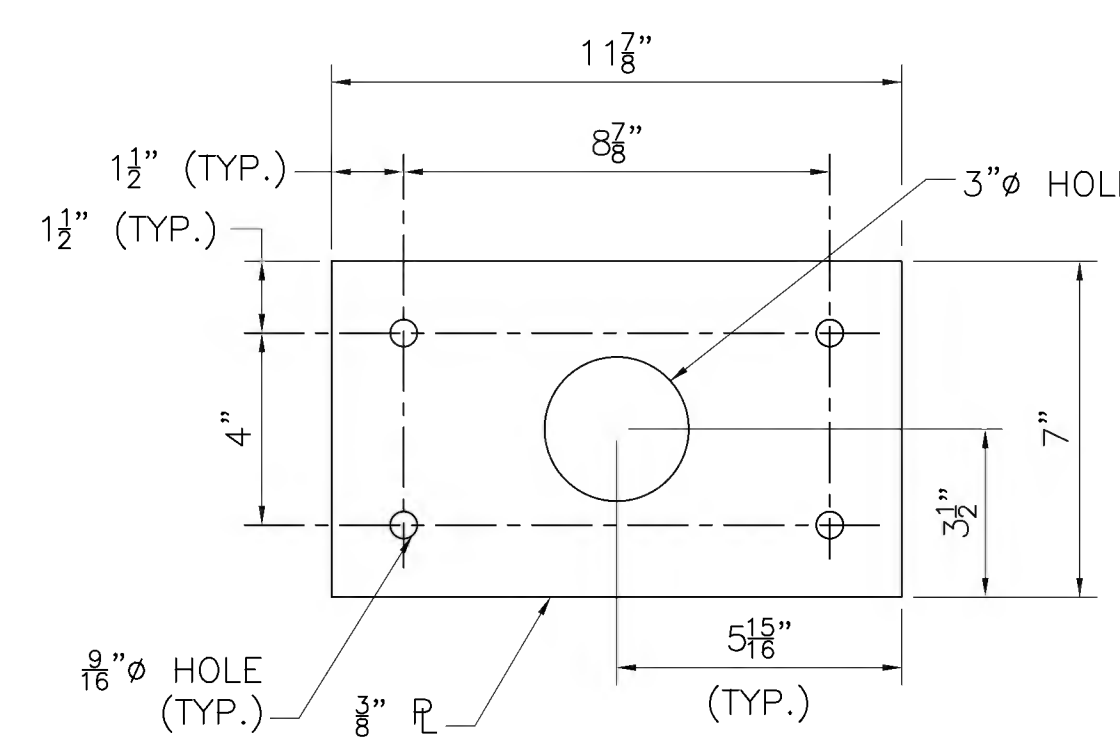


**TIMBER BRIDGE RAIL ELEVATION**  
SCALE: 1/2"=1'-0"

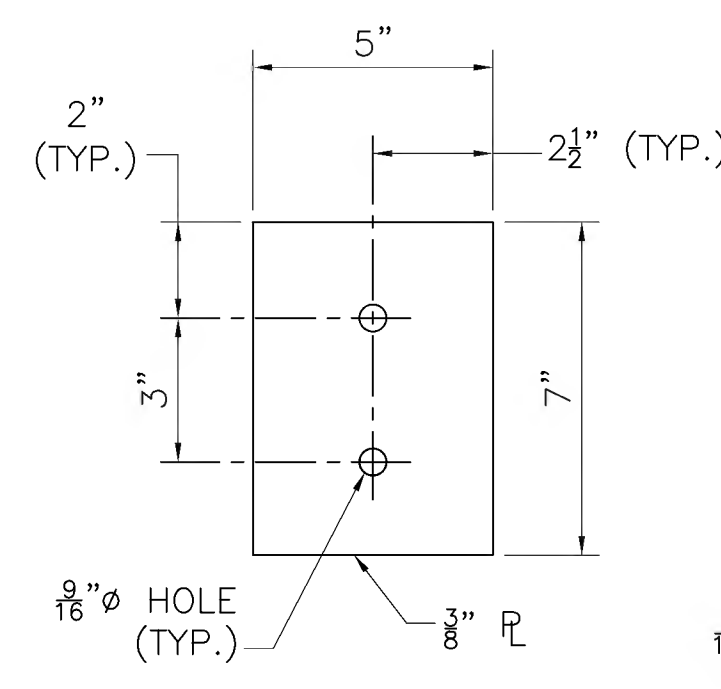
NOTE: BASE PLATE BOLTS NOT SHOWN FOR CLARITY



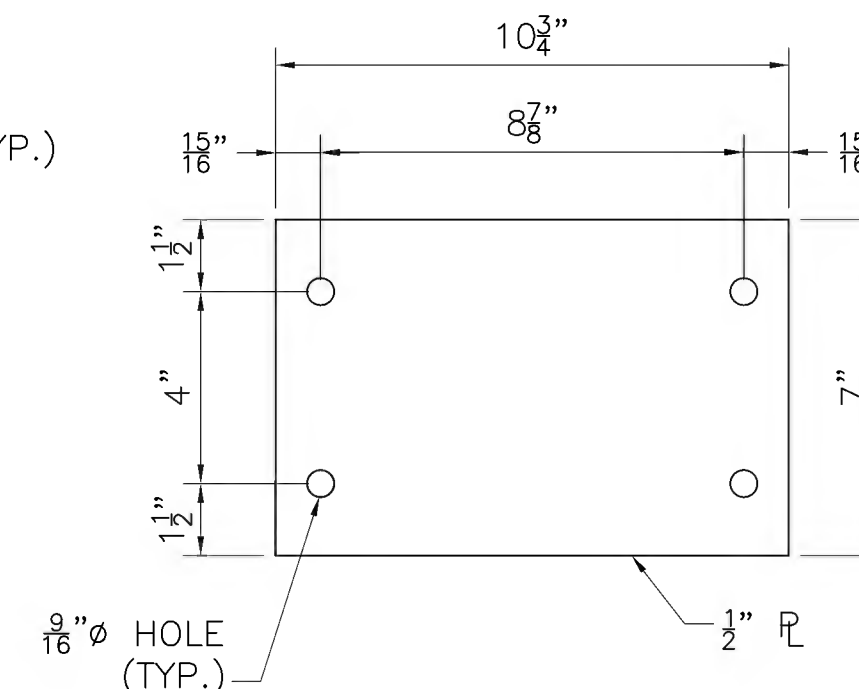
**SECTION 1**  
SCALE: 3"=1'-0"



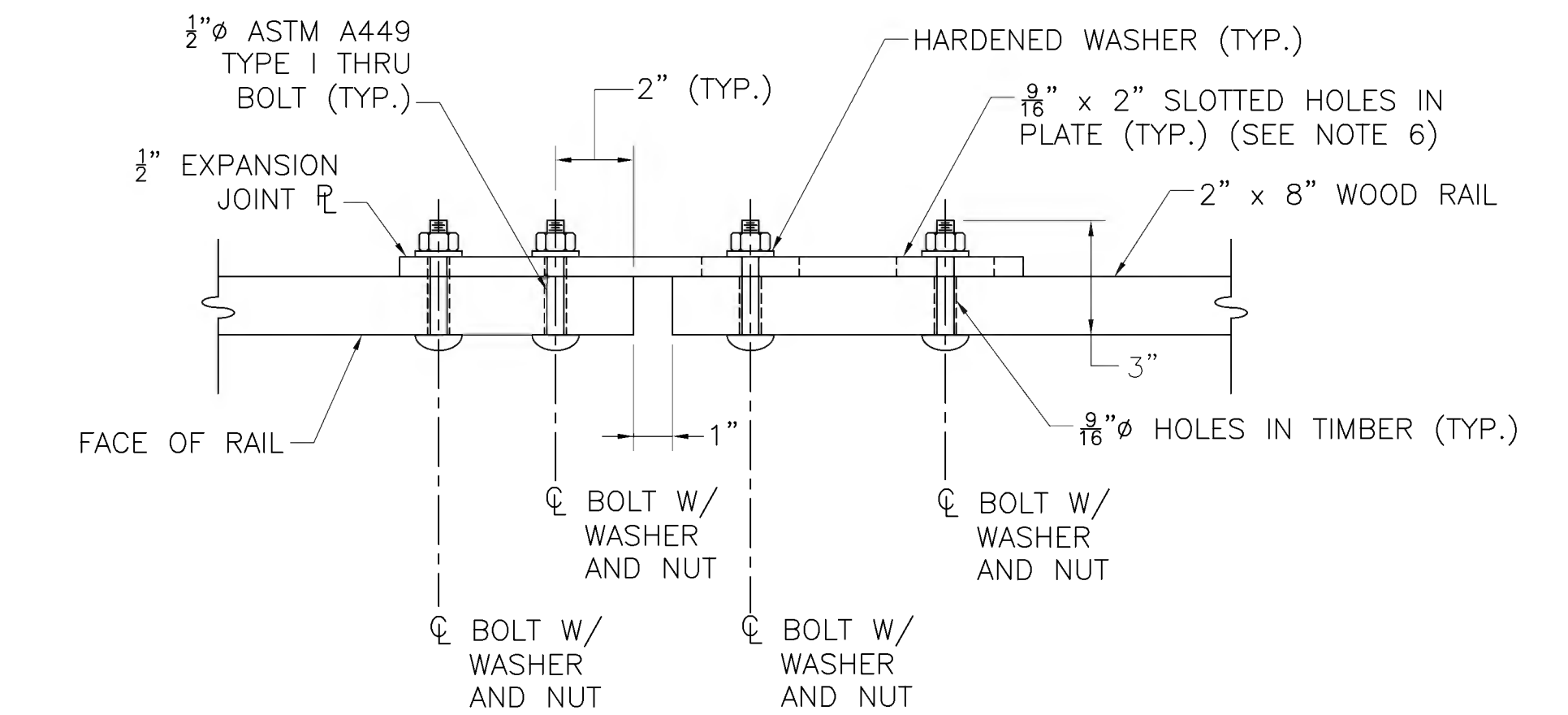
**ANCHOR PLATE**  
SCALE: 3"=1'-0"



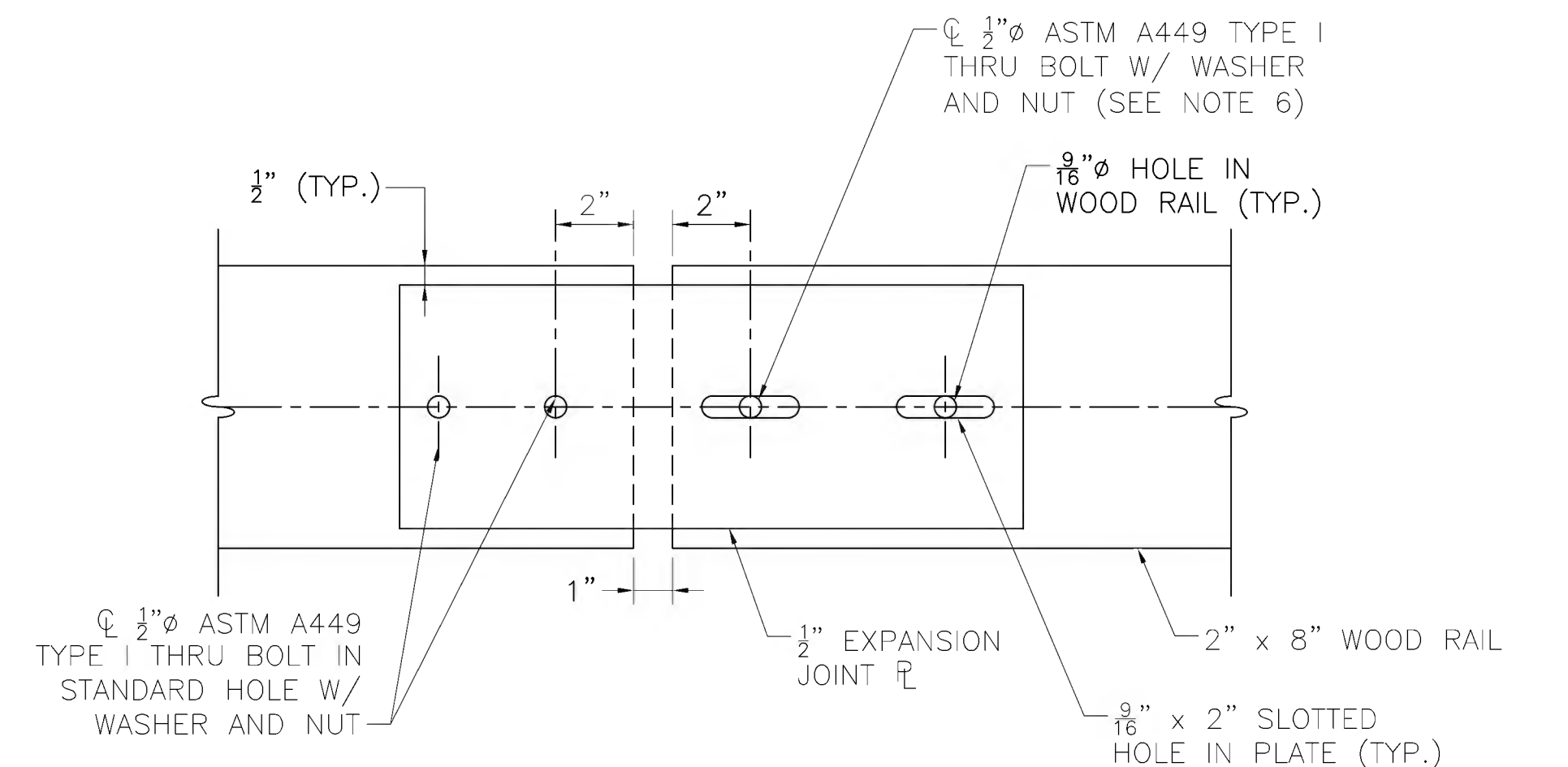
**SIDE PLATE**  
SCALE: 3"=1'-0"



**BASE PLATE**  
SCALE: 3"=1'-0"

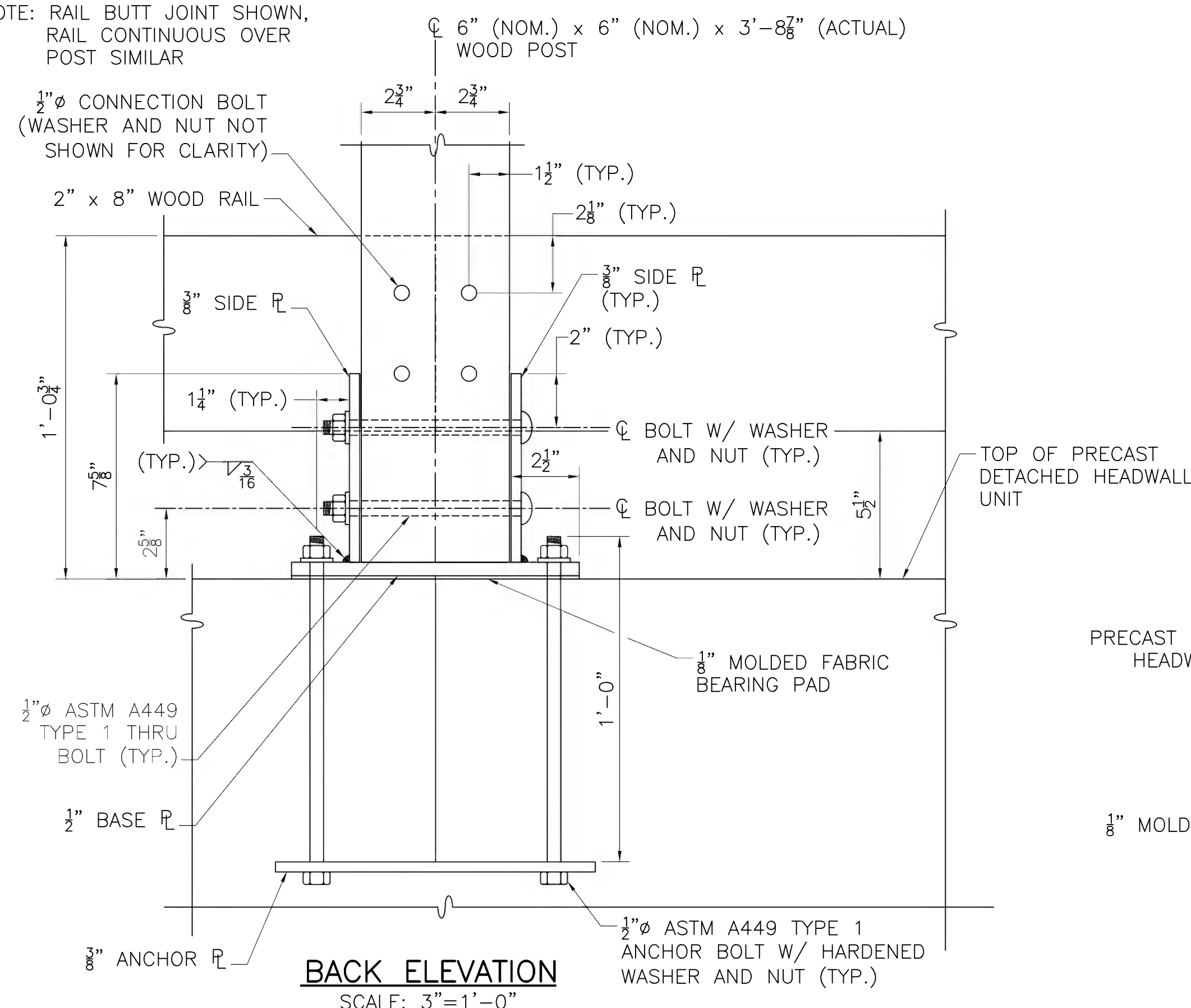


**TOP EXPANSION JOINT VIEW**  
SCALE: 3"=1'-0"

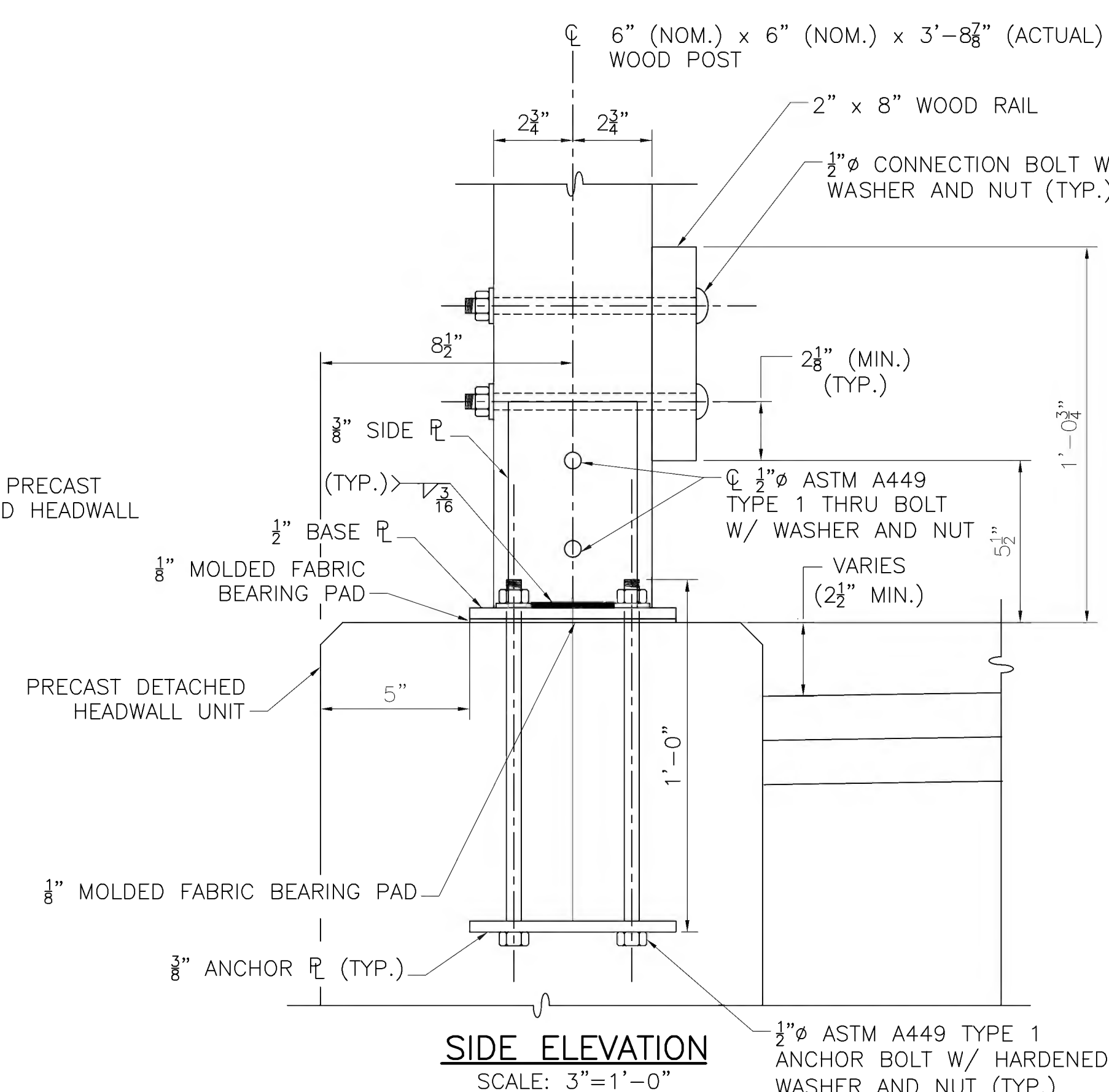


**BACK EXPANSION JOINT ELEVATION**  
SCALE: 3"=1'-0"

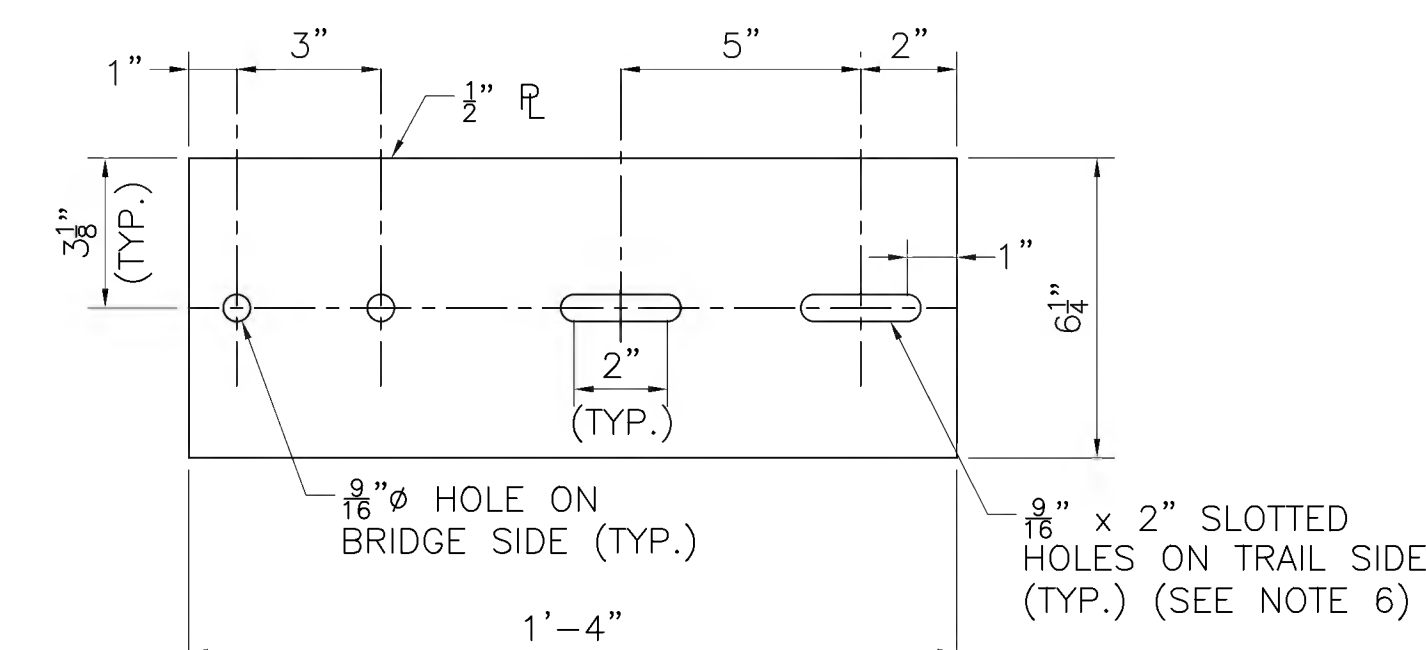
NOTE: RAIL BUTT JOINT SHOWN, RAIL CONTINUOUS OVER POST SIMILAR



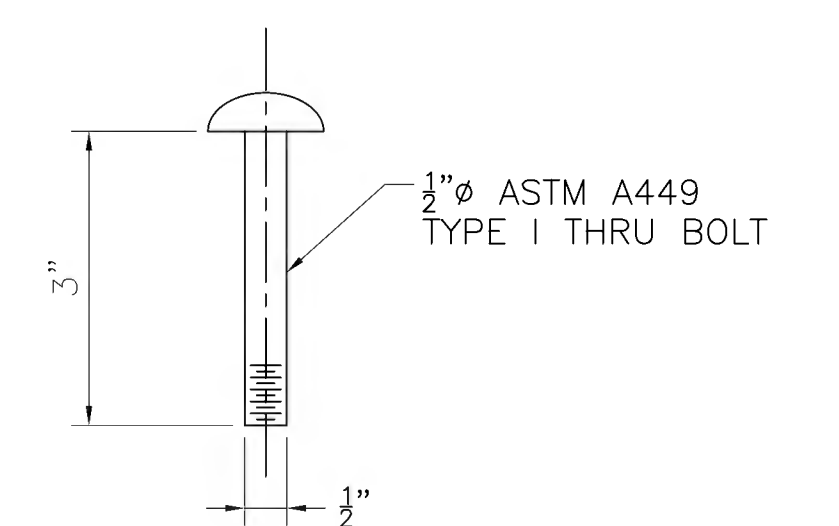
**BACK ELEVATION**  
SCALE: 3"=1'-0"



**SIDE ELEVATION**  
SCALE: 3"=1'-0"



**EXPANSION JOINT PLATE**  
SCALE: 3"=1'-0"



**EXPANSION JOINT BOLTS**  
SCALE: 6"=1'-0"

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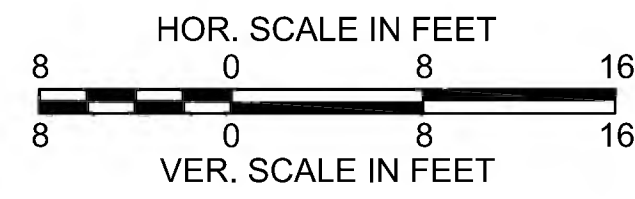


SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	245	319

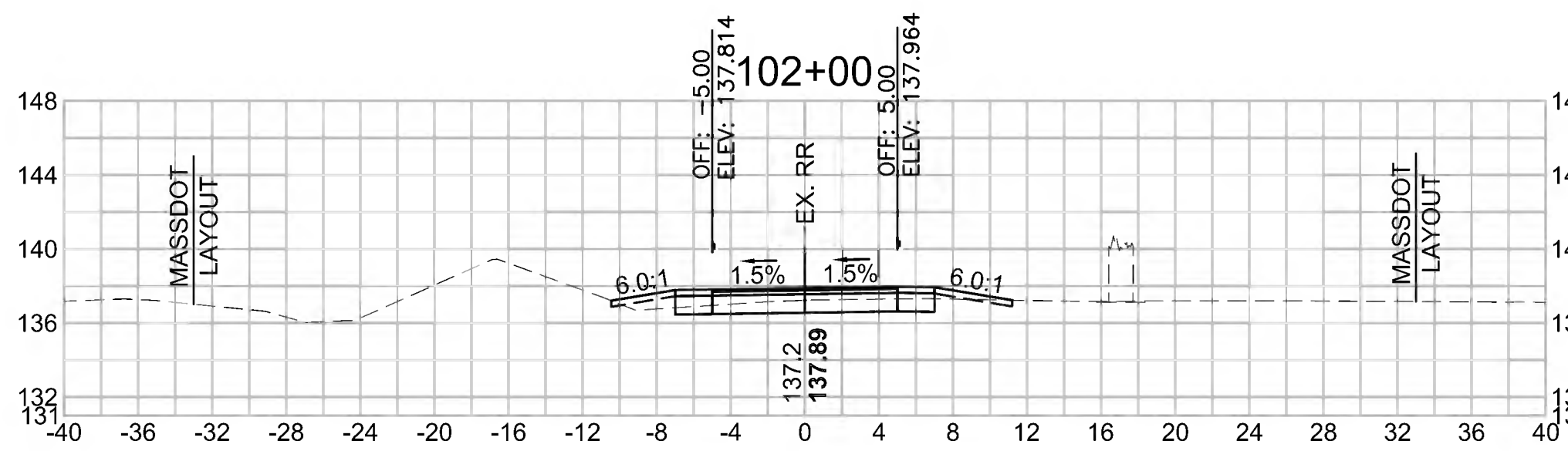
PROJECT FILE NO. 608164

CROSS SECTIONS



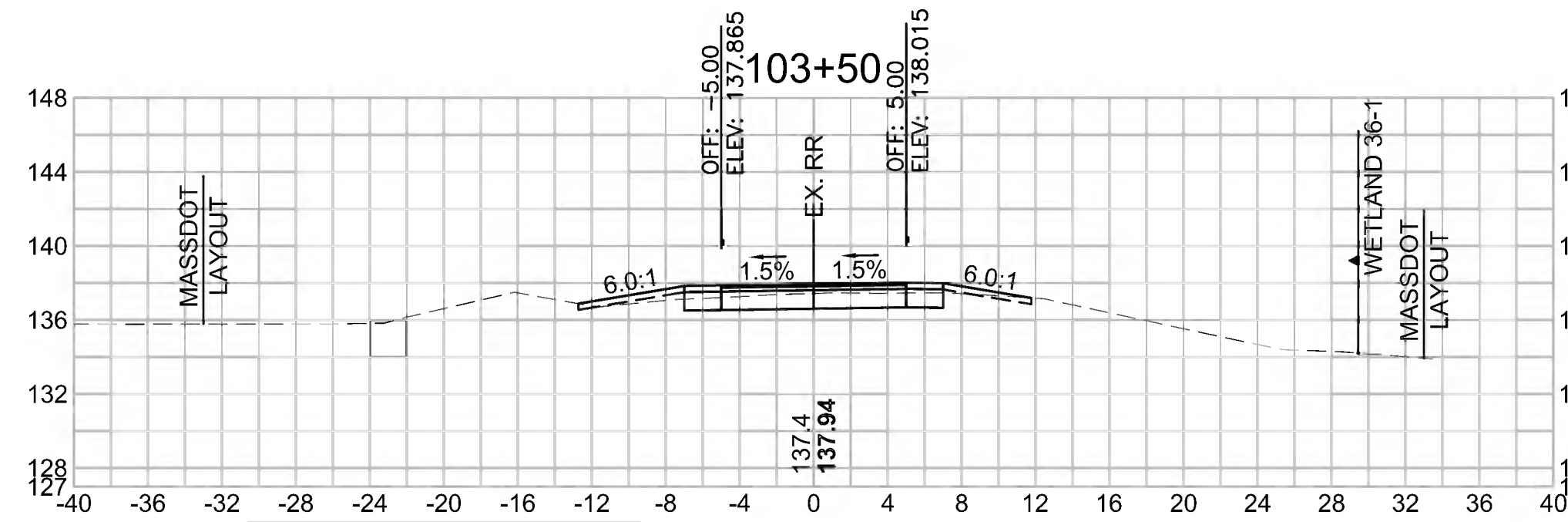
**Total Volume at Station 102+00.00**

Cut Area (SF)	9.488
Fill Area (SF)	0.350
Cut Vol (CF)	37.071
Fill Vol (CF)	0.4
Cum Cut Vol (CF)	100.898
Cum Fill Vol (CF)	0.6
Net Vol (CF)	100.3



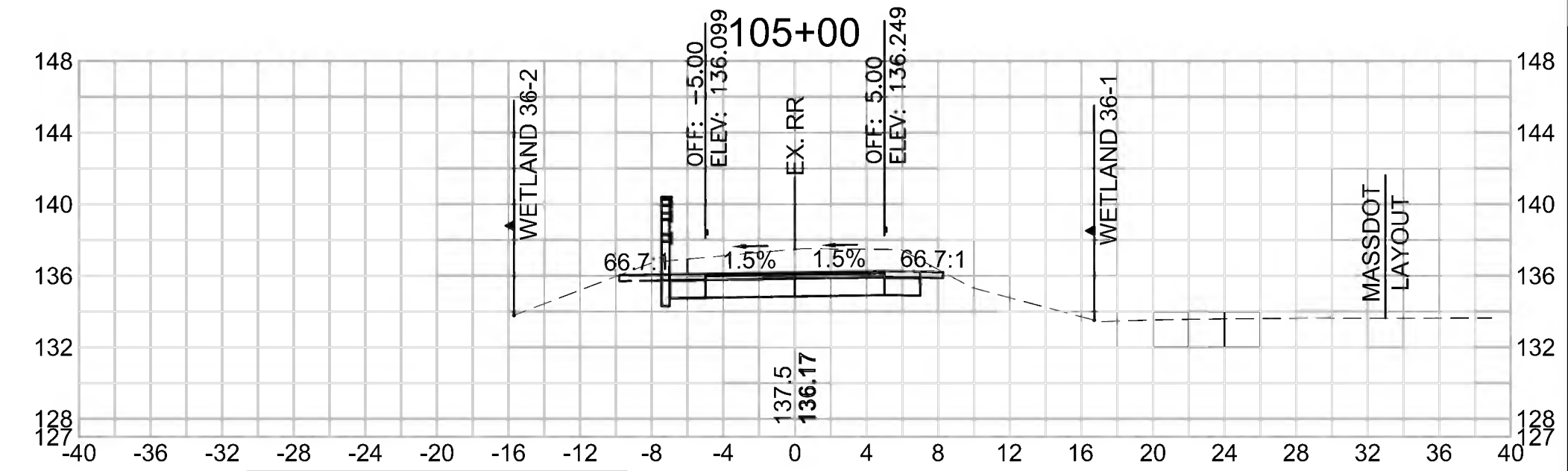
**Total Volume at Station 103+50.00**

Cut Area (SF)	11.445
Fill Area (SF)	0.994
Cut Vol (CF)	13.330
Fill Vol (CF)	5.7
Cum Cut Vol (CF)	137.088
Cum Fill Vol (CF)	17.9
Net Vol (CF)	119.2



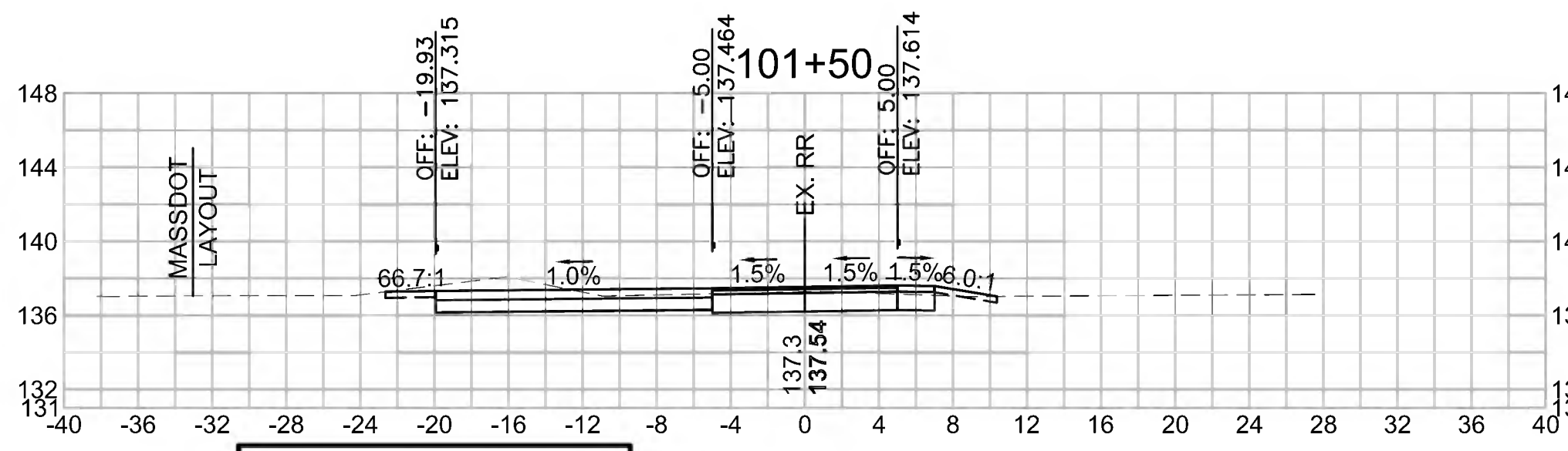
**Total Volume at Station 105+00.00**

Cut Area (SF)	37.599
Fill Area (SF)	0.000
Cut Vol (CF)	64.912
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	270.355
Cum Fill Vol (CF)	20.5
Net Vol (CF)	249.9



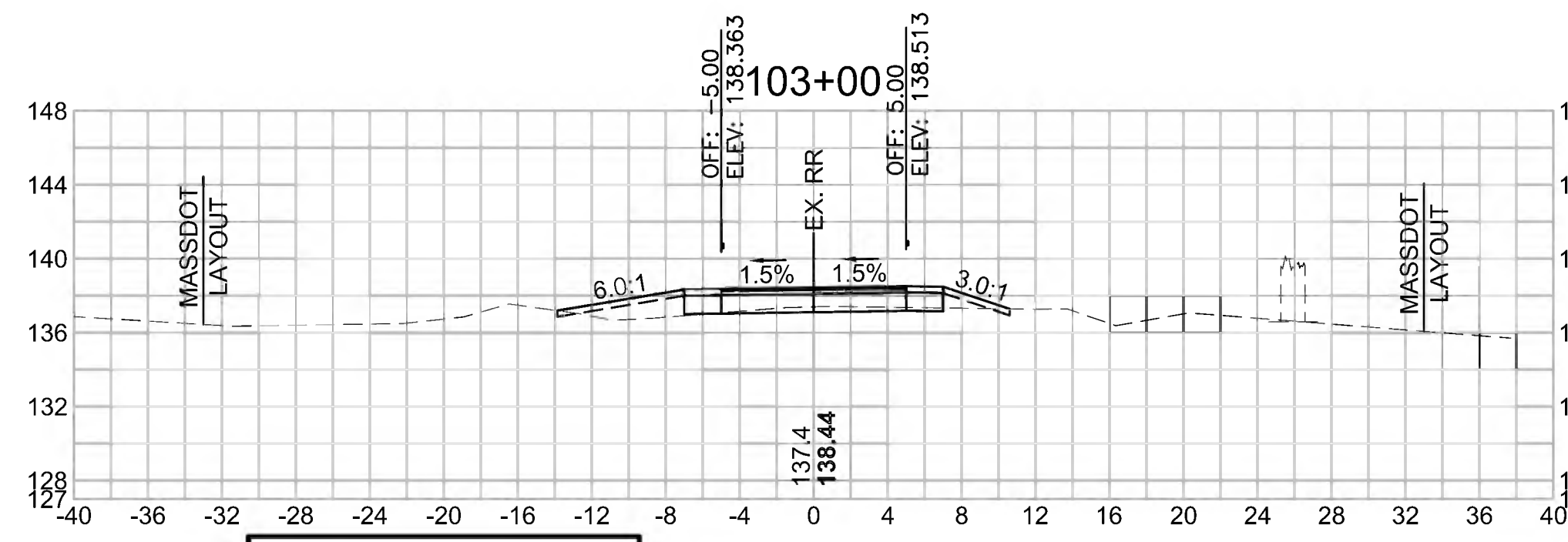
**Total Volume at Station 101+50.00**

Cut Area (SF)	30.547
Fill Area (SF)	0.131
Cut Vol (CF)	46.057
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	63.828
Cum Fill Vol (CF)	0.1
Net Vol (CF)	63.7



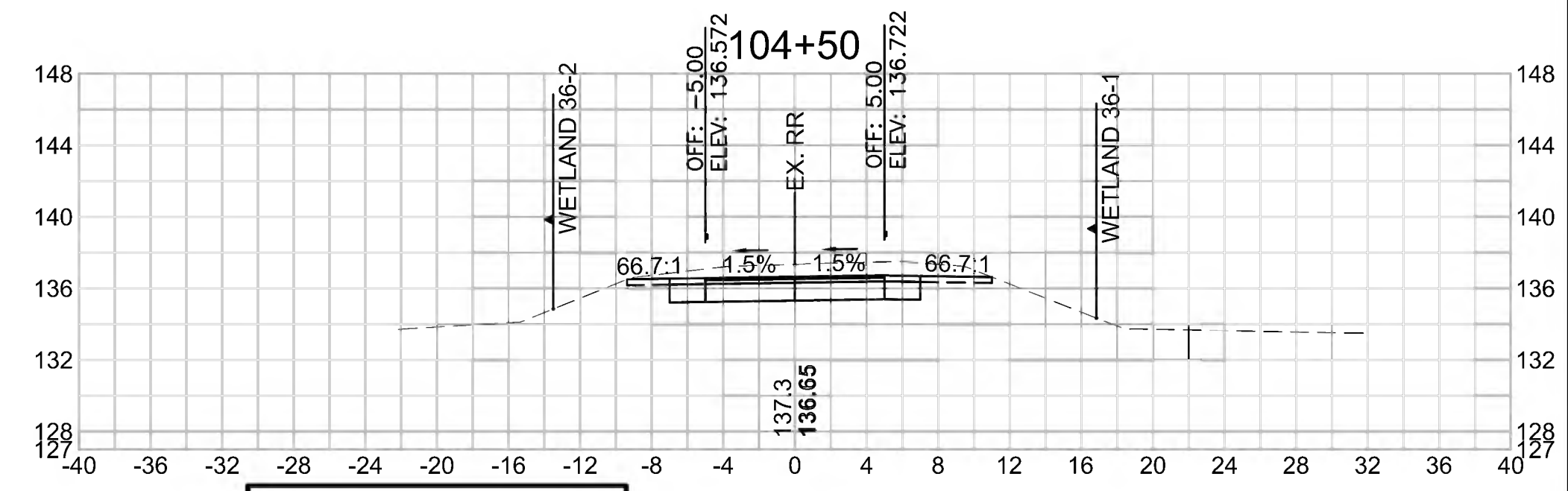
**Total Volume at Station 103+00.00**

Cut Area (SF)	2.951
Fill Area (SF)	5.186
Cut Vol (CF)	8.405
Fill Vol (CF)	8.1
Cum Cut Vol (CF)	123.759
Cum Fill Vol (CF)	12.2
Net Vol (CF)	111.5



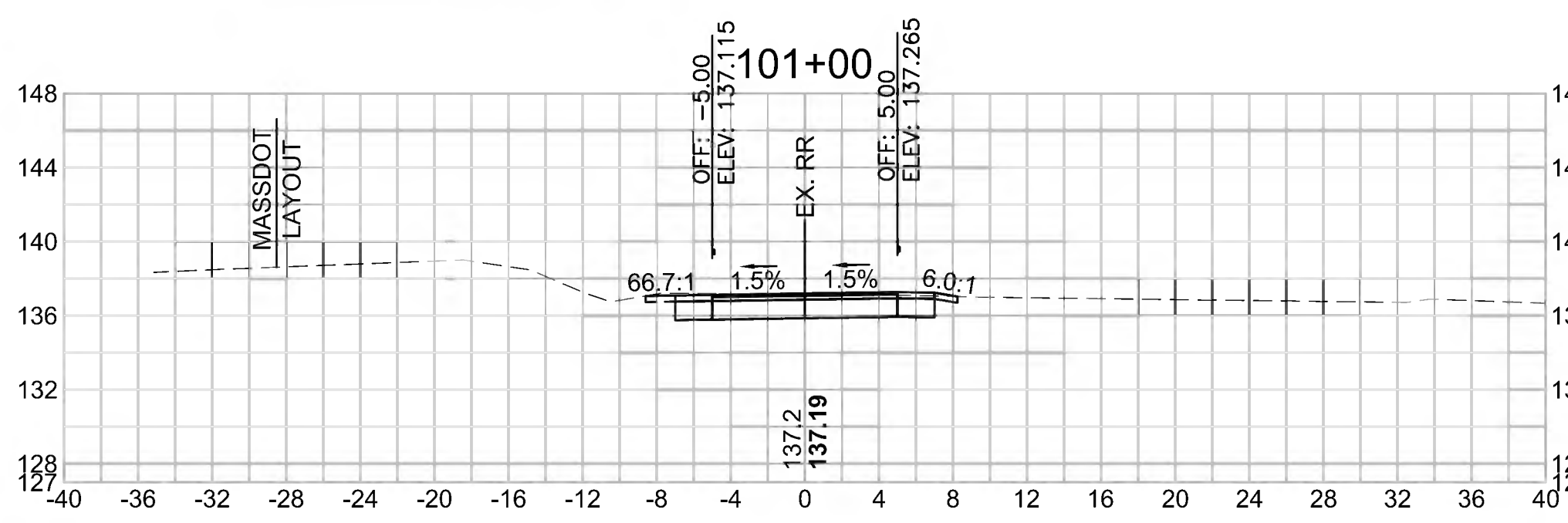
**Total Volume at Station 104+50.00**

Cut Area (SF)	32.506
Fill Area (SF)	0.000
Cut Vol (CF)	43.929
Fill Vol (CF)	0.8
Cum Cut Vol (CF)	205.443
Cum Fill Vol (CF)	20.5
Net Vol (CF)	185.0



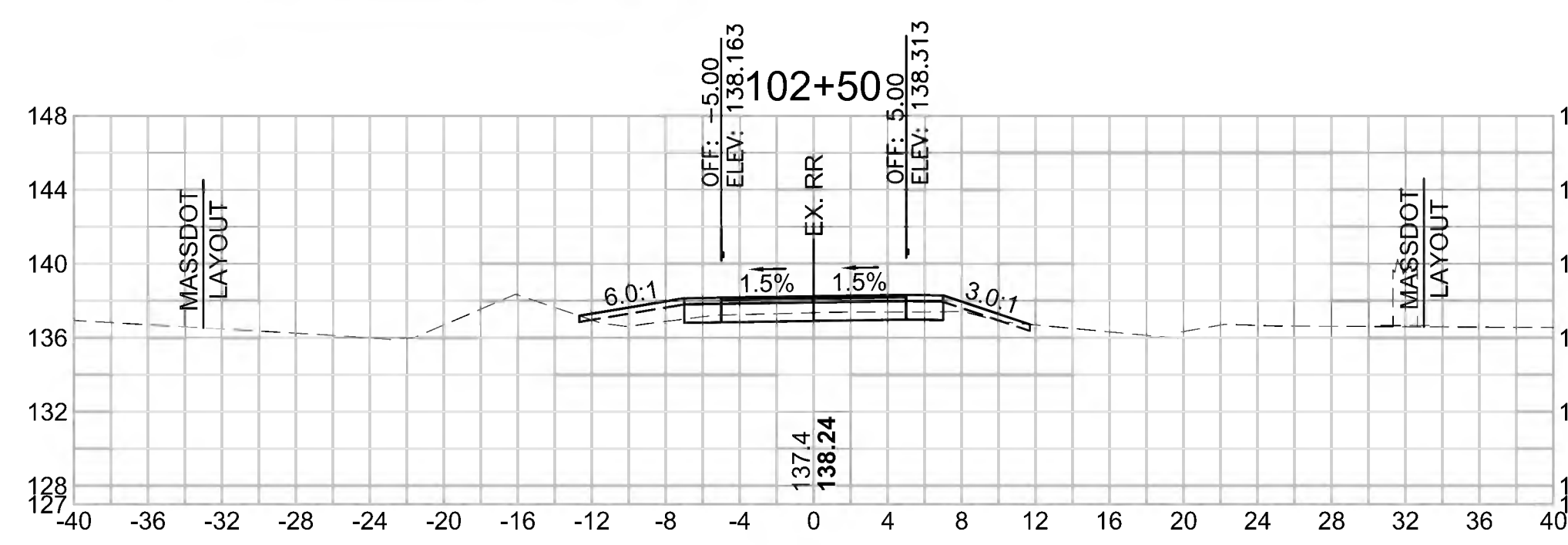
**Total Volume at Station 101+00.00**

Cut Area (SF)	19.193
Fill Area (SF)	0.000
Cut Vol (CF)	17.772
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	17.771
Cum Fill Vol (CF)	0.0
Net Vol (CF)	17.8



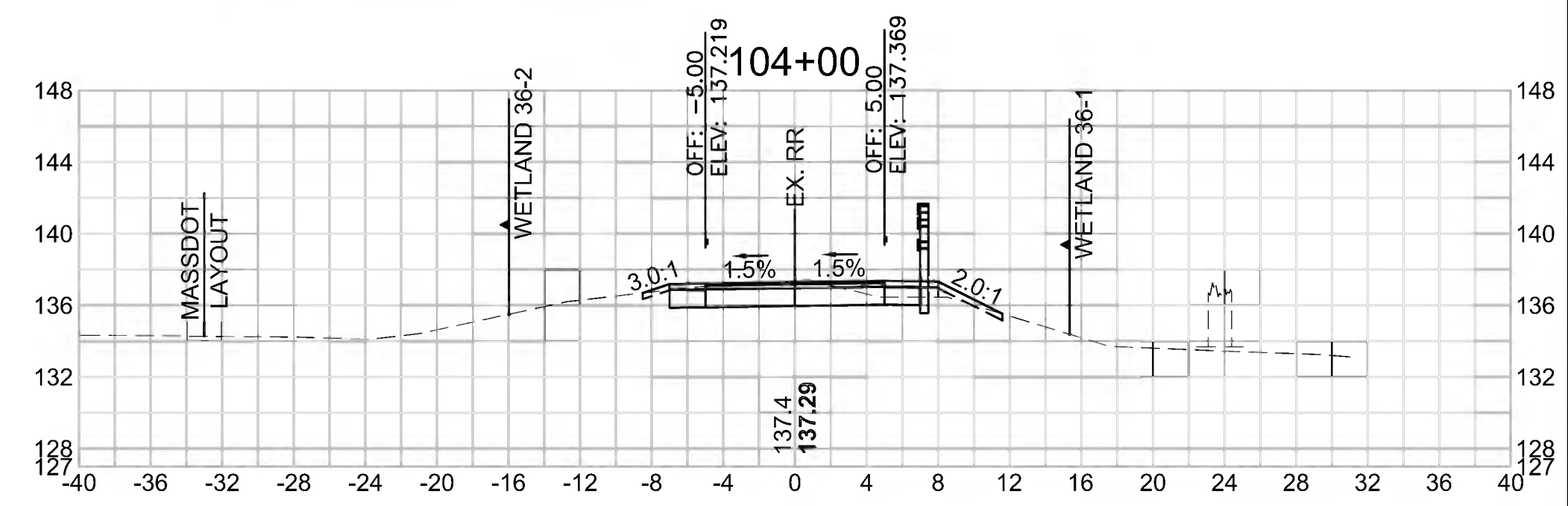
**Total Volume at Station 102+50.00**

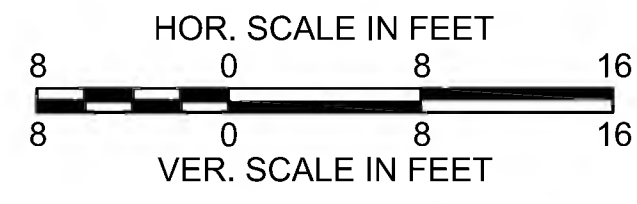
Cut Area (SF)	6.126
Fill Area (SF)	3.521
Cut Vol (CF)	14.458
Fill Vol (CF)	3.6
Cum Cut Vol (CF)	115.355
Cum Fill Vol (CF)	4.2
Net Vol (CF)	111.2



**Total Volume at Station 104+00.00**

Cut Area (SF)	14.937
Fill Area (SF)	0.878
Cut Vol (CF)	24.428
Fill Vol (CF)	1.7
Cum Cut Vol (CF)	161.515
Cum Fill Vol (CF)	19.7
Net Vol (CF)	141.8





SUDBURY  
 BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	246	319

PROJECT FILE NO. 608164

CROSS SECTIONS

**Total Volume at Station 106+50.00**

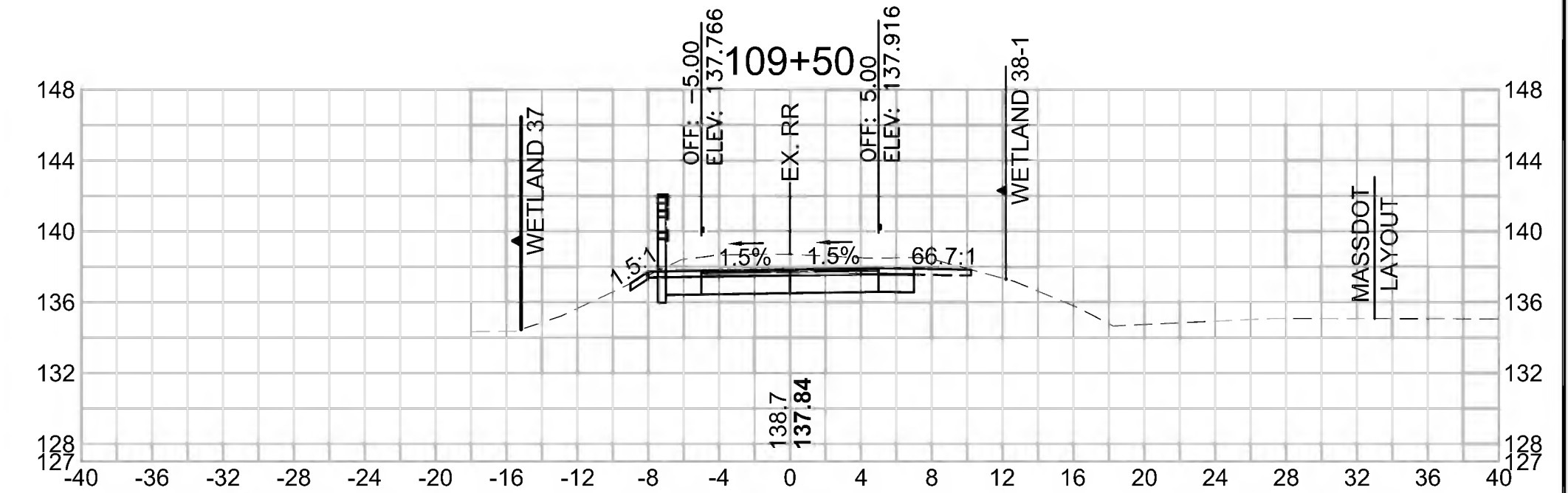
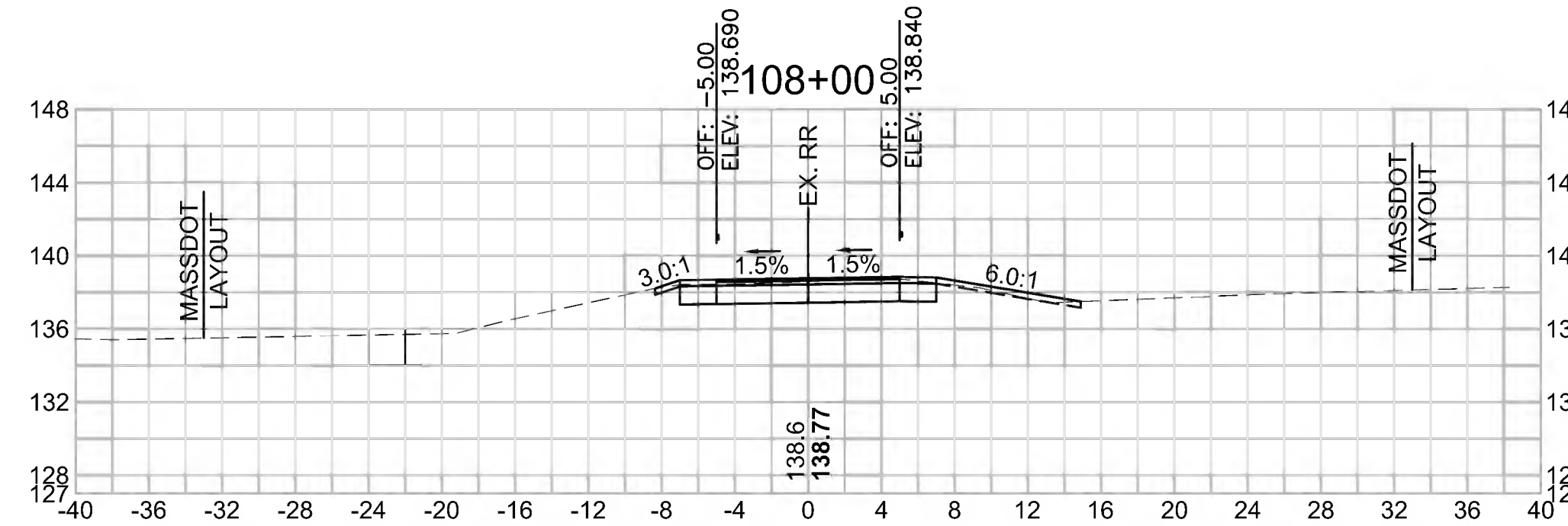
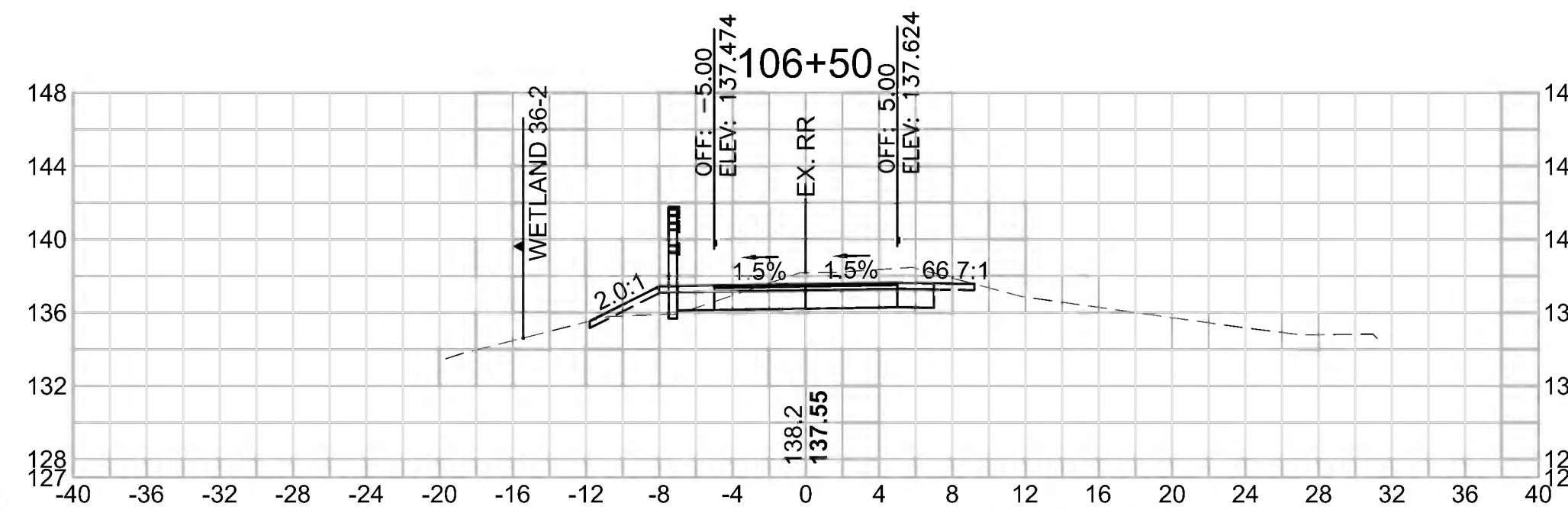
Cut Area (SF)	22.438
Fill Area (SF)	2.741
Cut Vol (CF)	49.607
Fill Vol (CF)	2.5
Cum Cut Vol (CF)	454.076
Cum Fill Vol (CF)	23.0
Net Vol (CF)	431.1

**Total Volume at Station 108+00.00**

Cut Area (SF)	17.189
Fill Area (SF)	0.008
Cut Vol (CF)	34.694
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	566.731
Cum Fill Vol (CF)	28.0
Net Vol (CF)	538.7

**Total Volume at Station 109+50.00**

Cut Area (SF)	31.928
Fill Area (SF)	0.000
Cut Vol (CF)	46.306
Fill Vol (CF)	1.0
Cum Cut Vol (CF)	696.427
Cum Fill Vol (CF)	30.0
Net Vol (CF)	666.4



**Total Volume at Station 106+00.00**

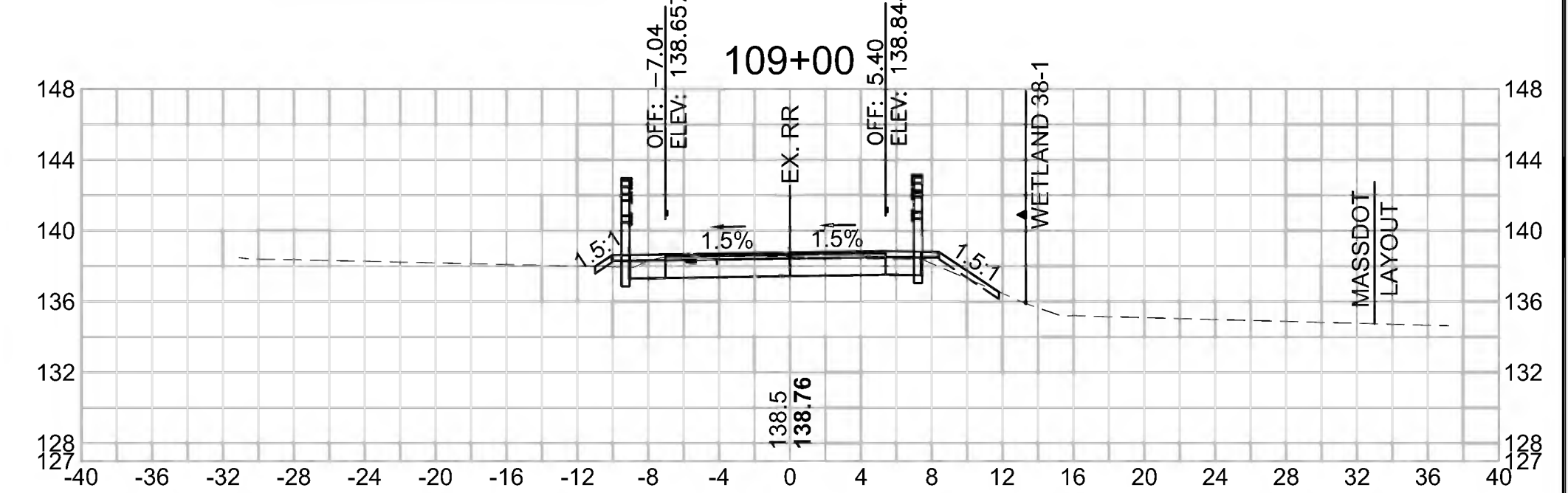
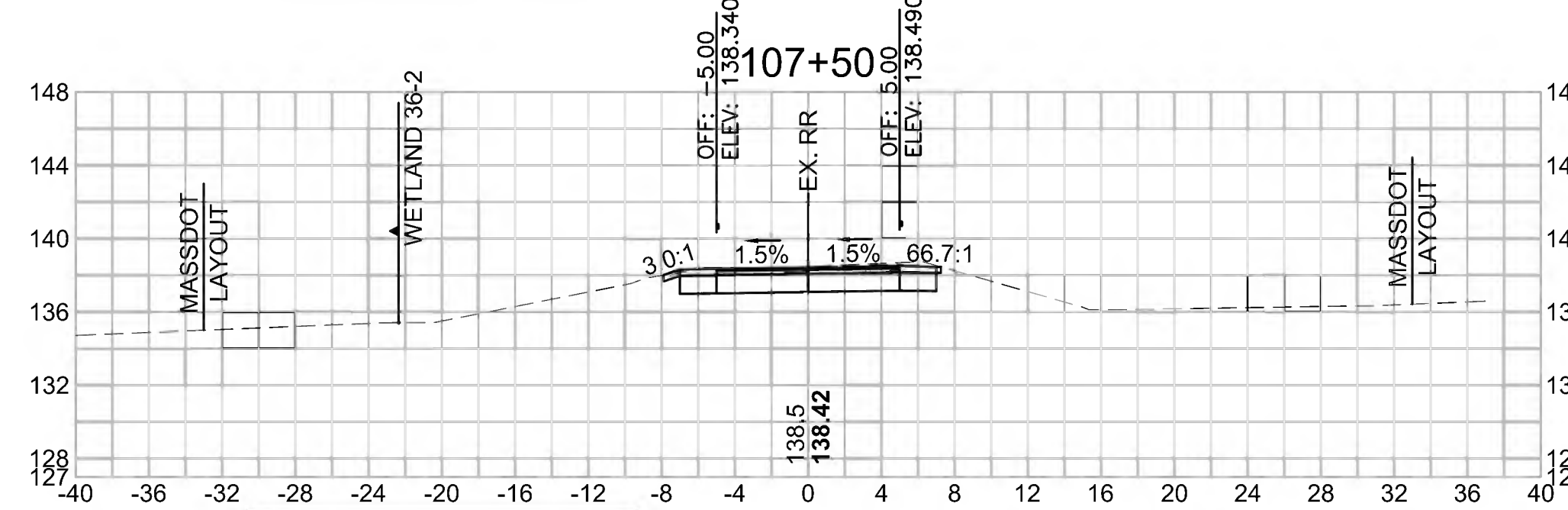
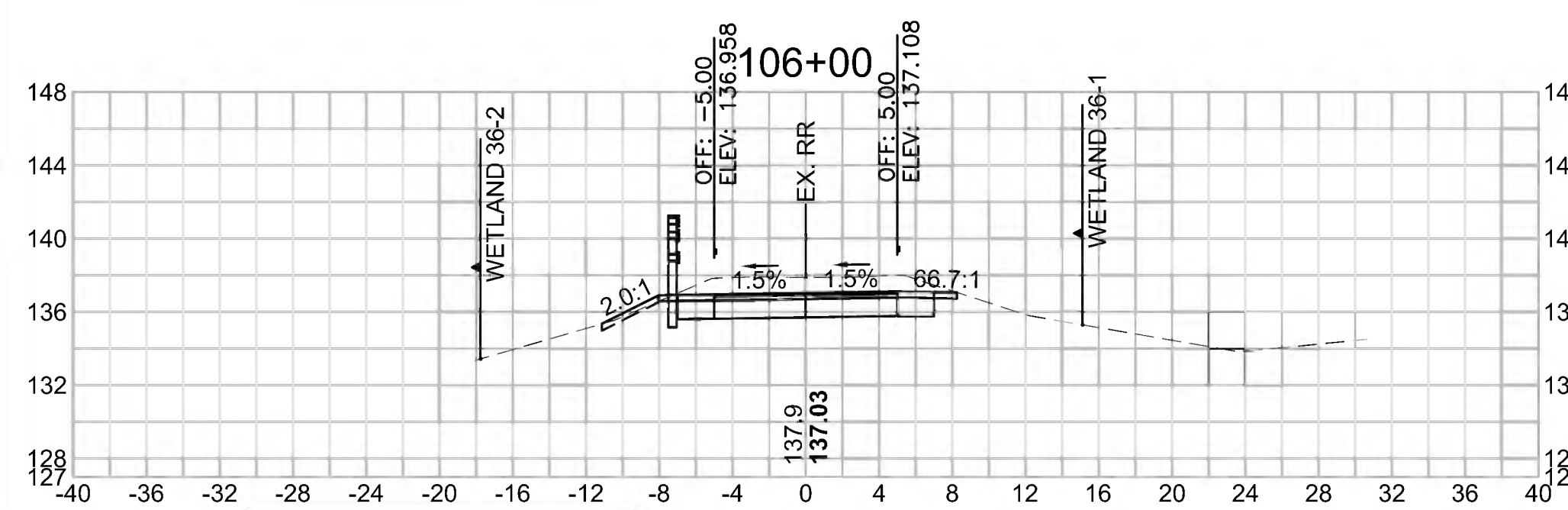
Cut Area (SF)	31.138
Fill Area (SF)	0.000
Cut Vol (CF)	64.066
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	404.469
Cum Fill Vol (CF)	20.5
Net Vol (CF)	384.0

**Total Volume at Station 107+50.00**

Cut Area (SF)	20.280
Fill Area (SF)	0.000
Cut Vol (CF)	37.982
Fill Vol (CF)	1.2
Cum Cut Vol (CF)	532.037
Cum Fill Vol (CF)	28.0
Net Vol (CF)	504.0

**Total Volume at Station 109+00.00**

Cut Area (SF)	18.081
Fill Area (SF)	1.072
Cut Vol (CF)	42.109
Fill Vol (CF)	1.0
Cum Cut Vol (CF)	650.122
Cum Fill Vol (CF)	29.0
Net Vol (CF)	621.1



**Total Volume at Station 105+50.00**

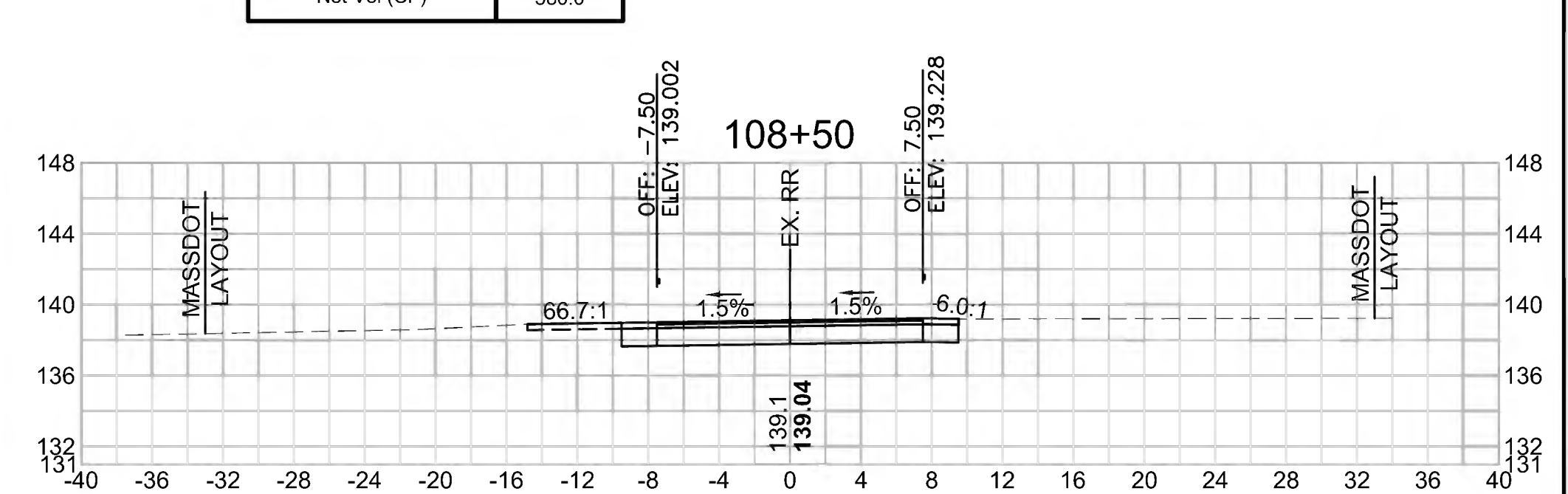
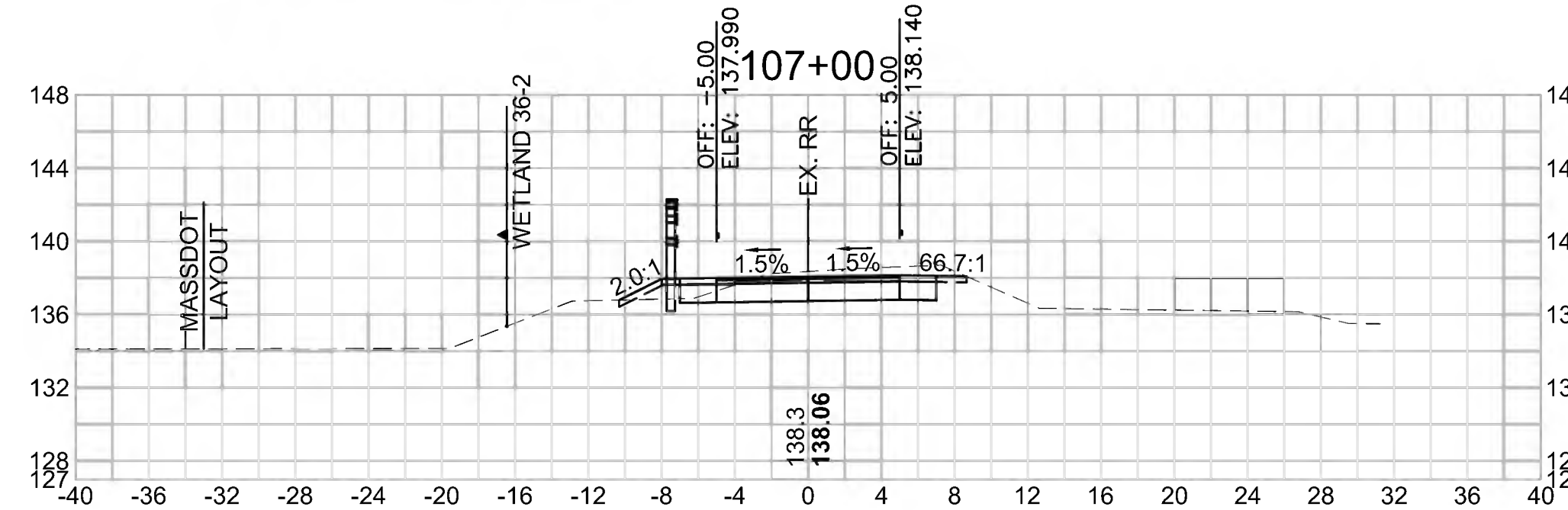
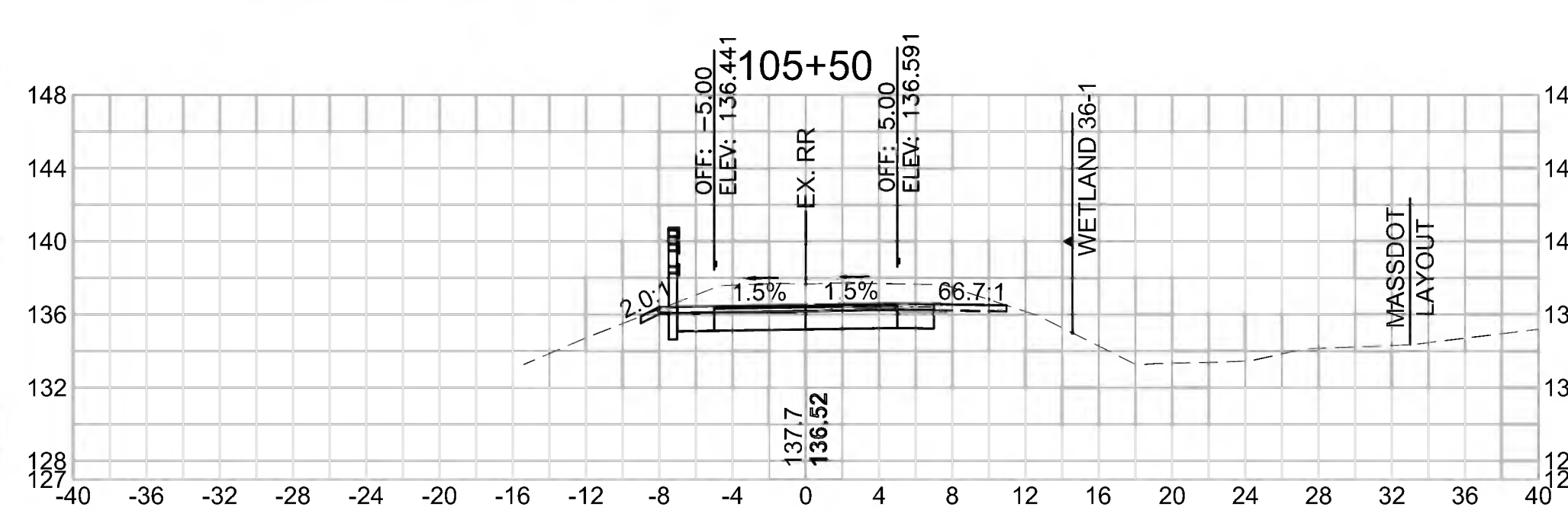
Cut Area (SF)	38.054
Fill Area (SF)	0.000
Cut Vol (CF)	70.049
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	340.403
Cum Fill Vol (CF)	20.5
Net Vol (CF)	319.9

**Total Volume at Station 107+00.00**

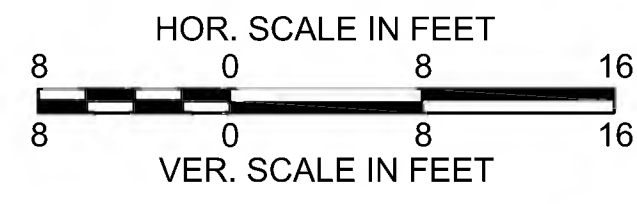
Cut Area (SF)	20.740
Fill Area (SF)	1.333
Cut Vol (CF)	39.980
Fill Vol (CF)	3.8
Cum Cut Vol (CF)	494.056
Cum Fill Vol (CF)	26.8
Net Vol (CF)	467.3

**Total Volume at Station 108+50.00**

Cut Area (SF)	27.396
Fill Area (SF)	0.000
Cut Vol (CF)	41.283
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	608.014
Cum Fill Vol (CF)	28.0
Net Vol (CF)	580.0







SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	247	319
PROJECT FILE NO. 608164			

CROSS SECTIONS

**Total Volume at Station 111+00.00**

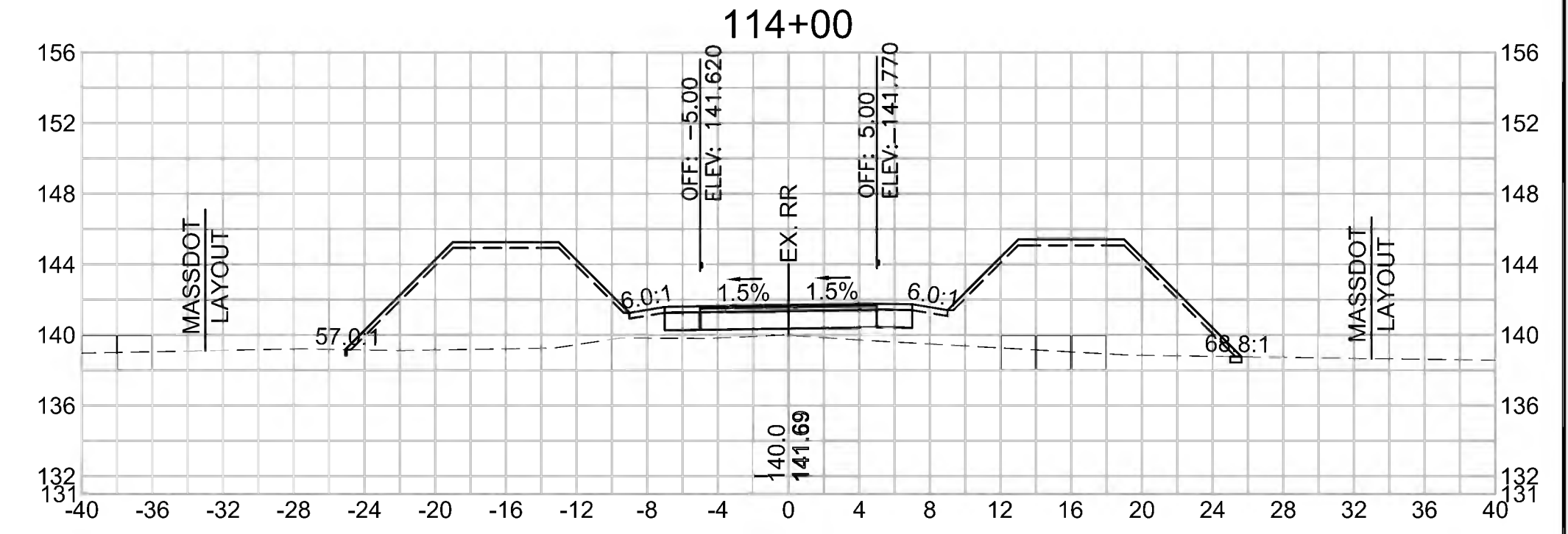
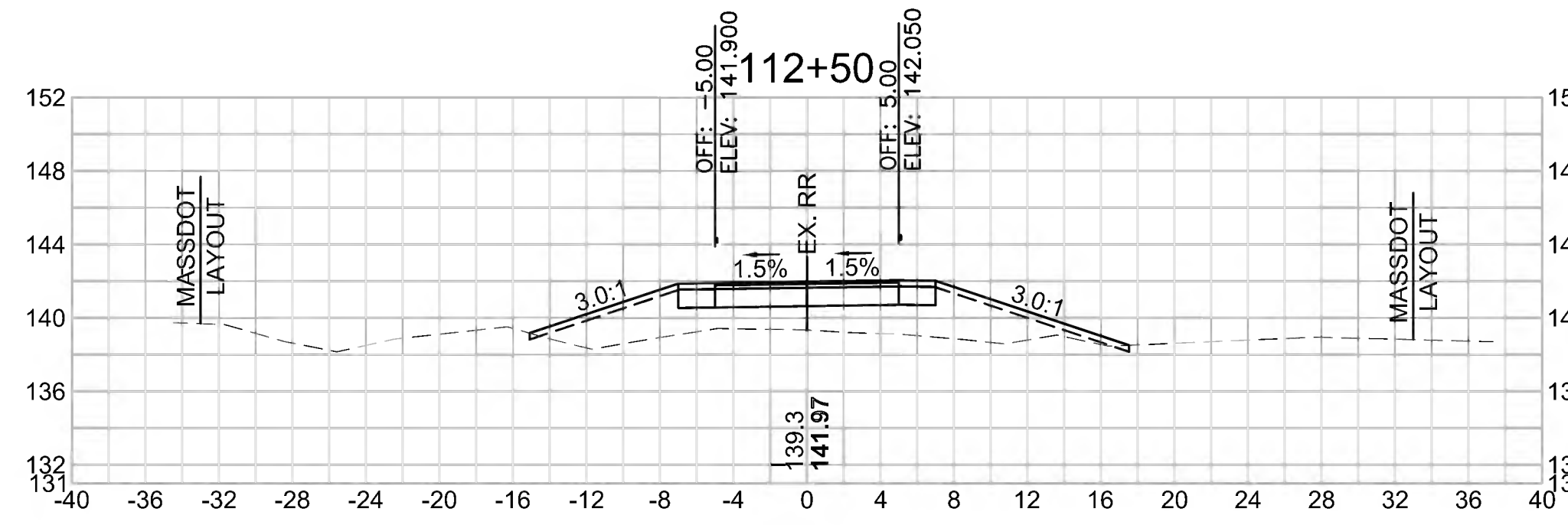
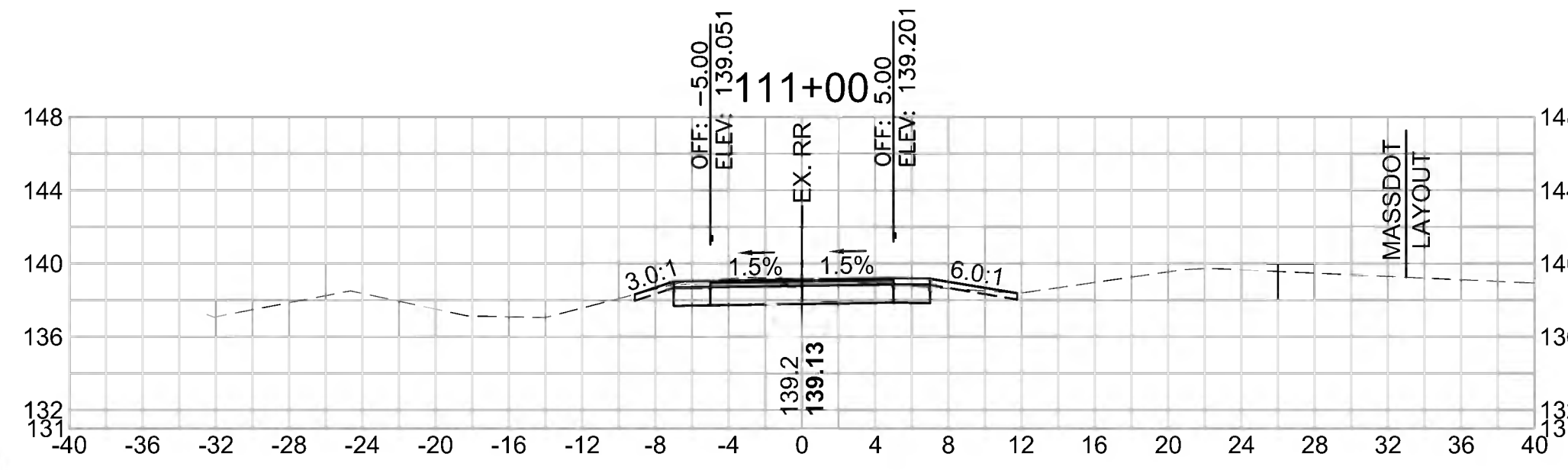
Cut Area (SF)	18.055
Fill Area (SF)	0.000
Cut Vol (CF)	40.035
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	848.287
Cum Fill Vol (CF)	30.0
Net Vol (CF)	818.3

**Total Volume at Station 112+50.00**

Cut Area (SF)	0.390
Fill Area (SF)	43.694
Cut Vol (CF)	0.714
Fill Vol (CF)	63.5
Cum Cut Vol (CF)	874.526
Cum Fill Vol (CF)	130.0
Net Vol (CF)	744.6

**Total Volume at Station 114+00.00**

Cut Area (SF)	0.282
Fill Area (SF)	148.843
Cut Vol (CF)	0.599
Fill Vol (CF)	160.4
Cum Cut Vol (CF)	876.451
Cum Fill Vol (CF)	436.6
Net Vol (CF)	439.8



**Total Volume at Station 110+50.00**

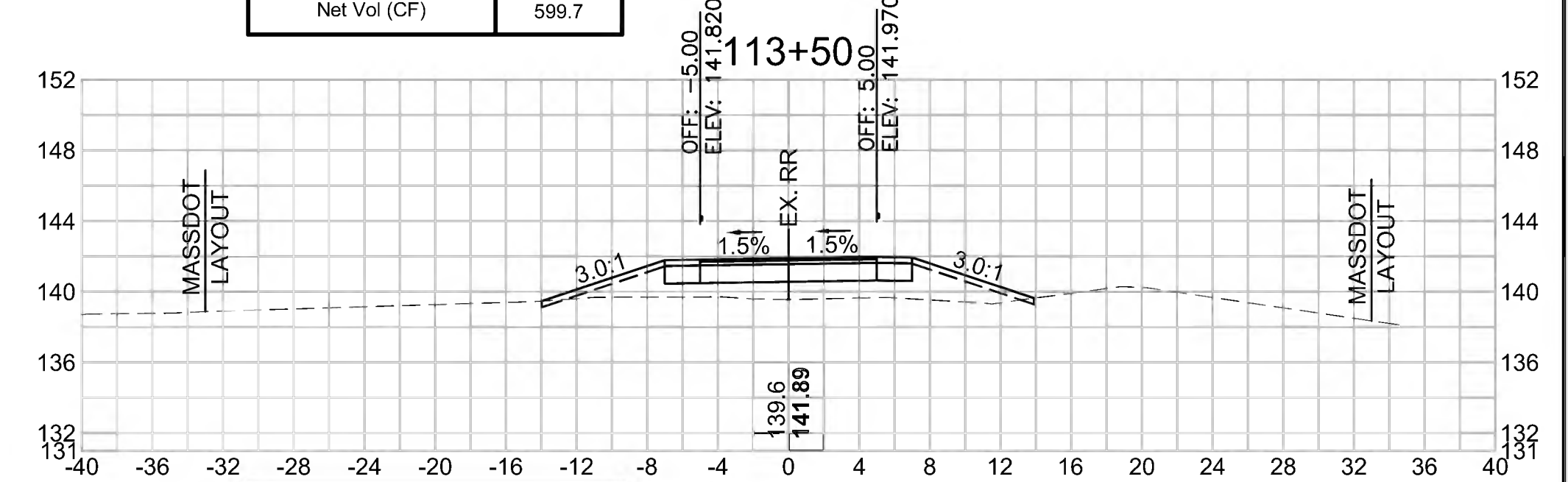
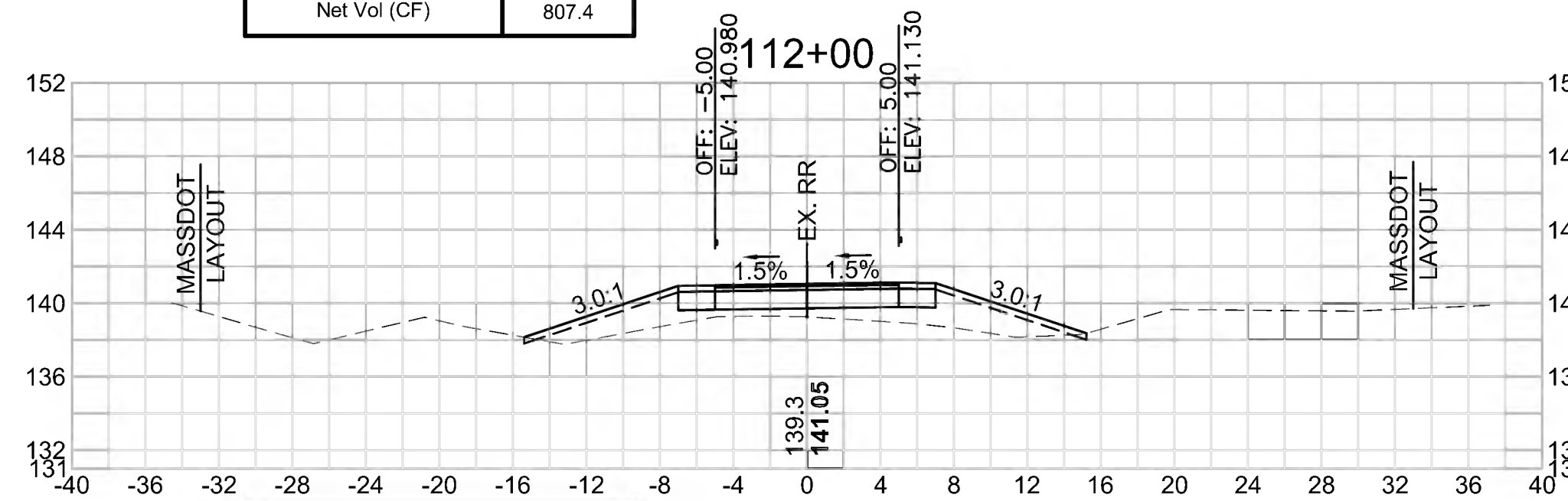
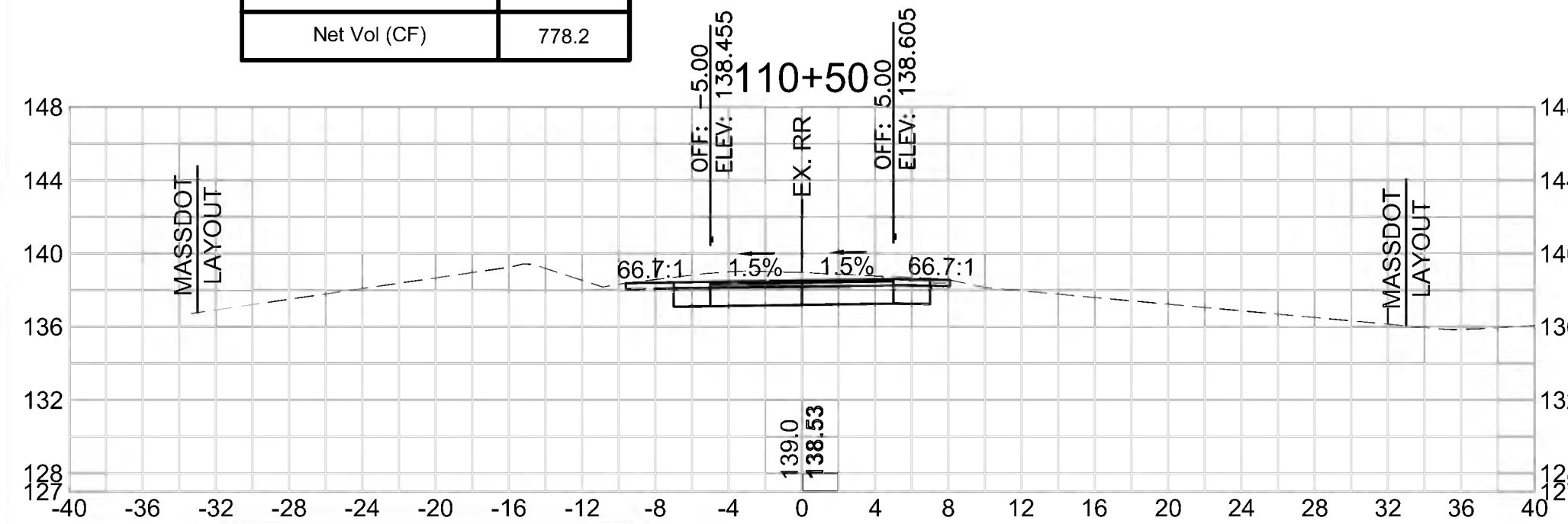
Cut Area (SF)	25.183
Fill Area (SF)	0.000
Cut Vol (CF)	52.790
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	808.252
Cum Fill Vol (CF)	30.0
Net Vol (CF)	778.2

**Total Volume at Station 112+00.00**

Cut Area (SF)	0.381
Fill Area (SF)	24.924
Cut Vol (CF)	4.581
Fill Vol (CF)	29.7
Cum Cut Vol (CF)	873.812
Cum Fill Vol (CF)	66.4
Net Vol (CF)	807.4

**Total Volume at Station 113+50.00**

Cut Area (SF)	0.364
Fill Area (SF)	24.397
Cut Vol (CF)	0.652
Fill Vol (CF)	64.2
Cum Cut Vol (CF)	875.853
Cum Fill Vol (CF)	276.2
Net Vol (CF)	599.7



**Total Volume at Station 110+00.00**

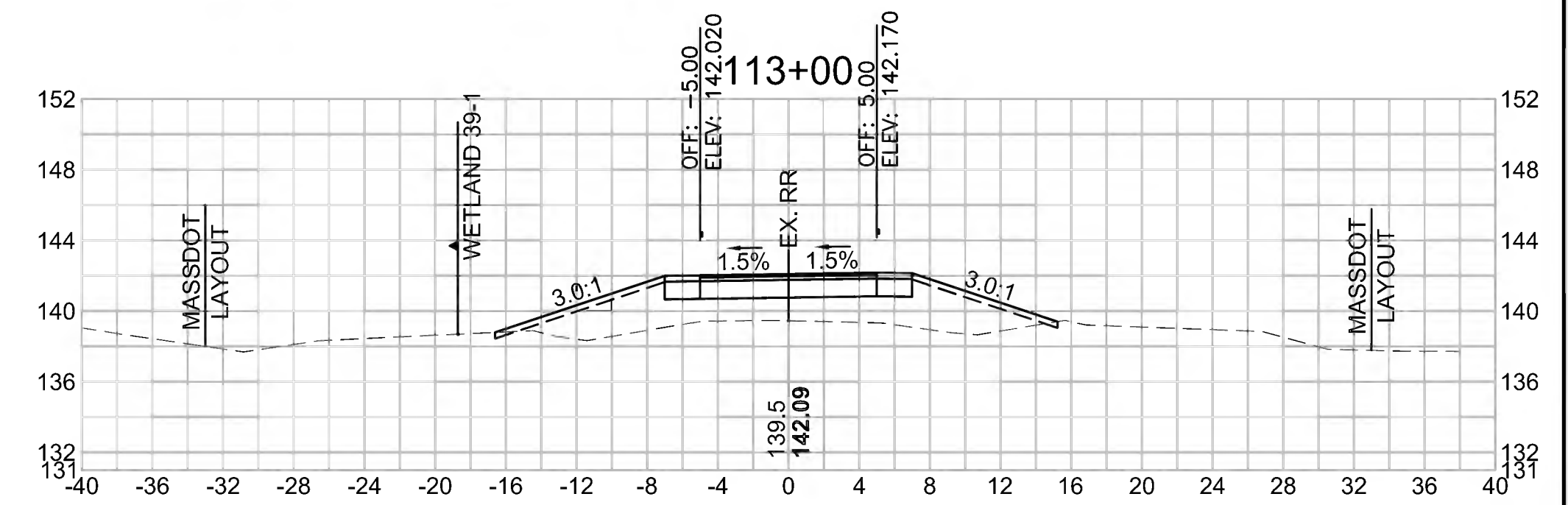
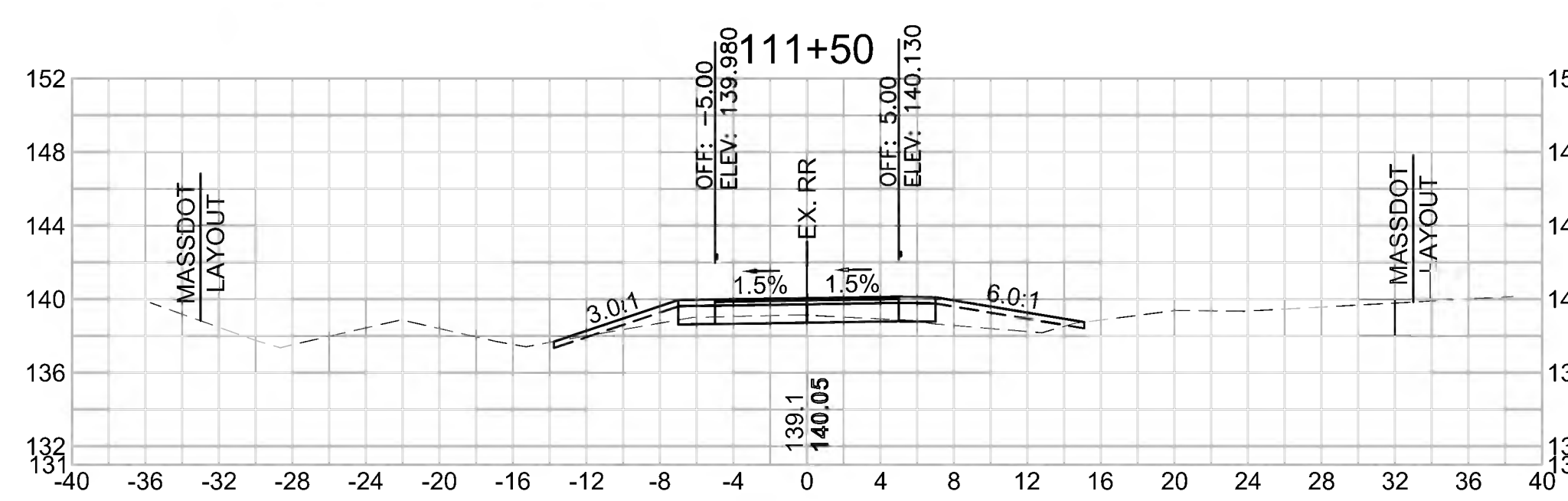
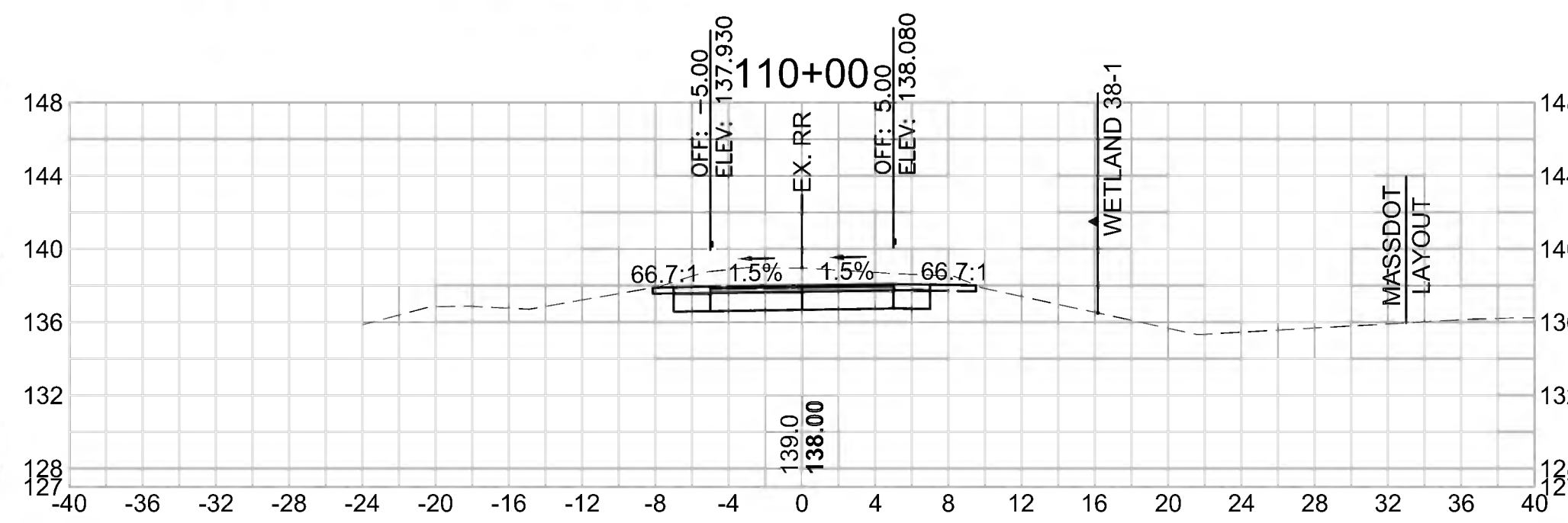
Cut Area (SF)	31.830
Fill Area (SF)	0.000
Cut Vol (CF)	59.036
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	755.462
Cum Fill Vol (CF)	30.0
Net Vol (CF)	725.4

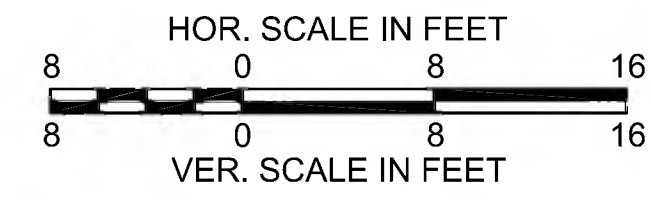
**Total Volume at Station 111+50.00**

Cut Area (SF)	4.565
Fill Area (SF)	7.194
Cut Vol (CF)	20.945
Fill Vol (CF)	6.7
Cum Cut Vol (CF)	869.232
Cum Fill Vol (CF)	36.7
Net Vol (CF)	832.5

**Total Volume at Station 113+00.00**

Cut Area (SF)	0.340
Fill Area (SF)	44.923
Cut Vol (CF)	0.676
Fill Vol (CF)	82.1
Cum Cut Vol (CF)	875.201
Cum Fill Vol (CF)	212.0
Net Vol (CF)	663.2





**SUDBURY  
BRUCE FREEMAN RAIL TRAIL**

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**CROSS SECTIONS**

**Total Volume at Station 115+50.00**

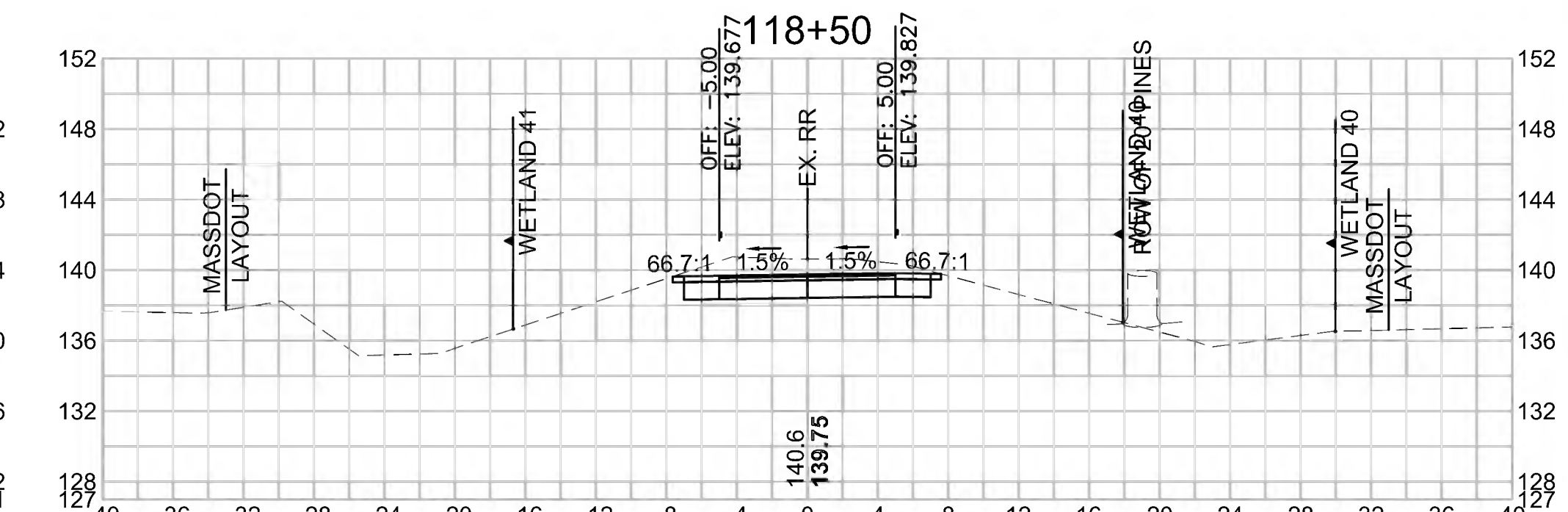
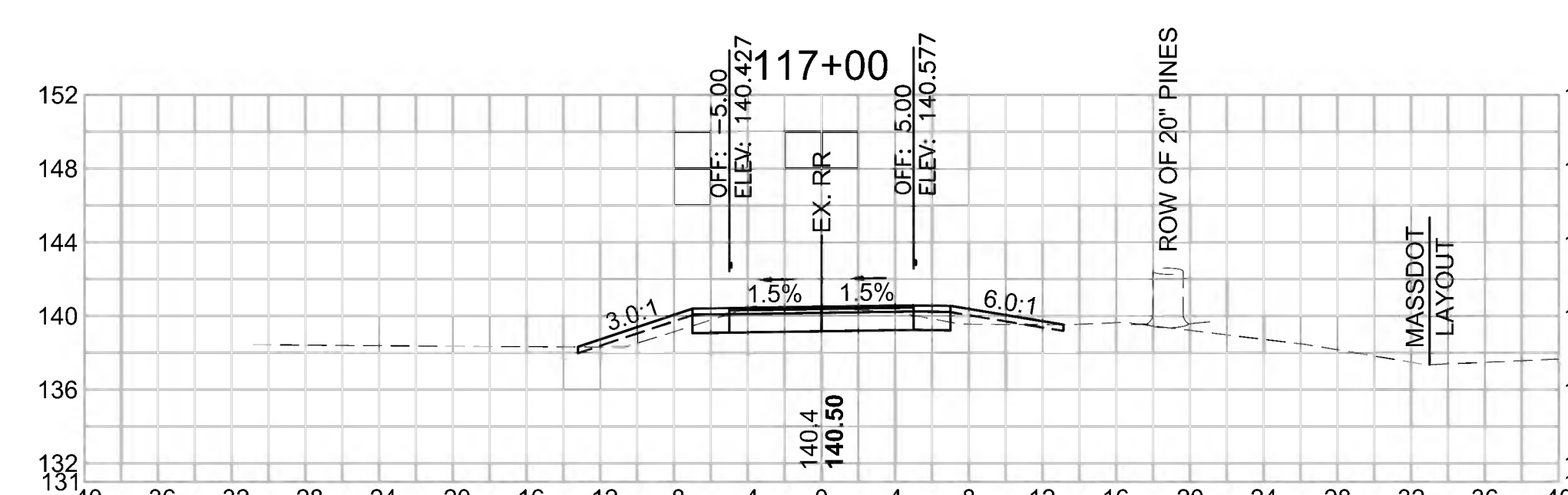
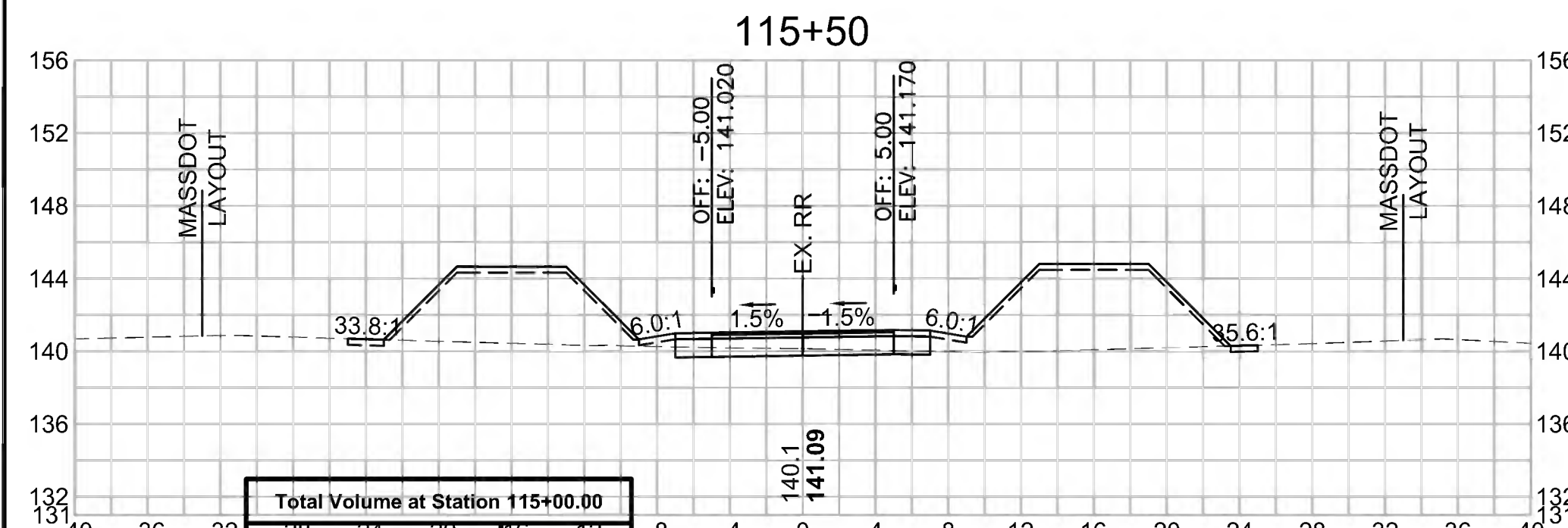
Cut Area (SF)	6.410
Fill Area (SF)	62.442
Cut Vol (CF)	6.873
Fill Vol (CF)	157.1
Cum Cut Vol (CF)	885.341
Cum Fill Vol (CF)	1072.8
Net Vol (CF)	-187.5

**Total Volume at Station 117+00.00**

Cut Area (SF)	14.901
Fill Area (SF)	3.704
Cut Vol (CF)	28.320
Fill Vol (CF)	3.6
Cum Cut Vol (CF)	969.531
Cum Fill Vol (CF)	1134.5
Net Vol (CF)	-165.0

**Total Volume at Station 118+50.00**

Cut Area (SF)	29.627
Fill Area (SF)	0.000
Cut Vol (CF)	50.928
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	1093.257
Cum Fill Vol (CF)	1139.9
Net Vol (CF)	-46.6



**Total Volume at Station 115+00.00**

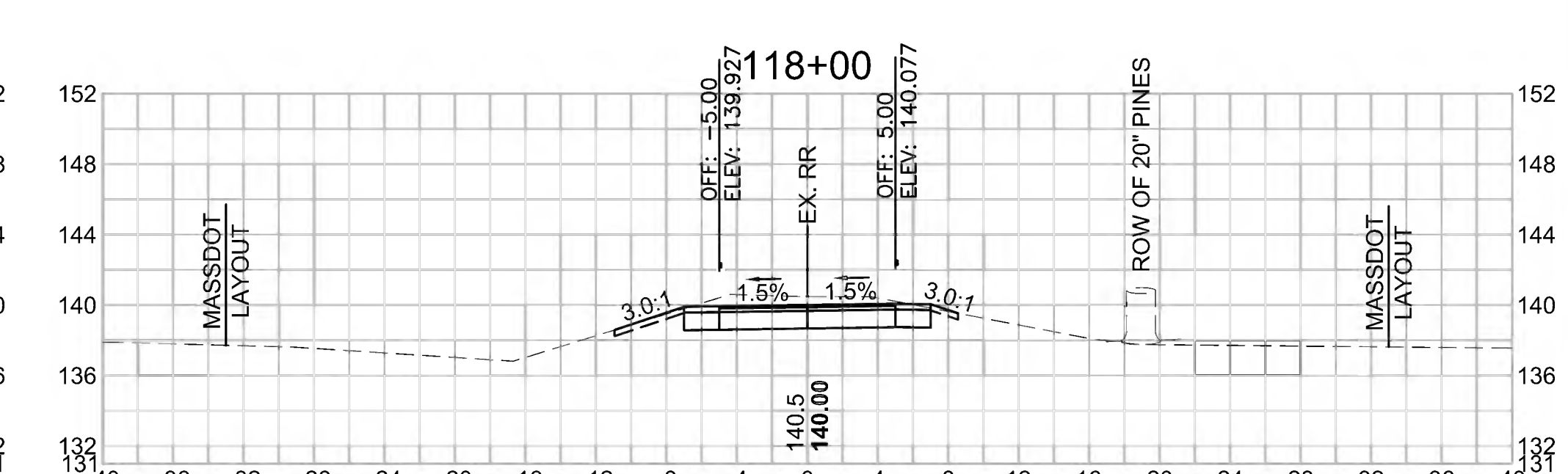
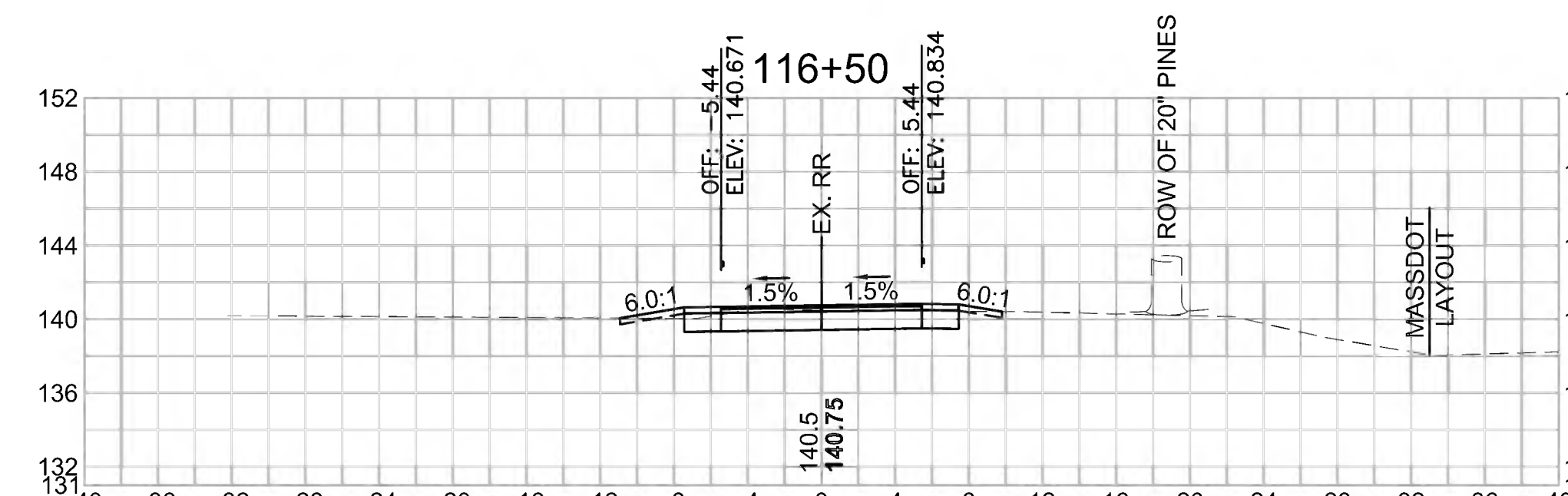
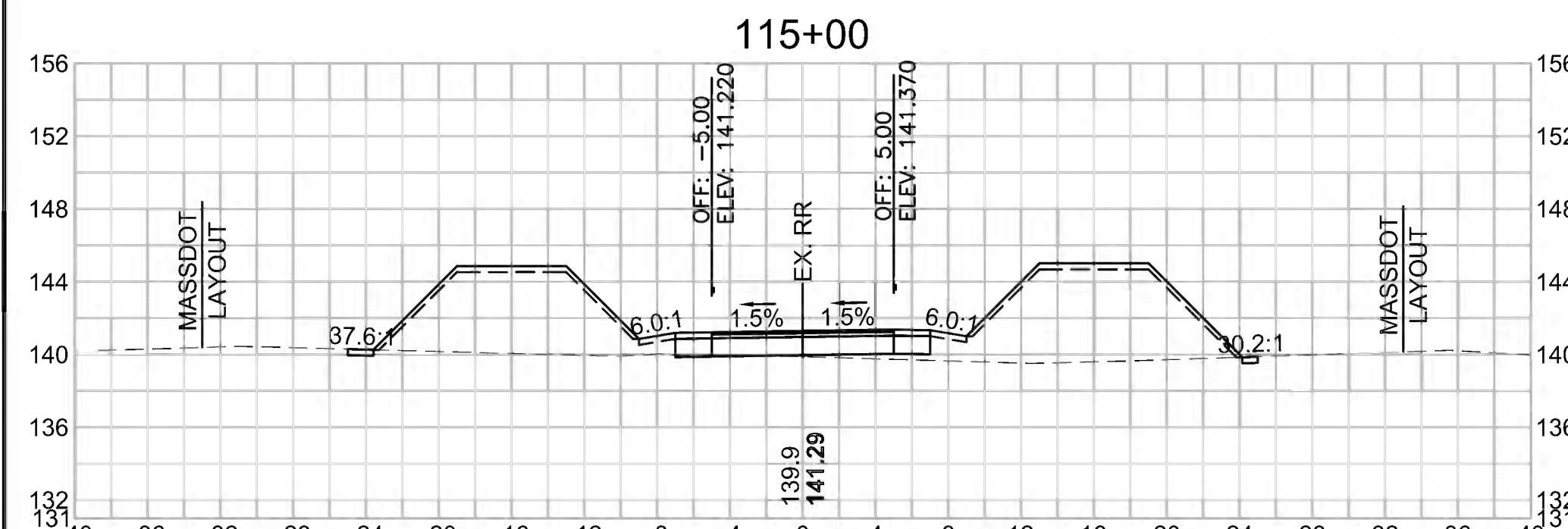
Cut Area (SF)	1.012
Fill Area (SF)	107.174
Cut Vol (CF)	1.347
Fill Vol (CF)	220.3
Cum Cut Vol (CF)	878.468
Cum Fill Vol (CF)	915.8
Net Vol (CF)	-37.3

**Total Volume at Station 116+50.00**

Cut Area (SF)	15.685
Fill Area (SF)	0.226
Cut Vol (CF)	32.229
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	941.211
Cum Fill Vol (CF)	1130.9
Net Vol (CF)	-189.6

**Total Volume at Station 118+00.00**

Cut Area (SF)	25.374
Fill Area (SF)	0.000
Cut Vol (CF)	41.248
Fill Vol (CF)	1.0
Cum Cut Vol (CF)	1042.329
Cum Fill Vol (CF)	1139.9
Net Vol (CF)	-97.5



**Total Volume at Station 114+50.00**

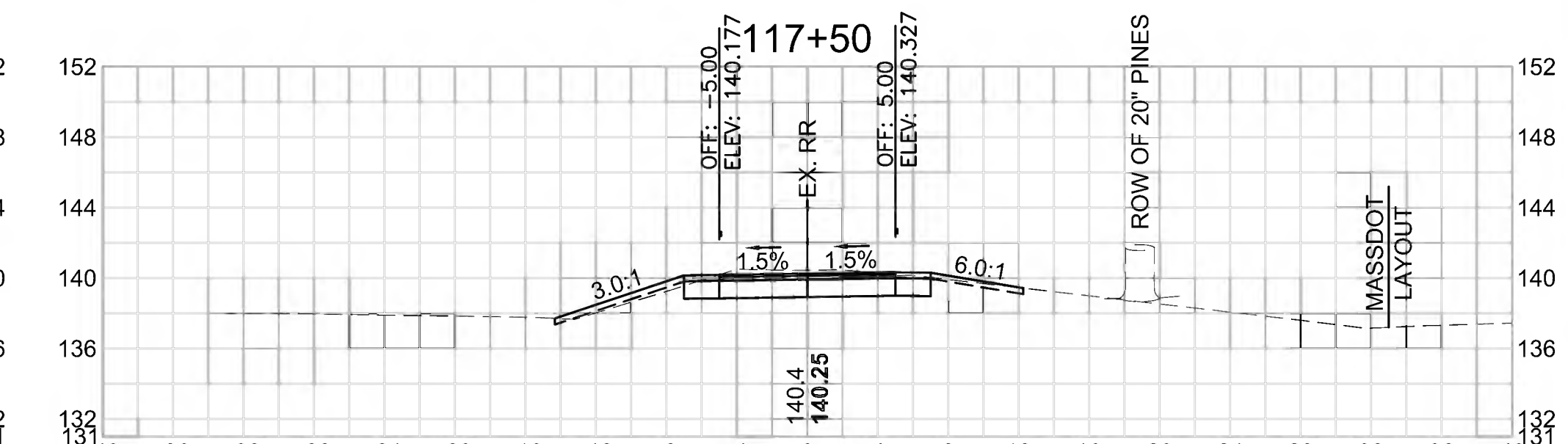
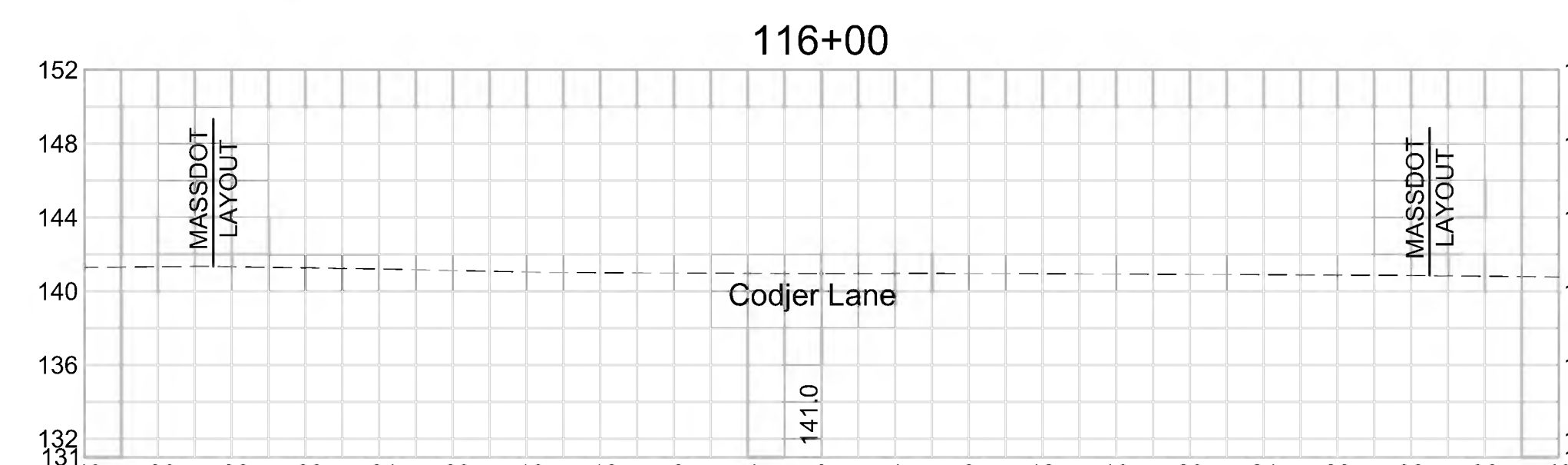
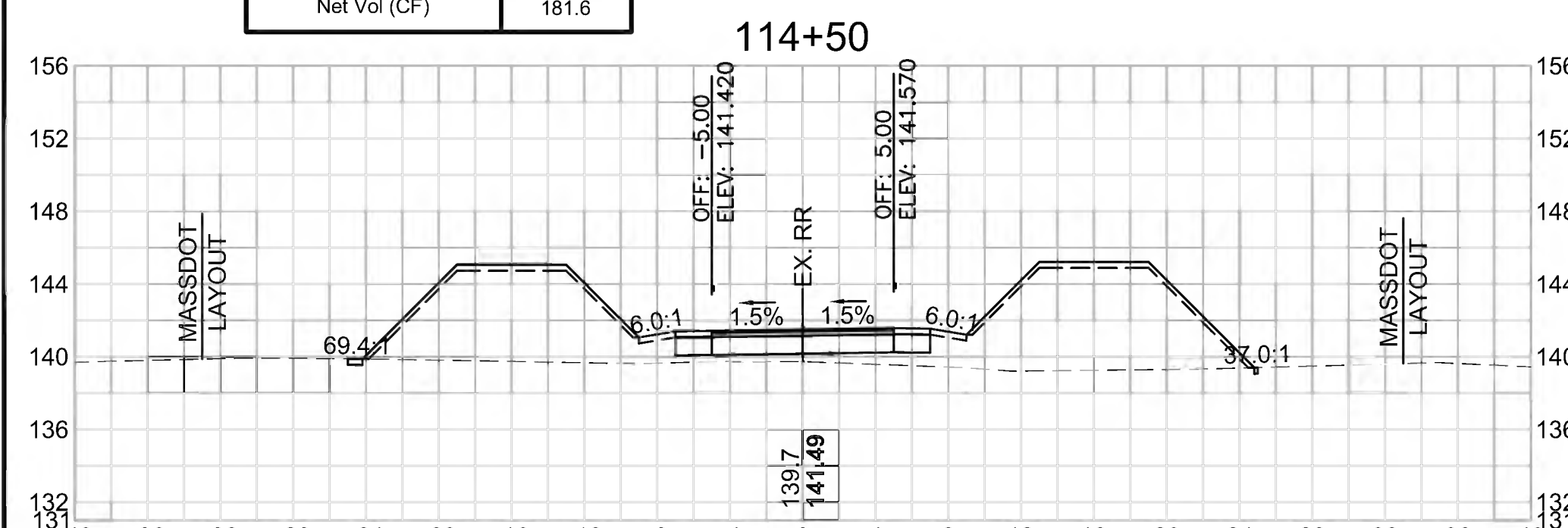
Cut Area (SF)	0.442
Fill Area (SF)	130.746
Cut Vol (CF)	0.671
Fill Vol (CF)	258.9
Cum Cut Vol (CF)	877.122
Cum Fill Vol (CF)	695.5
Net Vol (CF)	181.6

**Total Volume at Station 116+00.00**

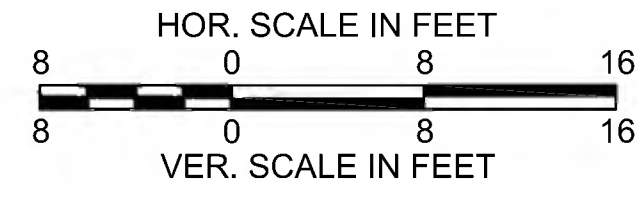
Cut Area (SF)	19.123
Fill Area (SF)	0.000
Cut Vol (CF)	23.642
Fill Vol (CF)	57.8
Cum Cut Vol (CF)	908.982
Cum Fill Vol (CF)	1130.6
Net Vol (CF)	-221.7

**Total Volume at Station 117+50.00**

Cut Area (SF)	19.174
Fill Area (SF)	1.053
Cut Vol (CF)	31.551
Fill Vol (CF)	4.4
Cum Cut Vol (CF)	1001.082
Cum Fill Vol (CF)	1138.9
Net Vol (CF)	-137.8







SUDBURY  
 BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	249	319

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CROSS SECTIONS

**Total Volume at Station 120+00.00**

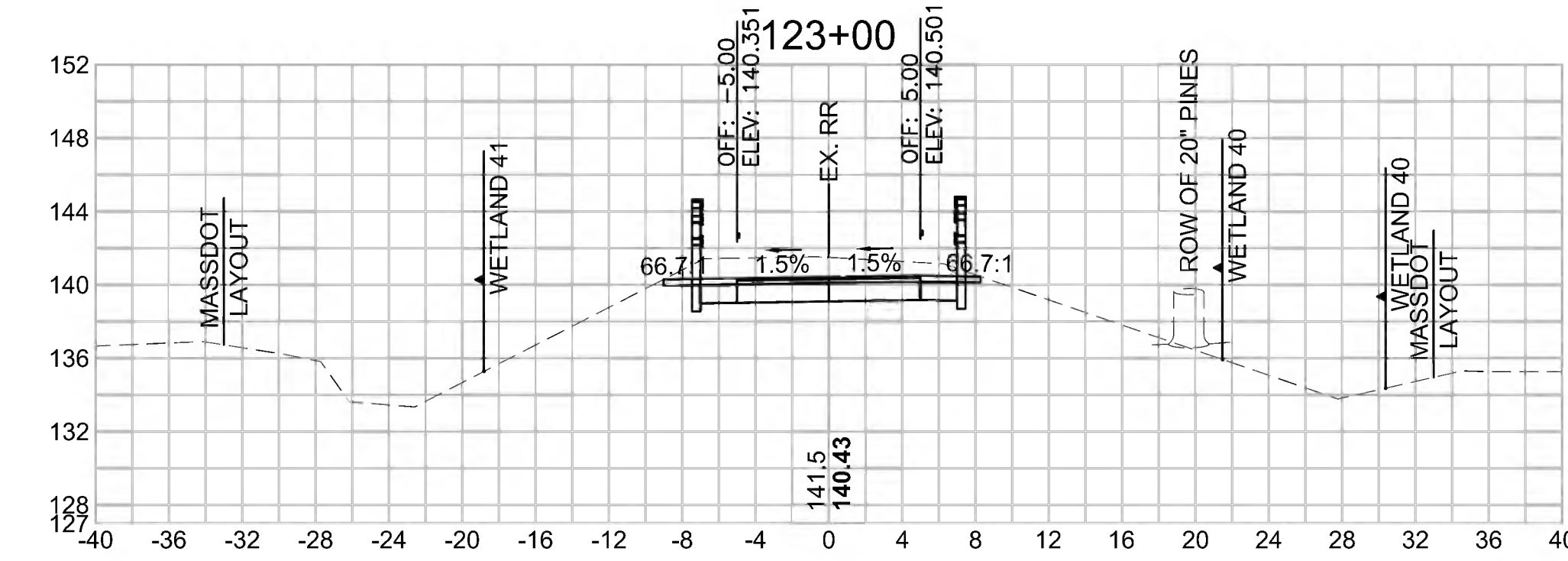
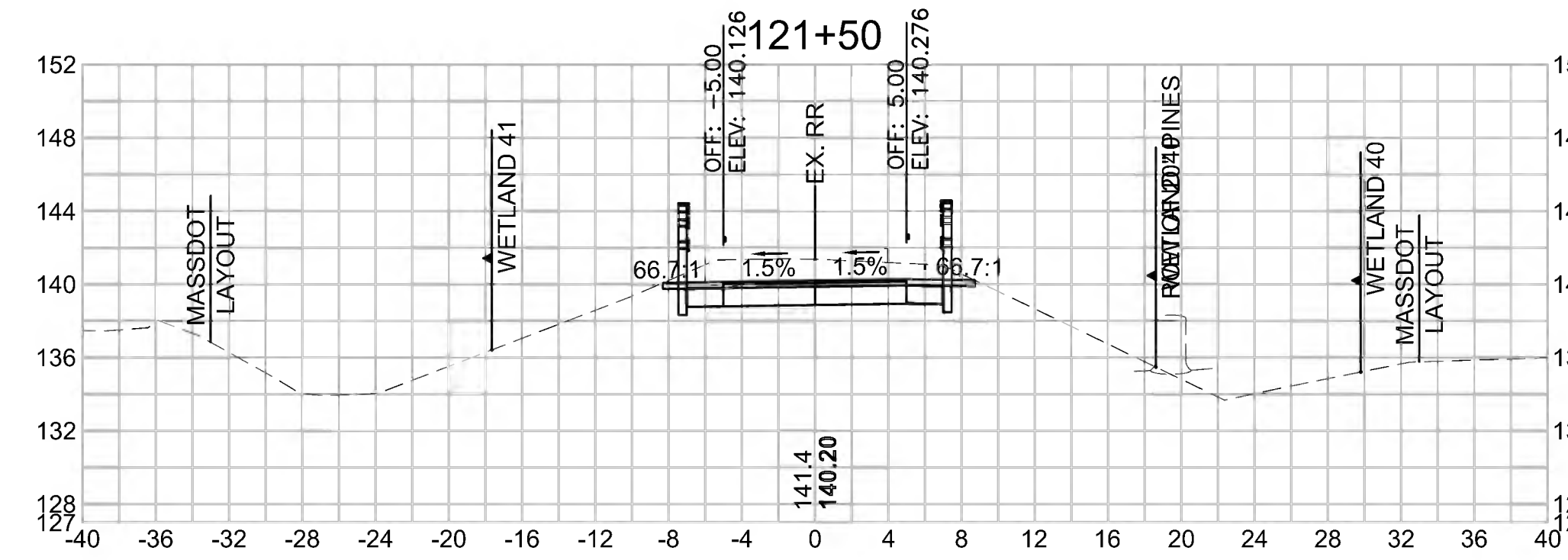
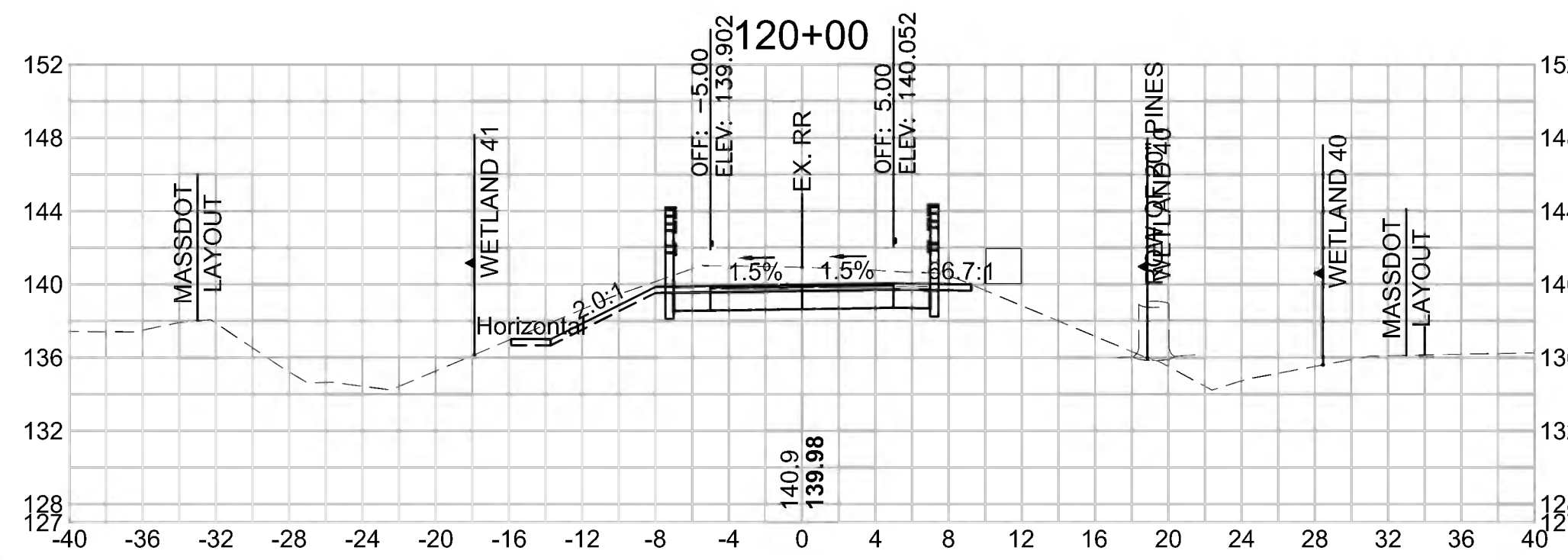
Cut Area (SF)	35.161
Fill Area (SF)	0.000
Cut Vol (CF)	63.024
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	1270.246
Cum Fill Vol (CF)	1139.9
Net Vol (CF)	130.4

**Total Volume at Station 121+50.00**

Cut Area (SF)	35.322
Fill Area (SF)	0.000
Cut Vol (CF)	65.465
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	1466.404
Cum Fill Vol (CF)	1139.9
Net Vol (CF)	326.5

**Total Volume at Station 123+00.00**

Cut Area (SF)	34.476
Fill Area (SF)	0.000
Cut Vol (CF)	64.981
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	1661.737
Cum Fill Vol (CF)	1139.9
Net Vol (CF)	521.9



**Total Volume at Station 119+50.00**

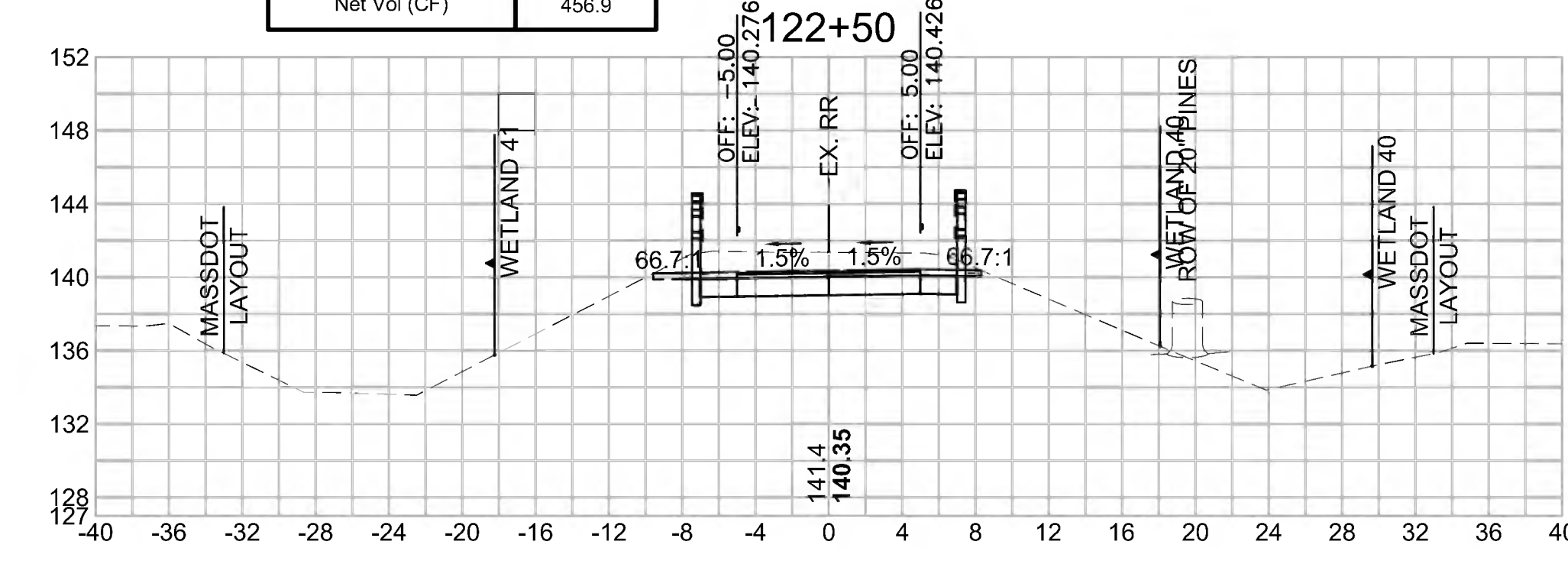
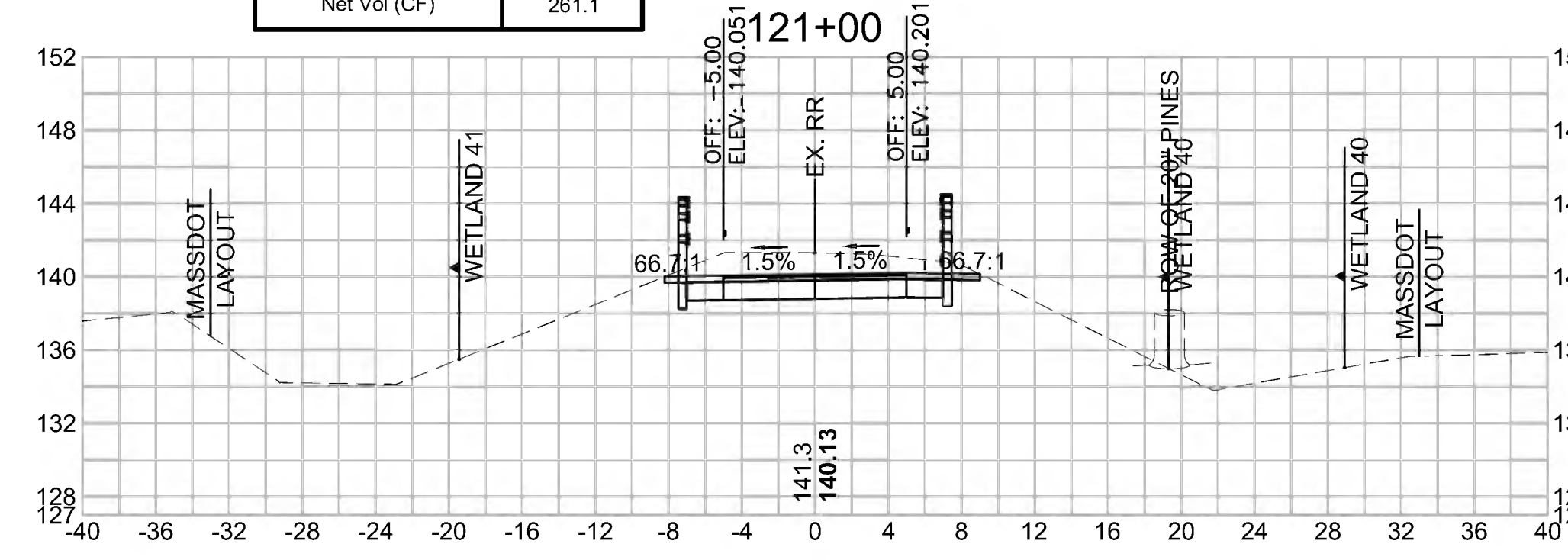
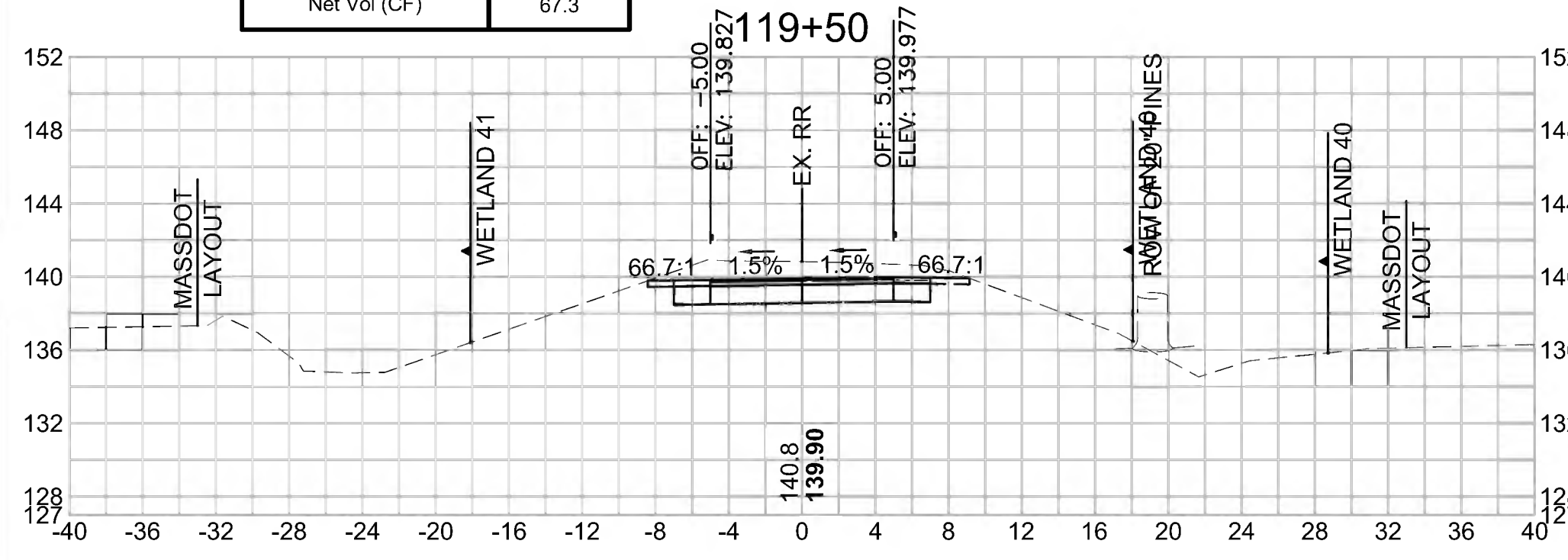
Cut Area (SF)	32.904
Fill Area (SF)	0.000
Cut Vol (CF)	58.501
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	1207.223
Cum Fill Vol (CF)	1139.9
Net Vol (CF)	67.3

**Total Volume at Station 121+00.00**

Cut Area (SF)	35.379
Fill Area (SF)	0.000
Cut Vol (CF)	65.448
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	1400.940
Cum Fill Vol (CF)	1139.9
Net Vol (CF)	261.1

**Total Volume at Station 122+50.00**

Cut Area (SF)	35.703
Fill Area (SF)	0.000
Cut Vol (CF)	65.353
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	1596.757
Cum Fill Vol (CF)	1139.9
Net Vol (CF)	456.9



**Total Volume at Station 119+00.00**

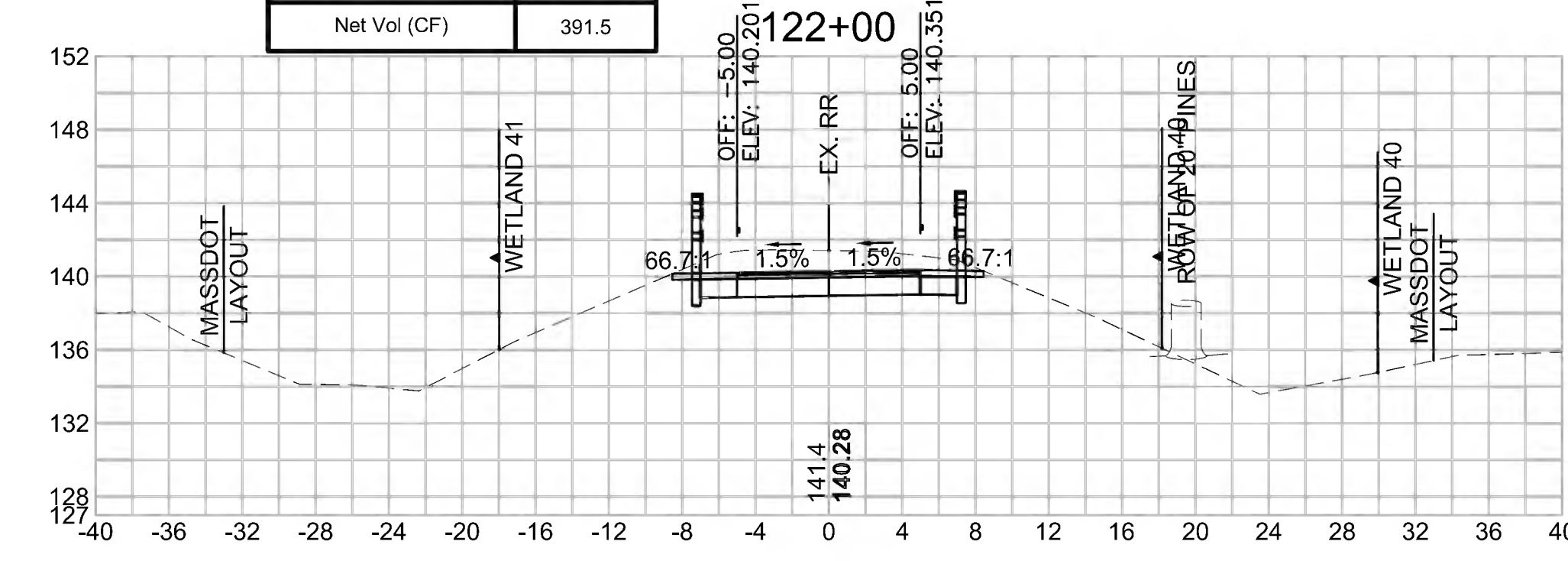
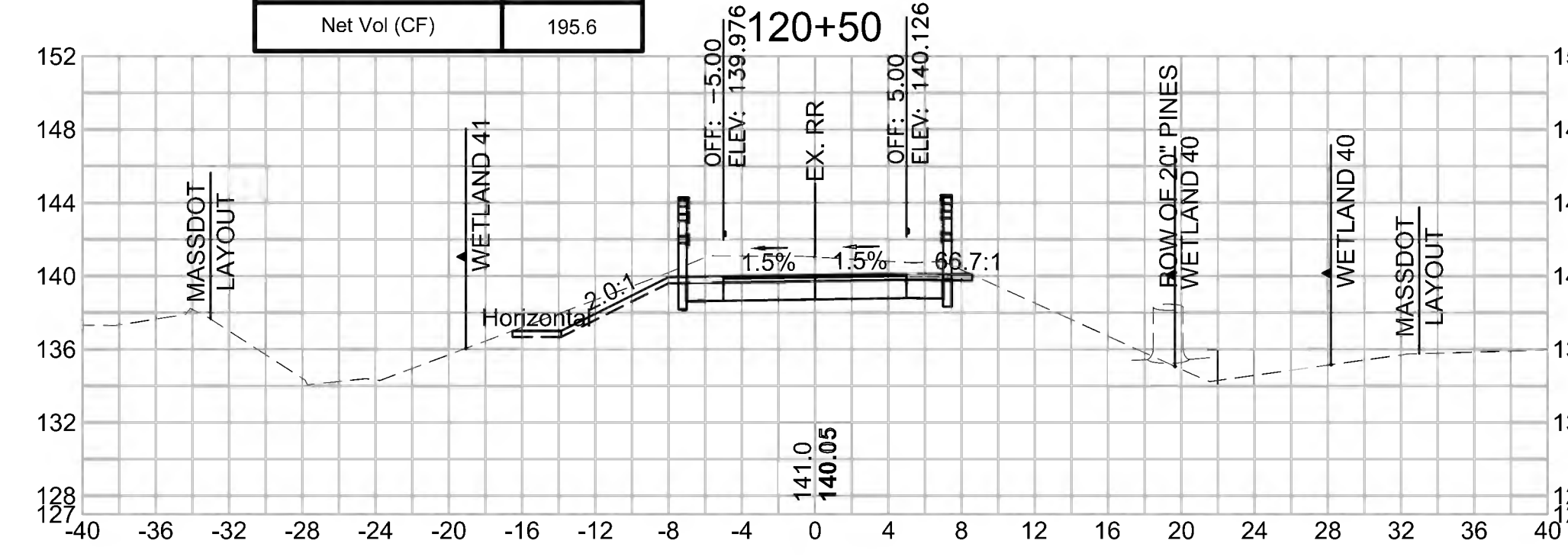
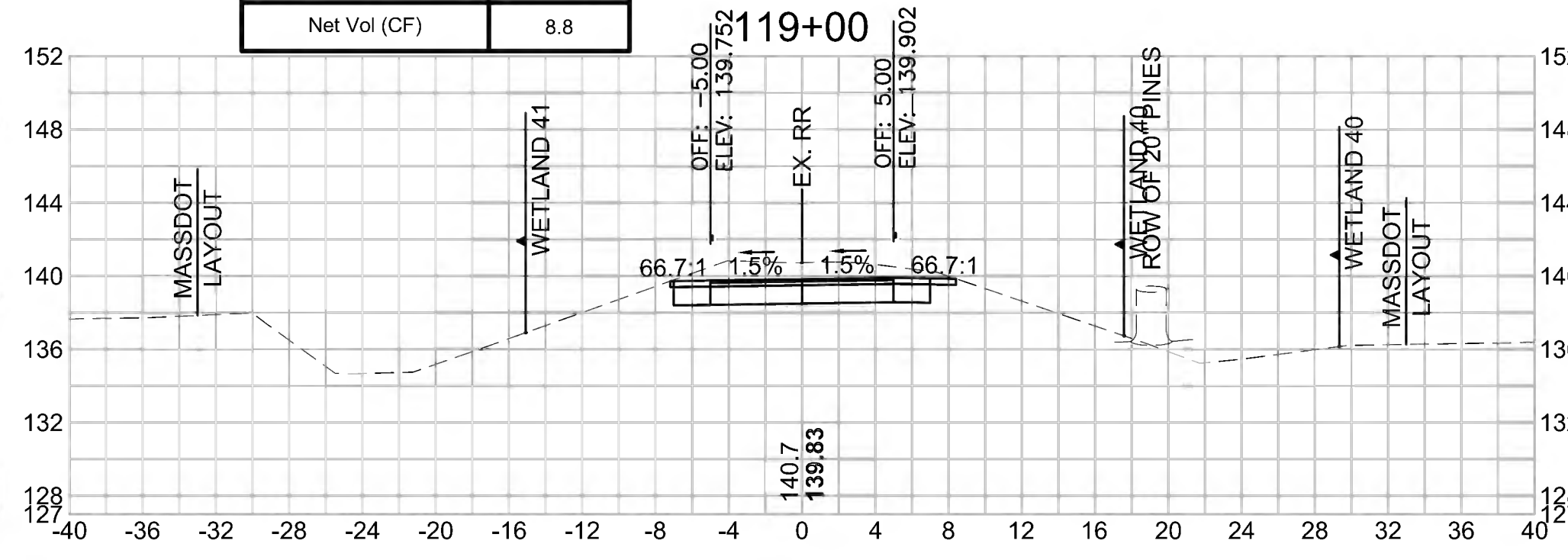
Cut Area (SF)	30.276
Fill Area (SF)	0.000
Cut Vol (CF)	55.467
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	1148.723
Cum Fill Vol (CF)	1139.9
Net Vol (CF)	8.8

**Total Volume at Station 120+50.00**

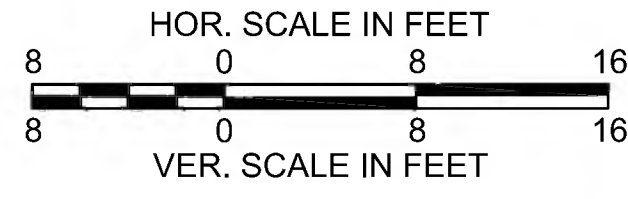
Cut Area (SF)	35.305
Fill Area (SF)	0.000
Cut Vol (CF)	65.246
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	1335.492
Cum Fill Vol (CF)	1139.9
Net Vol (CF)	195.6

**Total Volume at Station 122+00.00**

Cut Area (SF)	34.878
Fill Area (SF)	0.000
Cut Vol (CF)	65.001
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	1531.404
Cum Fill Vol (CF)	1139.9
Net Vol (CF)	391.5







SUDBURY  
 BRUCE FREEMAN RAIL TRAIL

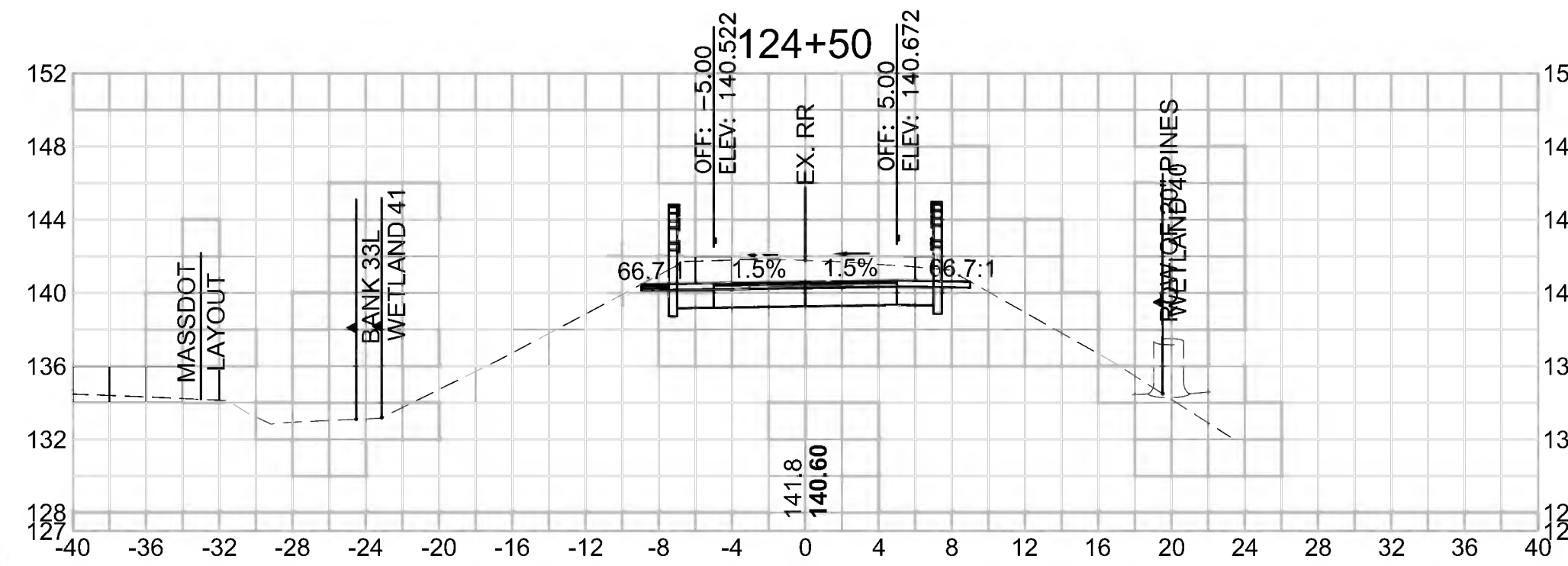
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	250	319

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CROSS SECTIONS

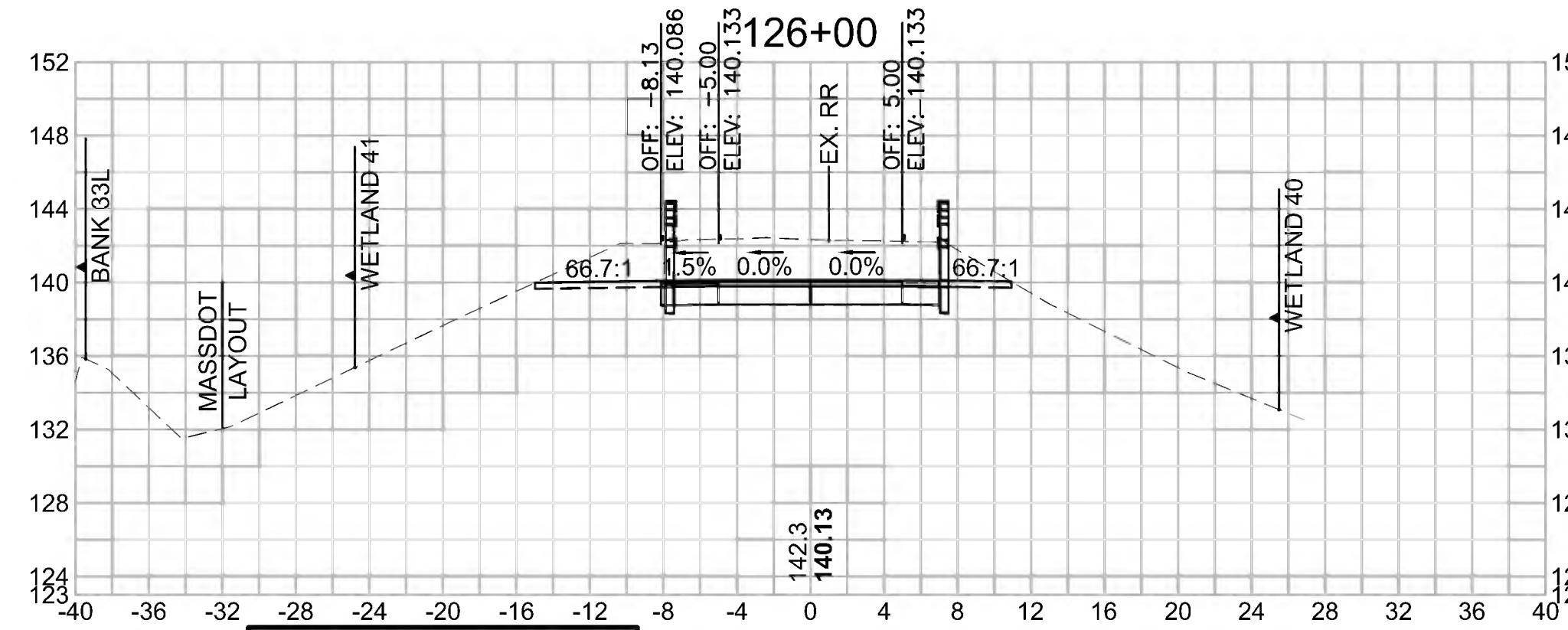
**Total Volume at Station 124+50.00**

Cut Area (SF)	37.090
Fill Area (SF)	0.000
Cut Vol (CF)	68.327
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	1859.926
Cum Fill Vol (CF)	1139.9
Net Vol (CF)	720.0



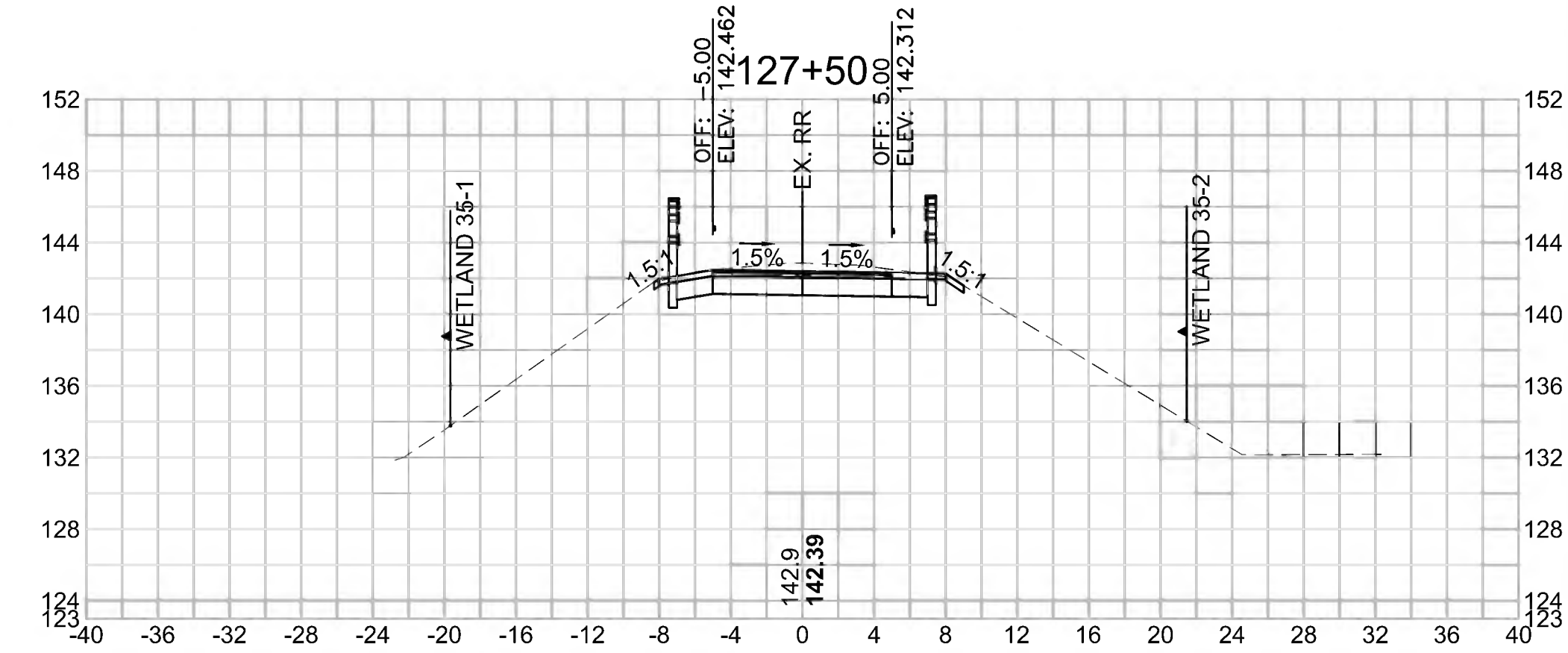
**Total Volume at Station 126+00.00**

Cut Area (SF)	58.889
Fill Area (SF)	0.000
Cut Vol (CF)	111.503
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	2160.079
Cum Fill Vol (CF)	1139.9
Net Vol (CF)	1020.2



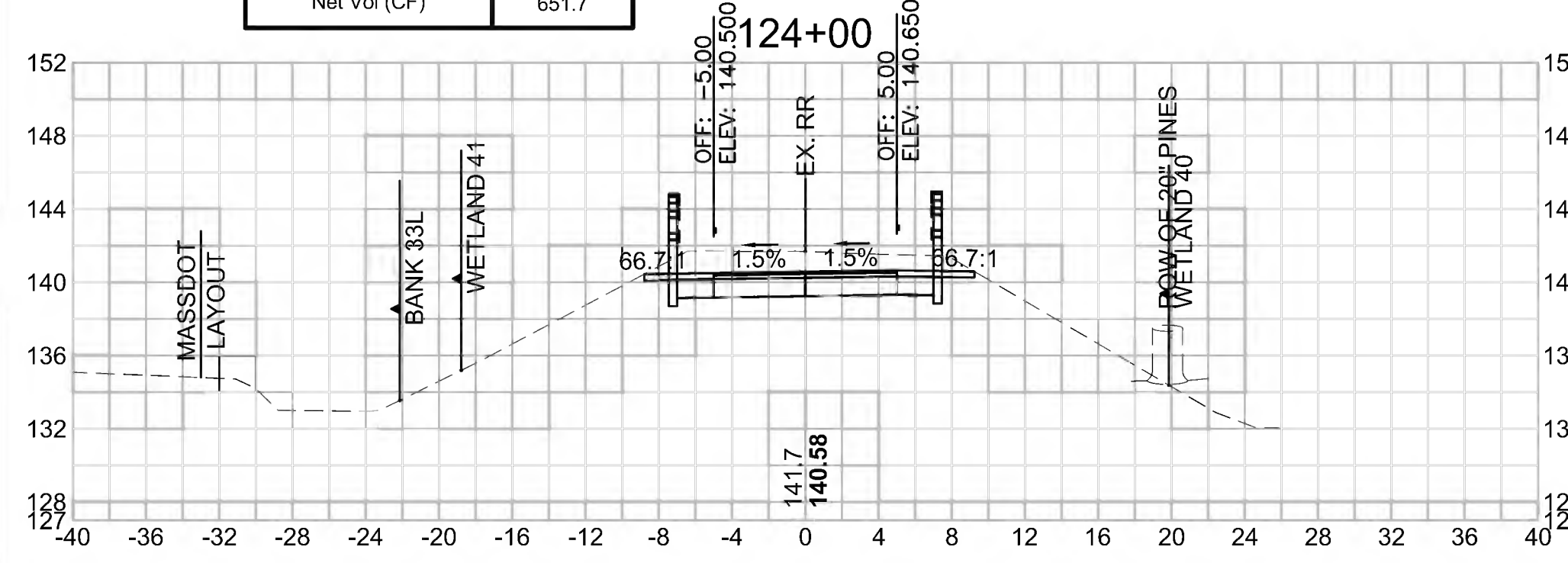
**Total Volume at Station 127+50.00**

Cut Area (SF)	22.655
Fill Area (SF)	0.000
Cut Vol (CF)	46.169
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	2317.144
Cum Fill Vol (CF)	1145.7
Net Vol (CF)	1171.4



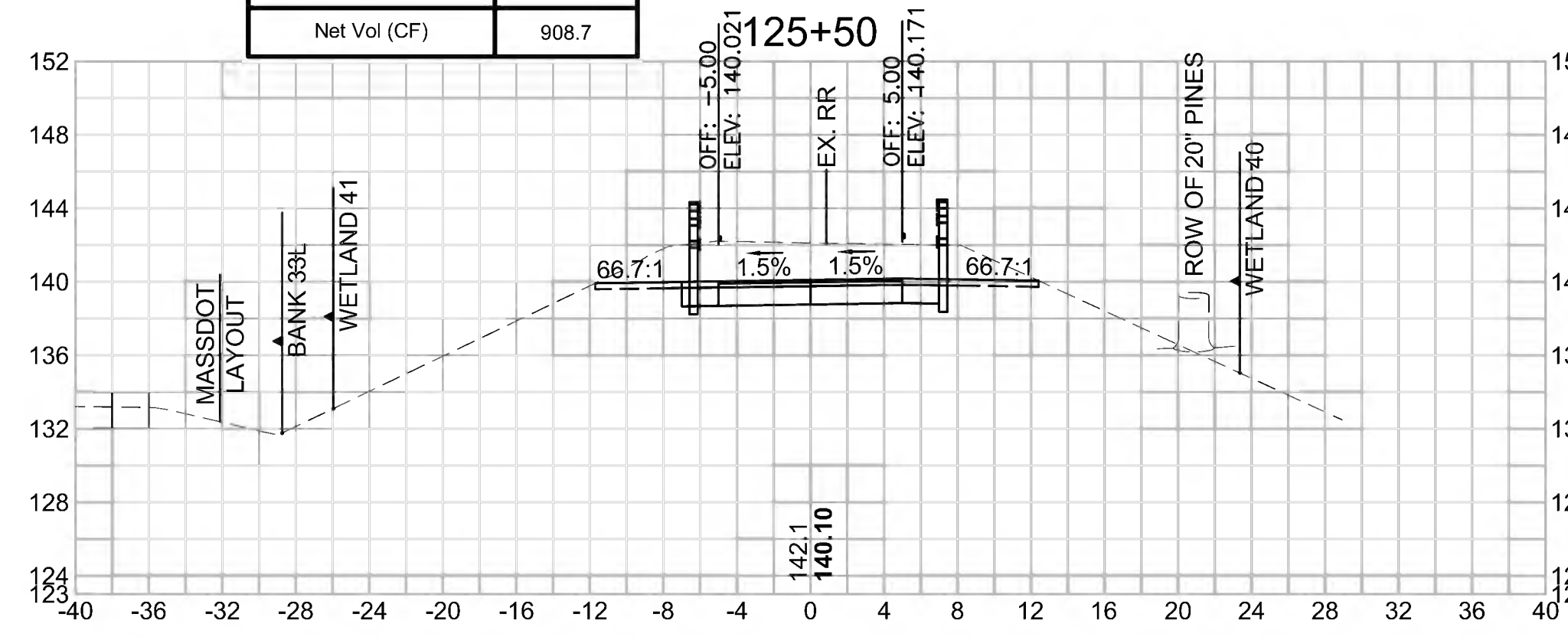
**Total Volume at Station 124+00.00**

Cut Area (SF)	36.702
Fill Area (SF)	0.000
Cut Vol (CF)	65.962
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	1791.600
Cum Fill Vol (CF)	1139.9
Net Vol (CF)	651.7



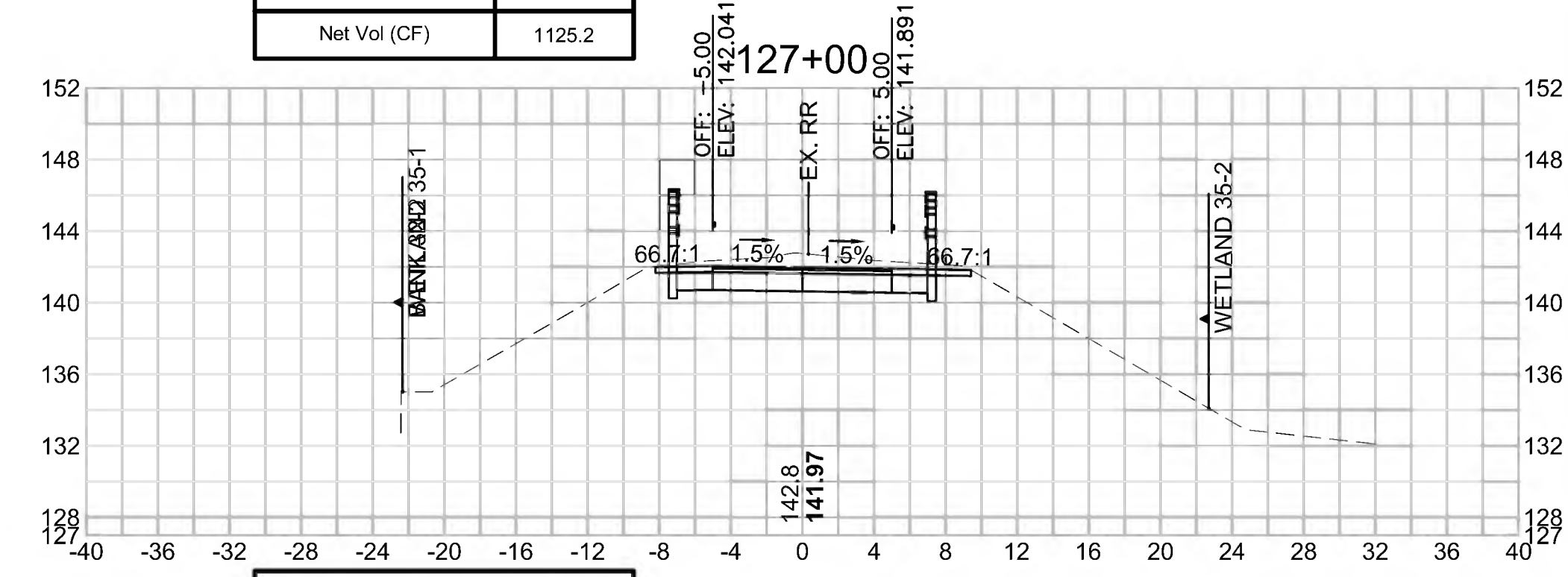
**Total Volume at Station 125+50.00**

Cut Area (SF)	61.534
Fill Area (SF)	0.000
Cut Vol (CF)	105.642
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	2048.577
Cum Fill Vol (CF)	1139.9
Net Vol (CF)	908.7



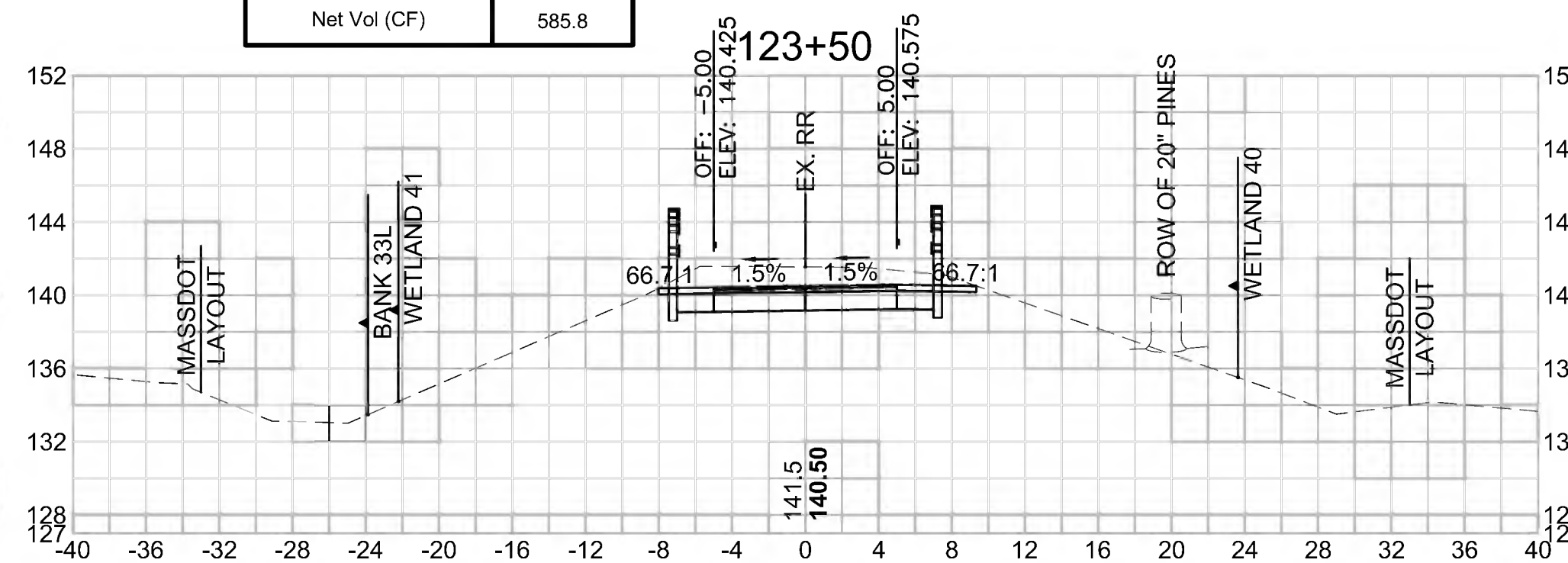
**Total Volume at Station 127+00.00**

Cut Area (SF)	27.206
Fill Area (SF)	0.000
Cut Vol (CF)	40.781
Fill Vol (CF)	2.9
Cum Cut Vol (CF)	2270.976
Cum Fill Vol (CF)	1145.7
Net Vol (CF)	1125.2



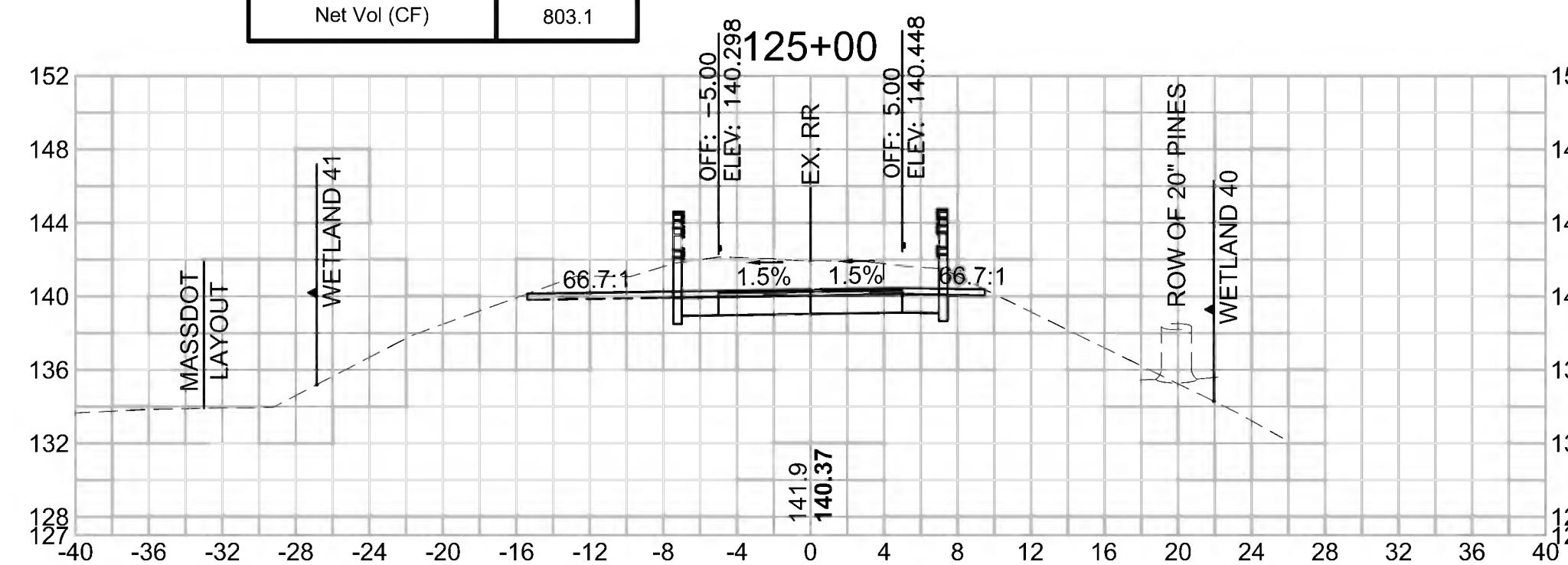
**Total Volume at Station 123+50.00**

Cut Area (SF)	34.537
Fill Area (SF)	0.000
Cut Vol (CF)	63.901
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	1725.638
Cum Fill Vol (CF)	1139.9
Net Vol (CF)	585.8



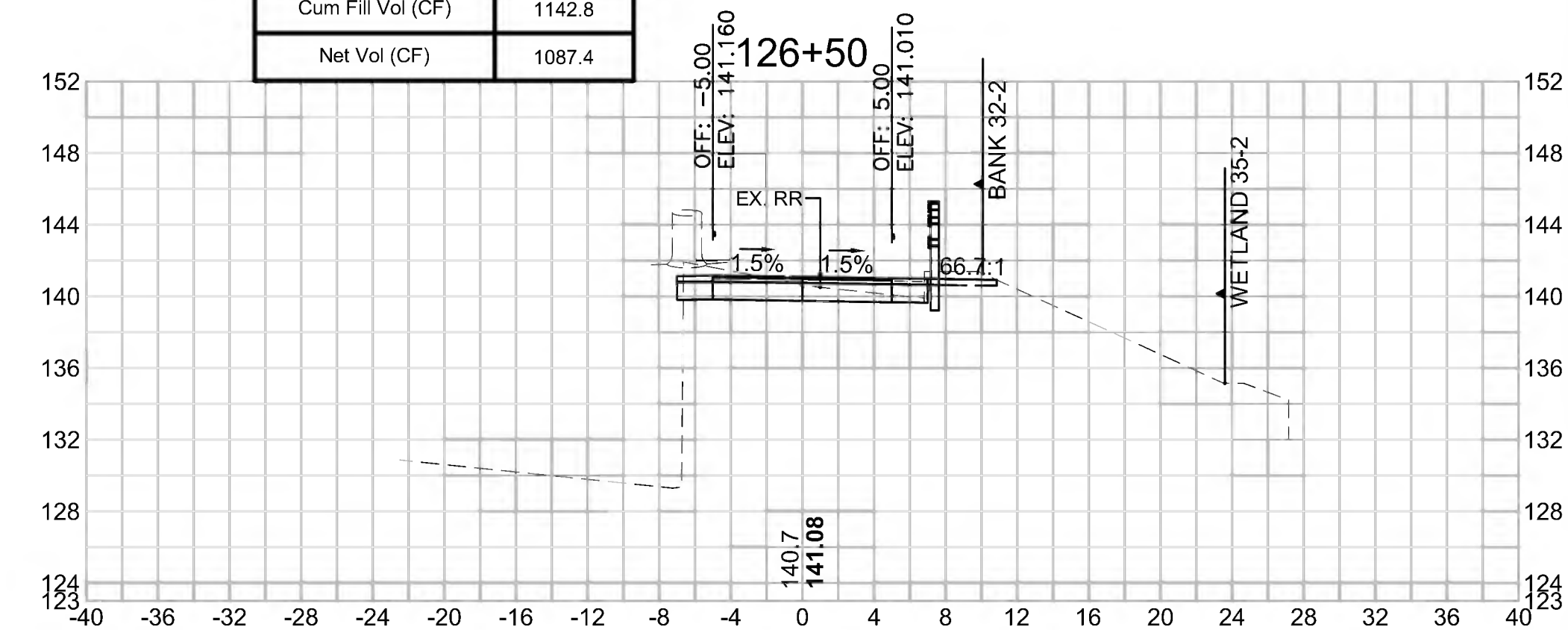
**Total Volume at Station 125+00.00**

Cut Area (SF)	52.560
Fill Area (SF)	0.000
Cut Vol (CF)	83.010
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	1942.935
Cum Fill Vol (CF)	1139.9
Net Vol (CF)	803.1



**Total Volume at Station 126+50.00**

Cut Area (SF)	16.837
Fill Area (SF)	3.166
Cut Vol (CF)	70.117
Fill Vol (CF)	2.9
Cum Cut Vol (CF)	2230.195
Cum Fill Vol (CF)	1142.8
Net Vol (CF)	1087.4

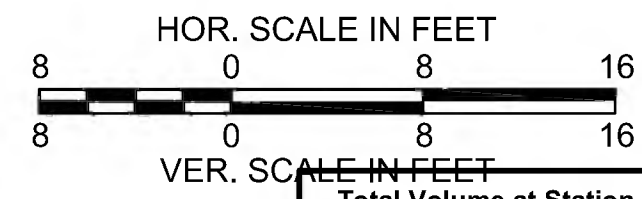




SUDBURY  
BRUCE FREEMAN RAIL TRAIL

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MA	CMQ/TAP/STP-0033(028)X	251	319
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CROSS SECTIONS



**Total Volume at Station 129+00.00**

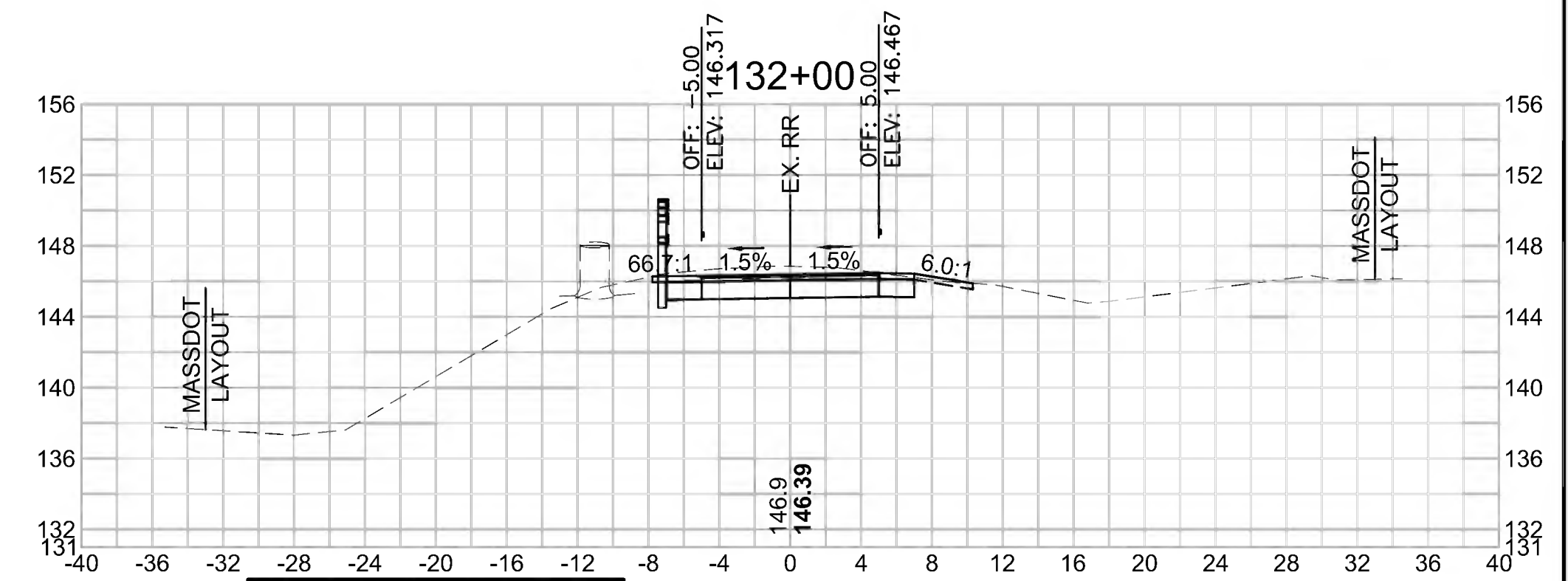
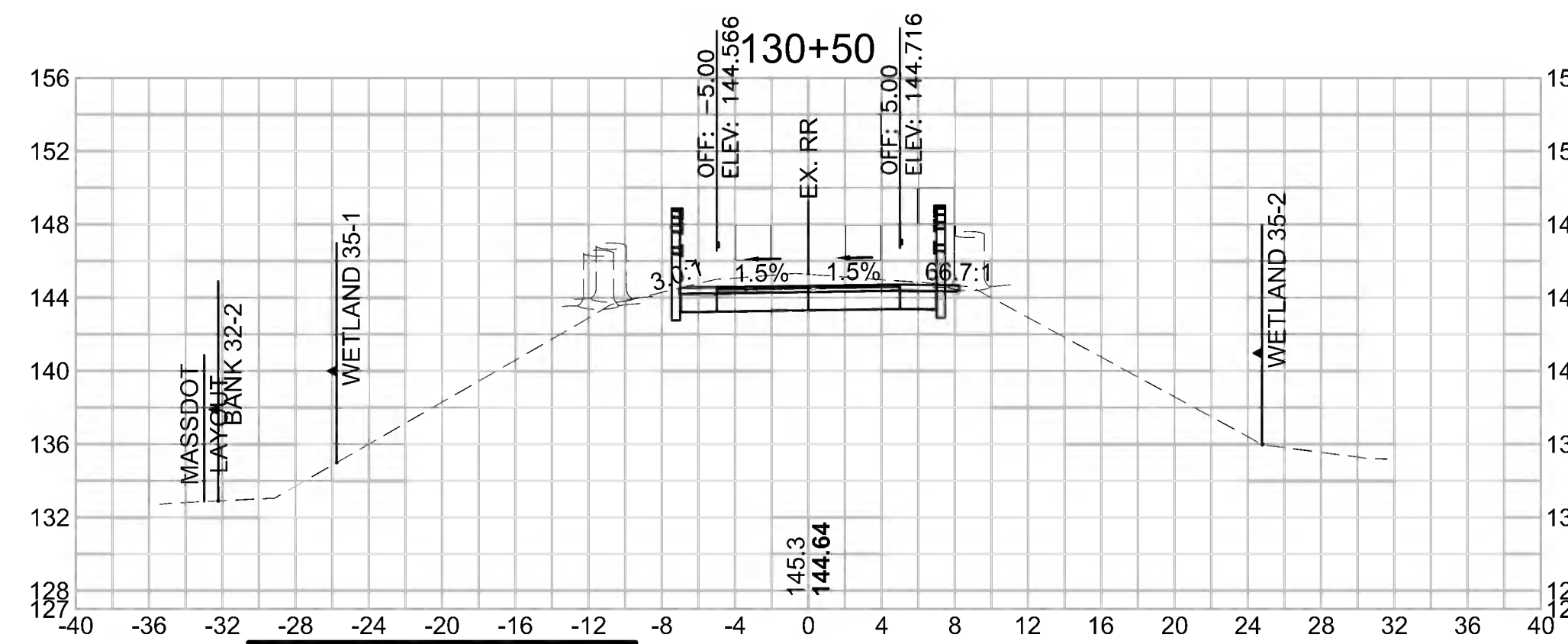
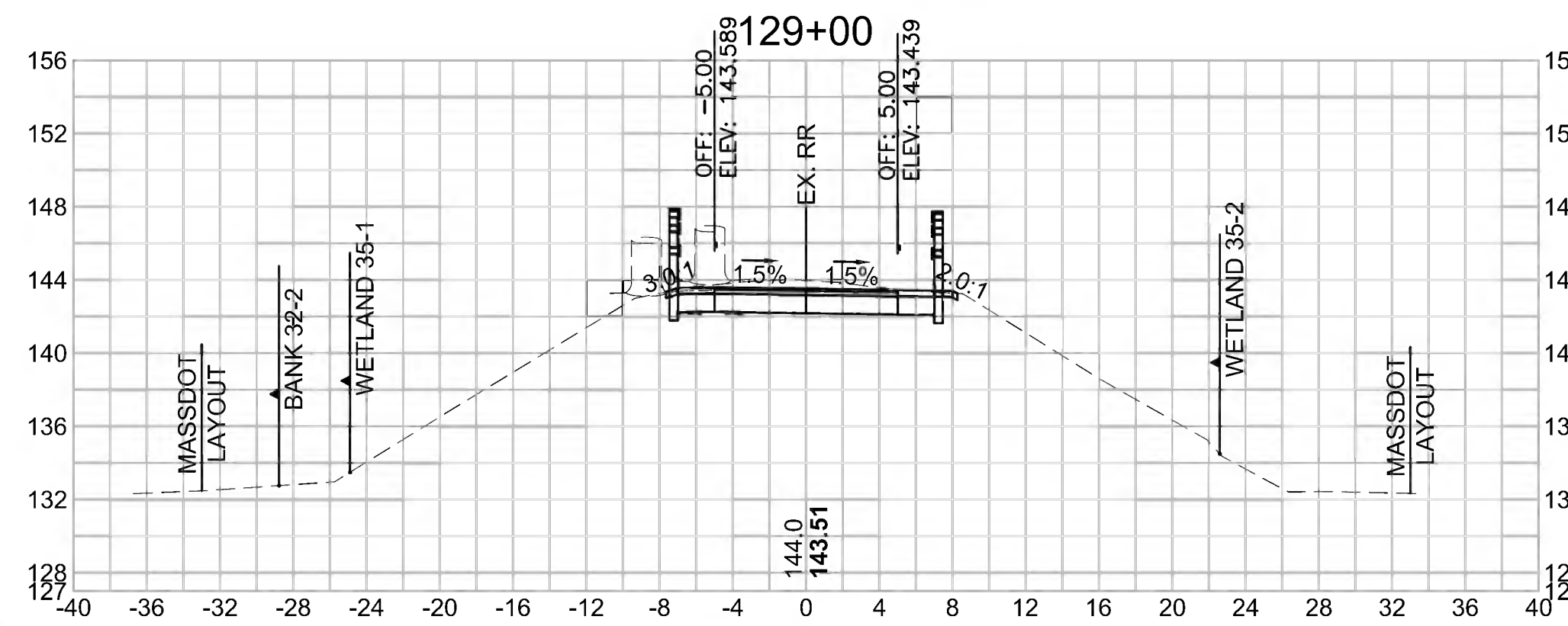
Cut Area (SF)	22.380
Fill Area (SF)	0.000
Cut Vol (CF)	42.336
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	2445.669
Cum Fill Vol (CF)	1145.7
Net Vol (CF)	1299.9

**Total Volume at Station 130+00.00**

Cut Area (SF)	24.796
Fill Area (SF)	0.000
Cut Vol (CF)	43.308
Fill Vol (CF)	0.3
Cum Cut Vol (CF)	2571.812
Cum Fill Vol (CF)	1146.4
Net Vol (CF)	1425.4

**Total Volume at Station 132+00.00**

Cut Area (SF)	23.474
Fill Area (SF)	0.000
Cut Vol (CF)	47.577
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	2718.379
Cum Fill Vol (CF)	1146.4
Net Vol (CF)	1572.0



**Total Volume at Station 128+50.00**

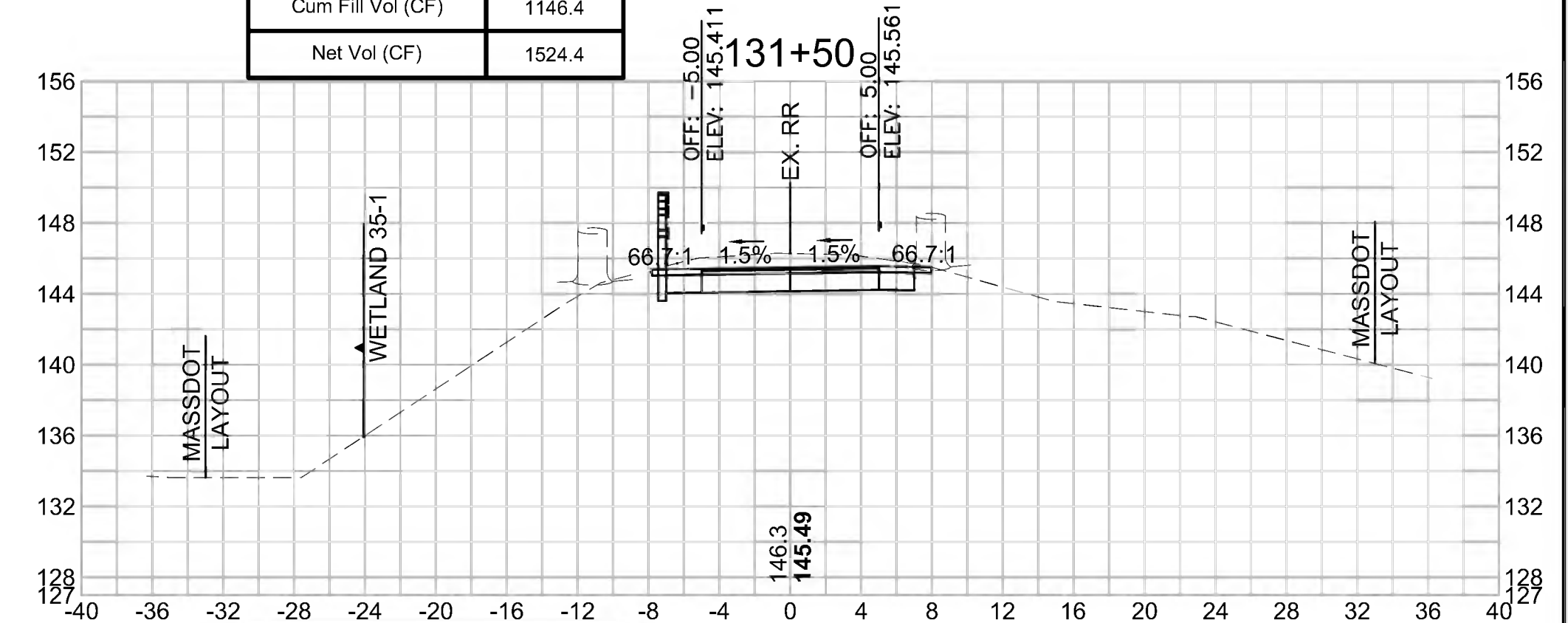
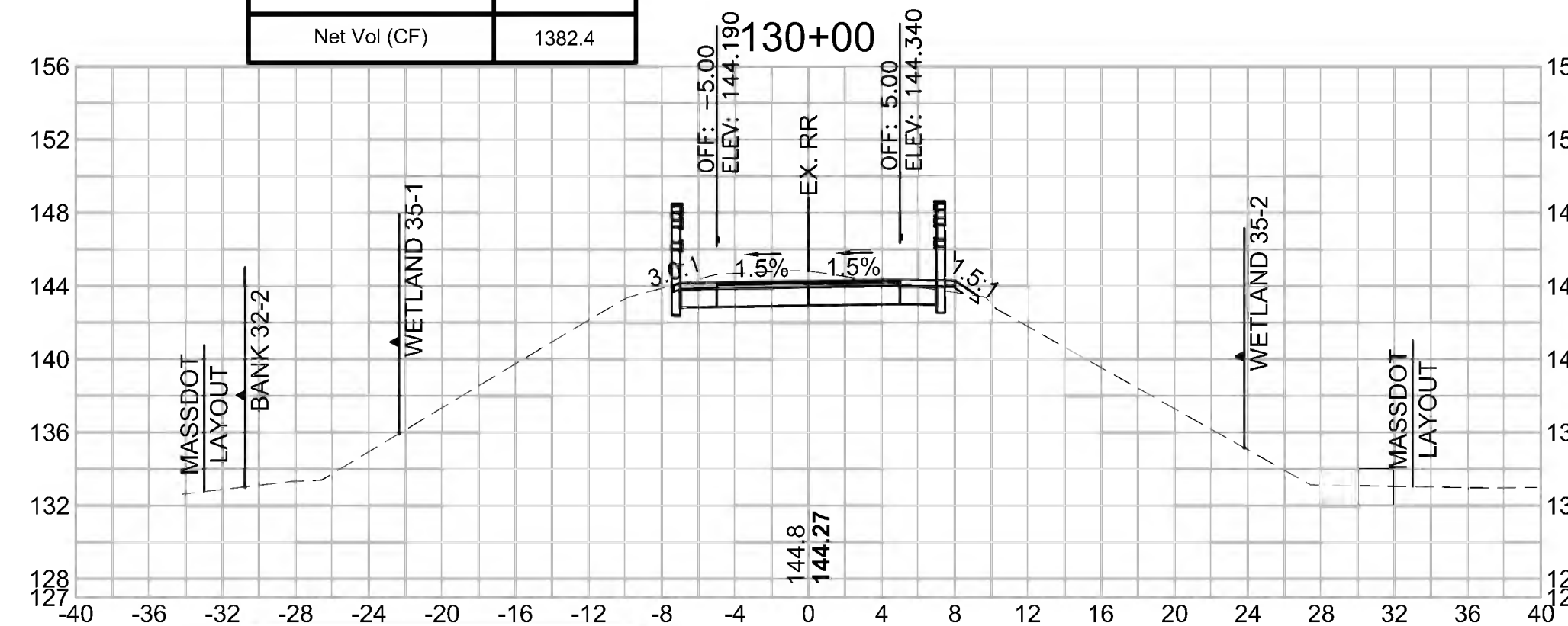
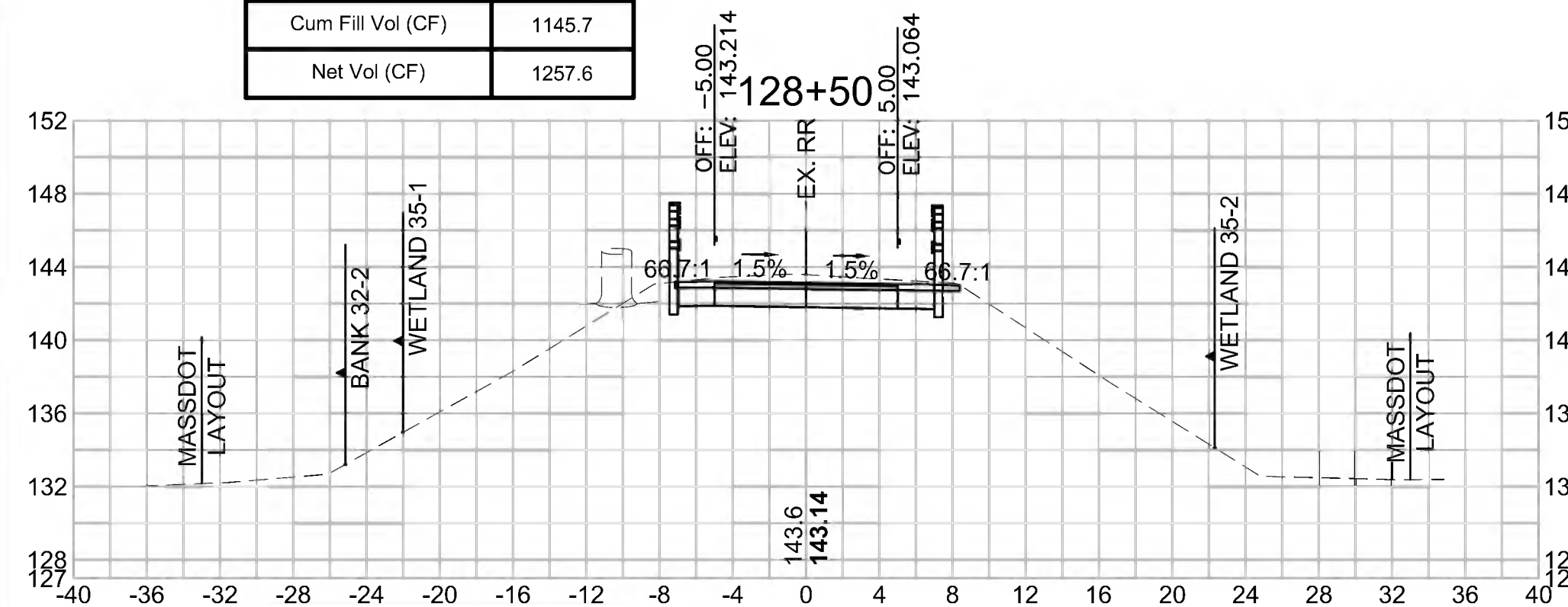
Cut Area (SF)	23.343
Fill Area (SF)	0.000
Cut Vol (CF)	43.413
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	2403.333
Cum Fill Vol (CF)	1145.7
Net Vol (CF)	1257.6

**Total Volume at Station 130+00.00**

Cut Area (SF)	21.976
Fill Area (SF)	0.307
Cut Vol (CF)	41.232
Fill Vol (CF)	0.3
Cum Cut Vol (CF)	2528.505
Cum Fill Vol (CF)	1146.1
Net Vol (CF)	1382.4

**Total Volume at Station 131+50.00**

Cut Area (SF)	27.909
Fill Area (SF)	0.000
Cut Vol (CF)	50.937
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	2670.802
Cum Fill Vol (CF)	1146.4
Net Vol (CF)	1524.4



**Total Volume at Station 128+00.00**

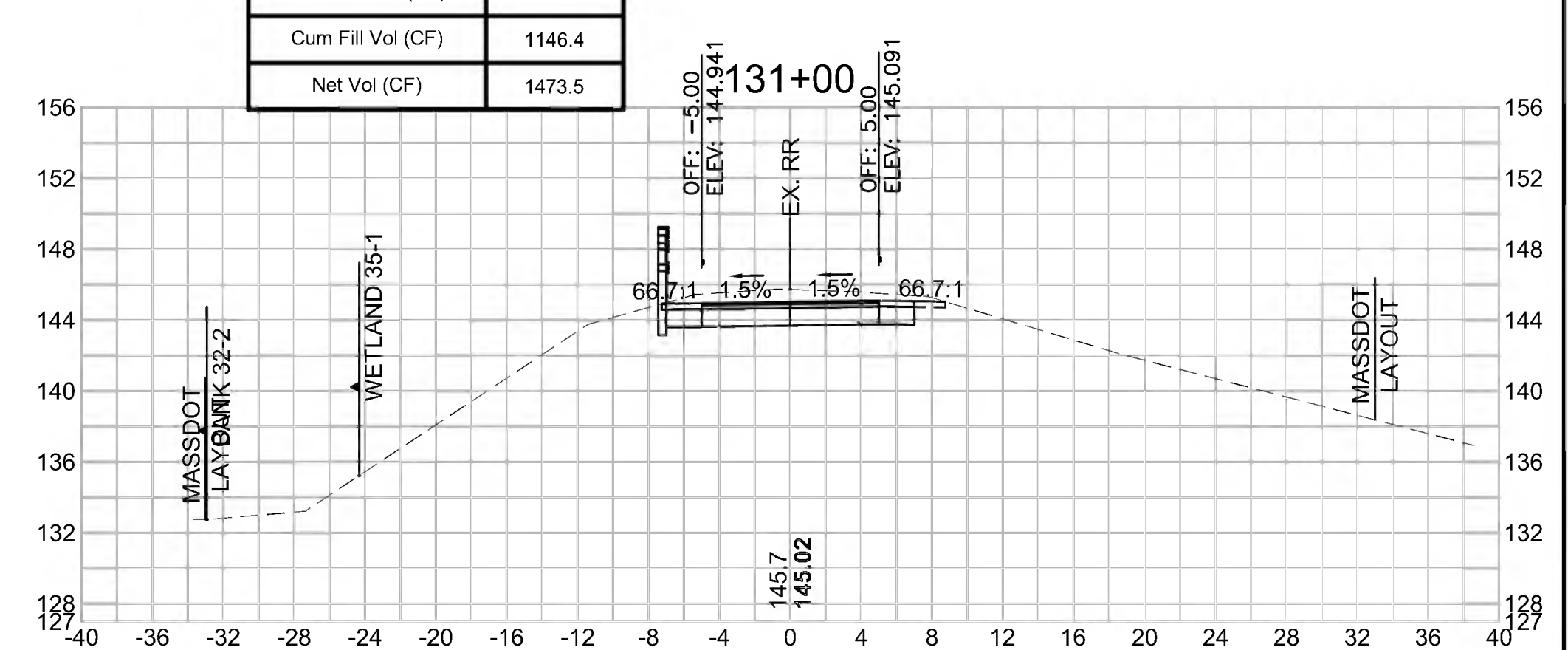
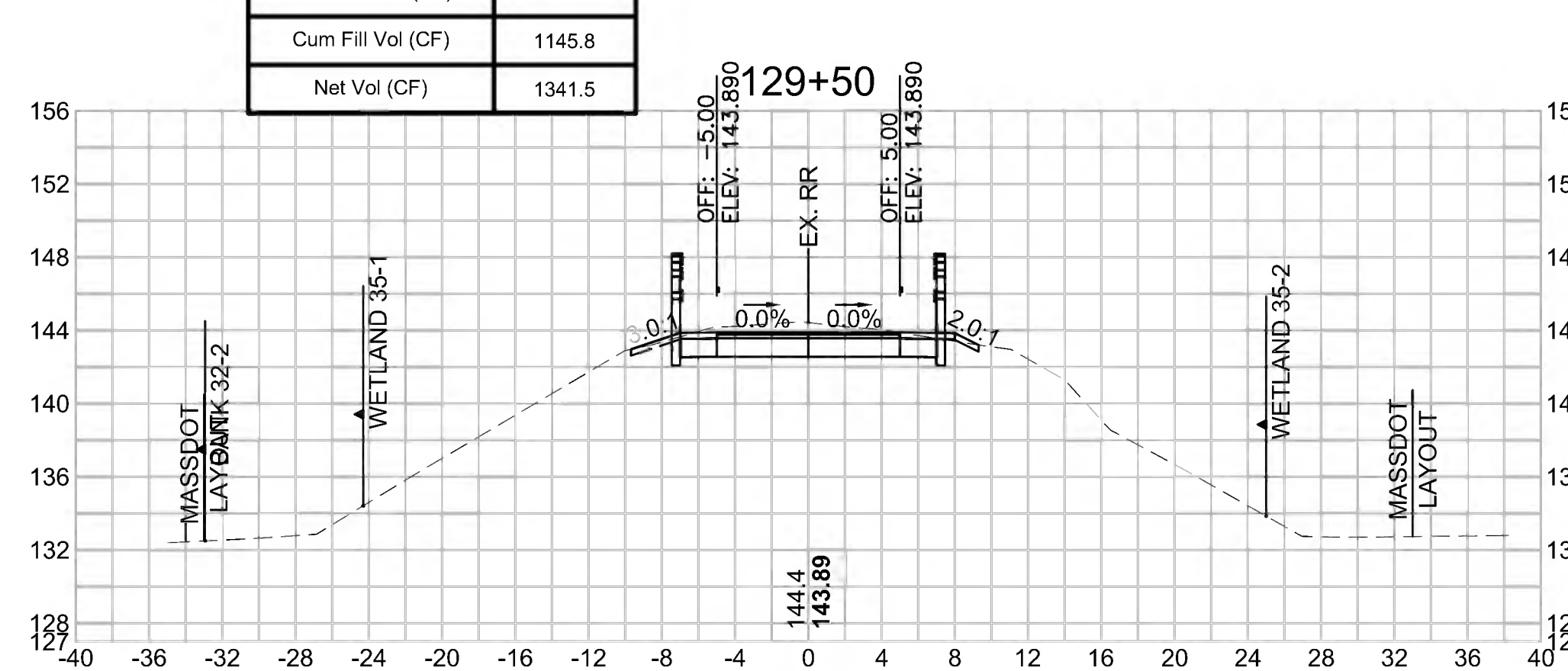
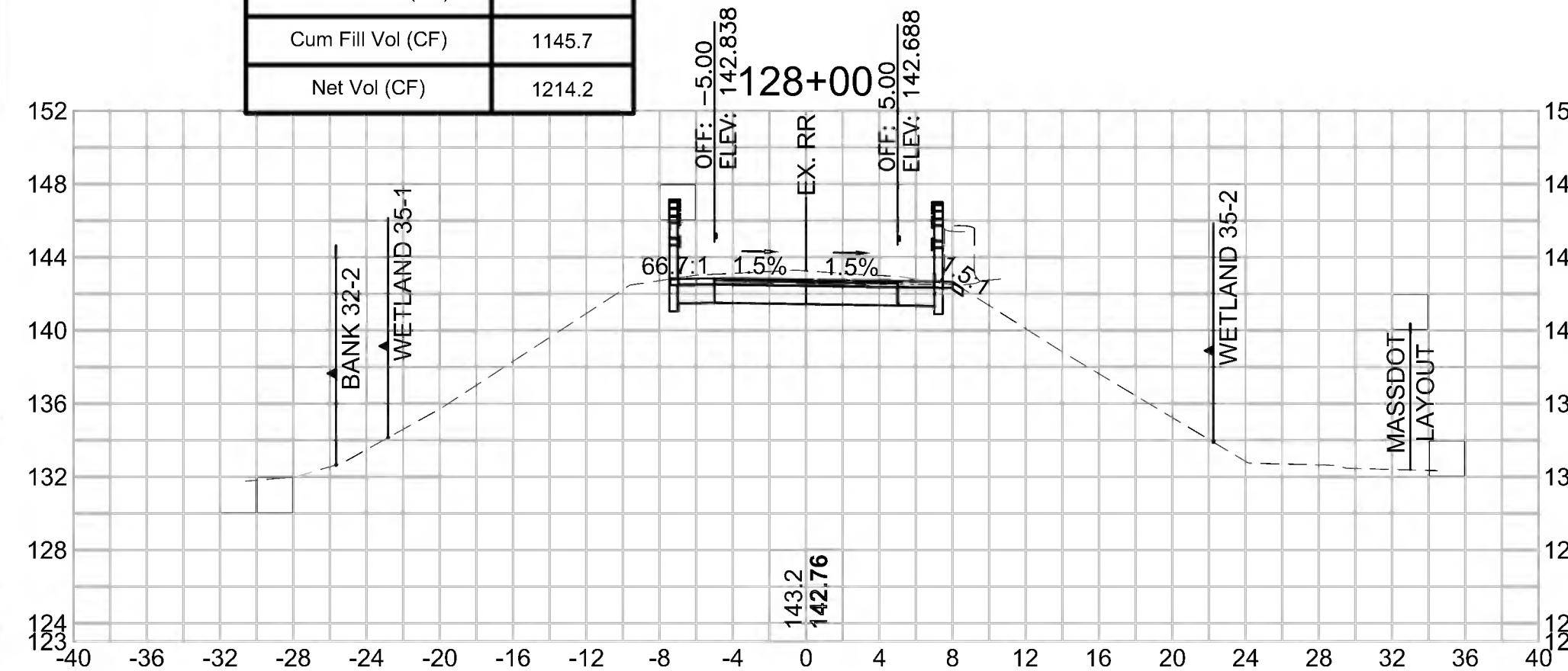
Cut Area (SF)	23.543
Fill Area (SF)	0.000
Cut Vol (CF)	42.777
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	2359.920
Cum Fill Vol (CF)	1145.7
Net Vol (CF)	1214.2

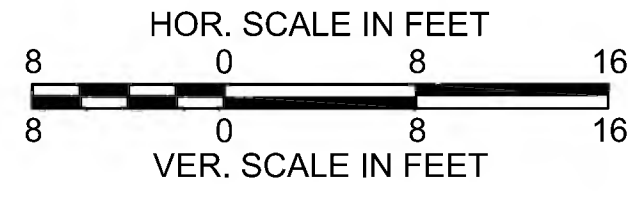
**Total Volume at Station 129+50.00**

Cut Area (SF)	22.554
Fill Area (SF)	0.046
Cut Vol (CF)	41.606
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	2487.274
Cum Fill Vol (CF)	1145.8
Net Vol (CF)	1341.5

**Total Volume at Station 131+00.00**

Cut Area (SF)	27.102
Fill Area (SF)	0.000
Cut Vol (CF)	48.054
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	2619.866
Cum Fill Vol (CF)	1146.4
Net Vol (CF)	1473.5





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 BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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**Total Volume at Station 133+50.00**

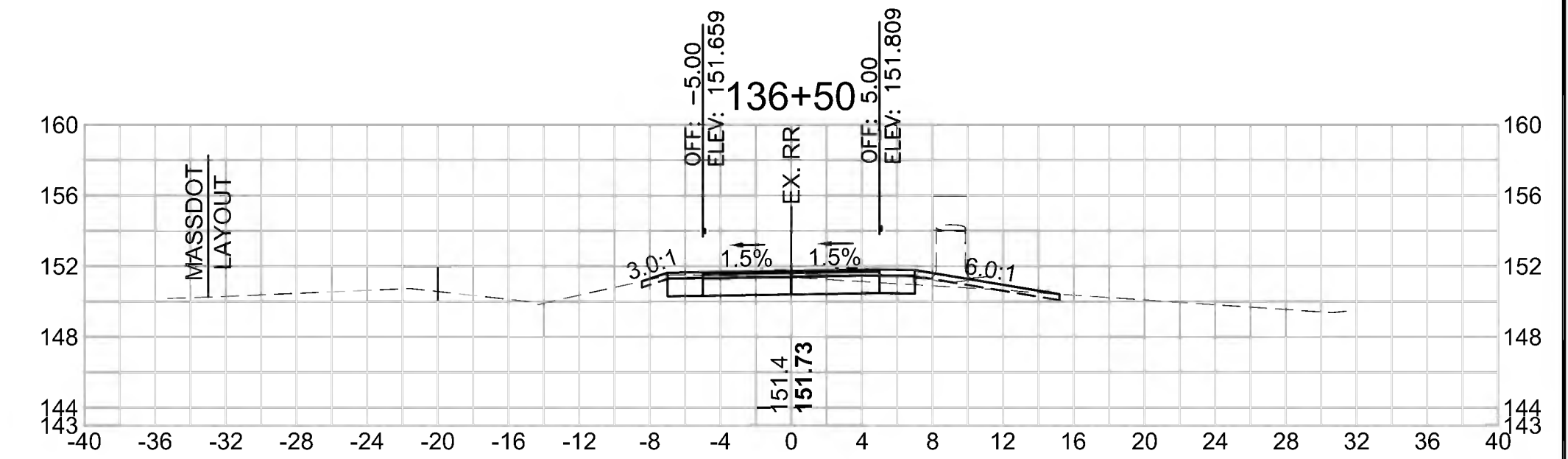
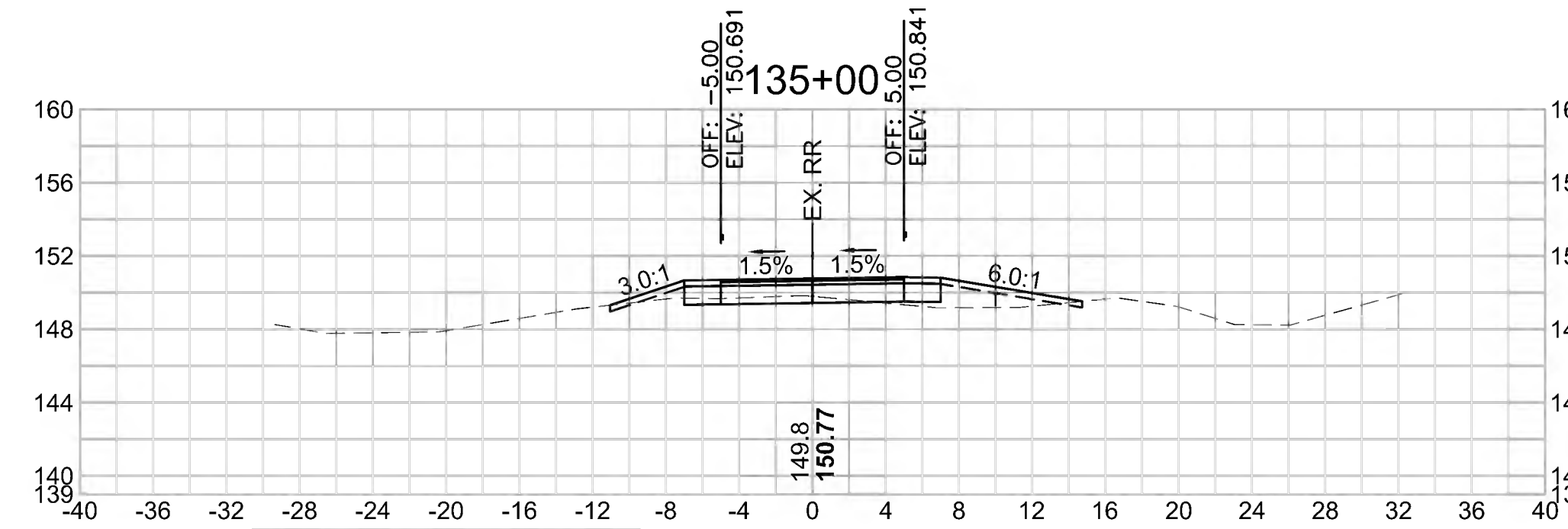
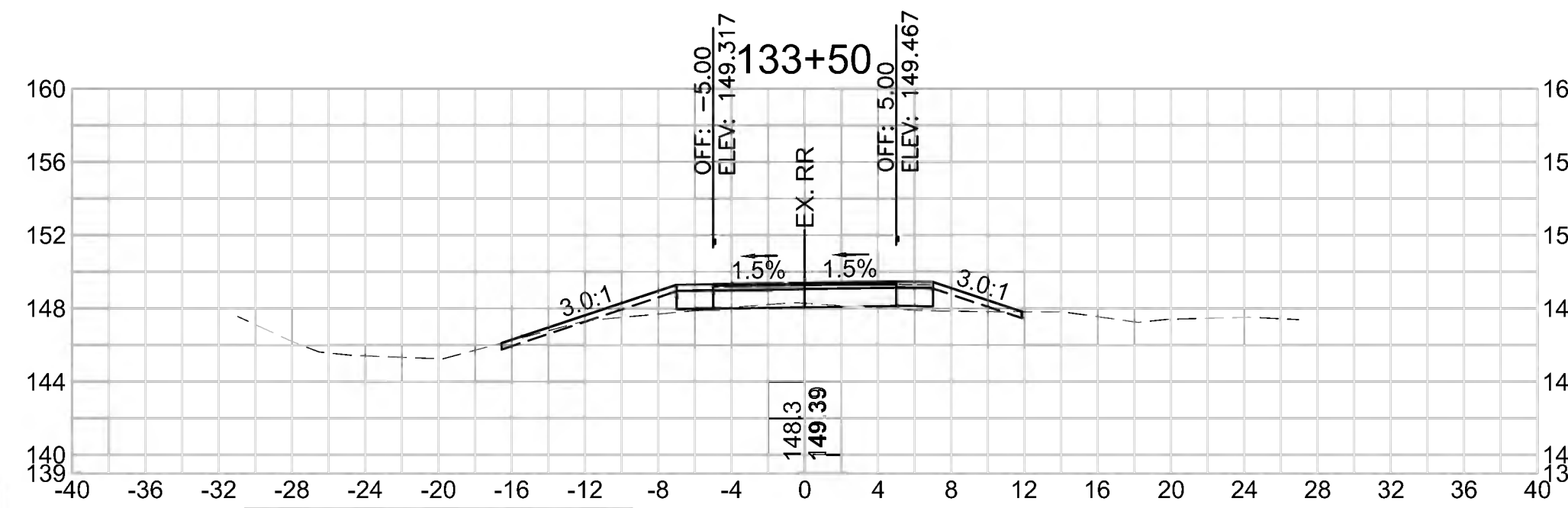
Cut Area (SF)	2.104
Fill Area (SF)	5.934
Cut Vol (CF)	10.399
Fill Vol (CF)	6.9
Cum Cut Vol (CF)	2788.987
Cum Fill Vol (CF)	1155.1
Net Vol (CF)	1633.9

**Total Volume at Station 135+00.00**

Cut Area (SF)	3.376
Fill Area (SF)	1.345
Cut Vol (CF)	4.433
Fill Vol (CF)	4.9
Cum Cut Vol (CF)	2797.338
Cum Fill Vol (CF)	1193.5
Net Vol (CF)	1603.8

**Total Volume at Station 136+50.00**

Cut Area (SF)	13.783
Fill Area (SF)	1.120
Cut Vol (CF)	21.161
Fill Vol (CF)	2.3
Cum Cut Vol (CF)	2844.393
Cum Fill Vol (CF)	1199.5
Net Vol (CF)	1644.9



**Total Volume at Station 133+00.00**

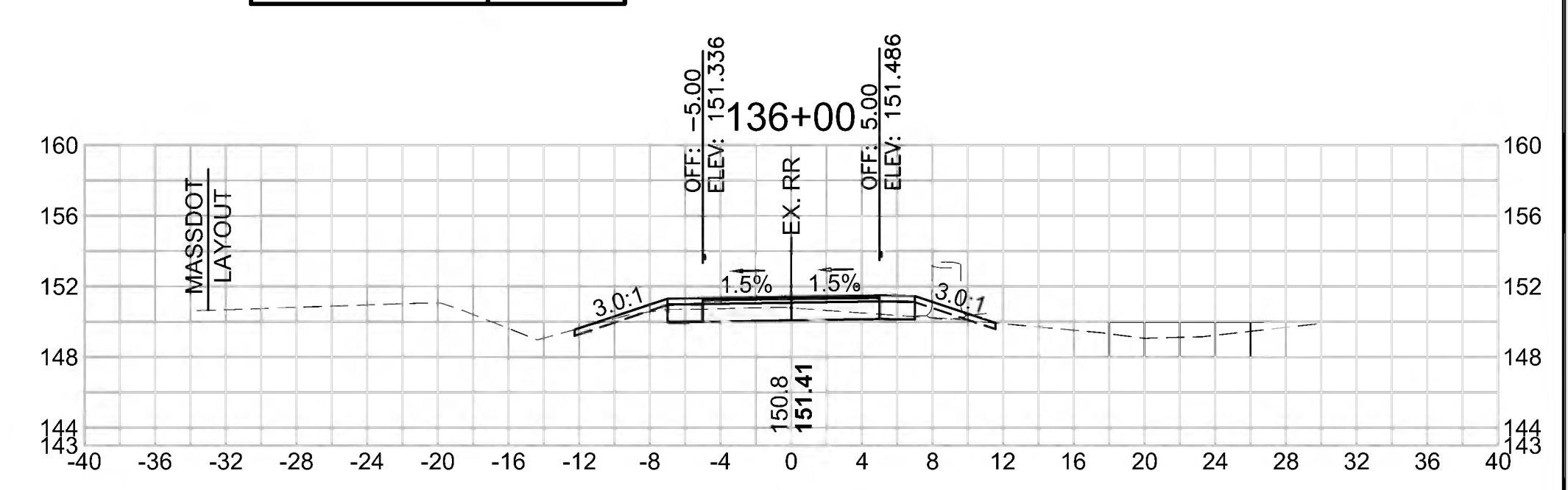
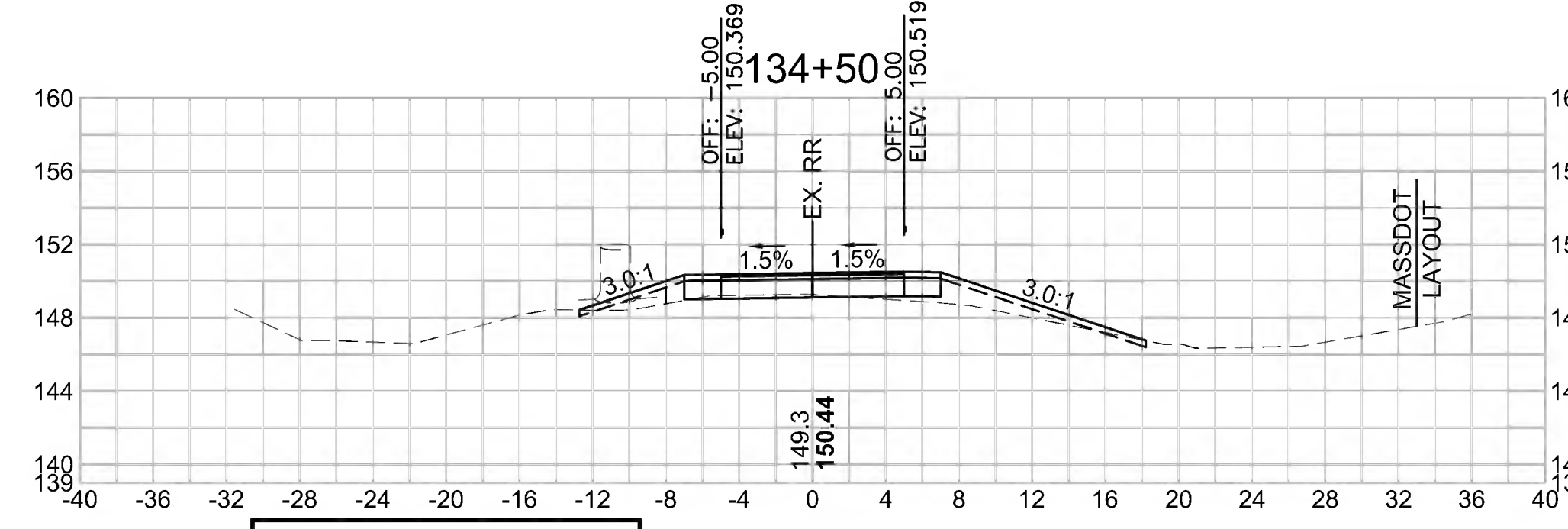
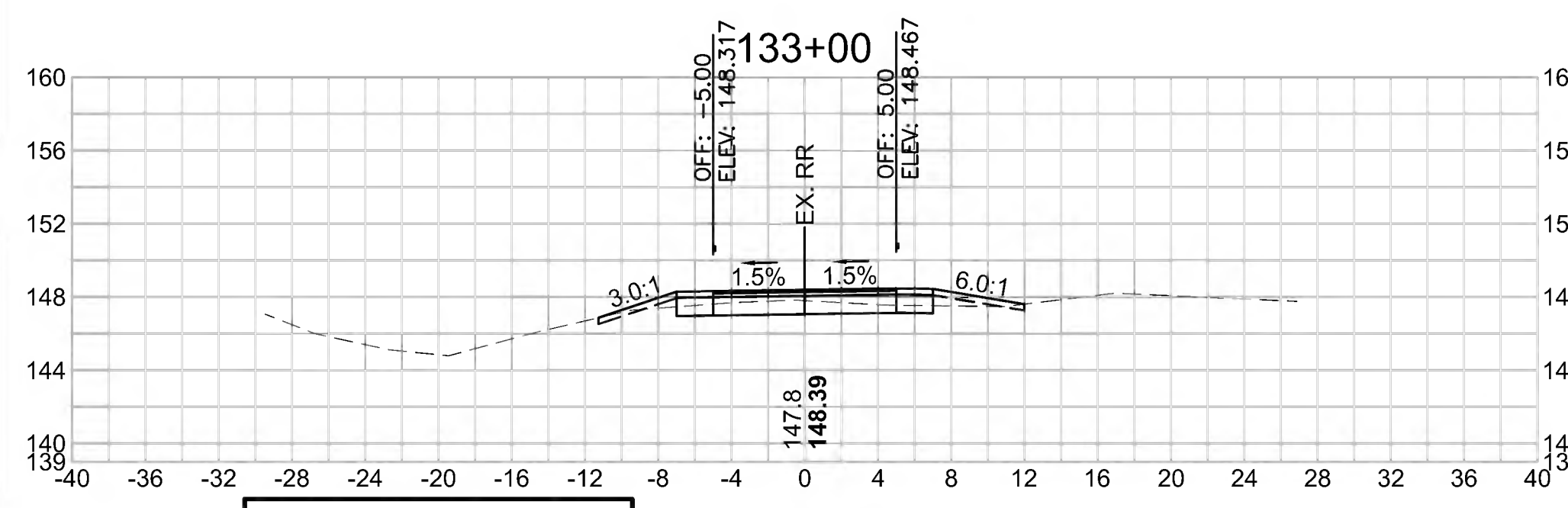
Cut Area (SF)	9.126
Fill Area (SF)	1.521
Cut Vol (CF)	23.463
Fill Vol (CF)	1.6
Cum Cut Vol (CF)	2778.588
Cum Fill Vol (CF)	1148.2
Net Vol (CF)	1630.4

**Total Volume at Station 134+50.00**

Cut Area (SF)	1.412
Fill Area (SF)	3.898
Cut Vol (CF)	1.639
Fill Vol (CF)	15.8
Cum Cut Vol (CF)	2792.906
Cum Fill Vol (CF)	1188.6
Net Vol (CF)	1604.3

**Total Volume at Station 136+00.00**

Cut Area (SF)	9.071
Fill Area (SF)	1.398
Cut Vol (CF)	15.584
Fill Vol (CF)	1.9
Cum Cut Vol (CF)	2823.232
Cum Fill Vol (CF)	1197.2
Net Vol (CF)	1626.0



**Total Volume at Station 132+50.00**

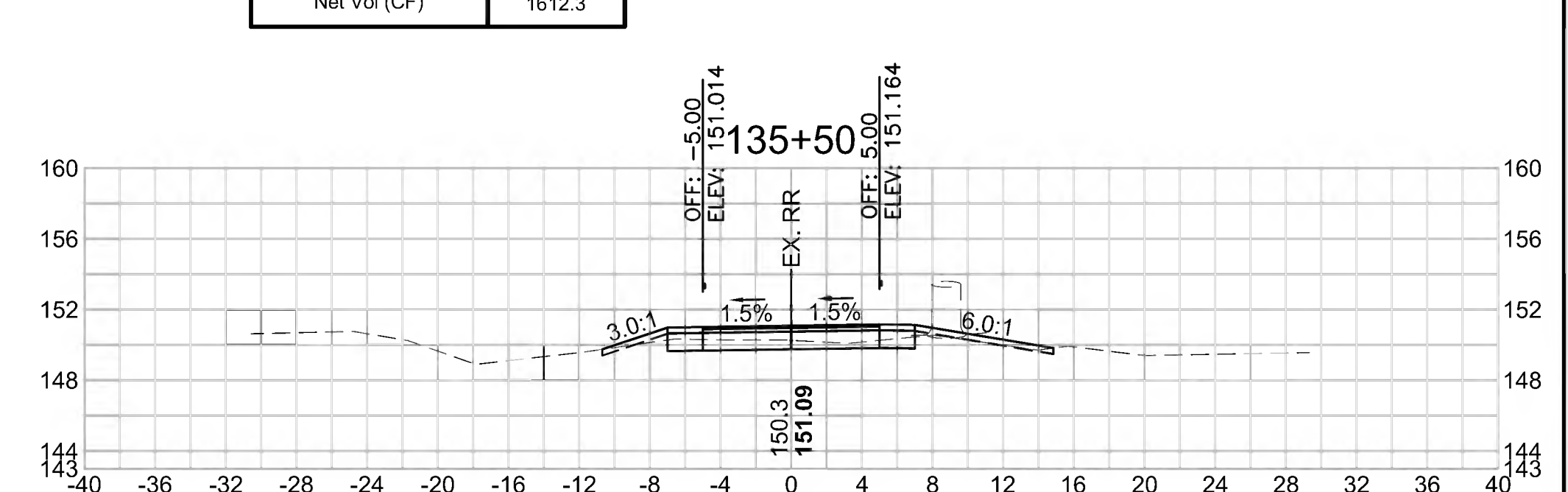
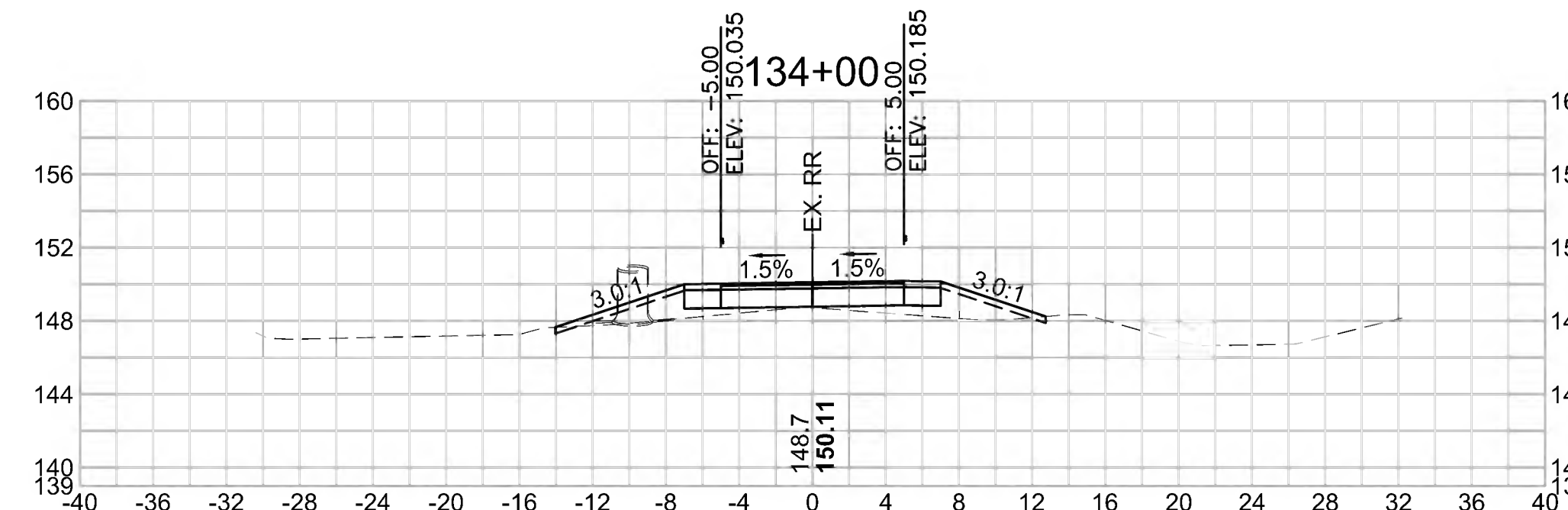
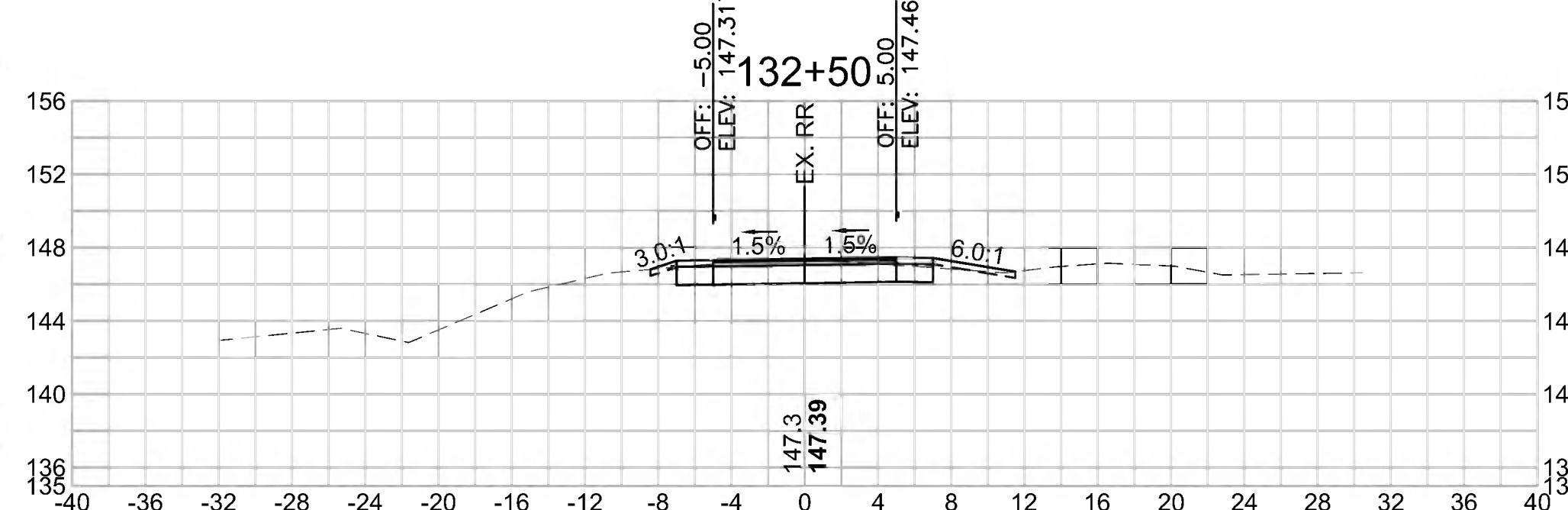
Cut Area (SF)	16.213
Fill Area (SF)	0.195
Cut Vol (CF)	36.748
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	2755.126
Cum Fill Vol (CF)	1146.6
Net Vol (CF)	1608.6

**Total Volume at Station 134+00.00**

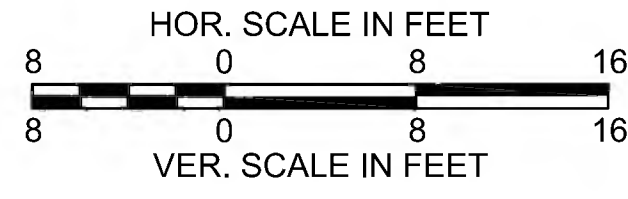
Cut Area (SF)	0.358
Fill Area (SF)	13.218
Cut Vol (CF)	2.281
Fill Vol (CF)	17.7
Cum Cut Vol (CF)	2791.267
Cum Fill Vol (CF)	1172.8
Net Vol (CF)	1618.5

**Total Volume at Station 135+50.00**

Cut Area (SF)	7.759
Fill Area (SF)	0.630
Cut Vol (CF)	10.311
Fill Vol (CF)	1.8
Cum Cut Vol (CF)	2807.649
Cum Fill Vol (CF)	1195.3
Net Vol (CF)	1612.3







SUDBURY  
 BRUCE FREEMAN RAIL TRAIL

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**Total Volume at Station 138+00.00**

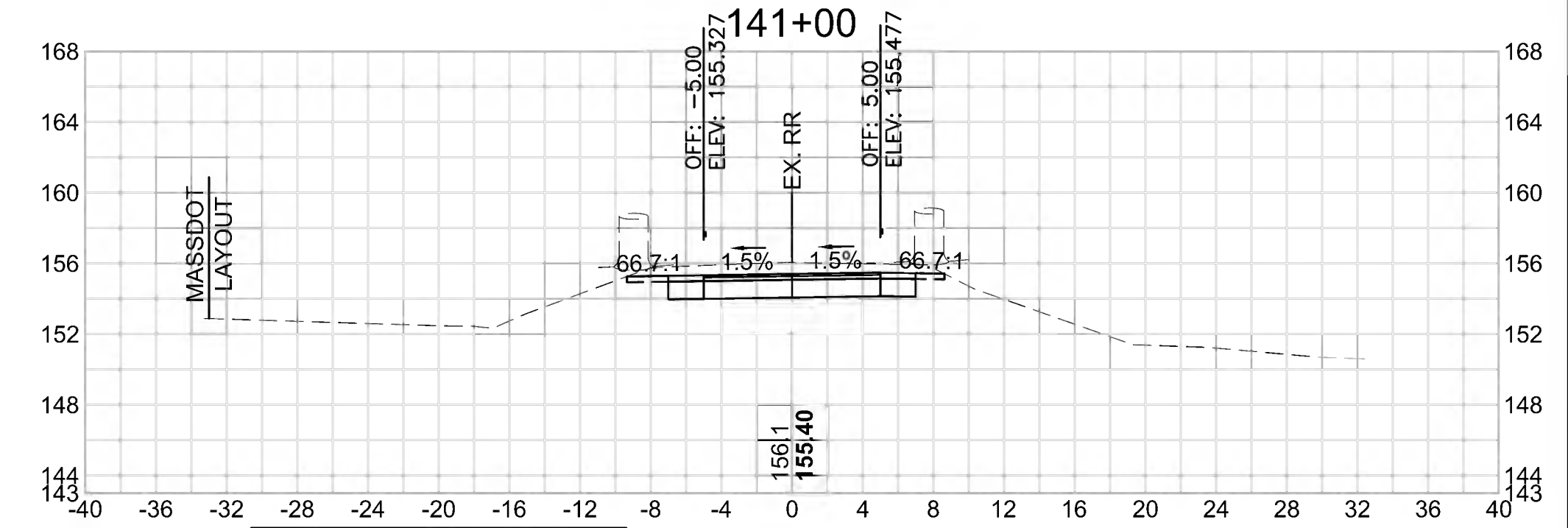
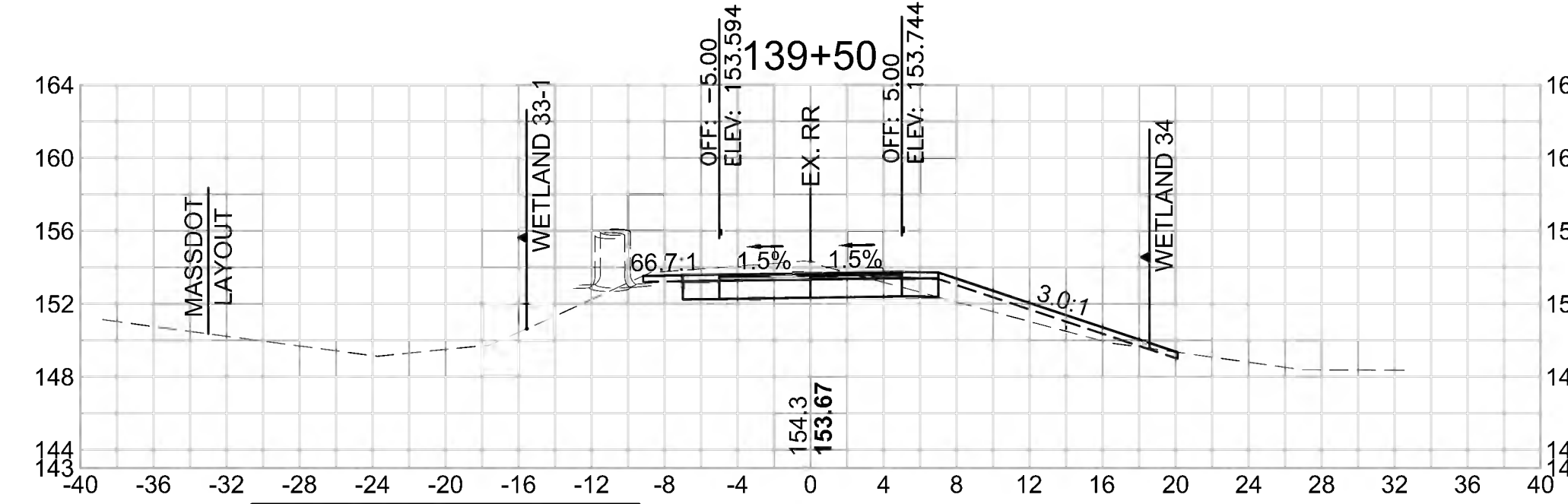
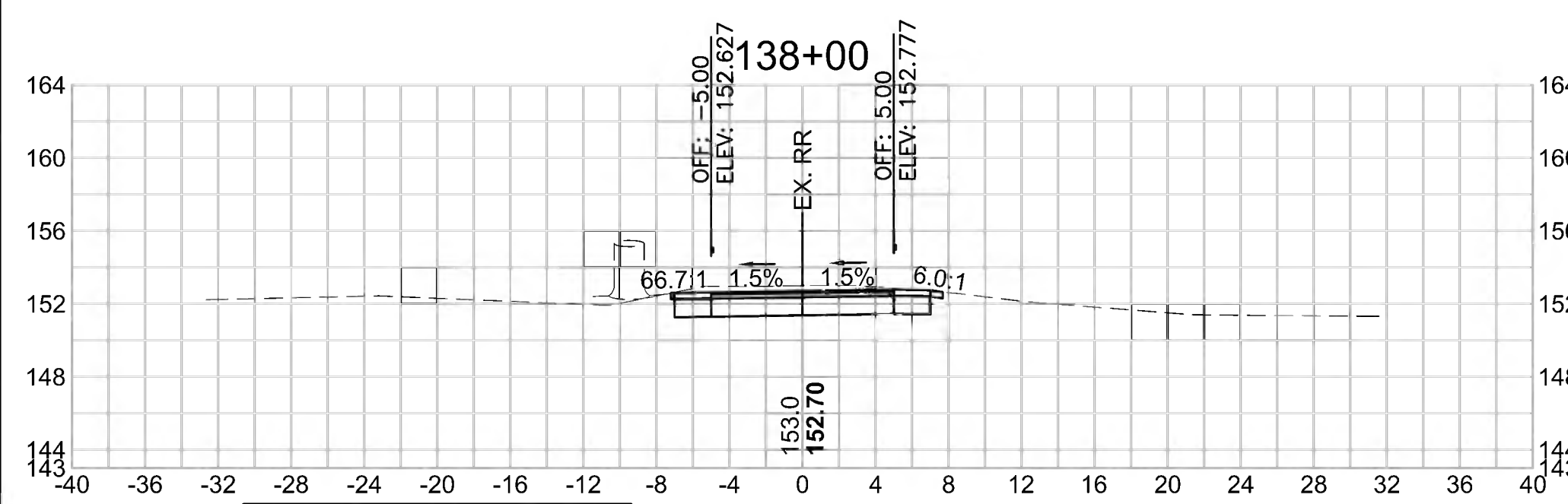
Cut Area (SF)	22.037
Fill Area (SF)	0.000
Cut Vol (CF)	39.805
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	2949.937
Cum Fill Vol (CF)	1201.2
Net Vol (CF)	1748.7

**Total Volume at Station 139+50.00**

Cut Area (SF)	20.464
Fill Area (SF)	0.000
Cut Vol (CF)	43.359
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	3083.625
Cum Fill Vol (CF)	1201.2
Net Vol (CF)	1882.4

**Total Volume at Station 141+00.00**

Cut Area (SF)	29.263
Fill Area (SF)	0.000
Cut Vol (CF)	58.810
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	3246.720
Cum Fill Vol (CF)	1201.2
Net Vol (CF)	2045.5



**Total Volume at Station 137+50.00**

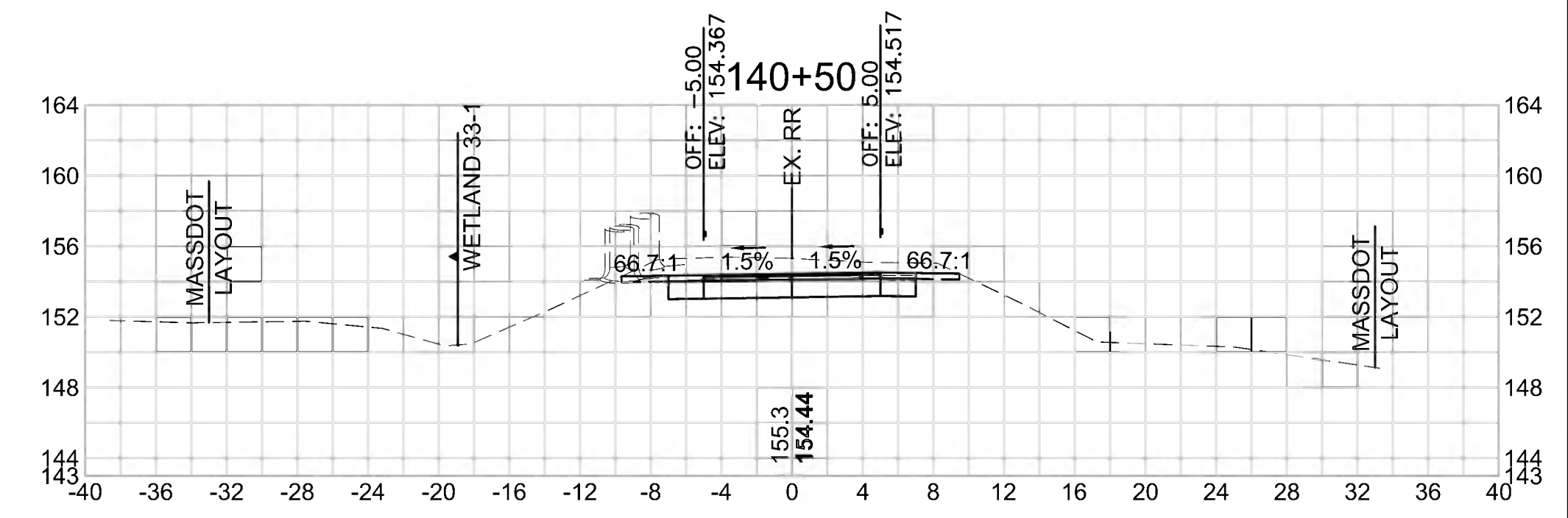
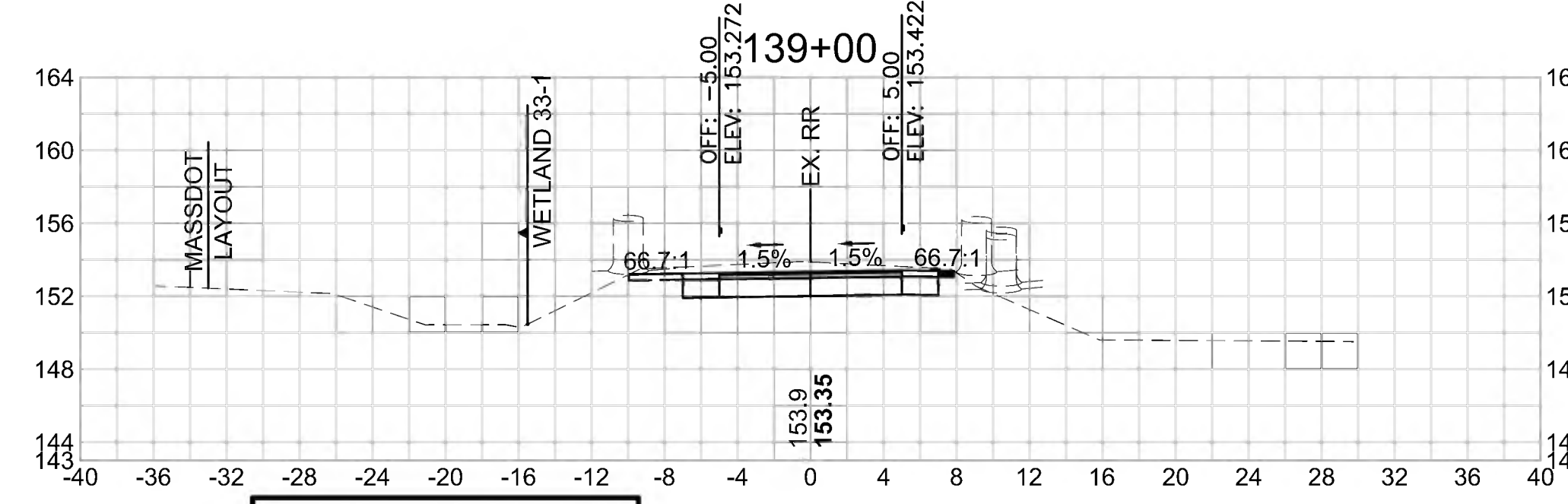
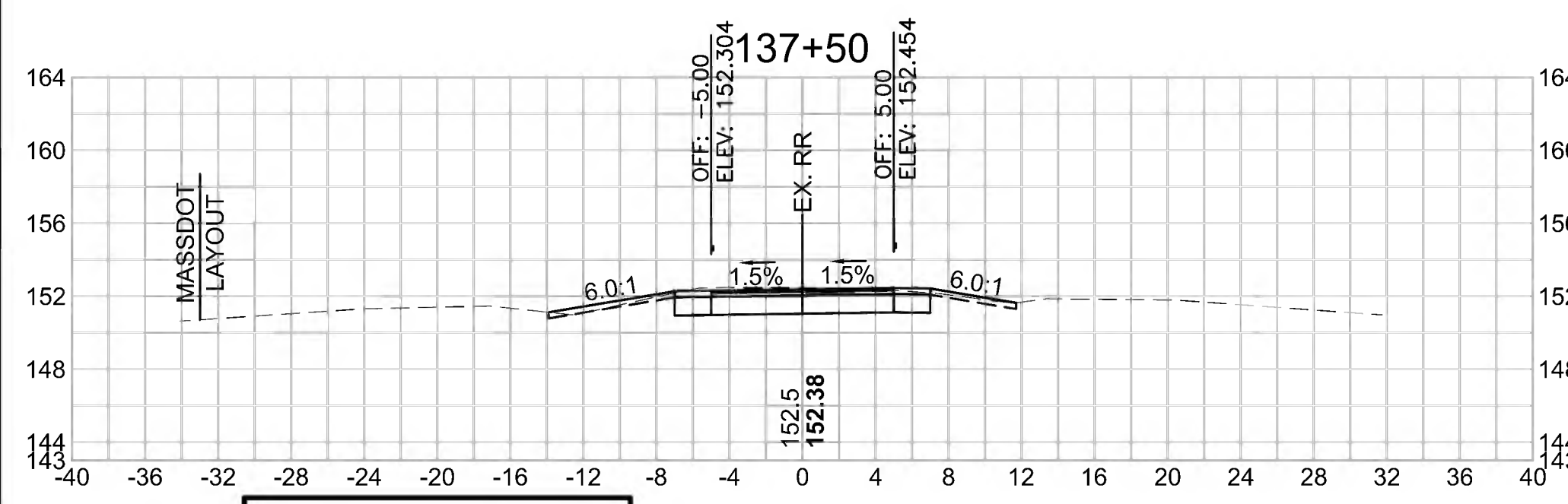
Cut Area (SF)	20.952
Fill Area (SF)	0.033
Cut Vol (CF)	36.189
Fill Vol (CF)	0.3
Cum Cut Vol (CF)	2910.133
Cum Fill Vol (CF)	1201.2
Net Vol (CF)	1708.9

**Total Volume at Station 139+00.00**

Cut Area (SF)	26.364
Fill Area (SF)	0.000
Cut Vol (CF)	47.168
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	3040.266
Cum Fill Vol (CF)	1201.2
Net Vol (CF)	1839.0

**Total Volume at Station 140+50.00**

Cut Area (SF)	34.252
Fill Area (SF)	0.000
Cut Vol (CF)	58.527
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	3187.910
Cum Fill Vol (CF)	1201.2
Net Vol (CF)	1986.7



**Total Volume at Station 137+00.00**

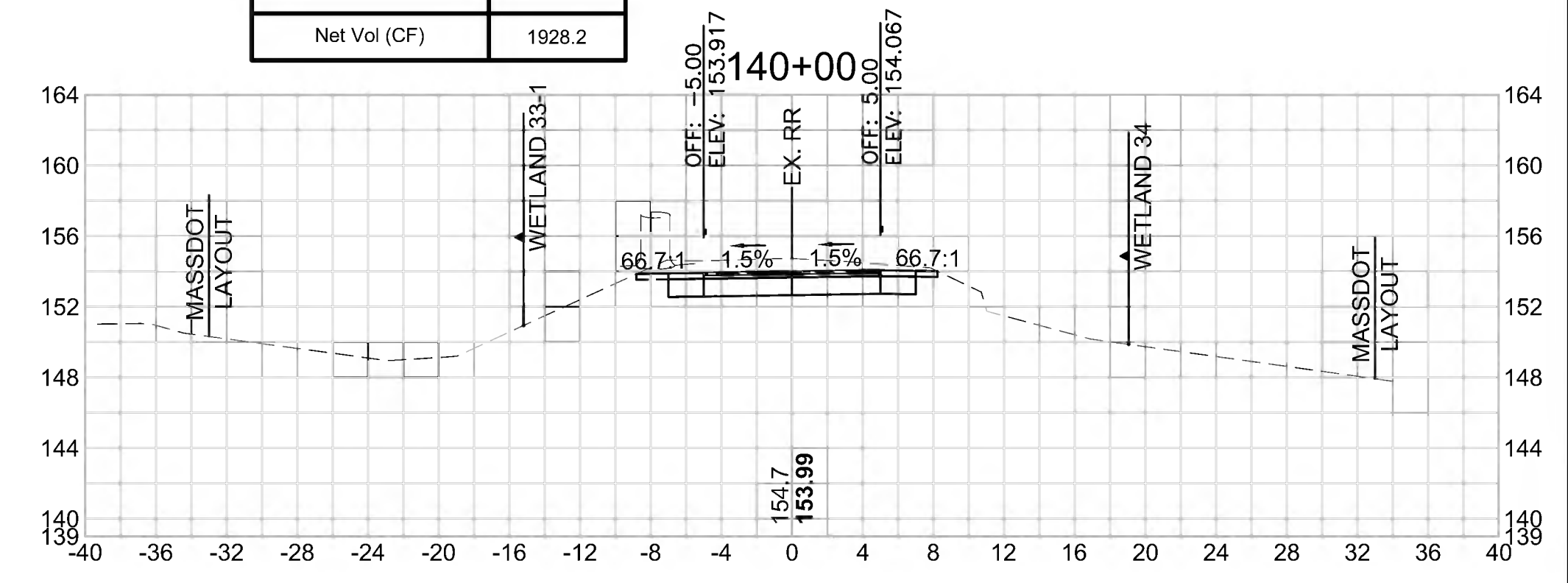
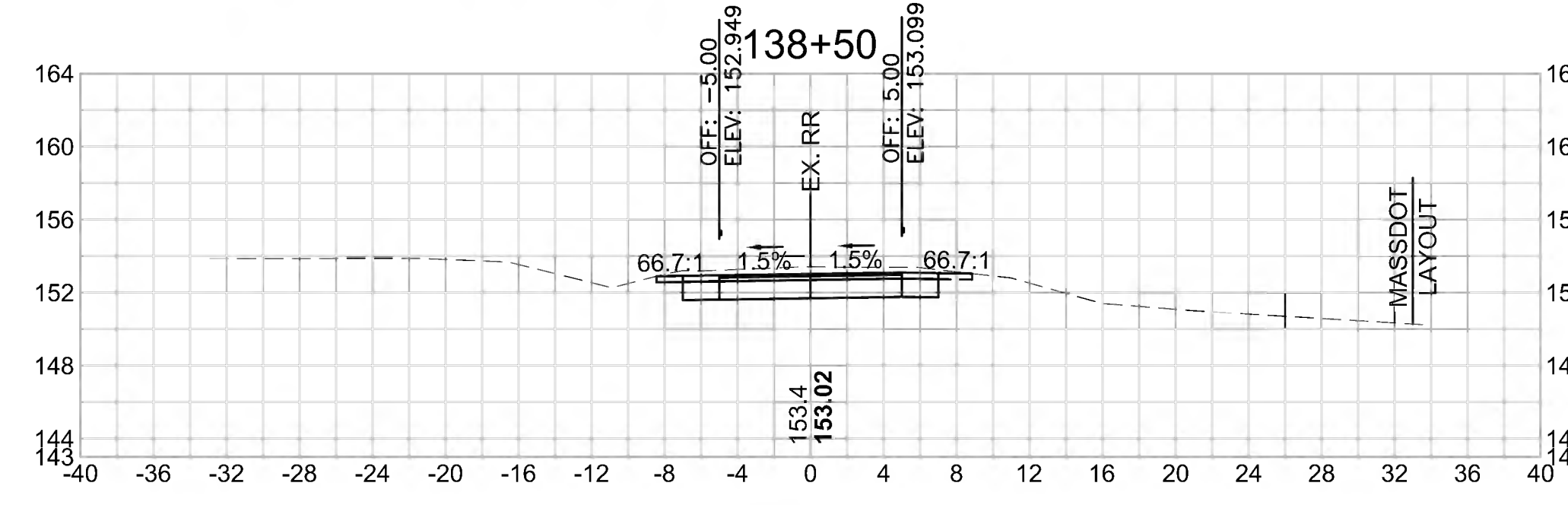
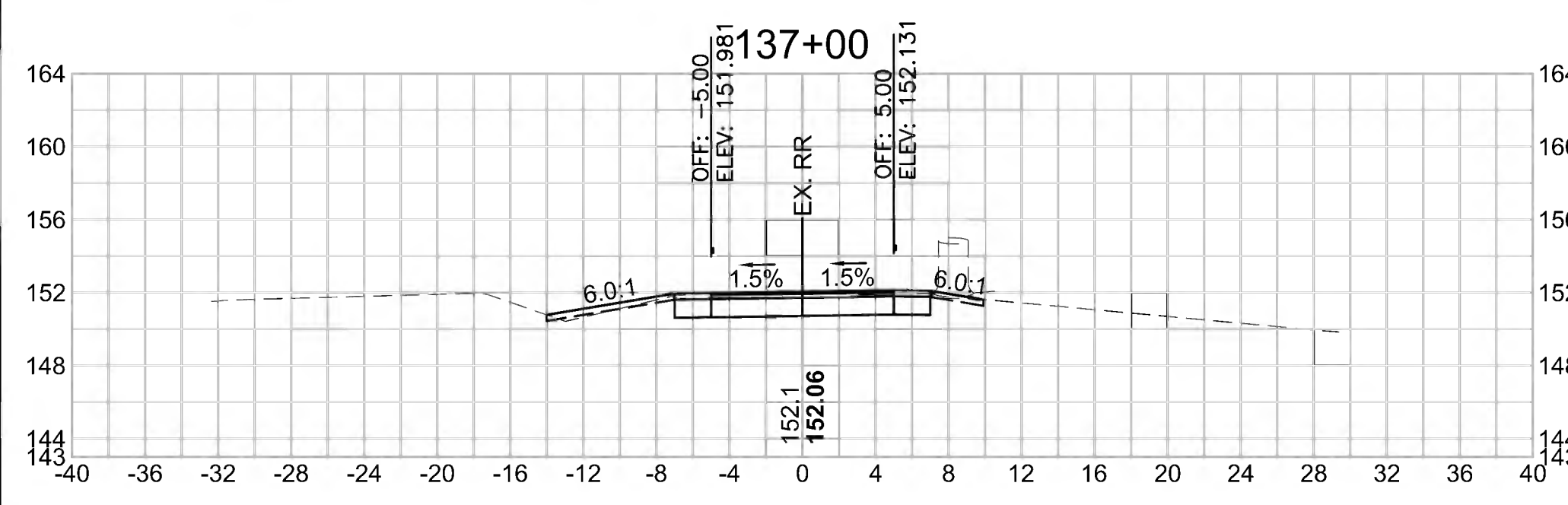
Cut Area (SF)	18.132
Fill Area (SF)	0.314
Cut Vol (CF)	29.552
Fill Vol (CF)	1.3
Cum Cut Vol (CF)	2873.944
Cum Fill Vol (CF)	1200.9
Net Vol (CF)	1673.1

**Total Volume at Station 138+50.00**

Cut Area (SF)	24.577
Fill Area (SF)	0.000
Cut Vol (CF)	43.162
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	2993.098
Cum Fill Vol (CF)	1201.2
Net Vol (CF)	1791.9

**Total Volume at Station 140+00.00**

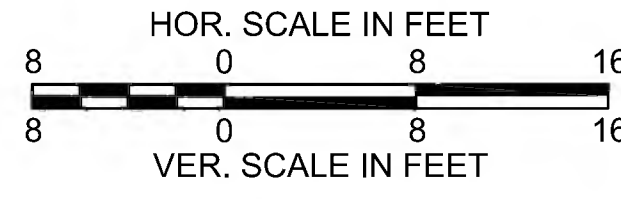
Cut Area (SF)	28.956
Fill Area (SF)	0.000
Cut Vol (CF)	45.760
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	3129.384
Cum Fill Vol (CF)	1201.2
Net Vol (CF)	1928.2



SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	254	319
PROJECT FILE NO. 608164			

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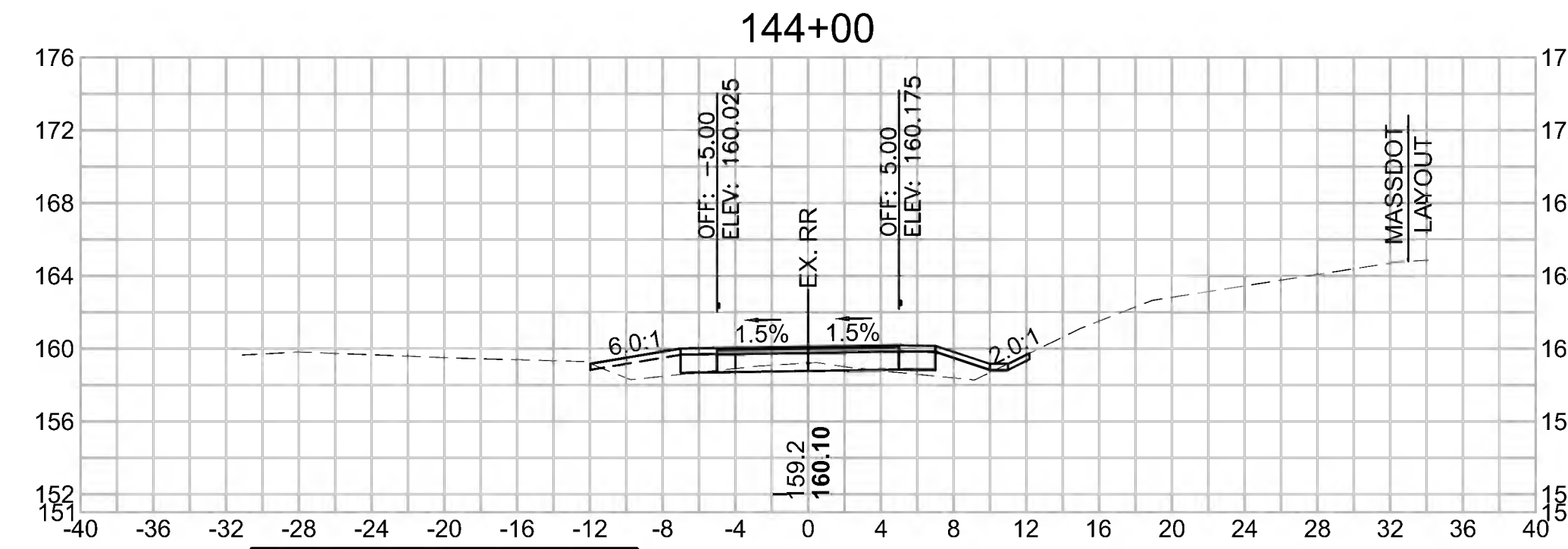
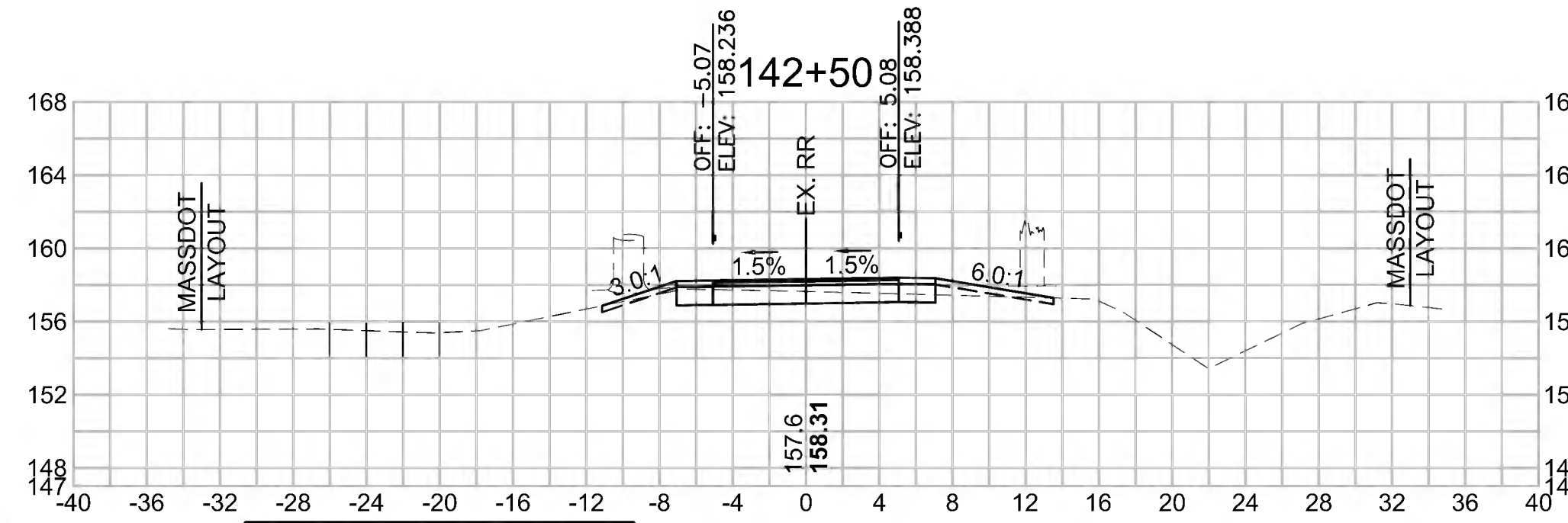


**Total Volume at Station 142+50.00**

Cut Area (SF)	10.105
Fill Area (SF)	1.261
Cut Vol (CF)	22.725
Fill Vol (CF)	2.3
Cum Cut Vol (CF)	3341.864
Cum Fill Vol (CF)	1206.3
Net Vol (CF)	2135.6

**Total Volume at Station 144+00.00**

Cut Area (SF)	3.029
Fill Area (SF)	6.893
Cut Vol (CF)	6.559
Fill Vol (CF)	12.5
Cum Cut Vol (CF)	3408.677
Cum Fill Vol (CF)	1226.1
Net Vol (CF)	2182.5

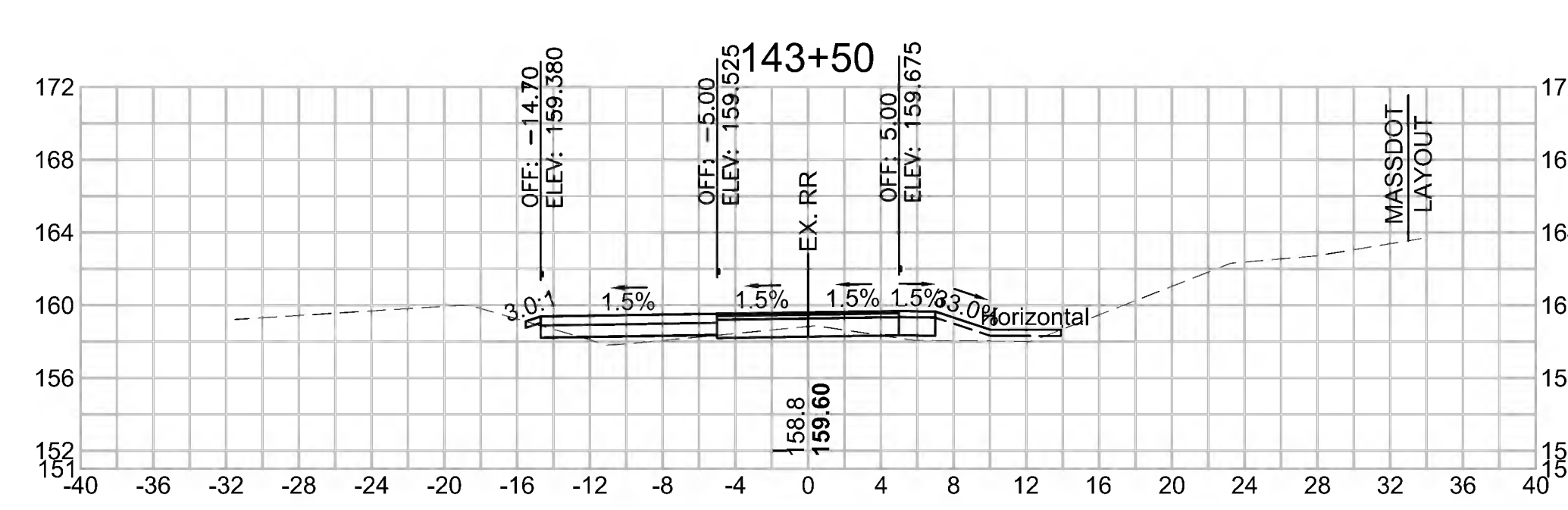
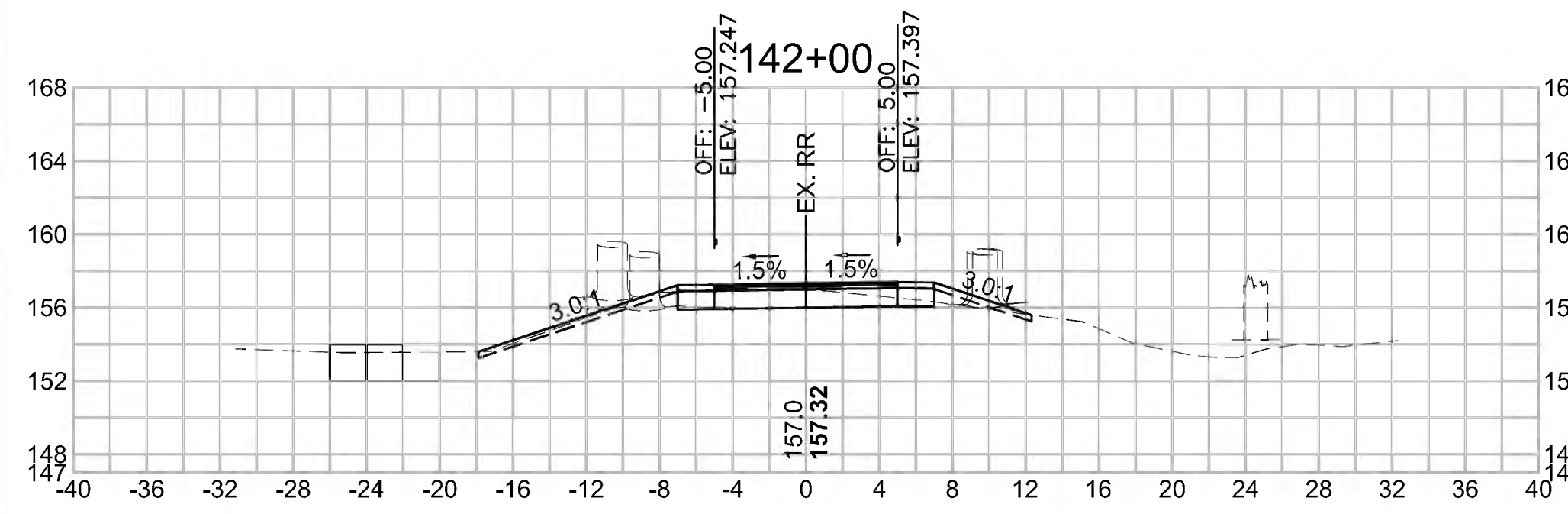


**Total Volume at Station 142+00.00**

Cut Area (SF)	14.437
Fill Area (SF)	1.258
Cut Vol (CF)	29.347
Fill Vol (CF)	1.9
Cum Cut Vol (CF)	3319.140
Cum Fill Vol (CF)	1203.9
Net Vol (CF)	2115.2

**Total Volume at Station 143+50.00**

Cut Area (SF)	4.054
Fill Area (SF)	6.653
Cut Vol (CF)	27.326
Fill Vol (CF)	6.2
Cum Cut Vol (CF)	3402.119
Cum Fill Vol (CF)	1213.6
Net Vol (CF)	2188.5

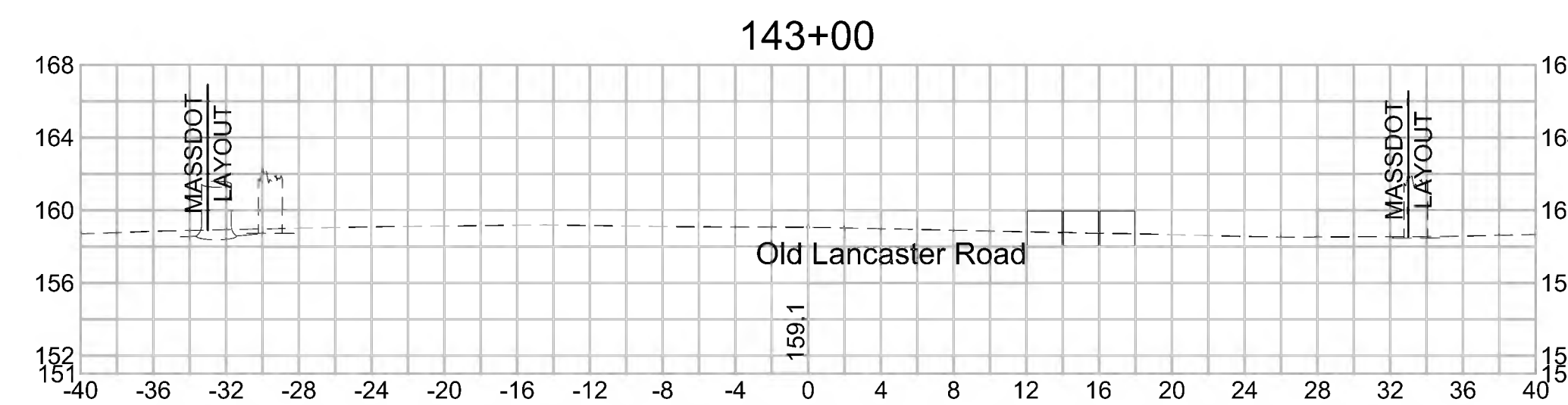
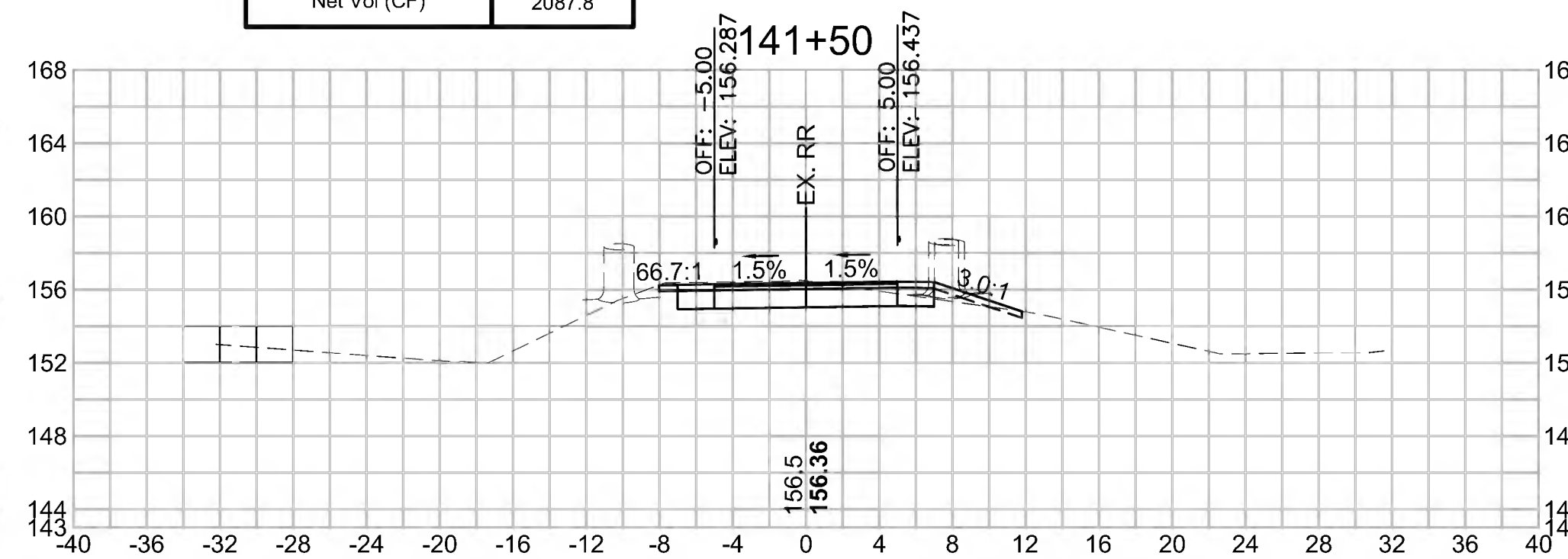


**Total Volume at Station 141+50.00**

Cut Area (SF)	17.257
Fill Area (SF)	0.838
Cut Vol (CF)	43.074
Fill Vol (CF)	0.8
Cum Cut Vol (CF)	3289.793
Cum Fill Vol (CF)	1202.0
Net Vol (CF)	2087.8

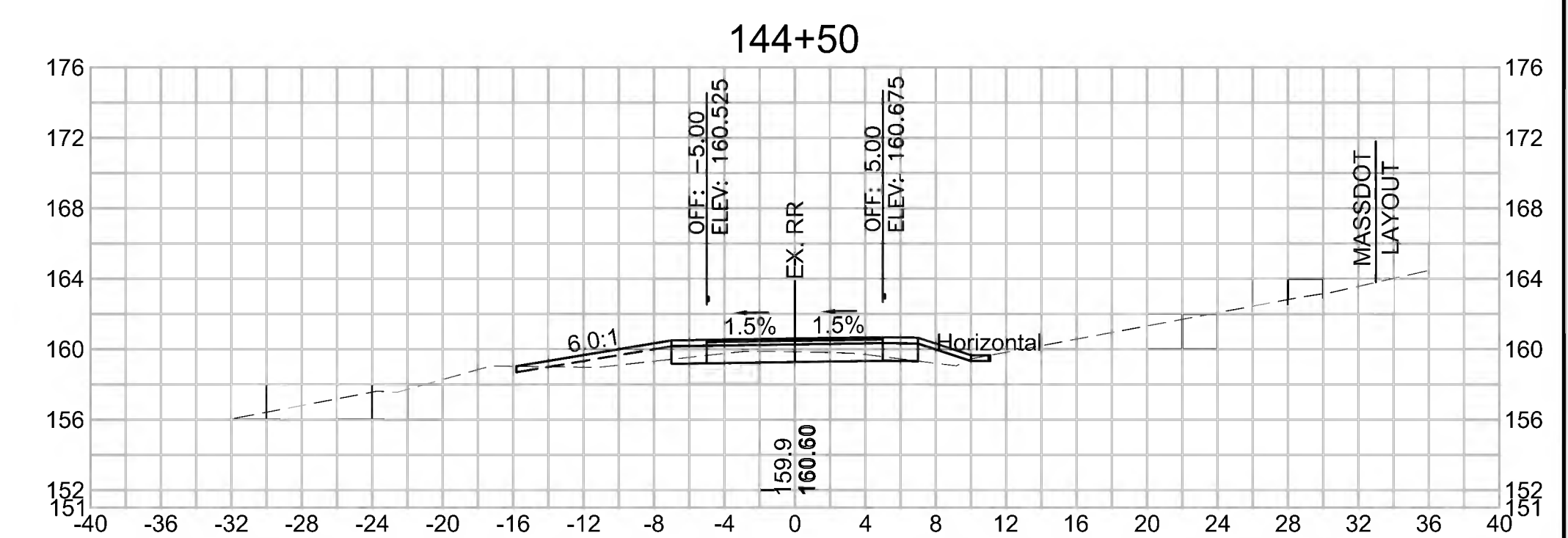
**Total Volume at Station 143+00.00**

Cut Area (SF)	25.458
Fill Area (SF)	0.000
Cut Vol (CF)	32.929
Fill Vol (CF)	1.2
Cum Cut Vol (CF)	3374.793
Cum Fill Vol (CF)	1207.4
Net Vol (CF)	2167.4



**Total Volume at Station 144+50.00**

Cut Area (SF)	6.791
Fill Area (SF)	5.125
Cut Vol (CF)	9.093
Fill Vol (CF)	11.1
Cum Cut Vol (CF)	3417.770
Cum Fill Vol (CF)	1237.3
Net Vol (CF)	2180.5





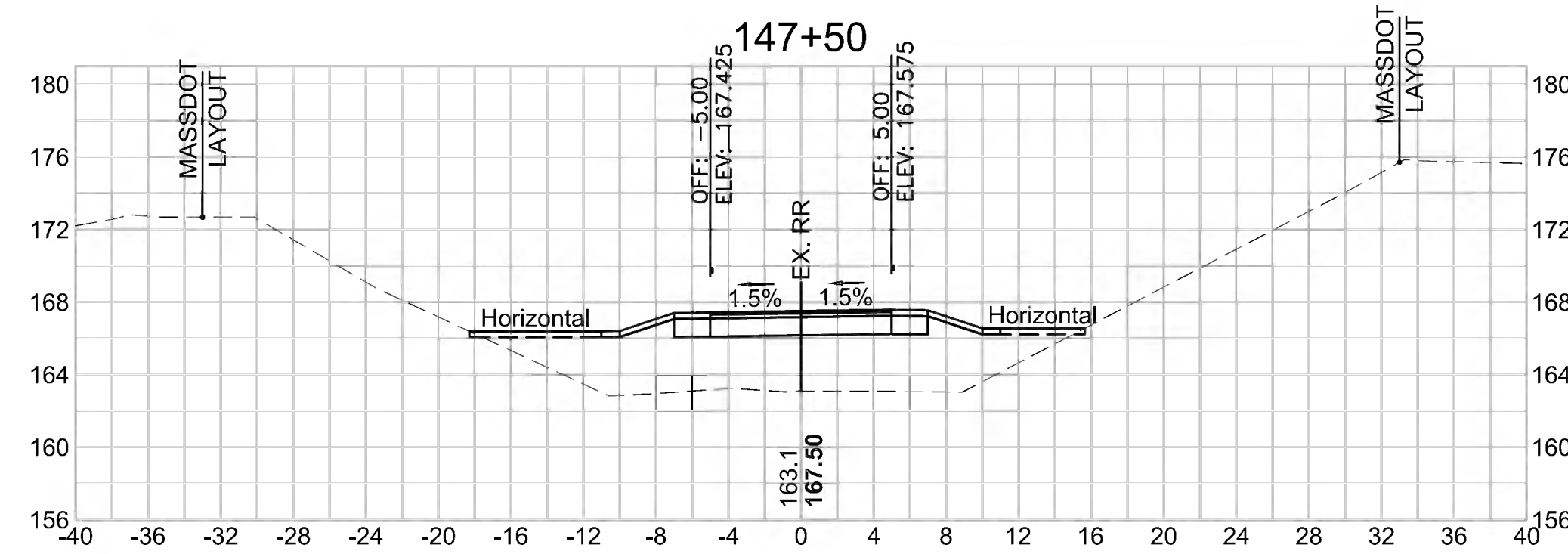
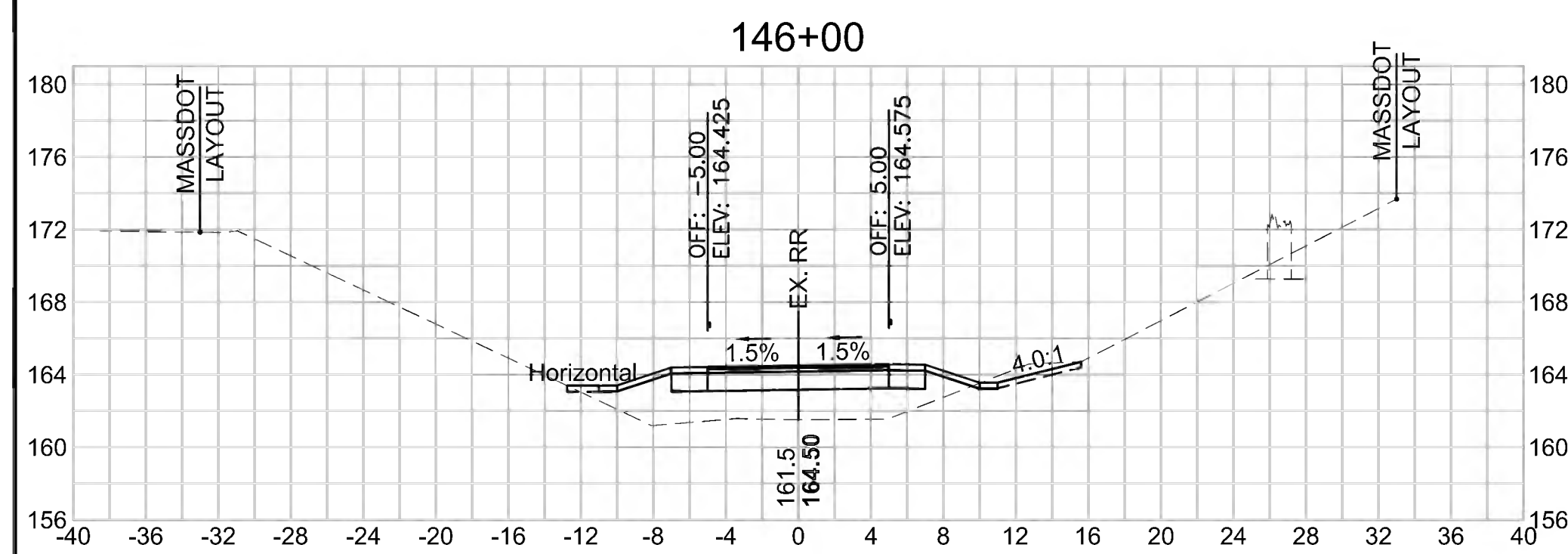
**CROSS SECTIONS**

**Total Volume at Station 146+00.00**

Cut Area (SF)	3.780
Fill Area (SF)	31.945
Cut Vol (CF)	7.5
Fill Vol (CF)	37.6
Cum Cut Vol (CF)	3448.5
Cum Fill Vol (CF)	1296.6
Net Vol (CF)	2151.9

**Total Volume at Station 147+50.00**

Cut Area (SF)	0.222
Fill Area (SF)	84.139
Cut Vol (CF)	0.4
Fill Vol (CF)	149.8
Cum Cut Vol (CF)	3453.1
Cum Fill Vol (CF)	1677.5
Net Vol (CF)	1775.5

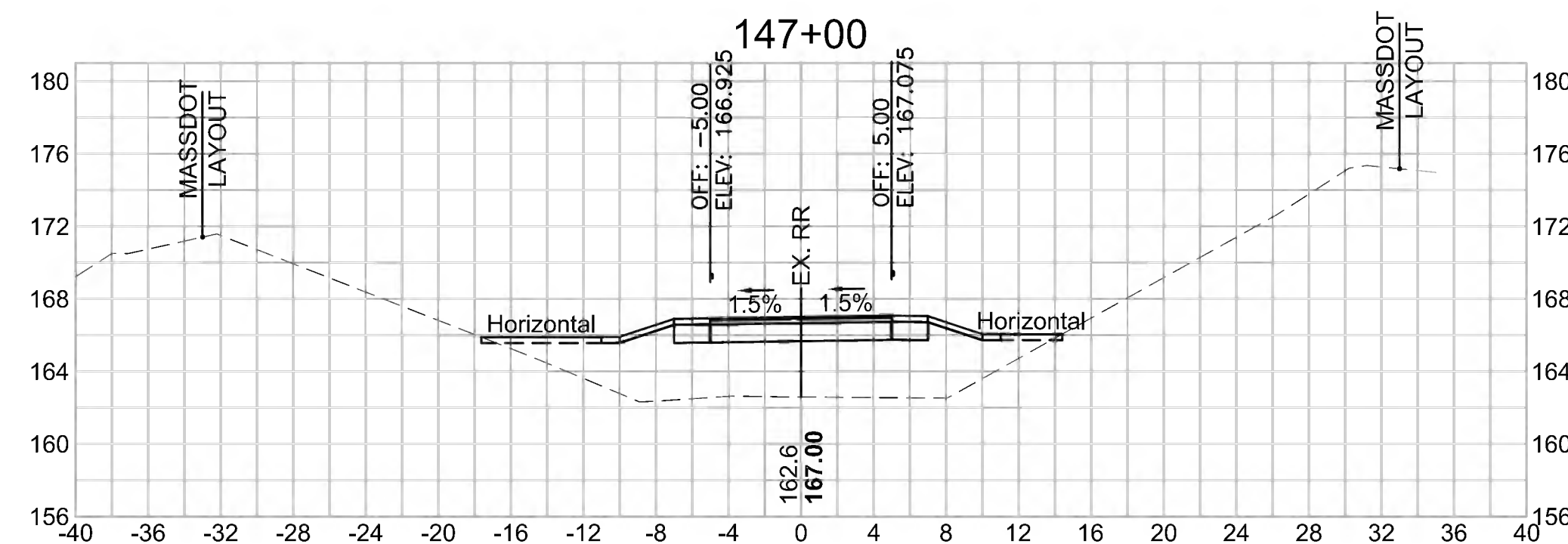
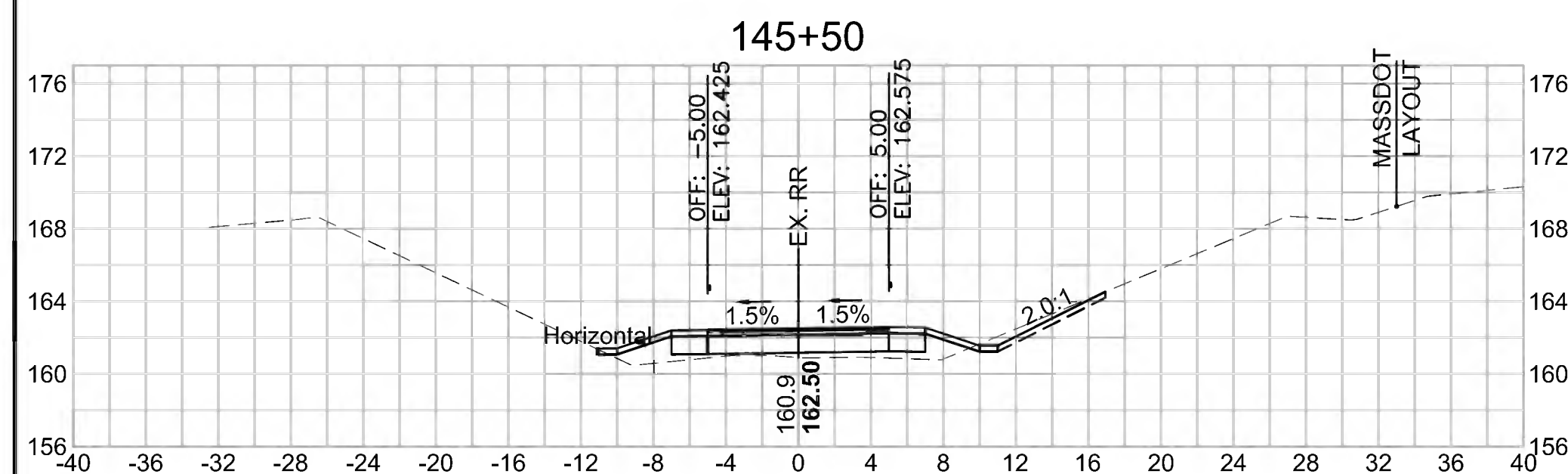


**Total Volume at Station 145+50.00**

Cut Area (SF)	4.316
Fill Area (SF)	8.617
Cut Vol (CF)	10.5
Fill Vol (CF)	12.5
Cum Cut Vol (CF)	3441.0
Cum Fill Vol (CF)	1259.1
Net Vol (CF)	2182.0

**Total Volume at Station 147+00.00**

Cut Area (SF)	0.237
Fill Area (SF)	77.656
Cut Vol (CF)	0.4
Fill Vol (CF)	136.7
Cum Cut Vol (CF)	3452.6
Cum Fill Vol (CF)	1527.7
Net Vol (CF)	1924.9

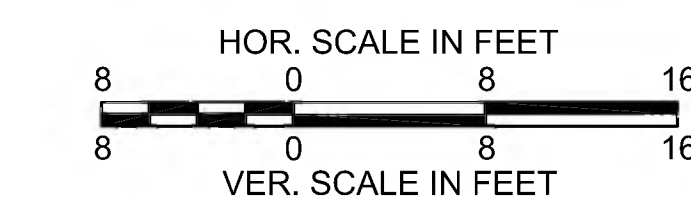
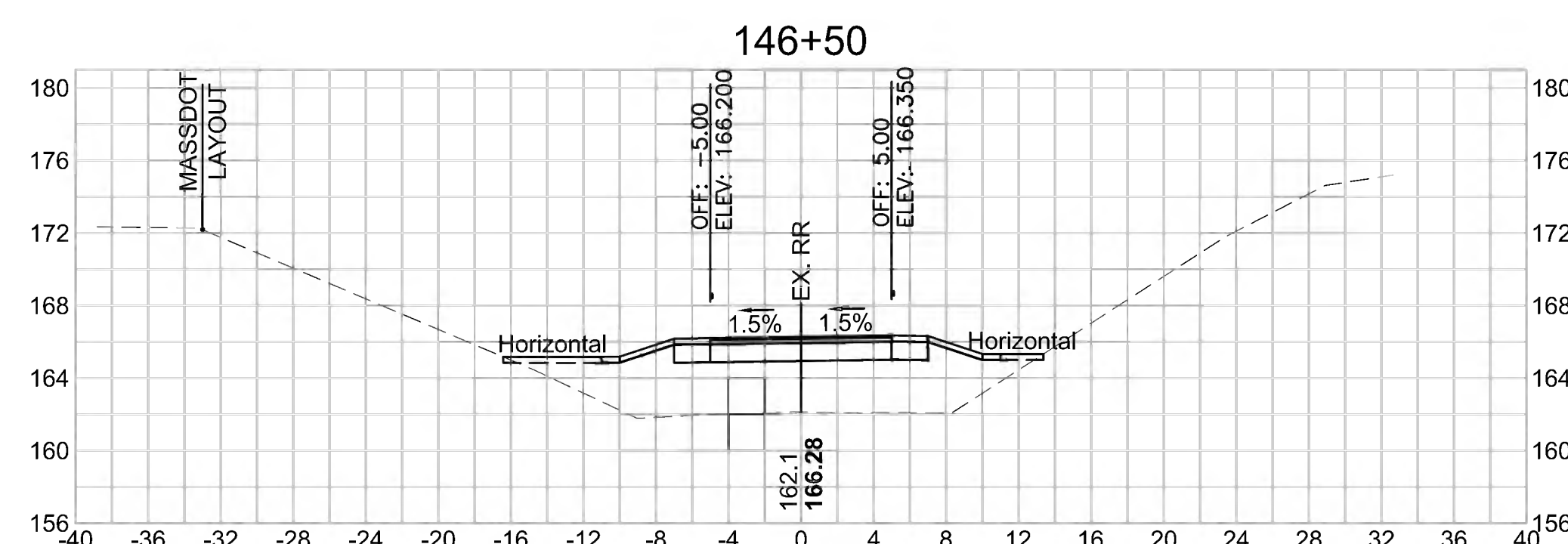
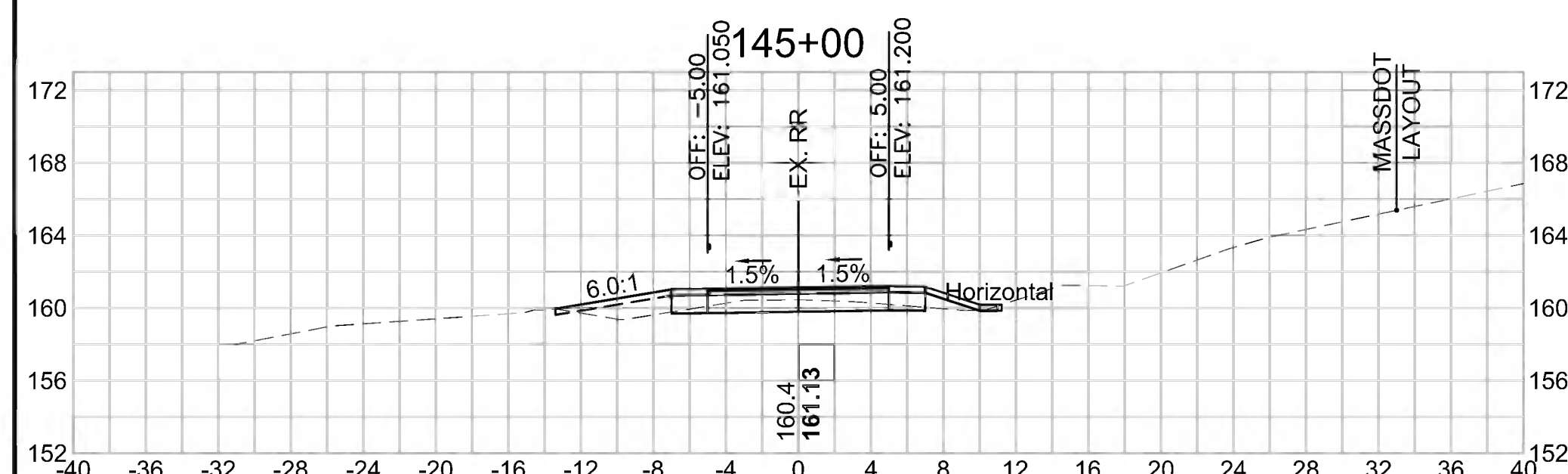


**Total Volume at Station 145+00.00**

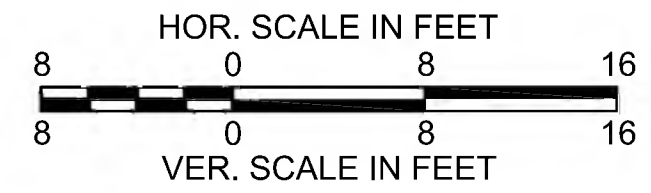
Cut Area (SF)	6.999
Fill Area (SF)	4.897
Cut Vol (CF)	12.8
Fill Vol (CF)	9.3
Cum Cut Vol (CF)	3430.5
Cum Fill Vol (CF)	1246.5
Net Vol (CF)	2184.0

**Total Volume at Station 146+50.00**

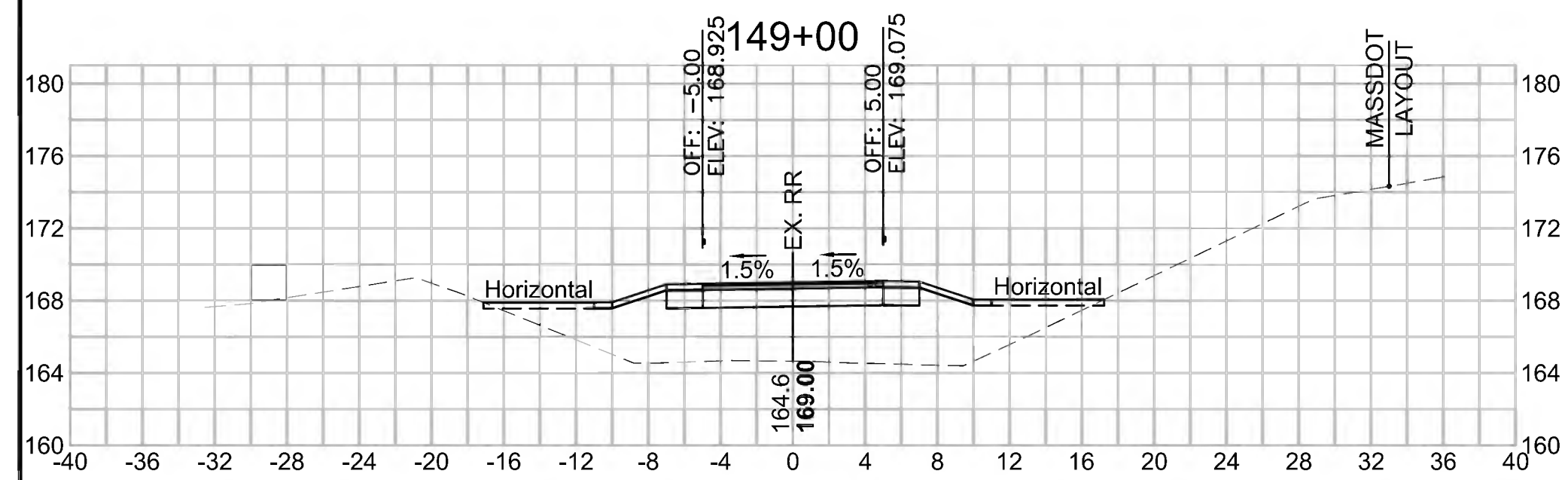
Cut Area (SF)	0.213
Fill Area (SF)	69.990
Cut Vol (CF)	3.7
Fill Vol (CF)	94.4
Cum Cut Vol (CF)	3452.2
Cum Fill Vol (CF)	1391.0
Net Vol (CF)	2061.2



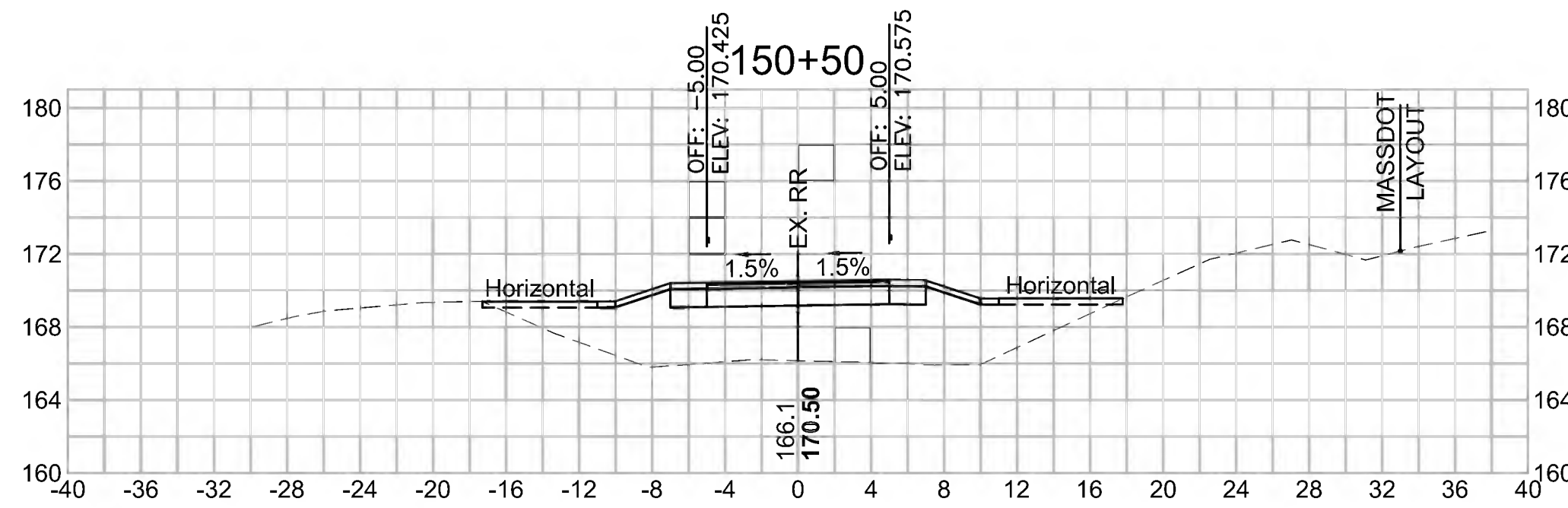
CROSS SECTIONS



Cut Area (SF)	0.249
Fill Area (SF)	82.781
Cut Vol (CF)	0.4
Fill Vol (CF)	153.1
Cum Cut Vol (CF)	3454.2
Cum Fill Vol (CF)	2150.8
Net Vol (CF)	1303.5

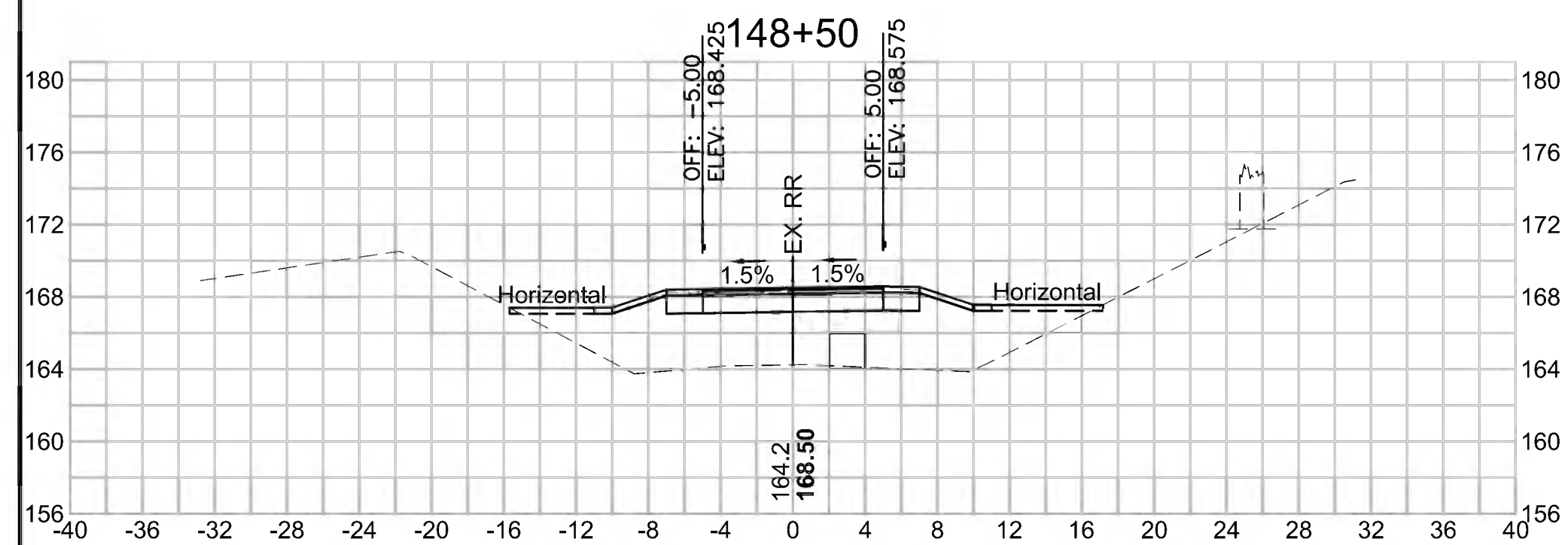


Cut Area (SF)	0.610
Fill Area (SF)	84.824
Cut Vol (CF)	0.8
Fill Vol (CF)	155.0
Cum Cut Vol (CF)	3456.1
Cum Fill Vol (CF)	2618.4
Net Vol (CF)	837.7



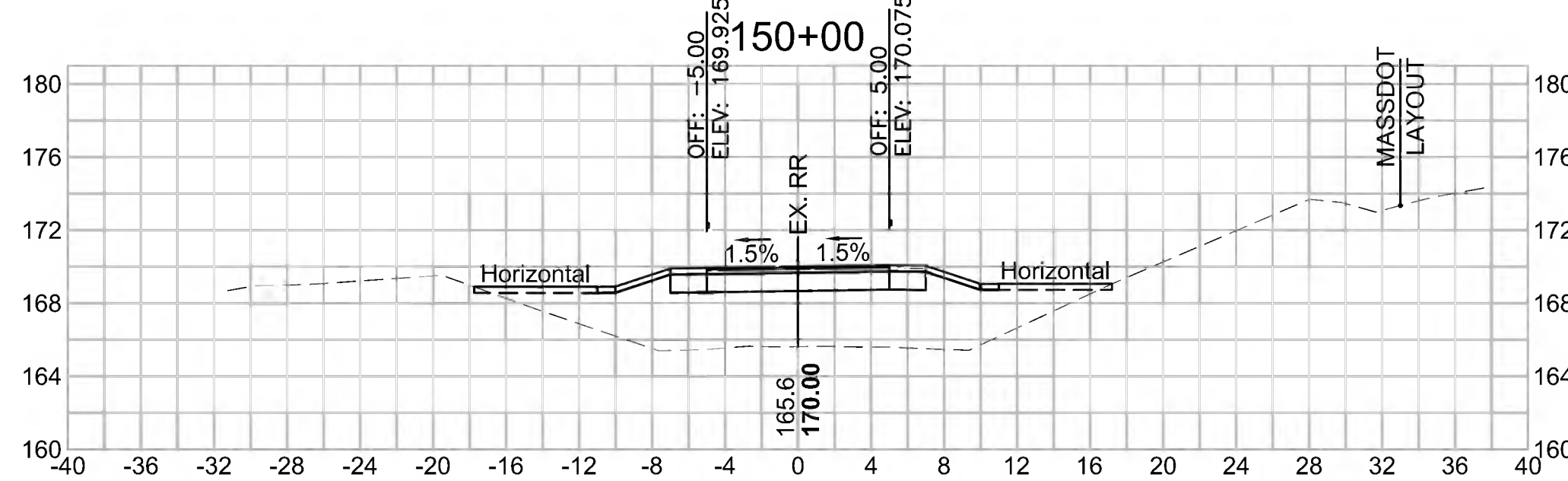
**Total Volume at Station 148+50.00**

Cut Area (SF)	0.210
Fill Area (SF)	82.557
Cut Vol (CF)	0.4
Fill Vol (CF)	159.3
Cum Cut Vol (CF)	3453.8
Cum Fill Vol (CF)	1997.7
Net Vol (CF)	1456.2



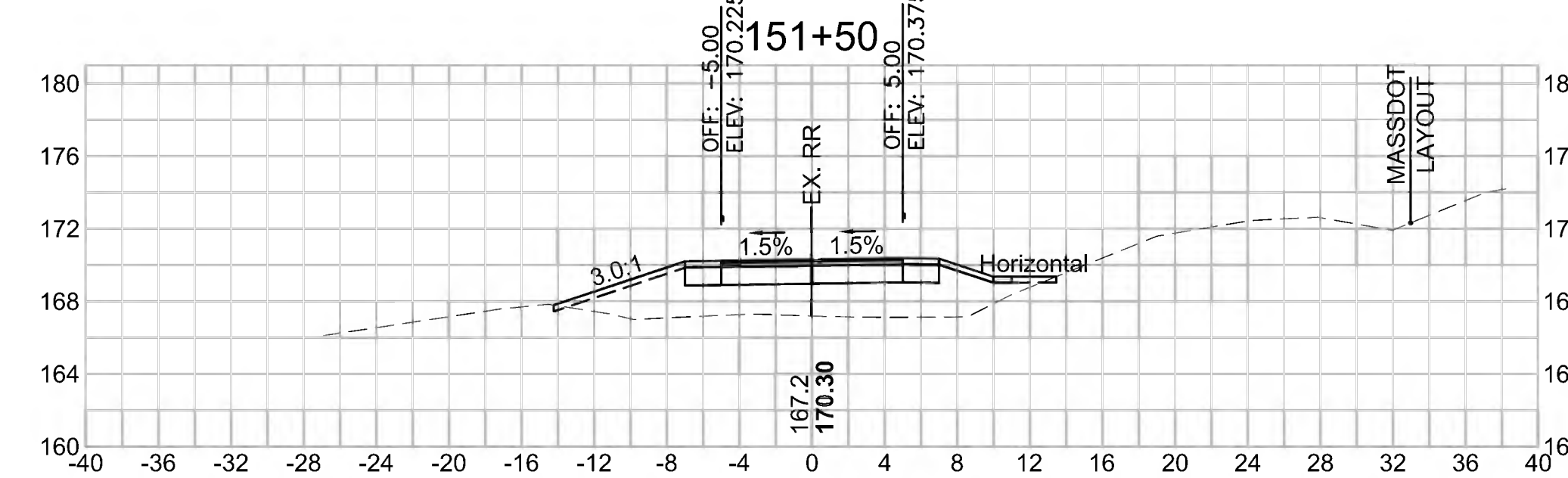
**Total Volume at Station 150+00.00**

Cut Area (SF)	0.269
Fill Area (SF)	82.543
Cut Vol (CF)	0.5
Fill Vol (CF)	156.2
Cum Cut Vol (CF)	3455.2
Cum Fill Vol (CF)	2463.4
Net Vol (CF)	991.8



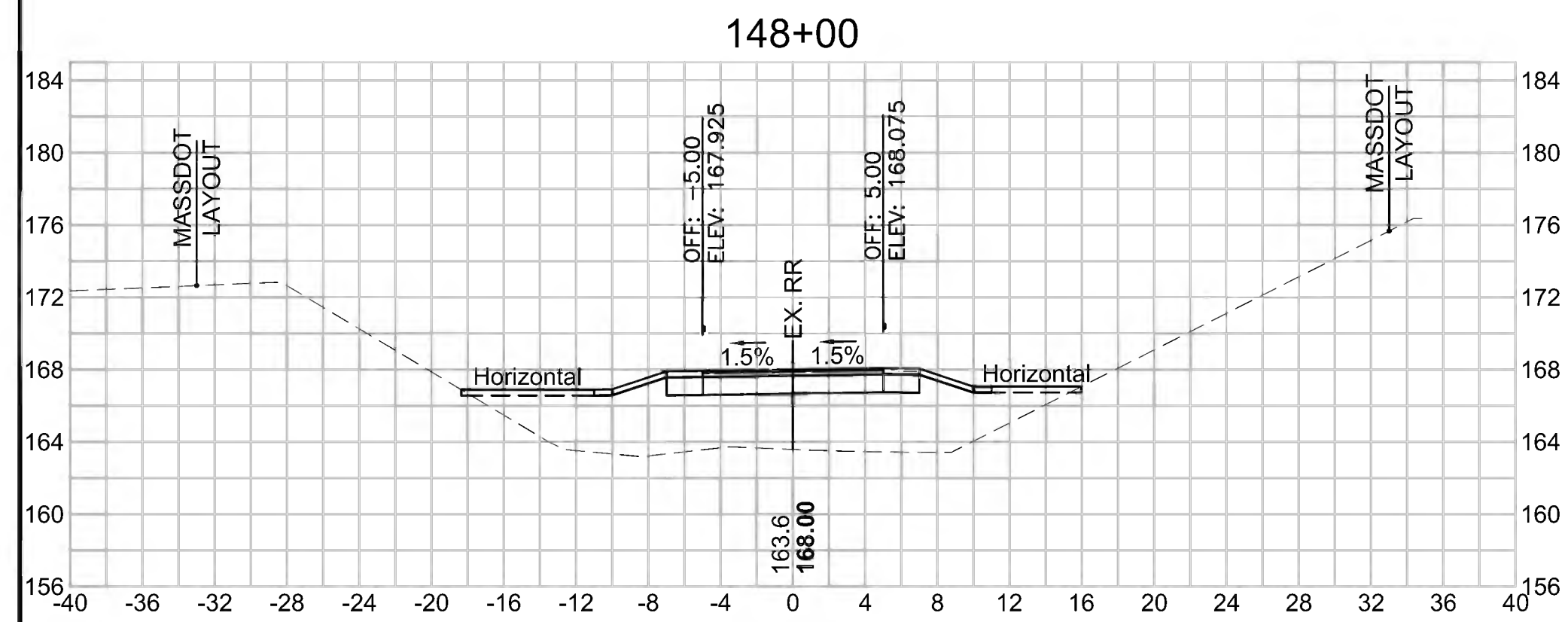
**Total Volume at Station 151+50.00**

Cut Area (SF)	0.259
Fill Area (SF)	42.987
Cut Vol (CF)	0.4
Fill Vol (CF)	109.5
Cum Cut Vol (CF)	3457.3
Cum Fill Vol (CF)	2876.0
Net Vol (CF)	581.3



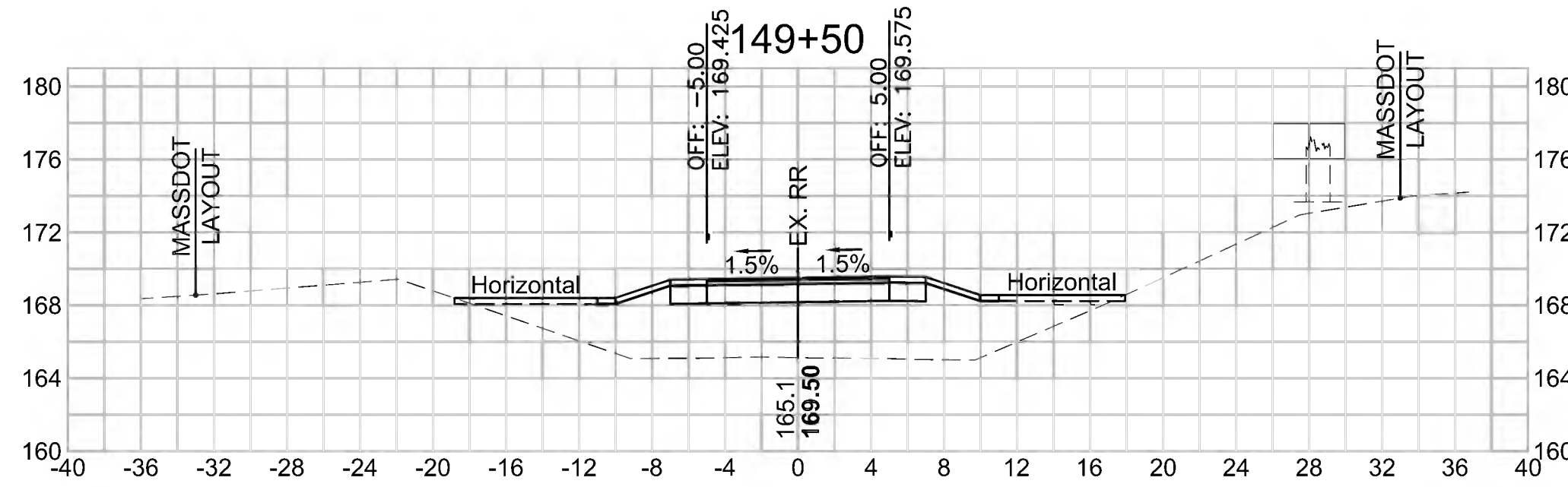
**Total Volume at Station 148+00.00**

Cut Area (SF)	0.199
Fill Area (SF)	89.527
Cut Vol (CF)	0.4
Fill Vol (CF)	160.8
Cum Cut Vol (CF)	3453.4
Cum Fill Vol (CF)	1838.3
Net Vol (CF)	1615.1



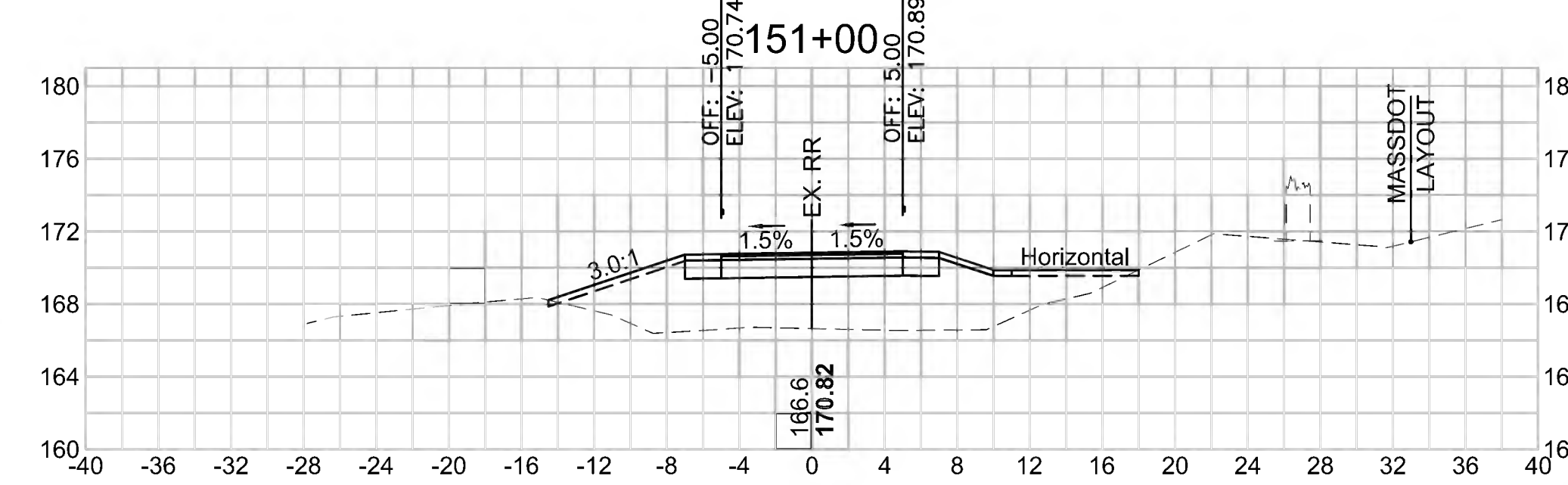
**Total Volume at Station 149+50.00**

Cut Area (SF)	0.280
Fill Area (SF)	86.165
Cut Vol (CF)	0.5
Fill Vol (CF)	156.4
Cum Cut Vol (CF)	3454.7
Cum Fill Vol (CF)	2307.2
Net Vol (CF)	1147.6



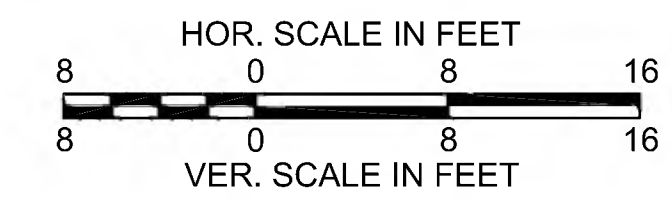
**Total Volume at Station 151+00.00**

Cut Area (SF)	0.219
Fill Area (SF)	75.223
Cut Vol (CF)	0.8
Fill Vol (CF)	148.2
Cum Cut Vol (CF)	3456.8
Cum Fill Vol (CF)	2766.6
Net Vol (CF)	690.3



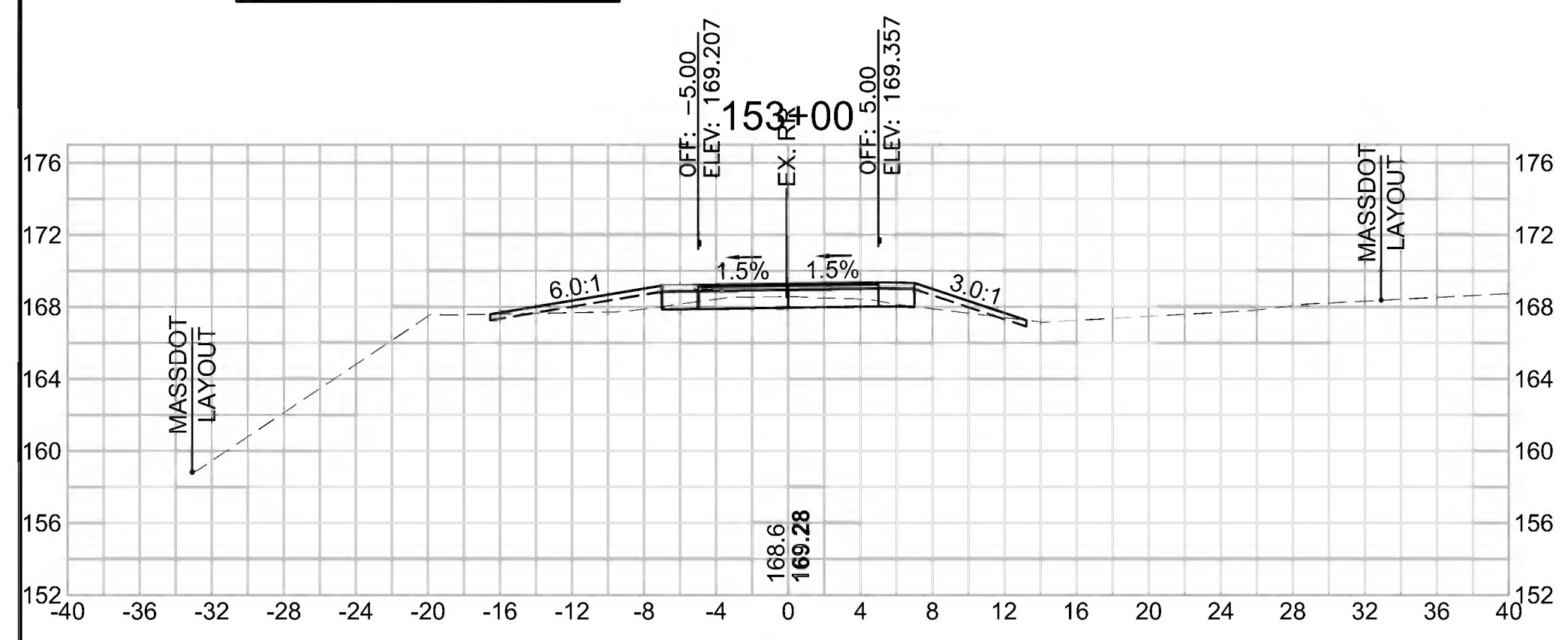


CROSS SECTIONS



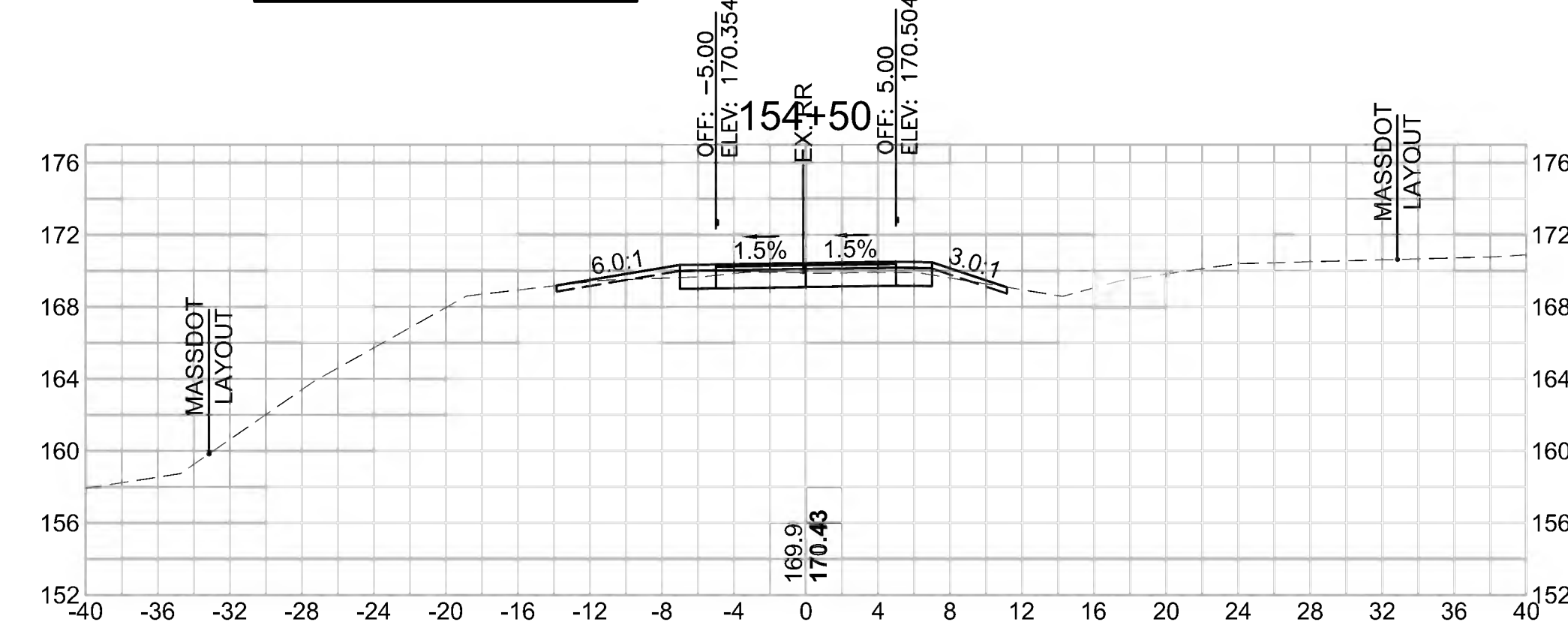
**Total Volume at Station 153+00.00**

Cut Area (SF)	6.879
Fill Area (SF)	5.832
Cut Vol (CF)	10.3
Fill Vol (CF)	8.4
Cum Cut Vol (CF)	3472.5
Cum Fill Vol (CF)	2953.8
Net Vol (CF)	518.7



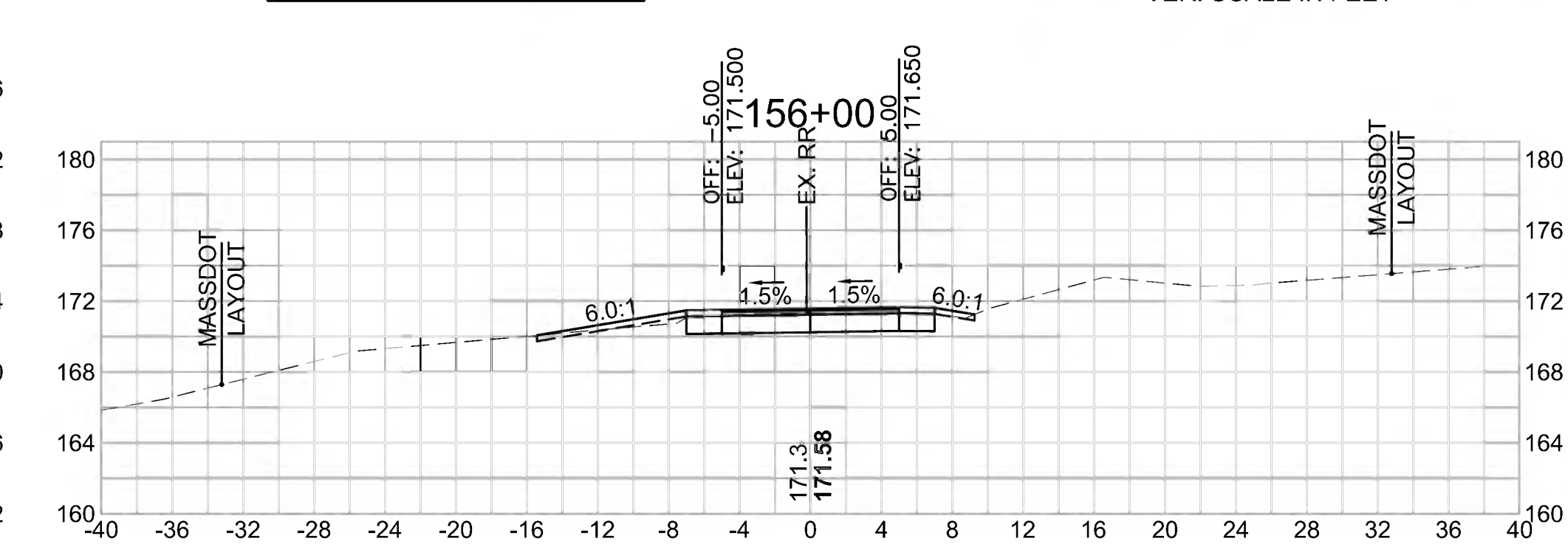
**Total Volume at Station 154+50.00**

Cut Area (SF)	11.824
Fill Area (SF)	0.877
Cut Vol (CF)	18.9
Fill Vol (CF)	7.7
Cum Cut Vol (CF)	3519.1
Cum Fill Vol (CF)	2990.7
Net Vol (CF)	528.4



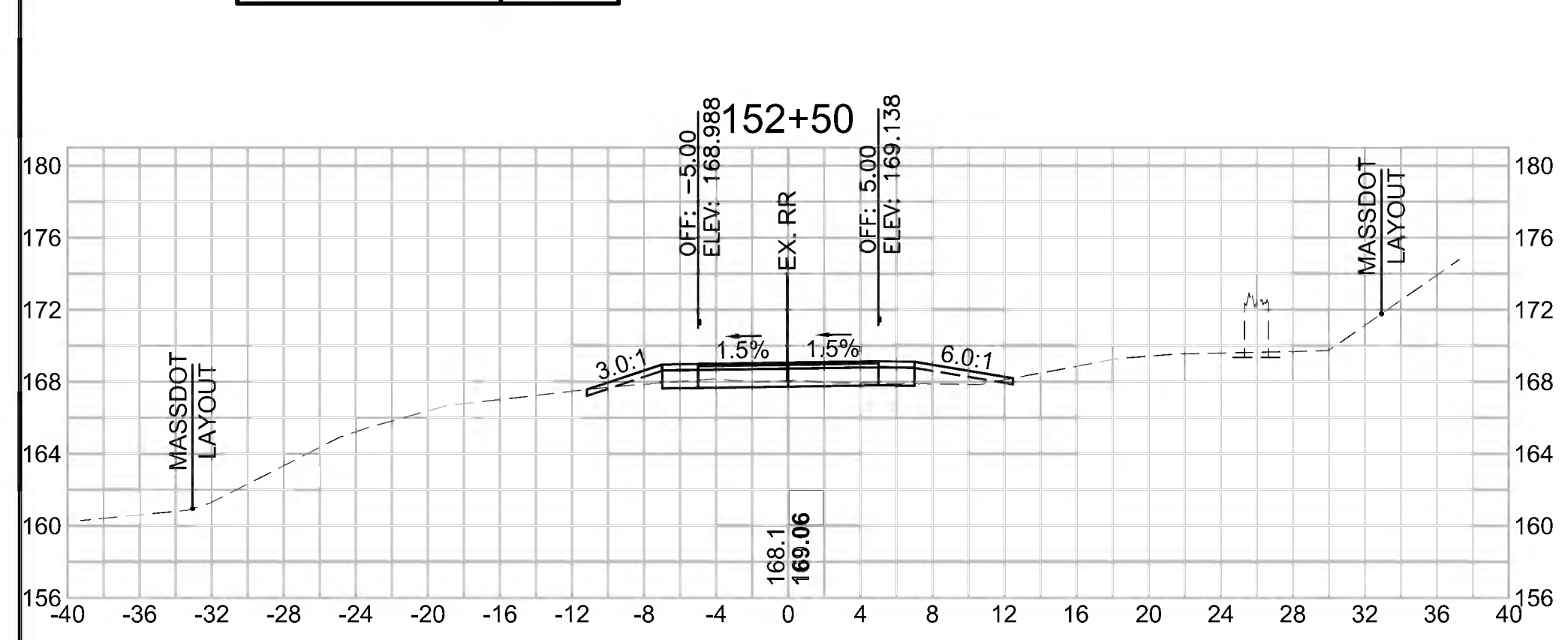
**Total Volume at Station 156+00.00**

Cut Area (SF)	15.407
Fill Area (SF)	0.672
Cut Vol (CF)	27.4
Fill Vol (CF)	0.7
Cum Cut Vol (CF)	3592.9
Cum Fill Vol (CF)	2993.4
Net Vol (CF)	599.5



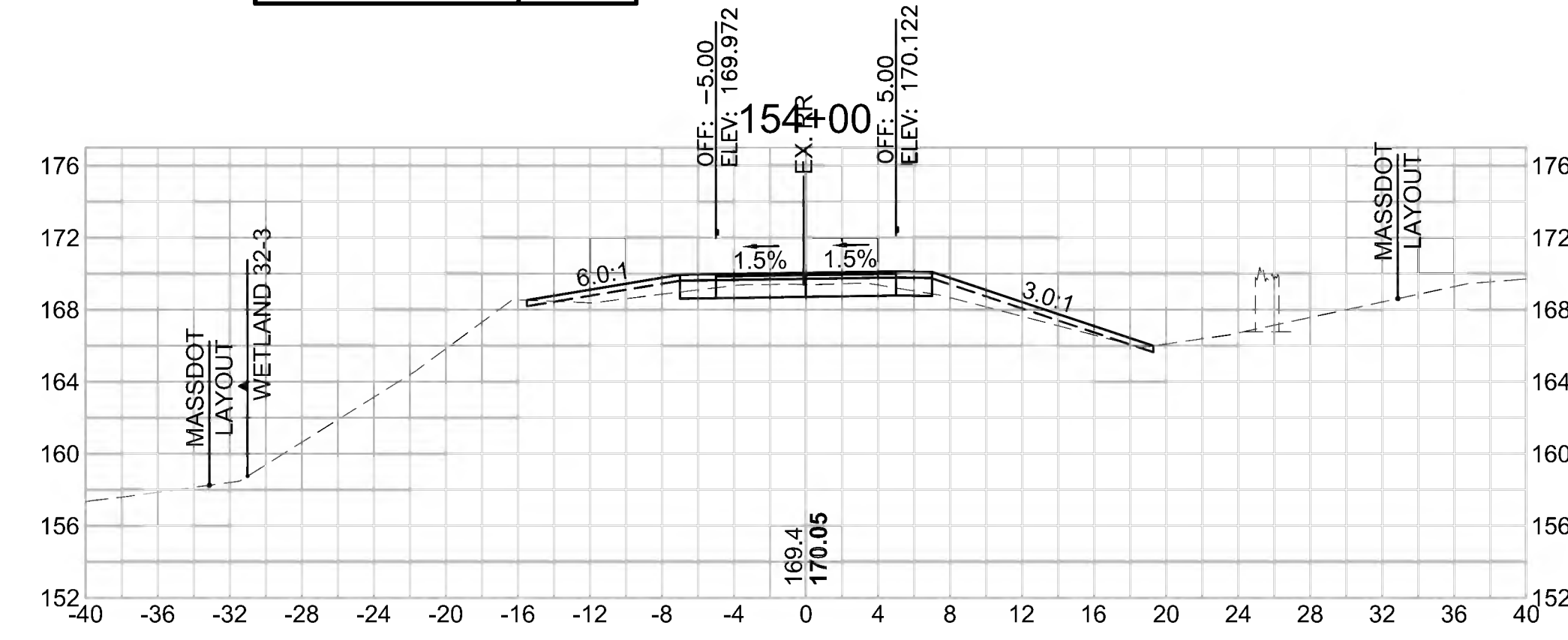
**Total Volume at Station 152+50.00**

Cut Area (SF)	4.291
Fill Area (SF)	3.199
Cut Vol (CF)	4.3
Fill Vol (CF)	16.3
Cum Cut Vol (CF)	3462.2
Cum Fill Vol (CF)	2945.4
Net Vol (CF)	516.7



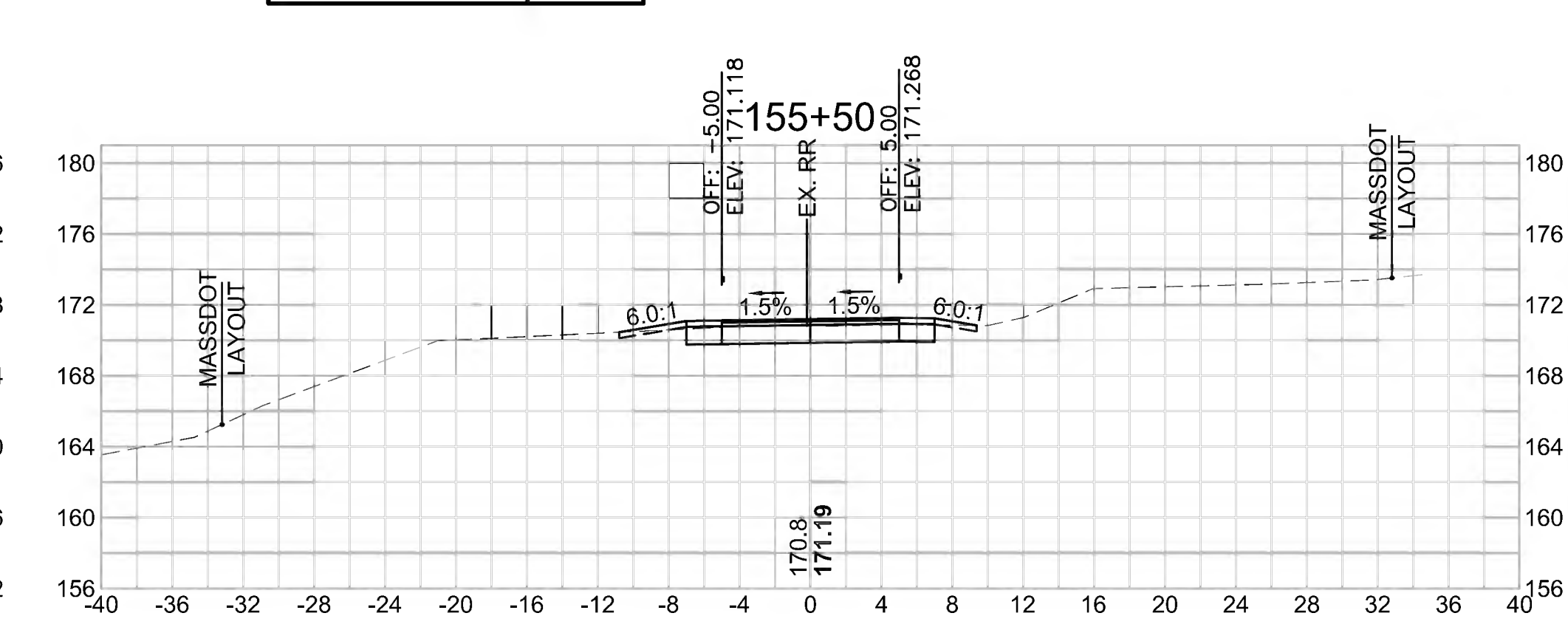
**Total Volume at Station 154+00.00**

Cut Area (SF)	8.619
Fill Area (SF)	7.408
Cut Vol (CF)	14.6
Fill Vol (CF)	15.3
Cum Cut Vol (CF)	3500.1
Cum Fill Vol (CF)	2983.0
Net Vol (CF)	517.1



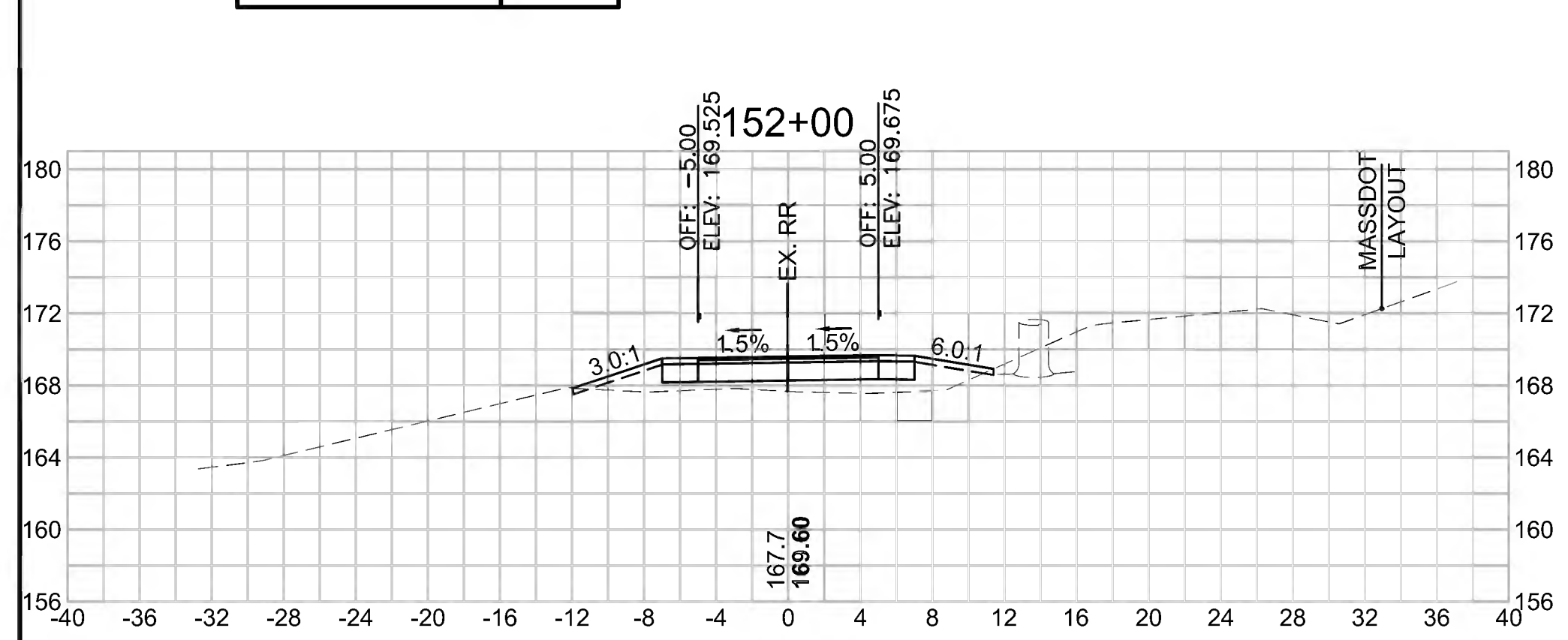
**Total Volume at Station 155+50.00**

Cut Area (SF)	14.224
Fill Area (SF)	0.060
Cut Vol (CF)	24.3
Fill Vol (CF)	0.6
Cum Cut Vol (CF)	3565.5
Cum Fill Vol (CF)	2992.7
Net Vol (CF)	572.7



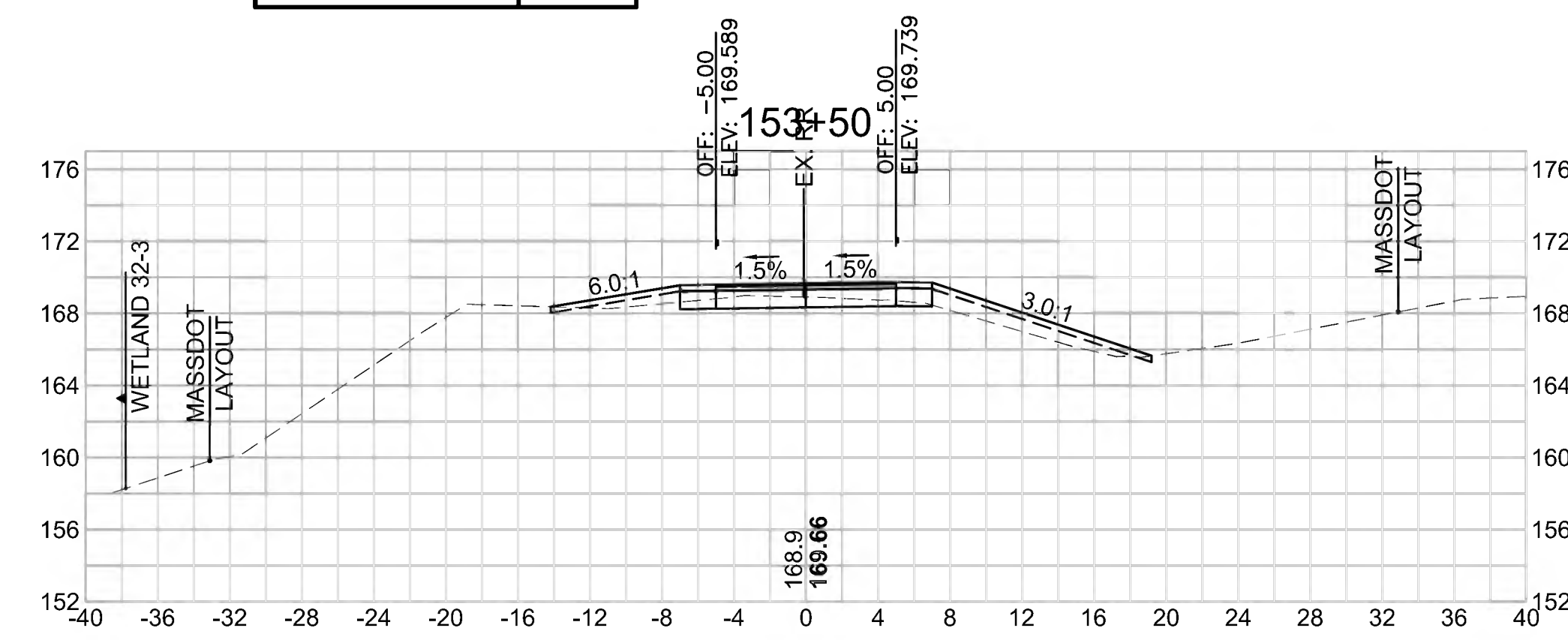
**Total Volume at Station 152+00.00**

Cut Area (SF)	0.363
Fill Area (SF)	14.405
Cut Vol (CF)	0.6
Fill Vol (CF)	53.1
Cum Cut Vol (CF)	3457.8
Cum Fill Vol (CF)	2929.1
Net Vol (CF)	528.7



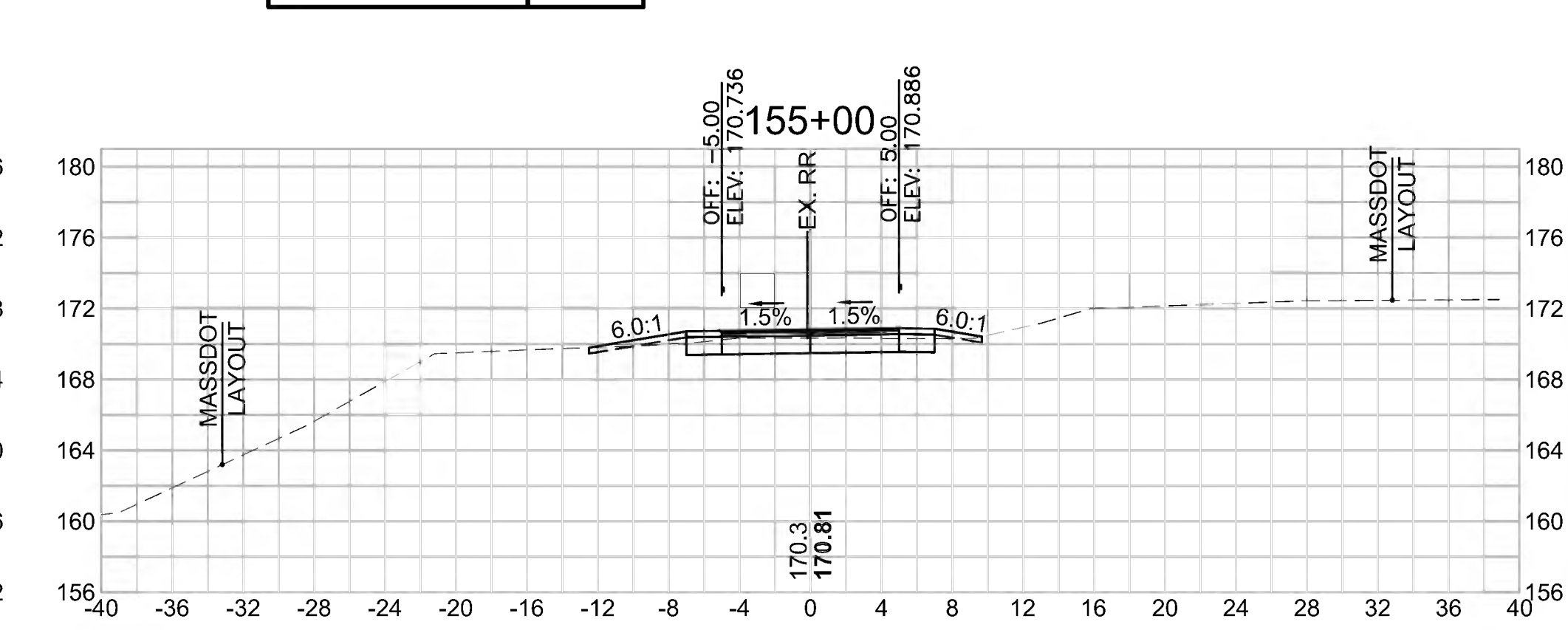
**Total Volume at Station 153+50.00**

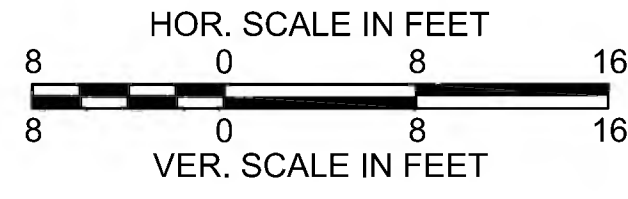
Cut Area (SF)	7.183
Fill Area (SF)	9.162
Cut Vol (CF)	13.0
Fill Vol (CF)	13.9
Cum Cut Vol (CF)	3485.5
Cum Fill Vol (CF)	2967.7
Net Vol (CF)	517.8



**Total Volume at Station 155+00.00**

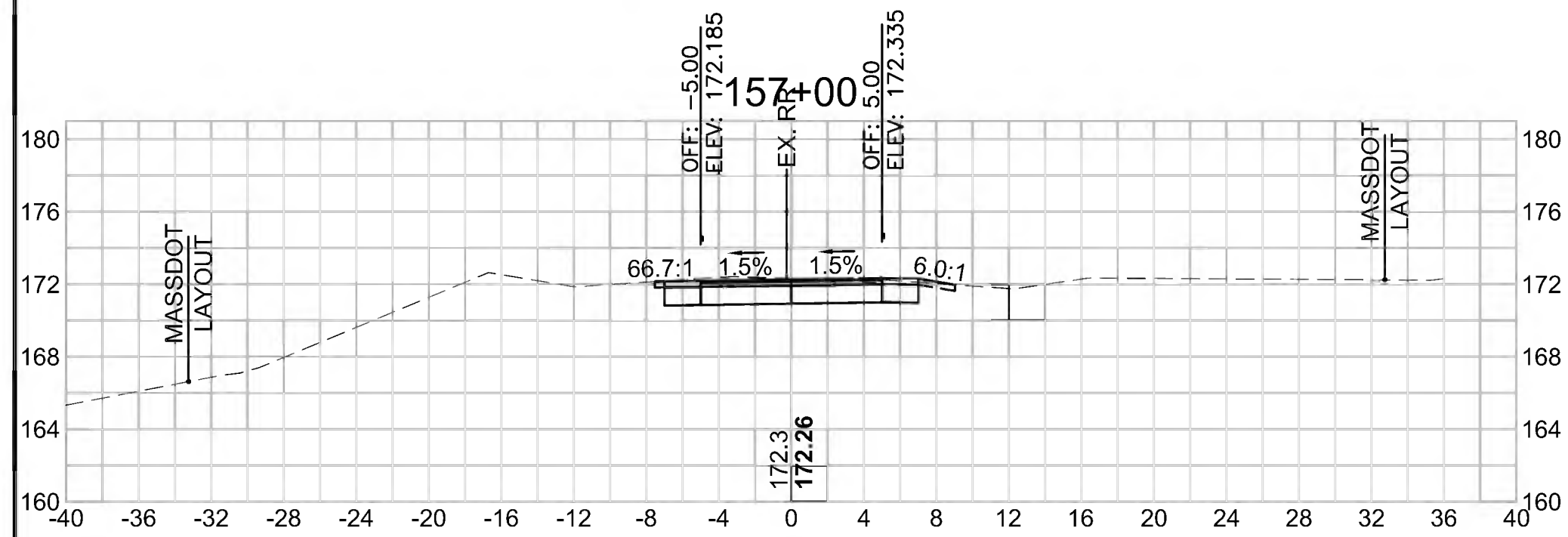
Cut Area (SF)	12.039
Fill Area (SF)	0.631
Cut Vol (CF)	22.1
Fill Vol (CF)	1.4
Cum Cut Vol (CF)	3541.2
Cum Fill Vol (CF)	2992.1
Net Vol (CF)	549.1





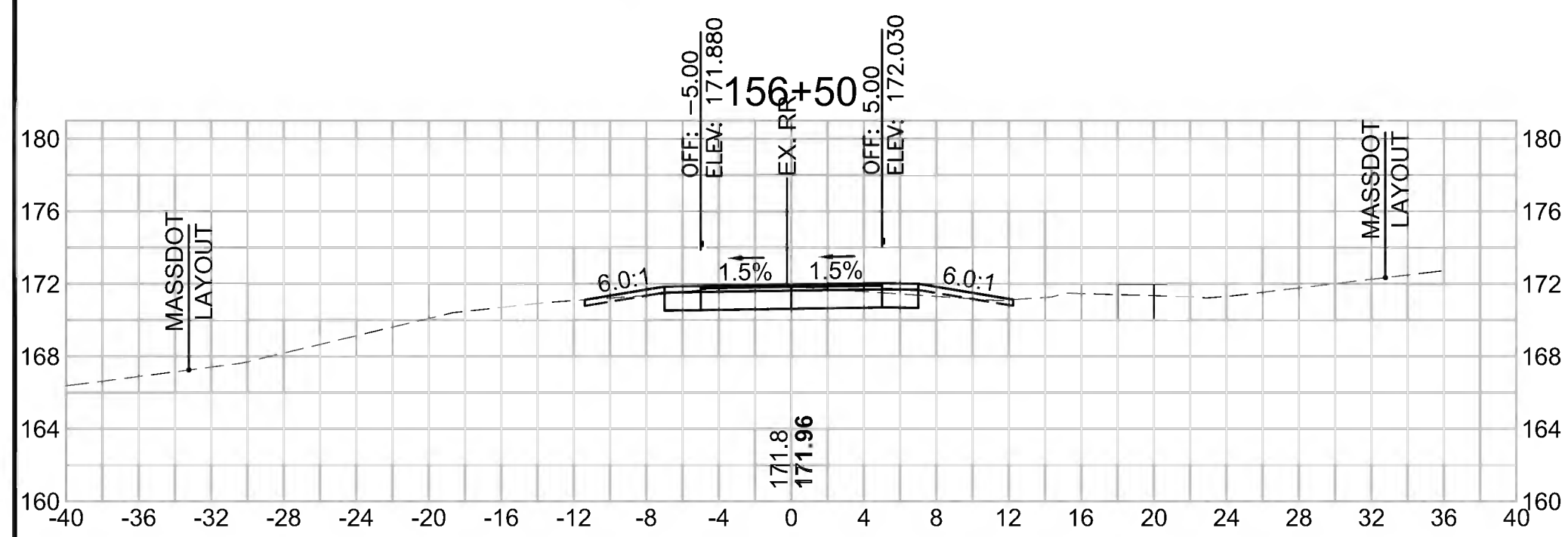
**Total Volume at Station 157+00.00**

Cut Area (SF)	19.980
Fill Area (SF)	0.000
Cut Vol (CF)	33.0
Fill Vol (CF)	0.4
Cum Cut Vol (CF)	3654.7
Cum Fill Vol (CF)	2994.9
Net Vol (CF)	659.8



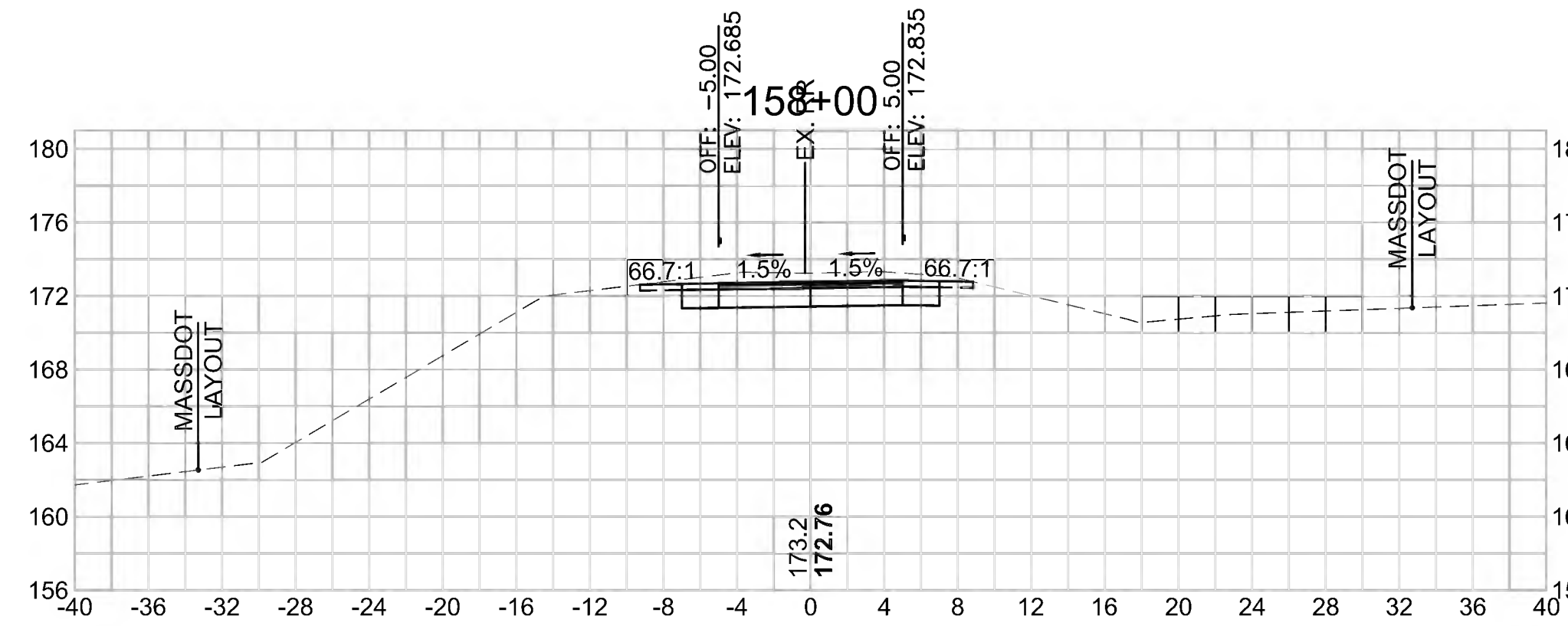
**Total Volume at Station 156+50.00**

Cut Area (SF)	15.684
Fill Area (SF)	0.452
Cut Vol (CF)	28.8
Fill Vol (CF)	1.0
Cum Cut Vol (CF)	3621.7
Cum Fill Vol (CF)	2994.5
Net Vol (CF)	627.2



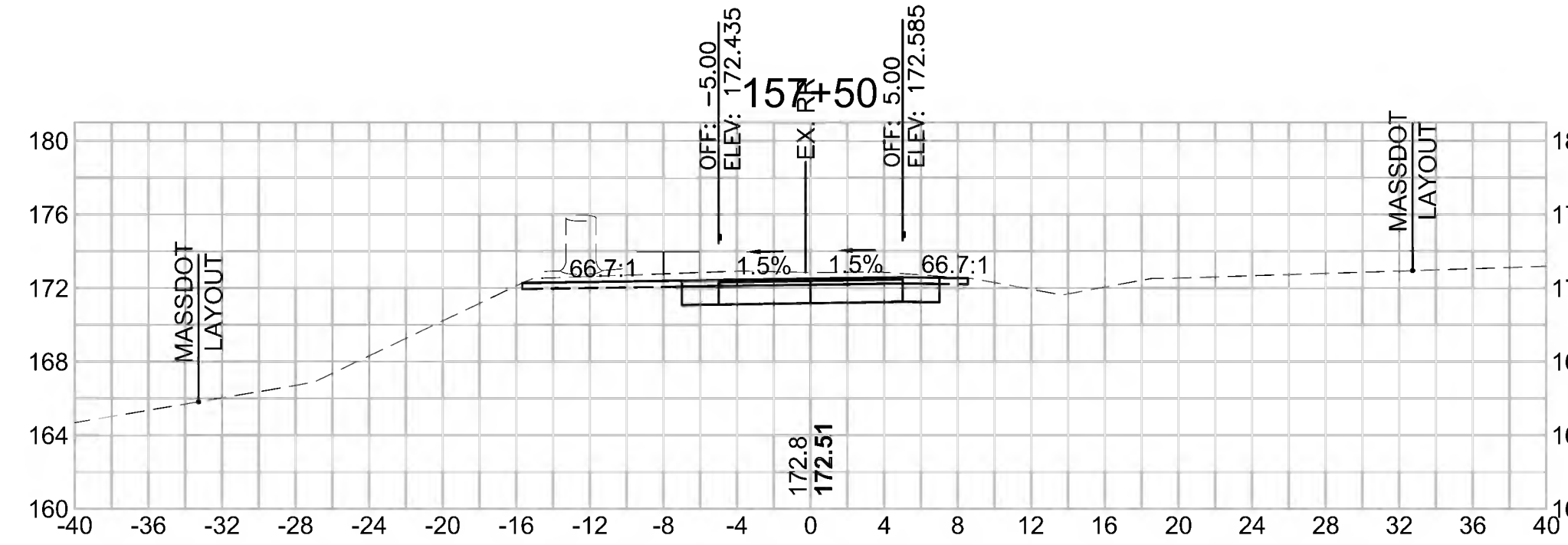
**Total Volume at Station 158+00.00**

Cut Area (SF)	27.125
Fill Area (SF)	0.000
Cut Vol (CF)	52.4
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	3752.9
Cum Fill Vol (CF)	2994.9
Net Vol (CF)	758.0



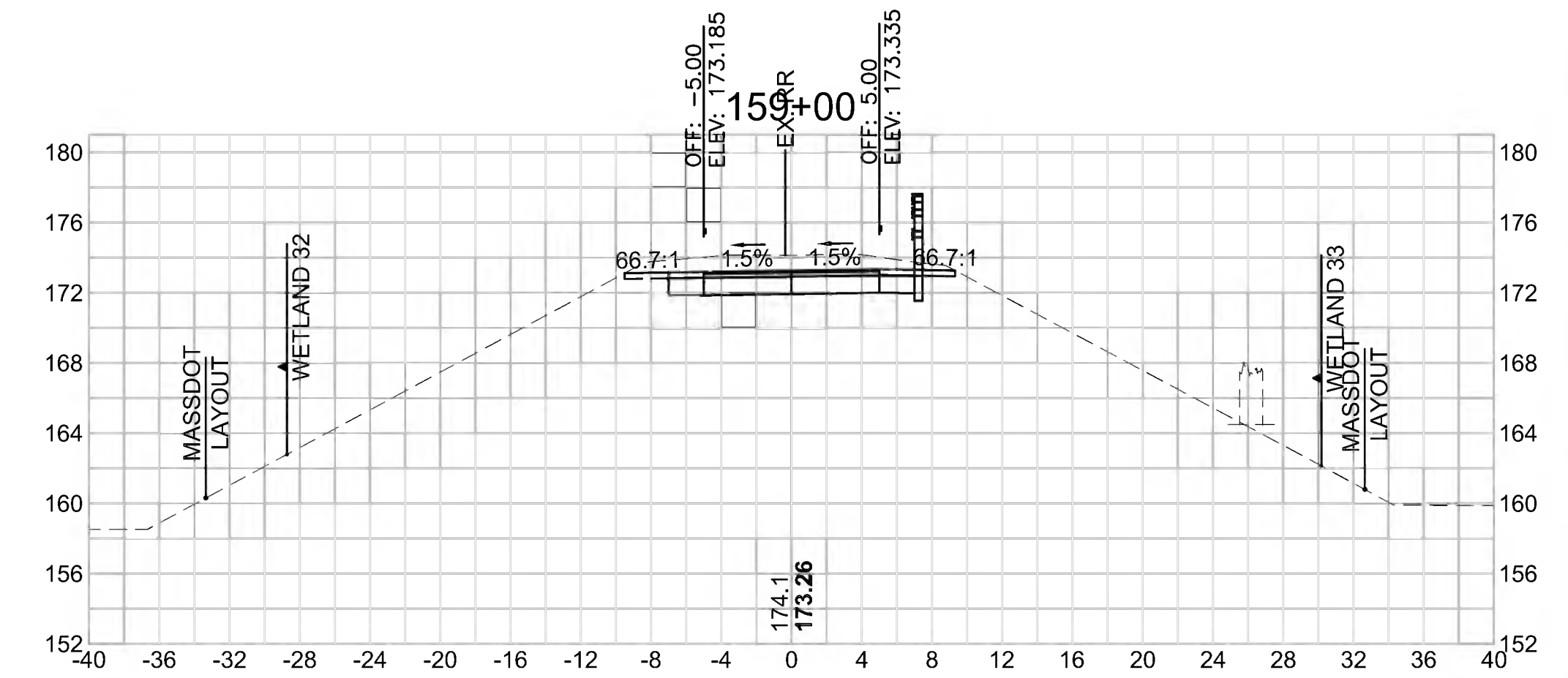
**Total Volume at Station 157+50.00**

Cut Area (SF)	29.473
Fill Area (SF)	0.000
Cut Vol (CF)	45.8
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	3700.5
Cum Fill Vol (CF)	2994.9
Net Vol (CF)	705.6



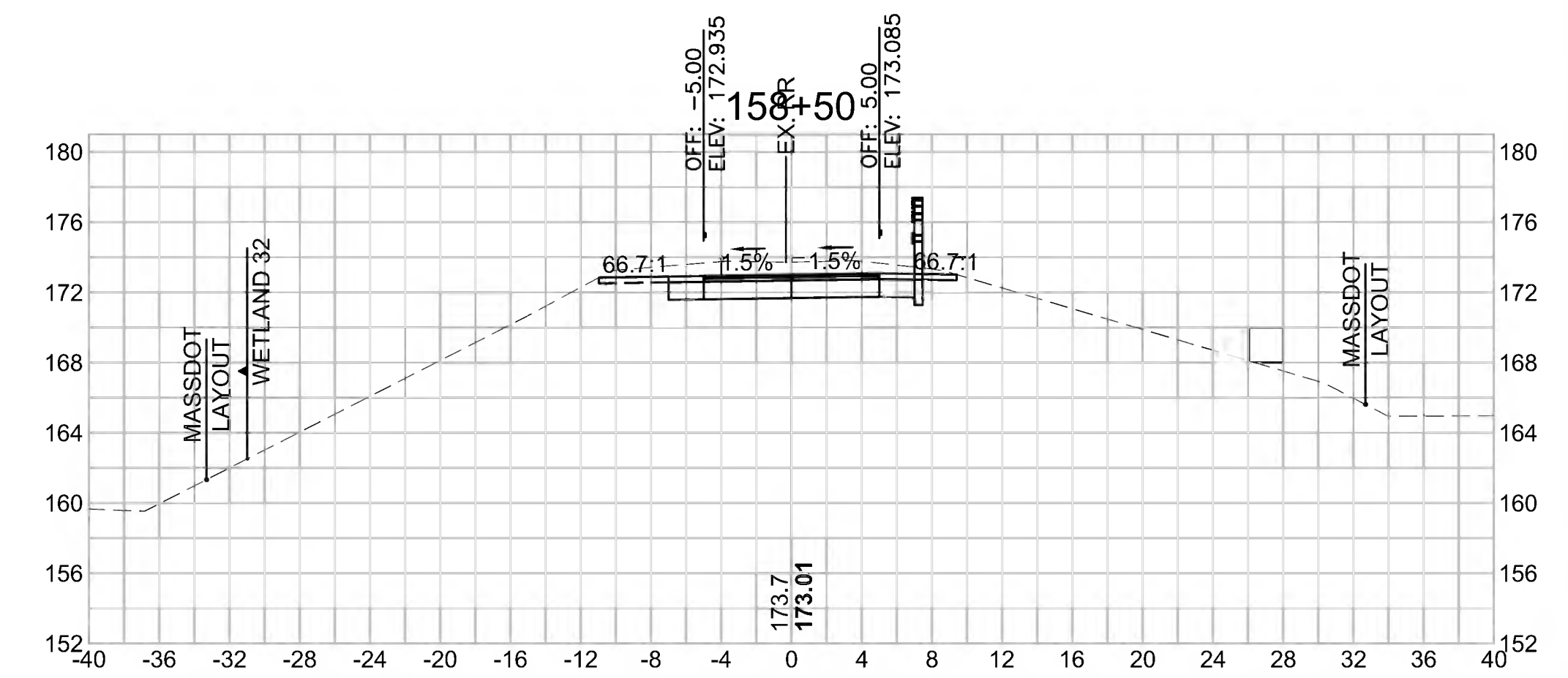
**Total Volume at Station 159+00.00**

Cut Area (SF)	33.680
Fill Area (SF)	0.000
Cut Vol (CF)	61.6
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	3870.0
Cum Fill Vol (CF)	2994.9
Net Vol (CF)	875.1



**Total Volume at Station 158+50.00**

Cut Area (SF)	32.796
Fill Area (SF)	0.000
Cut Vol (CF)	55.5
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	3808.4
Cum Fill Vol (CF)	2994.9
Net Vol (CF)	813.5



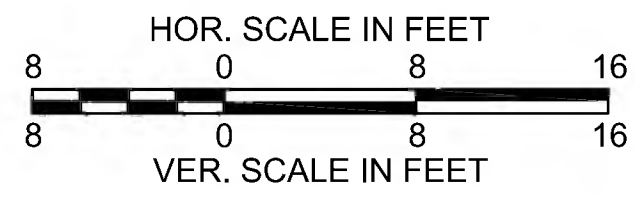


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STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	259	319

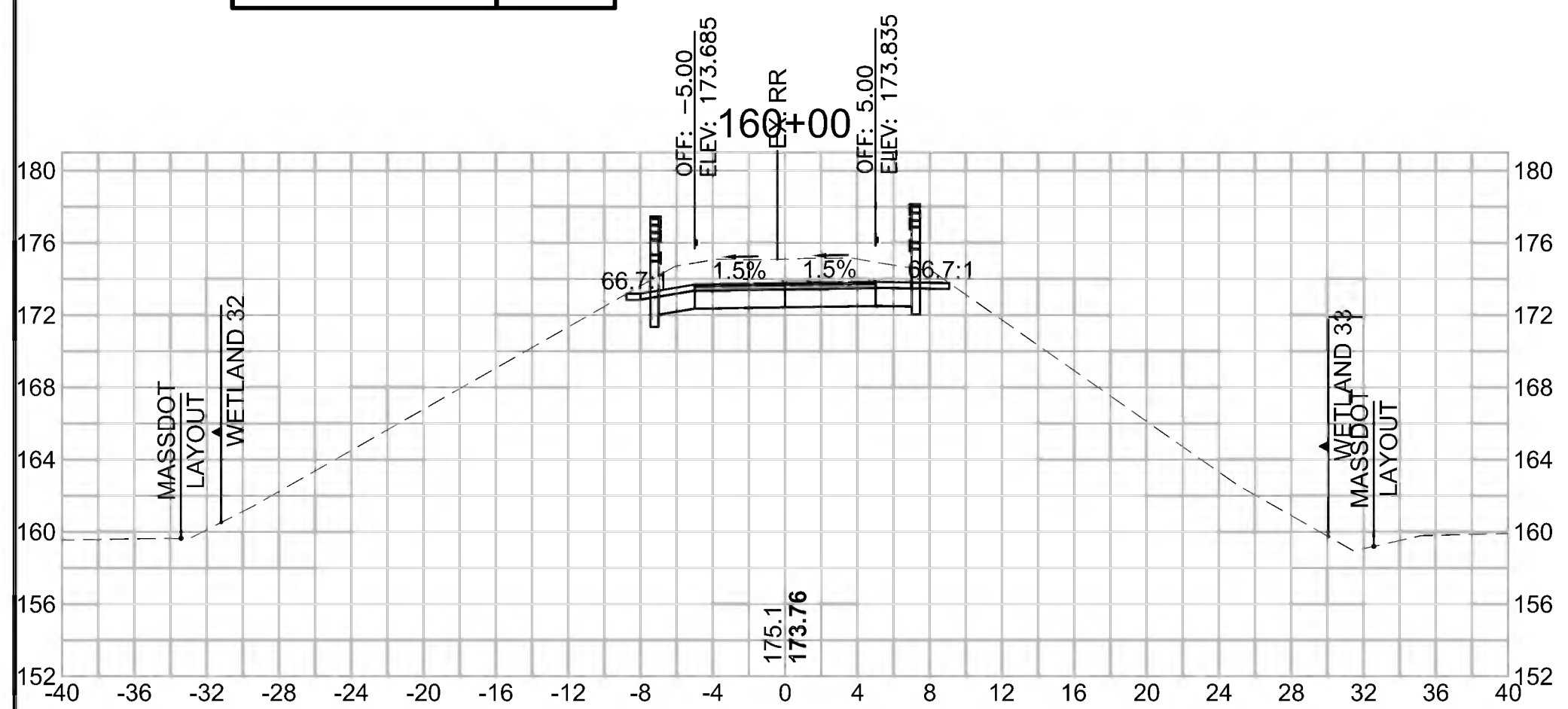
PROJECT FILE NO. 608164

CROSS SECTIONS



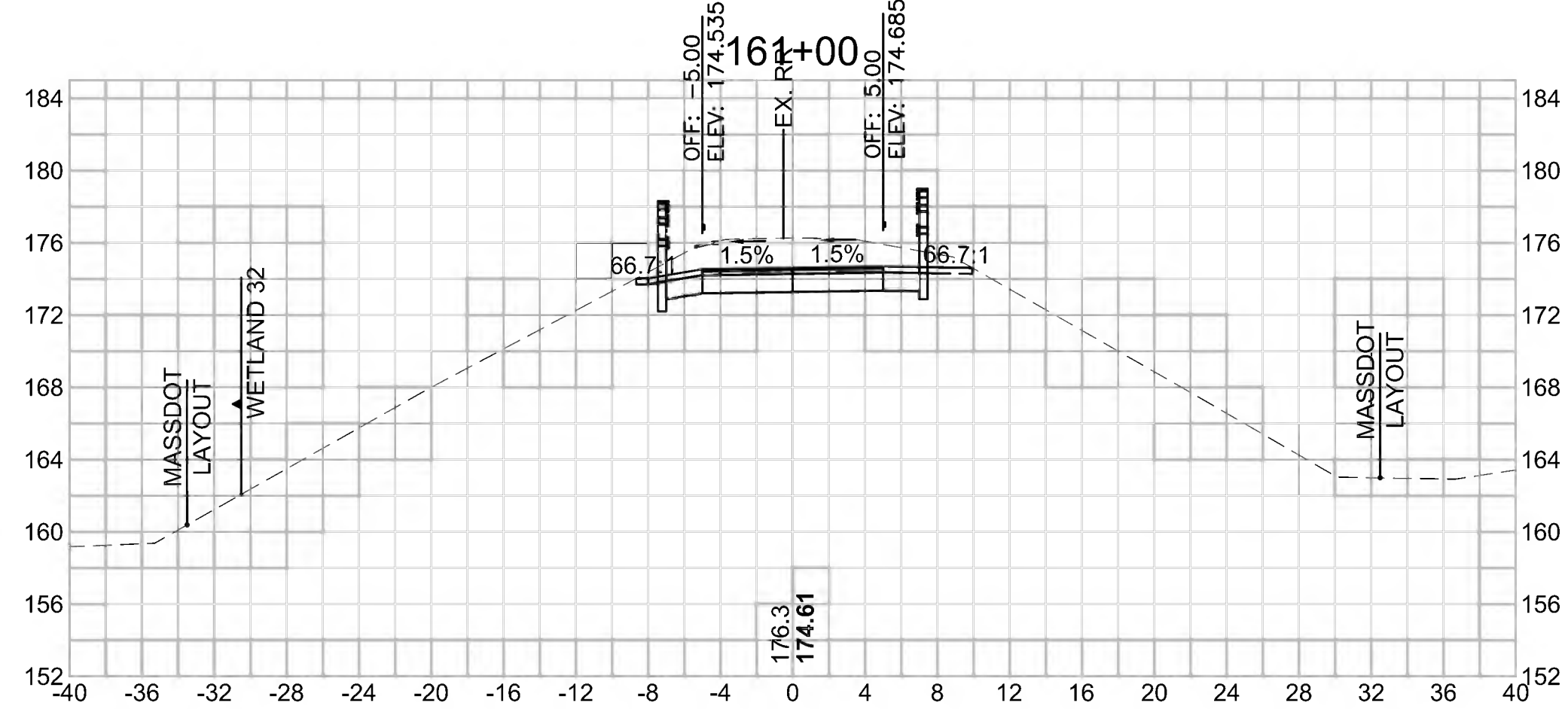
**Total Volume at Station 160+00.00**

Cut Area (SF)	39.189
Fill Area (SF)	0.000
Cut Vol (CF)	72.1
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	4009.1
Cum Fill Vol (CF)	2994.9
Net Vol (CF)	1014.2



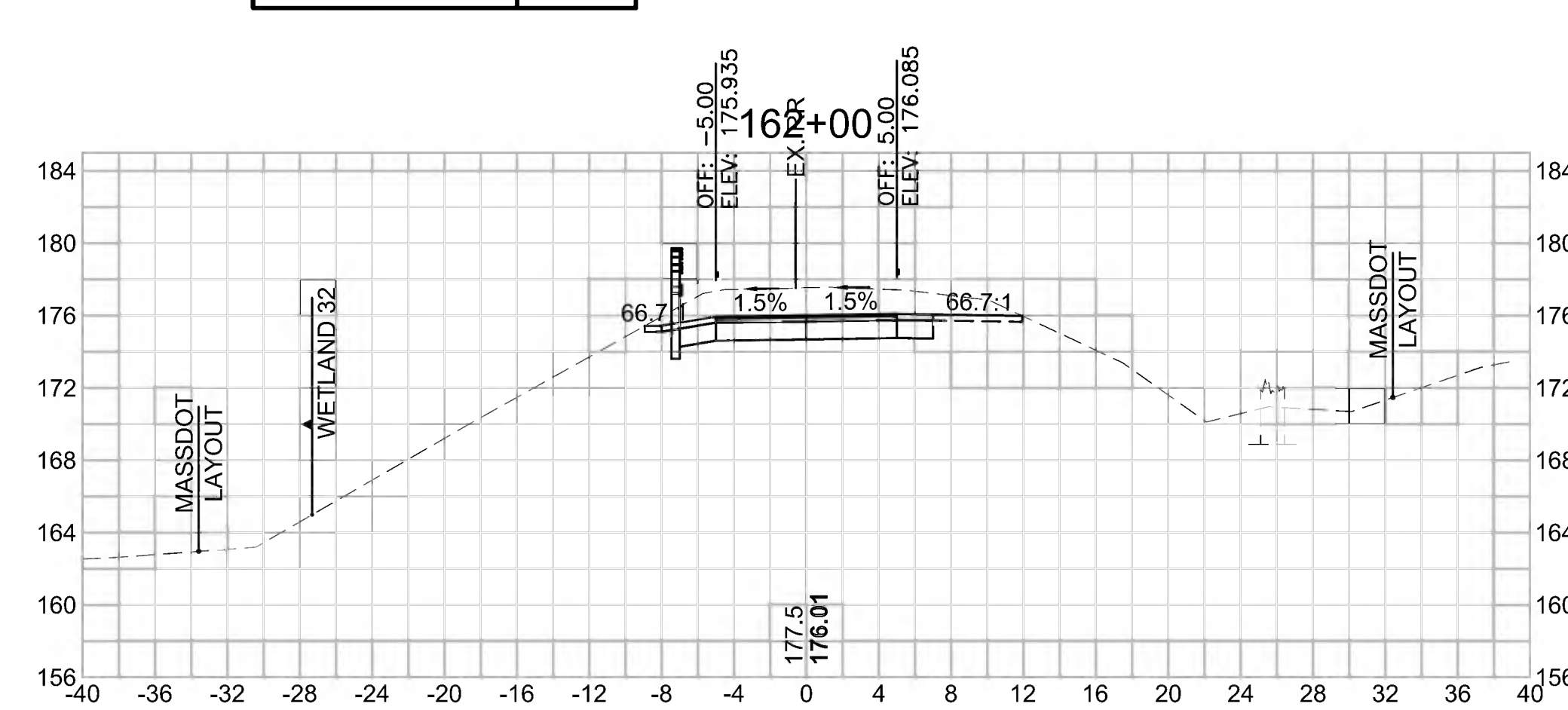
**Total Volume at Station 161+00.00**

Cut Area (SF)	42.411
Fill Area (SF)	0.000
Cut Vol (CF)	76.6
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	4159.3
Cum Fill Vol (CF)	2994.9
Net Vol (CF)	1164.4



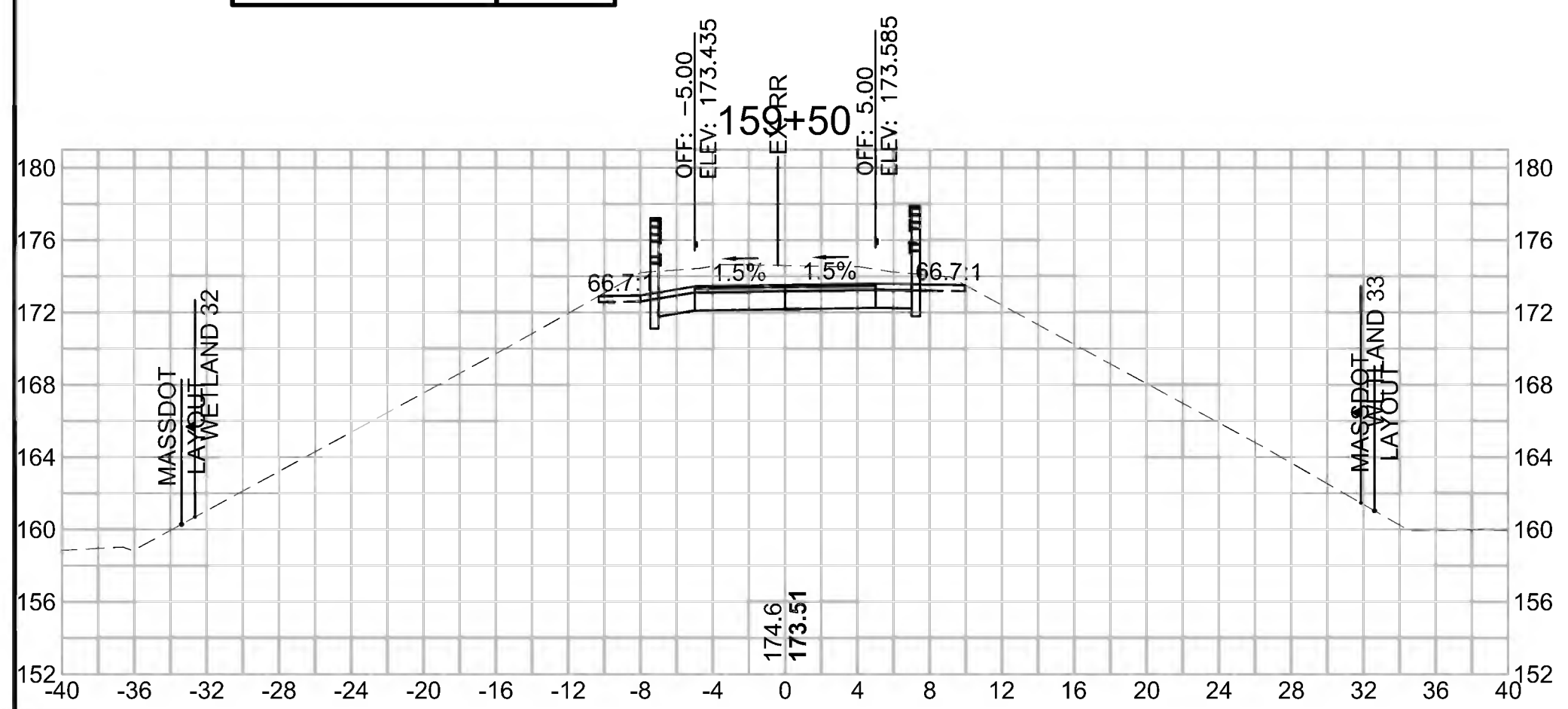
**Total Volume at Station 162+00.00**

Cut Area (SF)	45.471
Fill Area (SF)	0.000
Cut Vol (CF)	86.2
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	4328.8
Cum Fill Vol (CF)	2994.9
Net Vol (CF)	1333.9



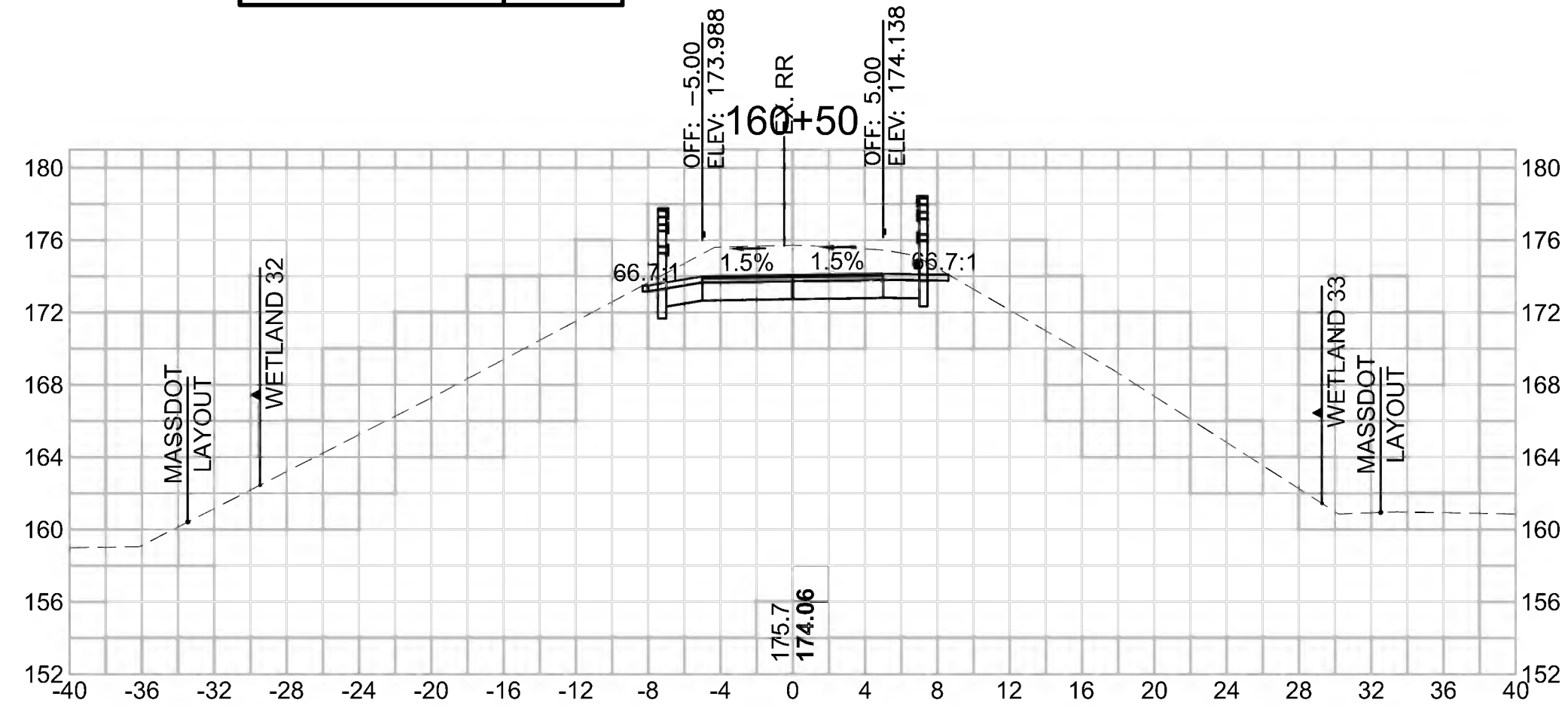
**Total Volume at Station 159+50.00**

Cut Area (SF)	38.715
Fill Area (SF)	0.000
Cut Vol (CF)	67.0
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	3937.0
Cum Fill Vol (CF)	2994.9
Net Vol (CF)	942.1



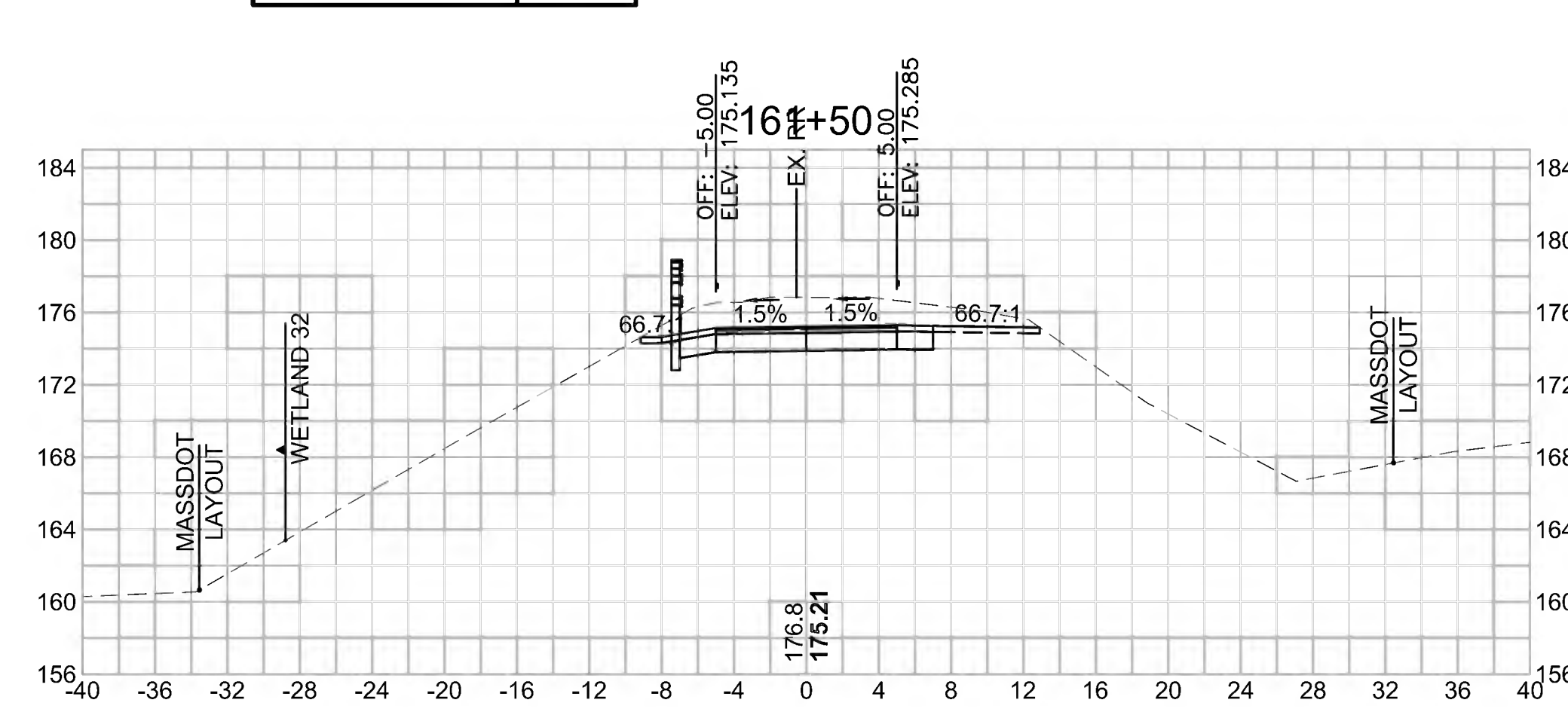
**Total Volume at Station 160+50.00**

Cut Area (SF)	40.277
Fill Area (SF)	0.000
Cut Vol (CF)	73.6
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	4082.7
Cum Fill Vol (CF)	2994.9
Net Vol (CF)	1087.8

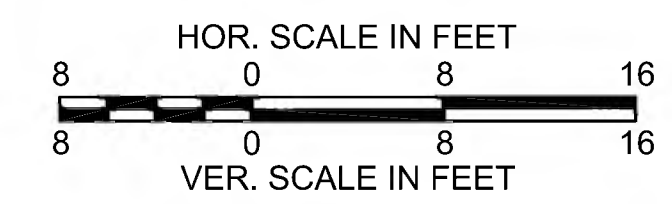


**Total Volume at Station 161+50.00**

Cut Area (SF)	47.585
Fill Area (SF)	0.000
Cut Vol (CF)	83.3
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	4242.6
Cum Fill Vol (CF)	2994.9
Net Vol (CF)	1247.7



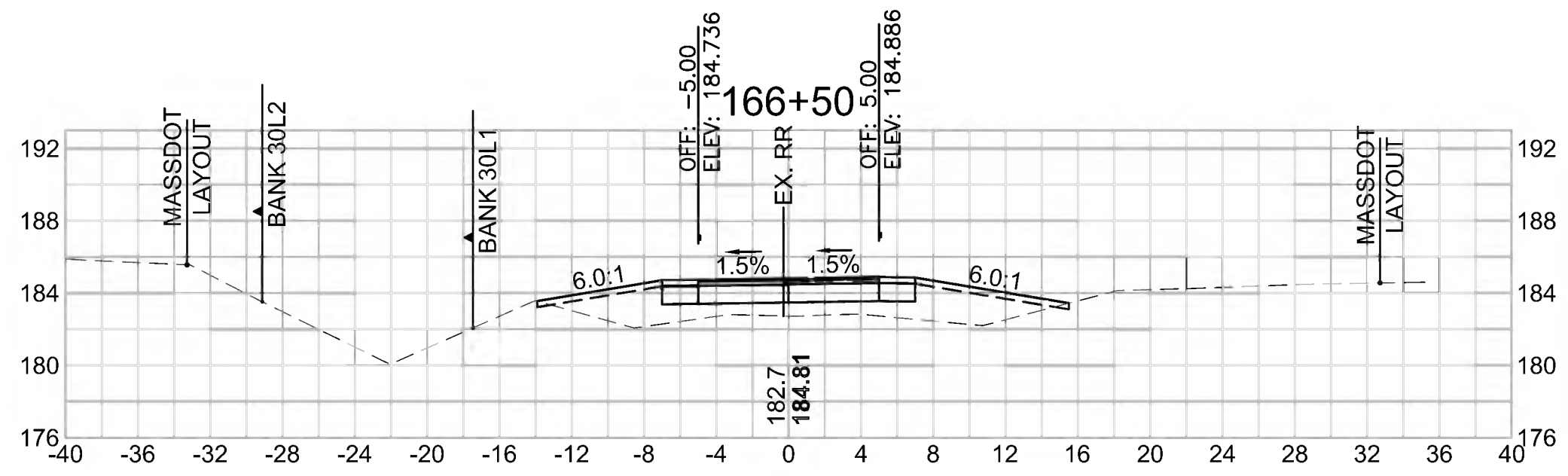
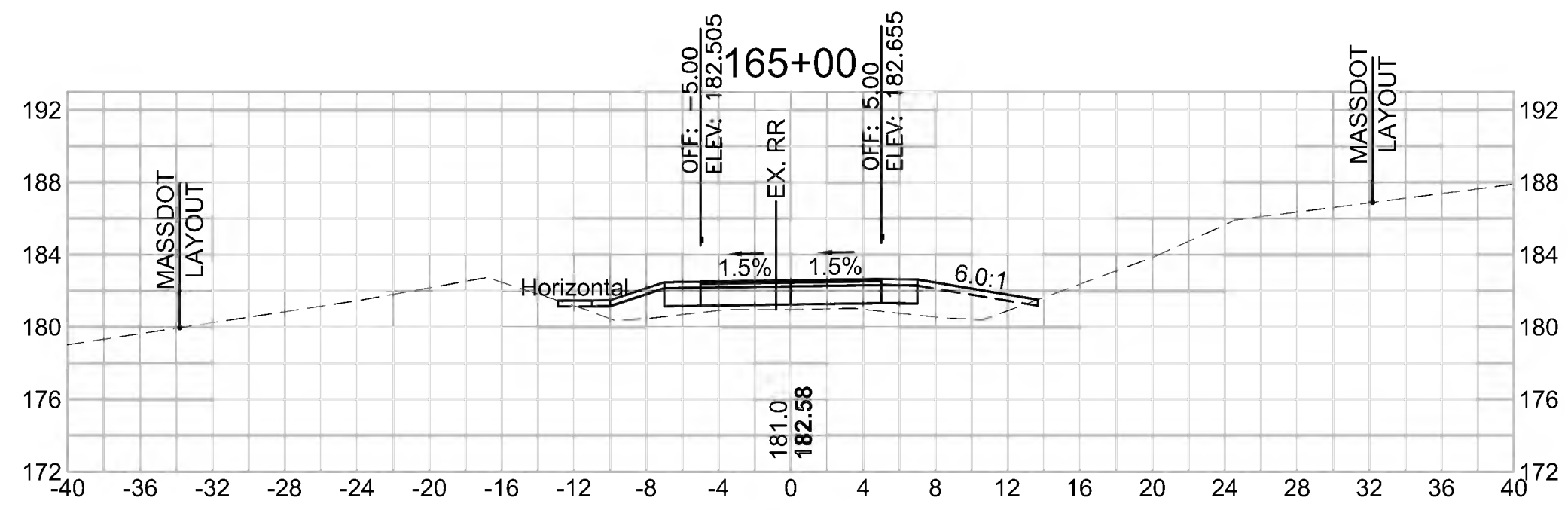
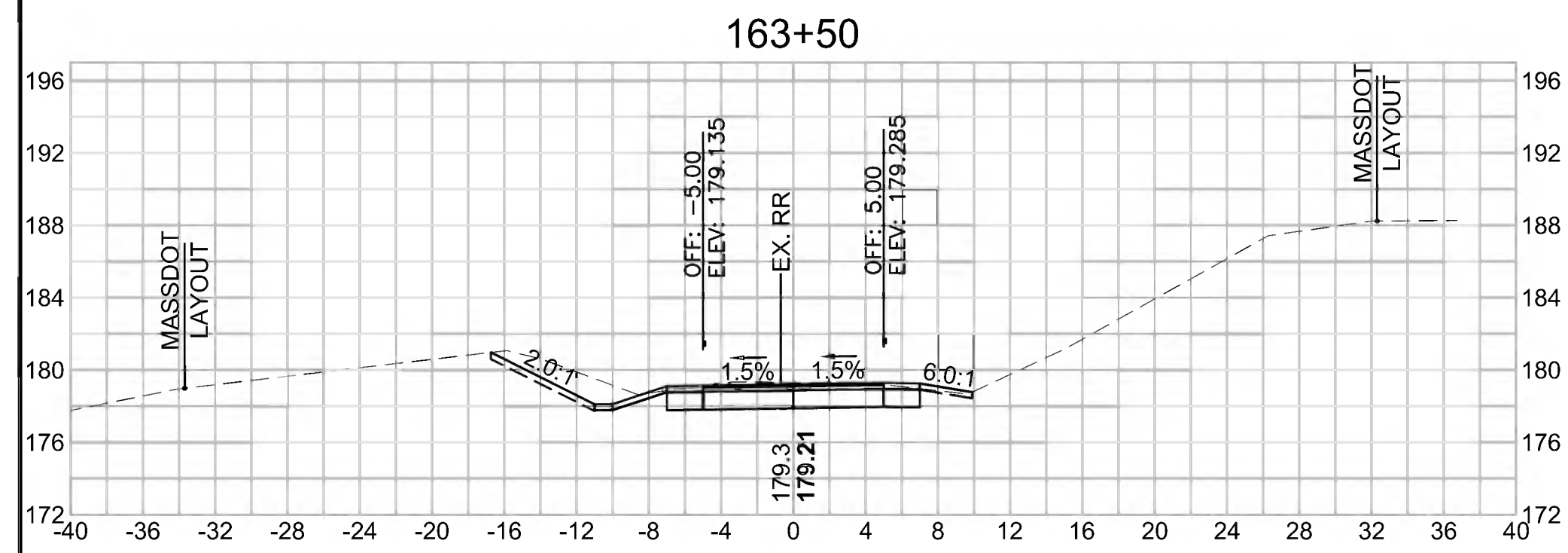
**CROSS SECTIONS**



Total Volume at Station 163+50.00	
Cut Area (SF)	29.921
Fill Area (SF)	0.000
Cut Vol (CF)	53.9
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	4519.6
Cum Fill Vol (CF)	2996.9
Net Vol (CF)	1522.8

Total Volume at Station 165+00.00	
Cut Area (SF)	0.275
Fill Area (SF)	16.030
Cut Vol (CF)	2.3
Fill Vol (CF)	19.8
Cum Cut Vol (CF)	4585.6
Cum Fill Vol (CF)	3024.8
Net Vol (CF)	1560.8

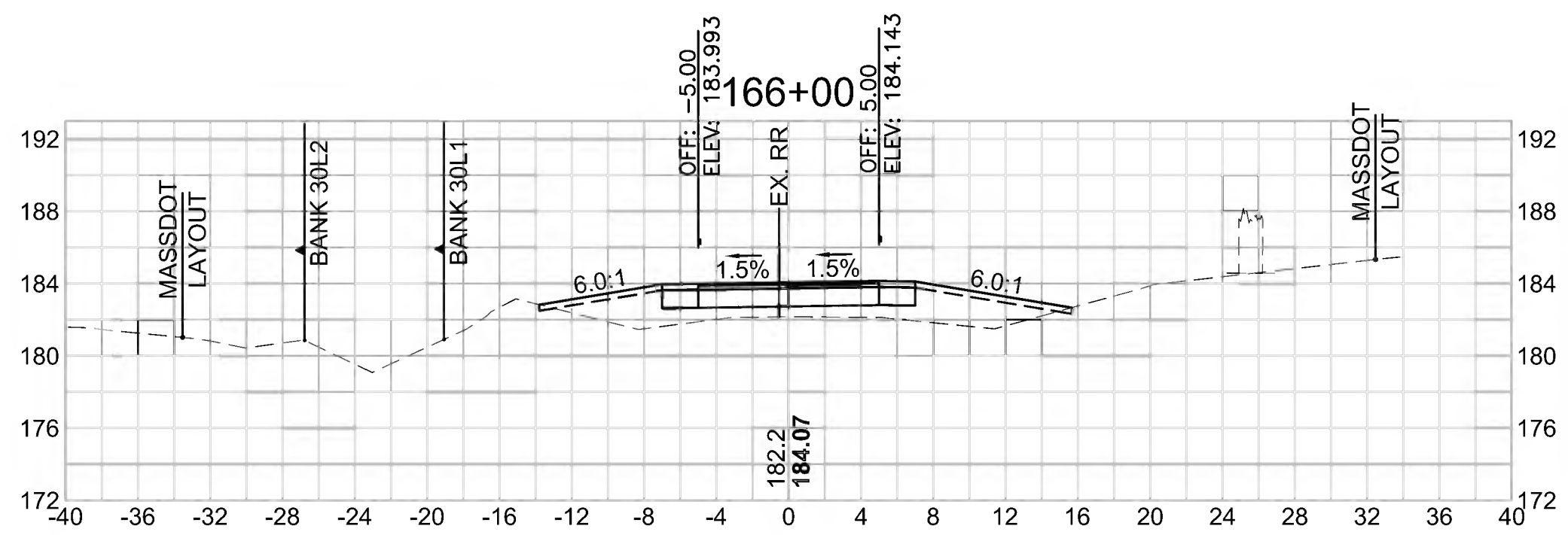
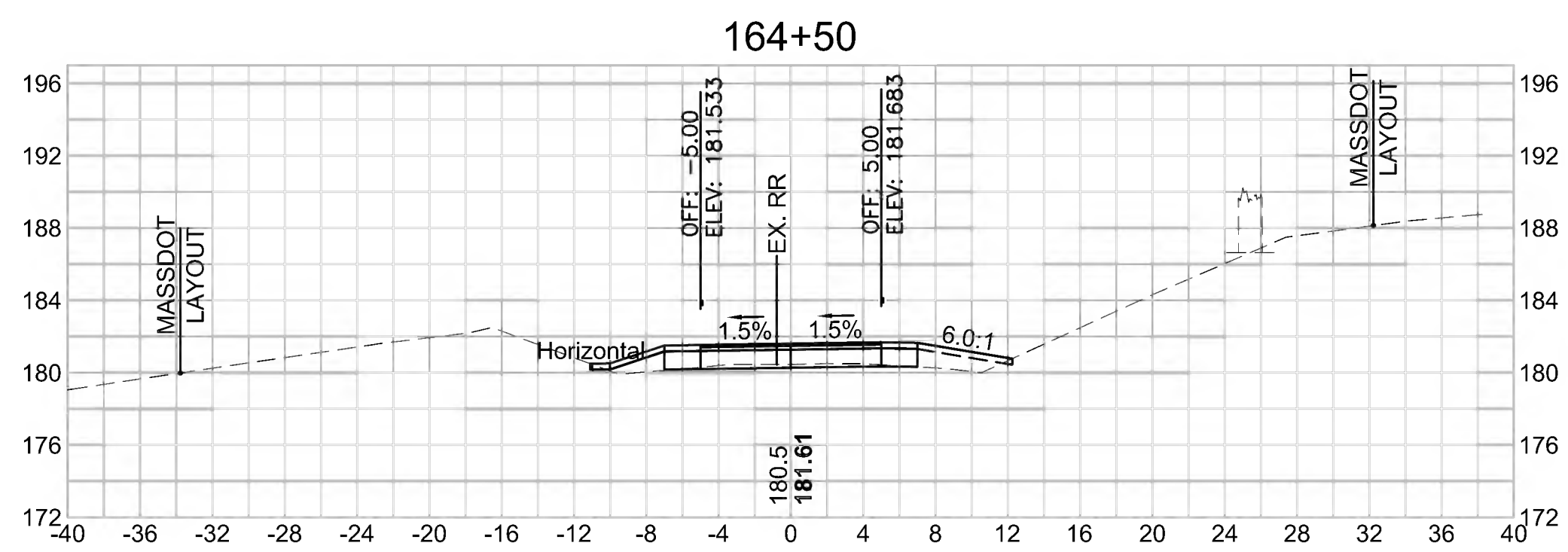
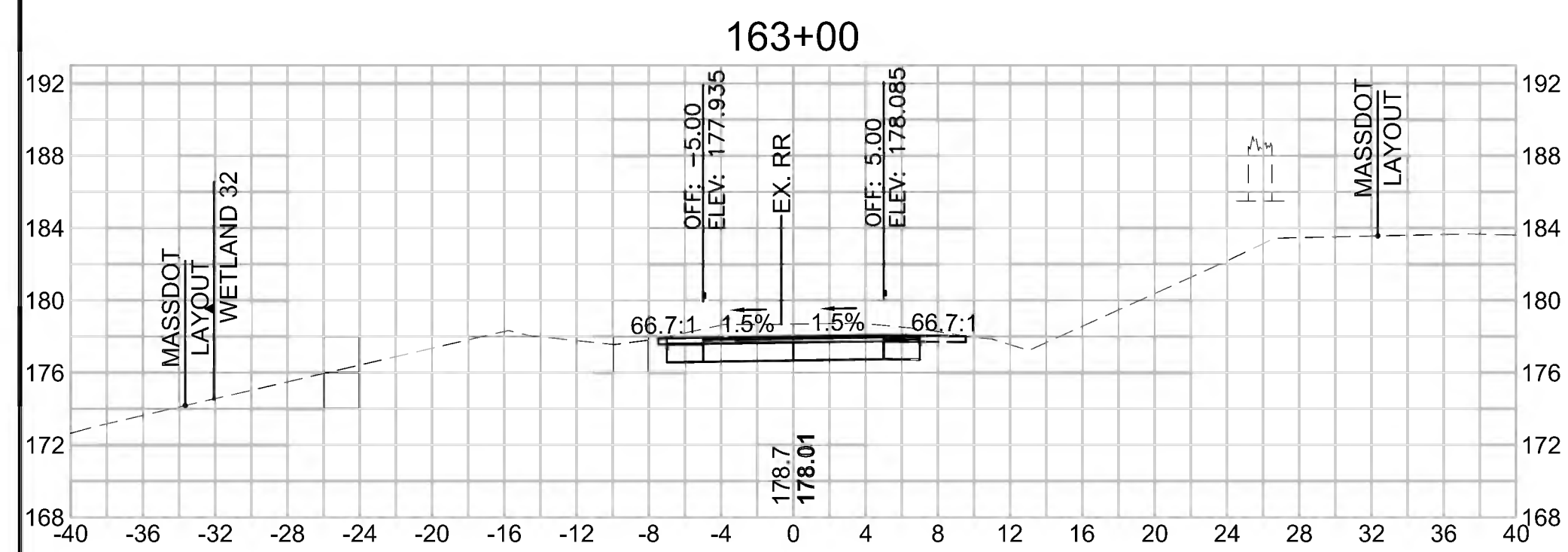
Total Volume at Station 166+50.00	
Cut Area (SF)	0.260
Fill Area (SF)	29.086
Cut Vol (CF)	0.5
Fill Vol (CF)	51.7
Cum Cut Vol (CF)	4587.0
Cum Fill Vol (CF)	3159.7
Net Vol (CF)	1427.3



Total Volume at Station 163+00.00	
Cut Area (SF)	28.289
Fill Area (SF)	0.000
Cut Vol (CF)	60.5
Fill Vol (CF)	1.0
Cum Cut Vol (CF)	4465.7
Cum Fill Vol (CF)	2996.9
Net Vol (CF)	1468.9

Total Volume at Station 164+50.00	
Cut Area (SF)	2.214
Fill Area (SF)	5.362
Cut Vol (CF)	19.0
Fill Vol (CF)	6.5
Cum Cut Vol (CF)	4583.3
Cum Fill Vol (CF)	3005.0
Net Vol (CF)	1578.3

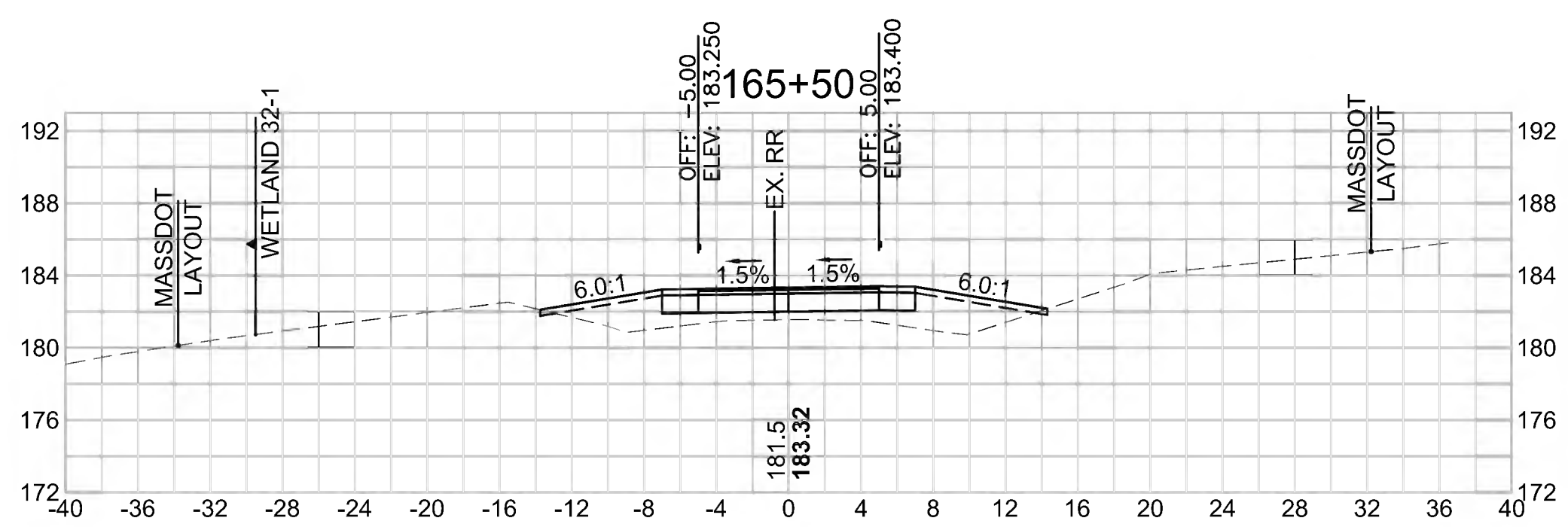
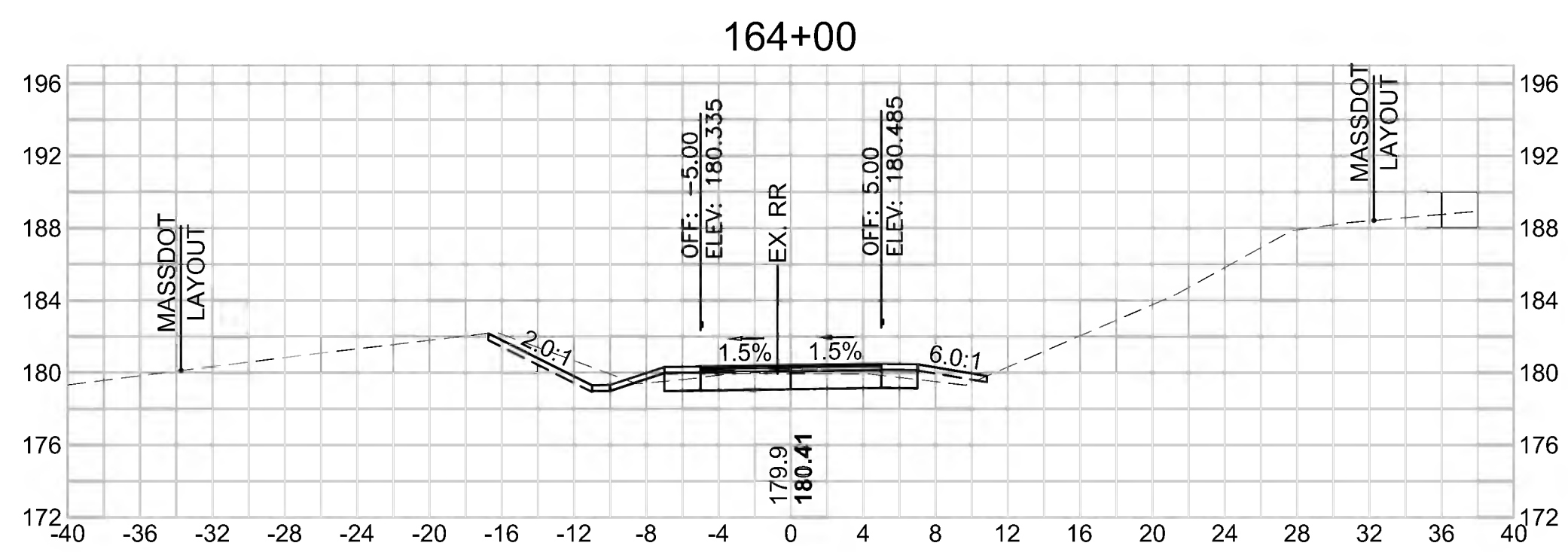
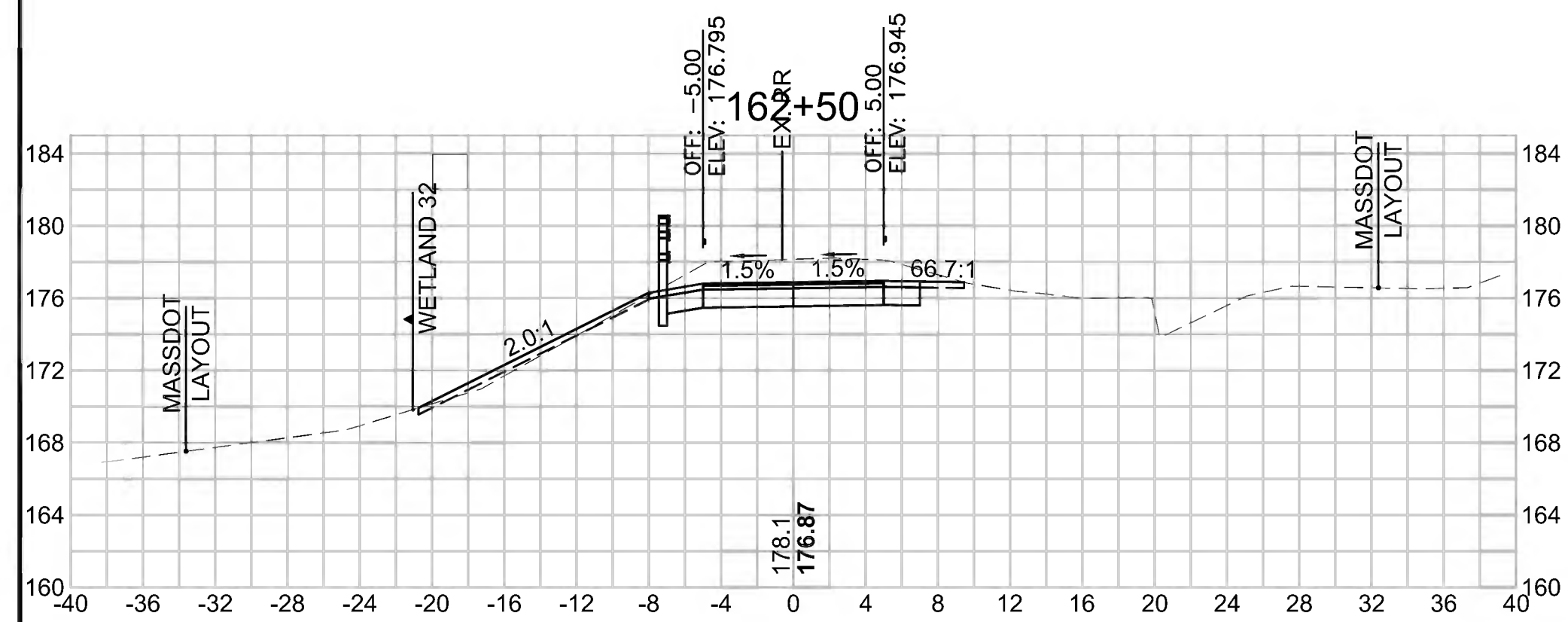
Total Volume at Station 166+00.00	
Cut Area (SF)	0.263
Fill Area (SF)	26.726
Cut Vol (CF)	0.5
Fill Vol (CF)	46.6
Cum Cut Vol (CF)	4586.5
Cum Fill Vol (CF)	3108.1
Net Vol (CF)	1478.5



Total Volume at Station 162+50.00	
Cut Area (SF)	37.075
Fill Area (SF)	1.063
Cut Vol (CF)	76.4
Fill Vol (CF)	1.0
Cum Cut Vol (CF)	4405.2
Cum Fill Vol (CF)	2995.9
Net Vol (CF)	1409.3

Total Volume at Station 164+00.00	
Cut Area (SF)	18.294
Fill Area (SF)	1.706
Cut Vol (CF)	44.6
Fill Vol (CF)	1.6
Cum Cut Vol (CF)	4564.3
Cum Fill Vol (CF)	2998.4
Net Vol (CF)	1565.8

Total Volume at Station 165+50.00	
Cut Area (SF)	0.254
Fill Area (SF)	23.589
Cut Vol (CF)	0.5
Fill Vol (CF)	36.7
Cum Cut Vol (CF)	4586.0
Cum Fill Vol (CF)	3061.5
Net Vol (CF)	1524.6

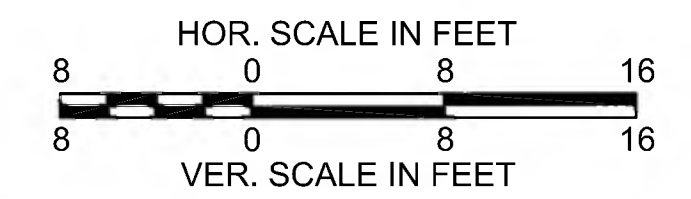




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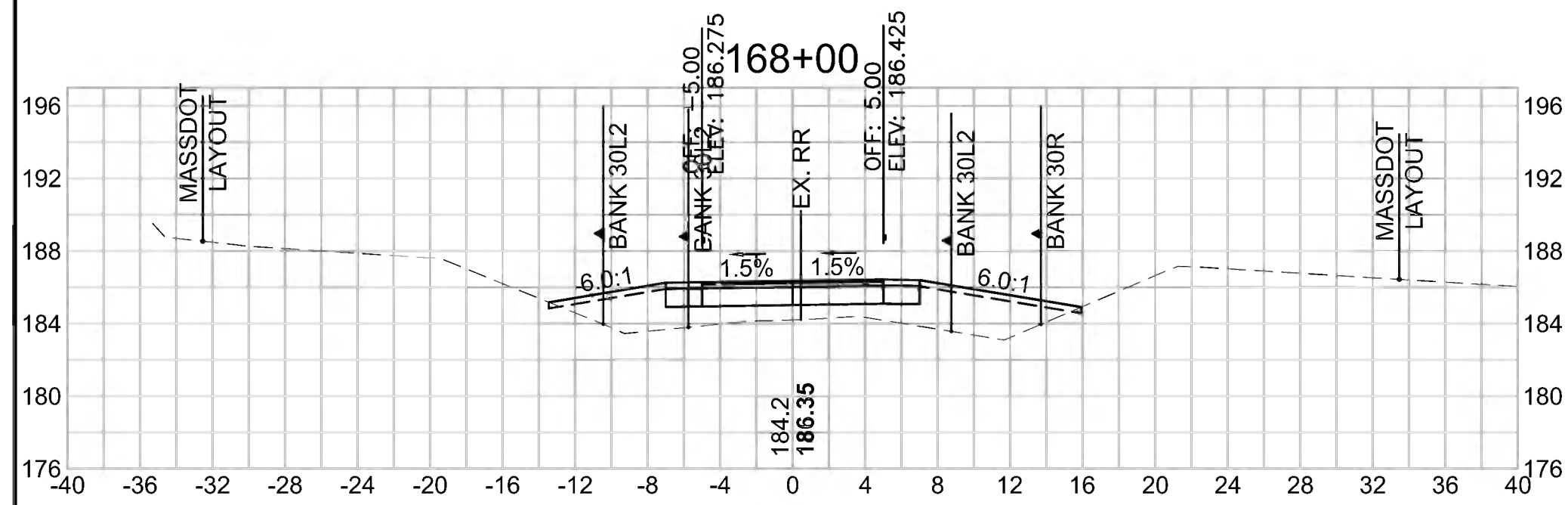
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	261	319
PROJECT FILE NO. 608164			

CROSS SECTIONS



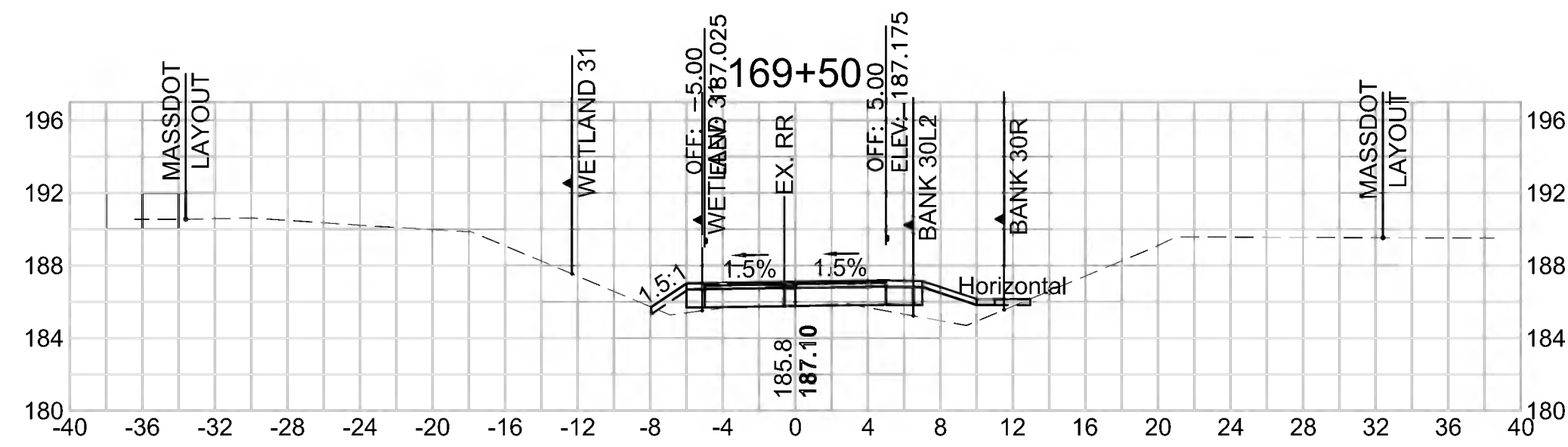
**Total Volume at Station 168+00.00**

Cut Area (SF)	0.194
Fill Area (SF)	35.619
Cut Vol (CF)	0.8
Fill Vol (CF)	65.0
Cum Cut Vol (CF)	4589.0
Cum Fill Vol (CF)	3336.3
Net Vol (CF)	1252.7



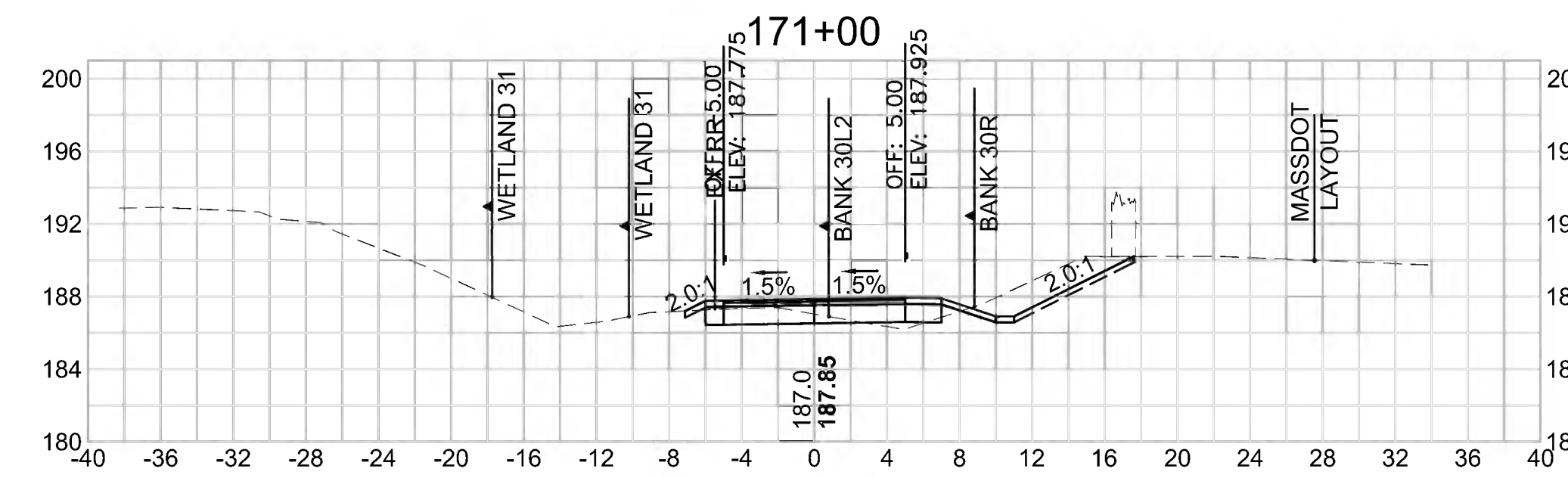
**Total Volume at Station 169+50.00**

Cut Area (SF)	0.403
Fill Area (SF)	8.035
Cut Vol (CF)	0.5
Fill Vol (CF)	21.7
Cum Cut Vol (CF)	4590.3
Cum Fill Vol (CF)	3461.8
Net Vol (CF)	1128.5



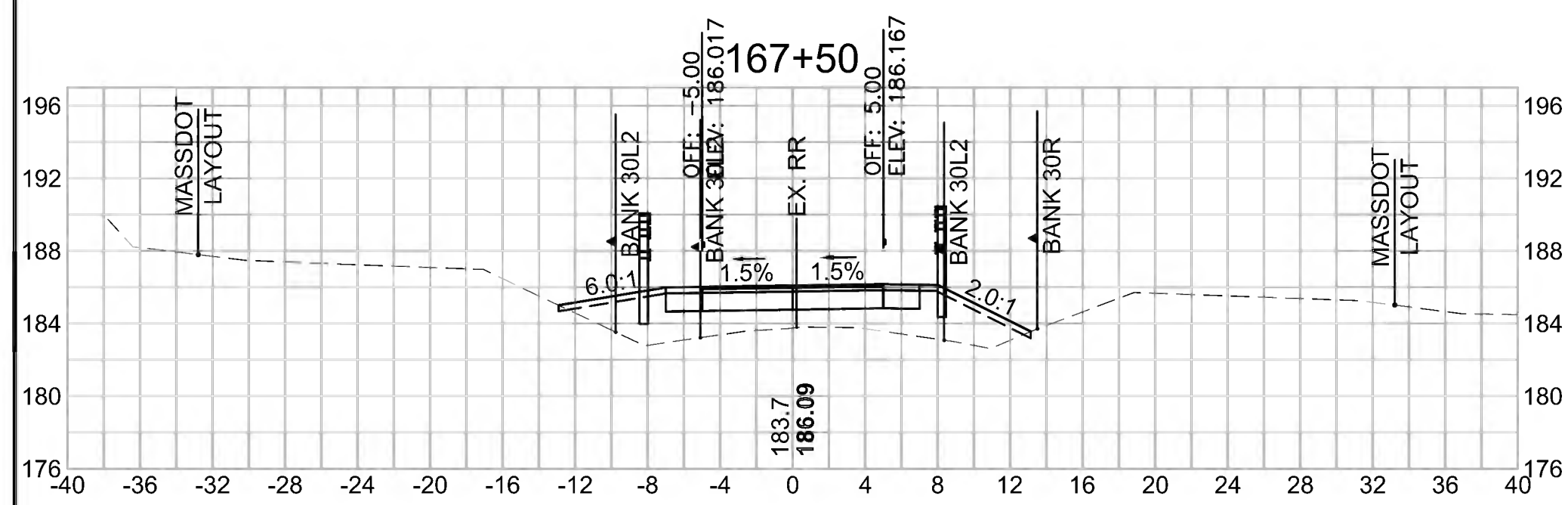
**Total Volume at Station 171+00.00**

Cut Area (SF)	18.314
Fill Area (SF)	1.100
Cut Vol (CF)	29.6
Fill Vol (CF)	4.1
Cum Cut Vol (CF)	4651.7
Cum Fill Vol (CF)	3485.8
Net Vol (CF)	1165.8



**Total Volume at Station 167+50.00**

Cut Area (SF)	0.684
Fill Area (SF)	34.621
Cut Vol (CF)	0.8
Fill Vol (CF)	58.3
Cum Cut Vol (CF)	4588.2
Cum Fill Vol (CF)	3271.3
Net Vol (CF)	1316.9



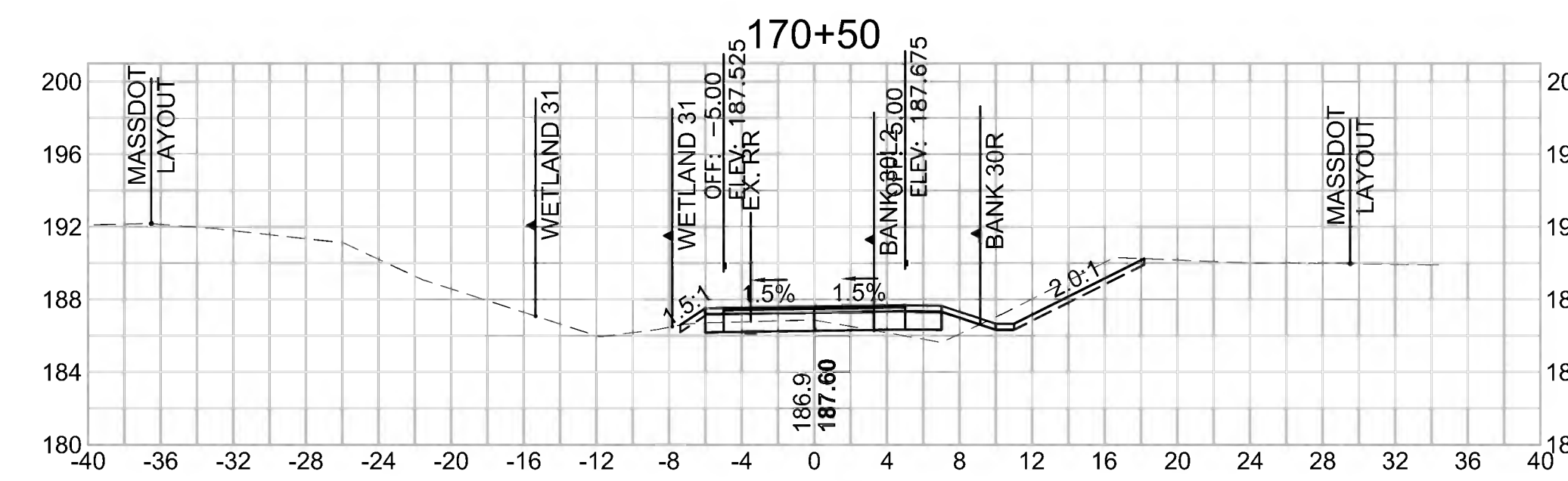
**Total Volume at Station 169+00.00**

Cut Area (SF)	0.176
Fill Area (SF)	15.367
Cut Vol (CF)	0.3
Fill Vol (CF)	42.5
Cum Cut Vol (CF)	4589.7
Cum Fill Vol (CF)	3440.1
Net Vol (CF)	1149.6



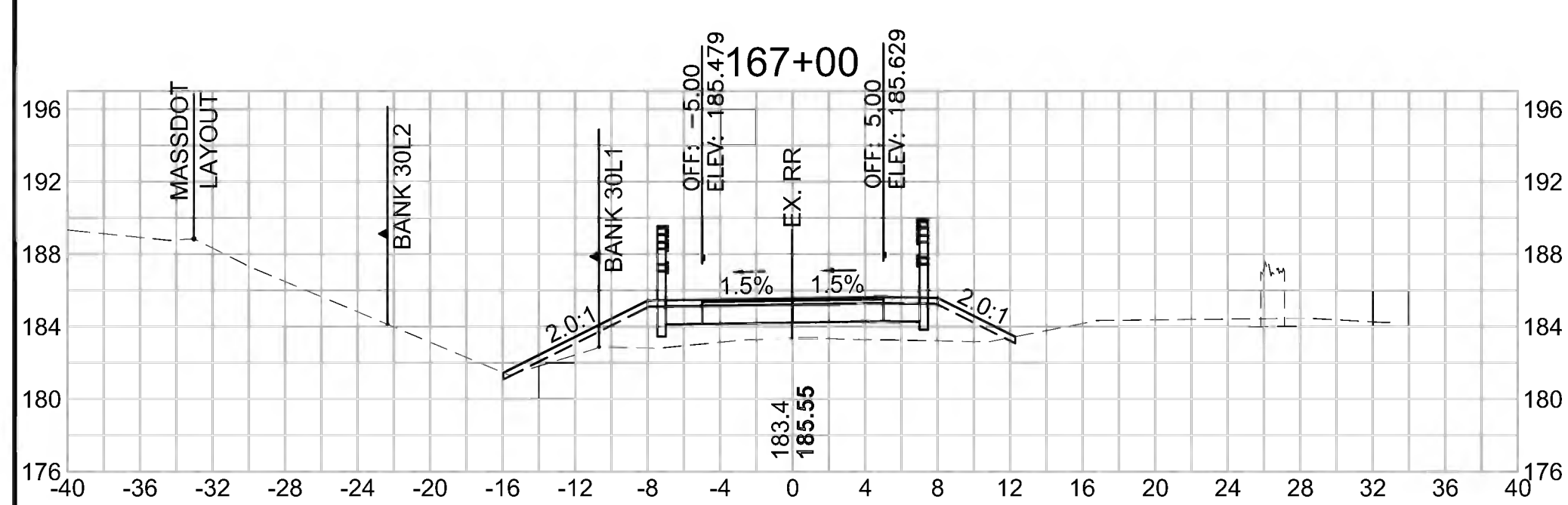
**Total Volume at Station 170+50.00**

Cut Area (SF)	13.656
Fill Area (SF)	3.305
Cut Vol (CF)	22.0
Fill Vol (CF)	7.8
Cum Cut Vol (CF)	4622.1
Cum Fill Vol (CF)	3481.7
Net Vol (CF)	1140.3



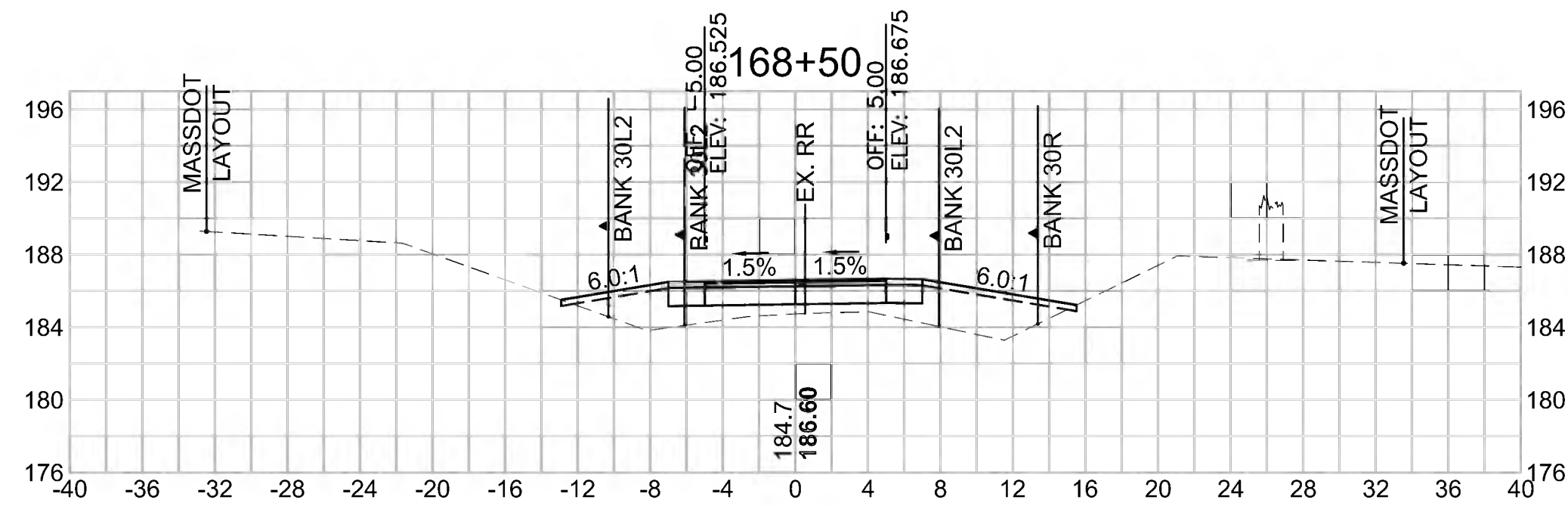
**Total Volume at Station 167+00.00**

Cut Area (SF)	0.182
Fill Area (SF)	28.381
Cut Vol (CF)	0.4
Fill Vol (CF)	53.2
Cum Cut Vol (CF)	4587.4
Cum Fill Vol (CF)	3212.9
Net Vol (CF)	1374.5



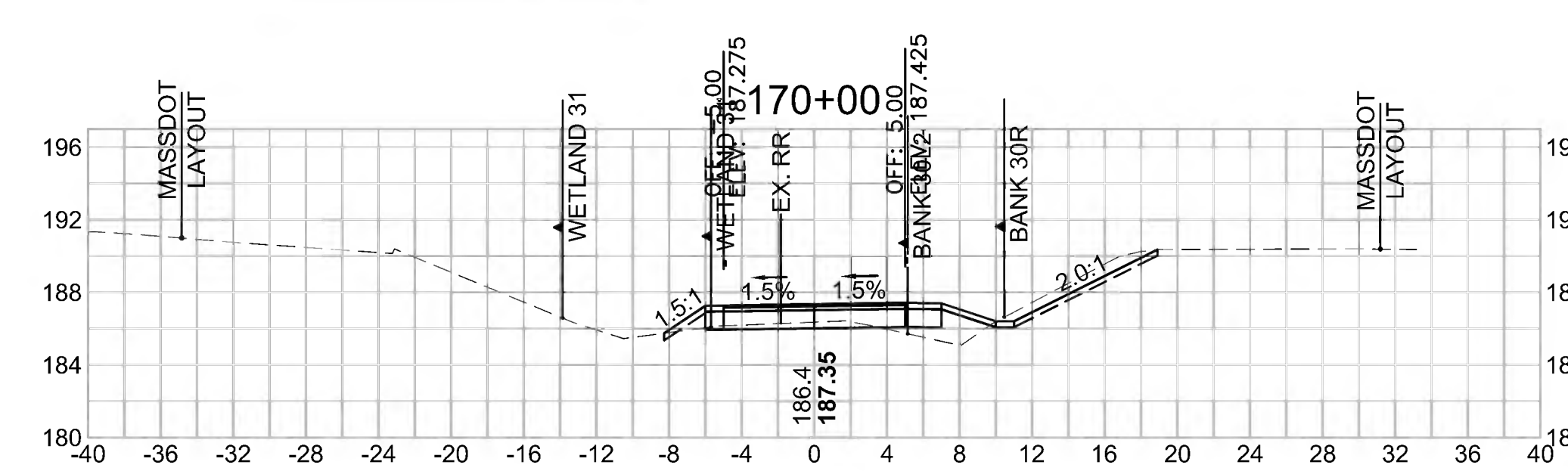
**Total Volume at Station 168+50.00**

Cut Area (SF)	0.194
Fill Area (SF)	30.567
Cut Vol (CF)	0.4
Fill Vol (CF)	61.3
Cum Cut Vol (CF)	4589.4
Cum Fill Vol (CF)	3397.6
Net Vol (CF)	1191.8



**Total Volume at Station 170+00.00**

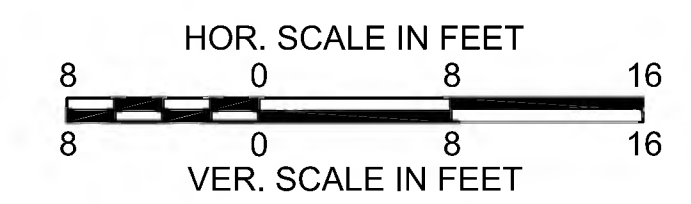
Cut Area (SF)	10.138
Fill Area (SF)	5.098
Cut Vol (CF)	9.8
Fill Vol (CF)	12.2
Cum Cut Vol (CF)	4600.0
Cum Fill Vol (CF)	3474.0
Net Vol (CF)	1126.1



SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	262	319
PROJECT FILE NO. 608164			

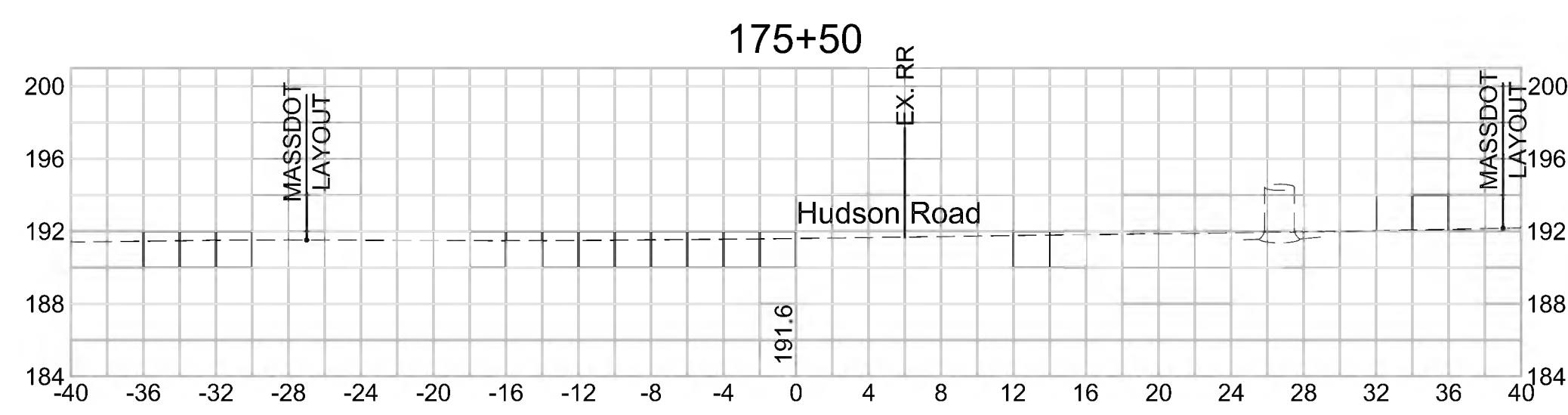
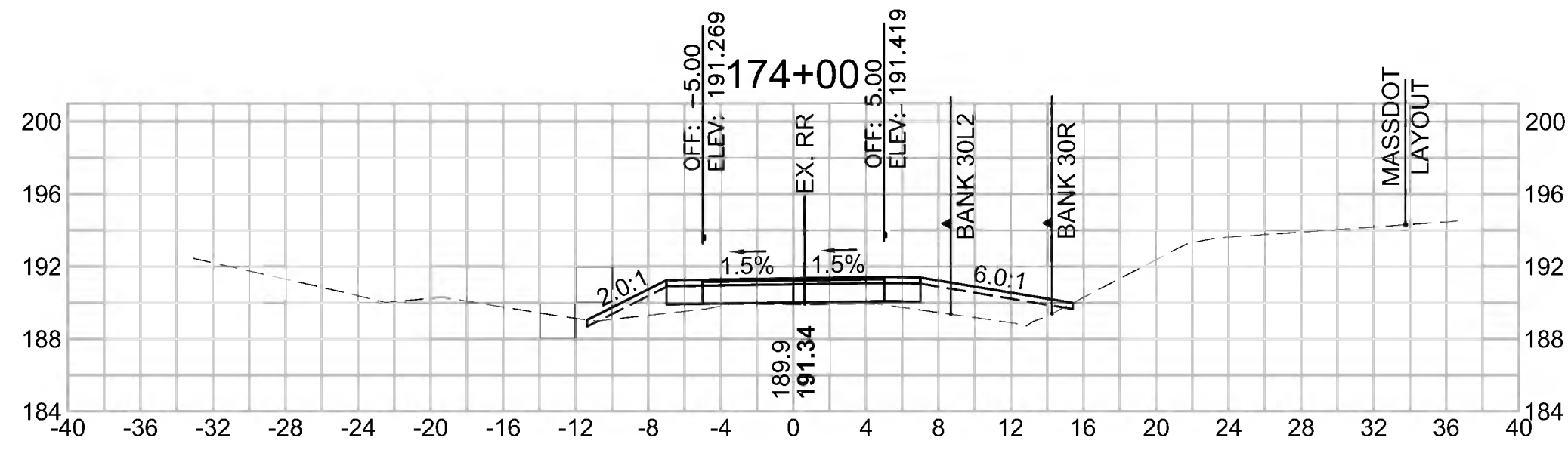
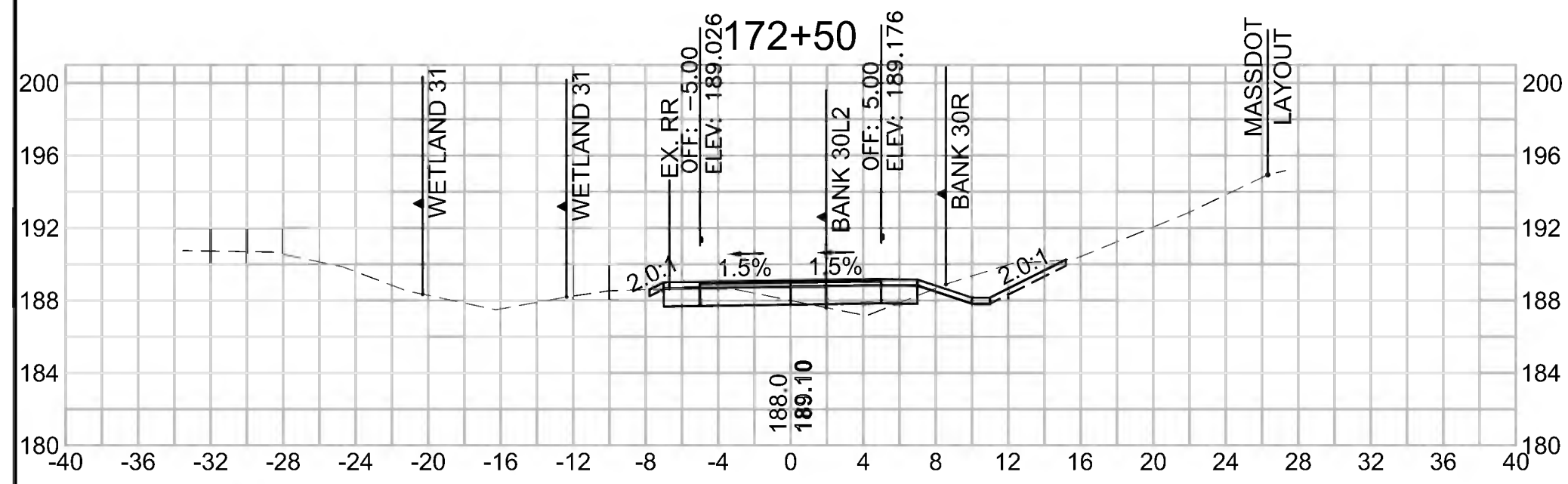
CROSS SECTIONS



Total Volume at Station 172+50.00	
Cut Area (SF)	14,444
Fill Area (SF)	1,856
Cut Vol (CF)	28.7
Fill Vol (CF)	2.4
Cum Cut Vol (CF)	4748.8
Cum Fill Vol (CF)	3491.8
Net Vol (CF)	1257.0

Total Volume at Station 174+00.00	
Cut Area (SF)	0,192
Fill Area (SF)	14,826
Cut Vol (CF)	2.1
Fill Vol (CF)	23.5
Cum Cut Vol (CF)	4778.9
Cum Fill Vol (CF)	3537.5
Net Vol (CF)	1241.5

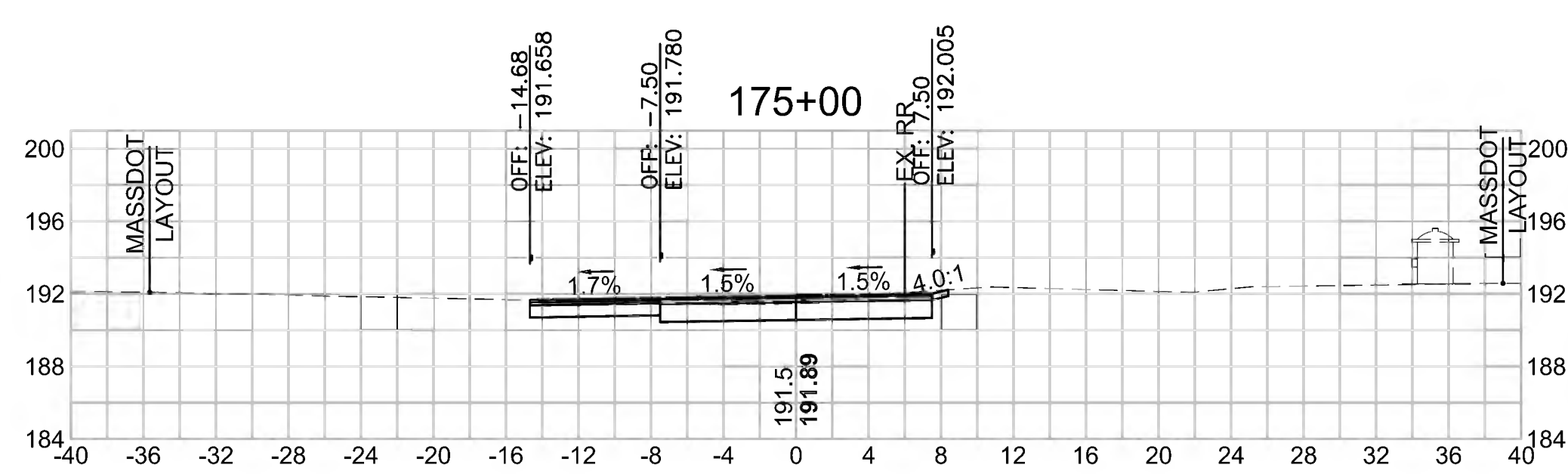
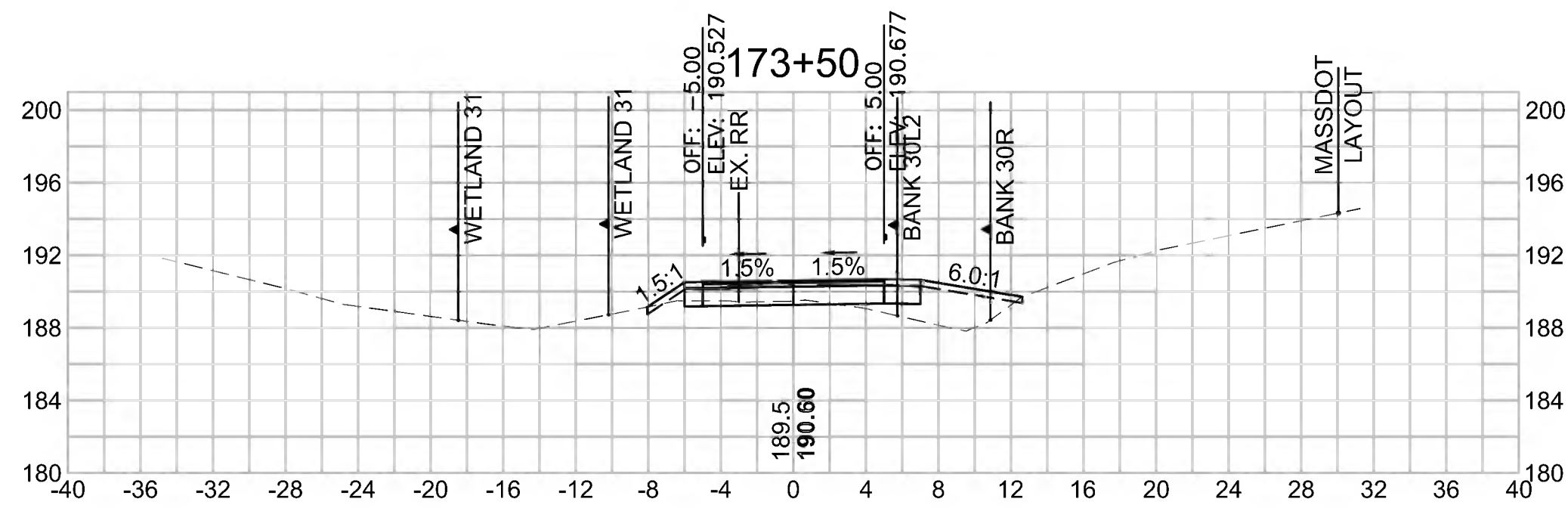
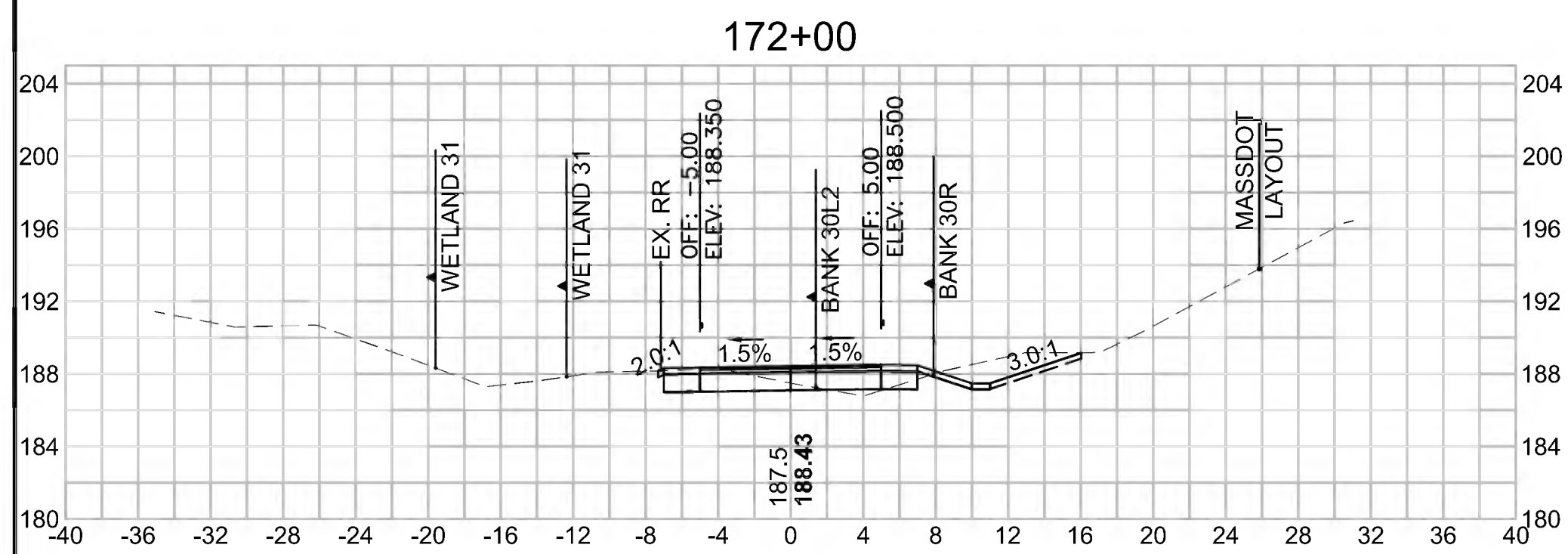
Total Volume at Station 175+50.00	
Cut Area (SF)	62,333
Fill Area (SF)	0,000
Cut Vol (CF)	78.3
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	4884.9
Cum Fill Vol (CF)	3556.4
Net Vol (CF)	1328.5



Total Volume at Station 172+00.00	
Cut Area (SF)	16,508
Fill Area (SF)	0,728
Cut Vol (CF)	33.4
Fill Vol (CF)	1.6
Cum Cut Vol (CF)	4720.2
Cum Fill Vol (CF)	3489.4
Net Vol (CF)	1230.8

Total Volume at Station 173+50.00	
Cut Area (SF)	2,056
Fill Area (SF)	10,538
Cut Vol (CF)	8.3
Fill Vol (CF)	15.1
Cum Cut Vol (CF)	4776.9
Cum Fill Vol (CF)	3514.0
Net Vol (CF)	1262.9

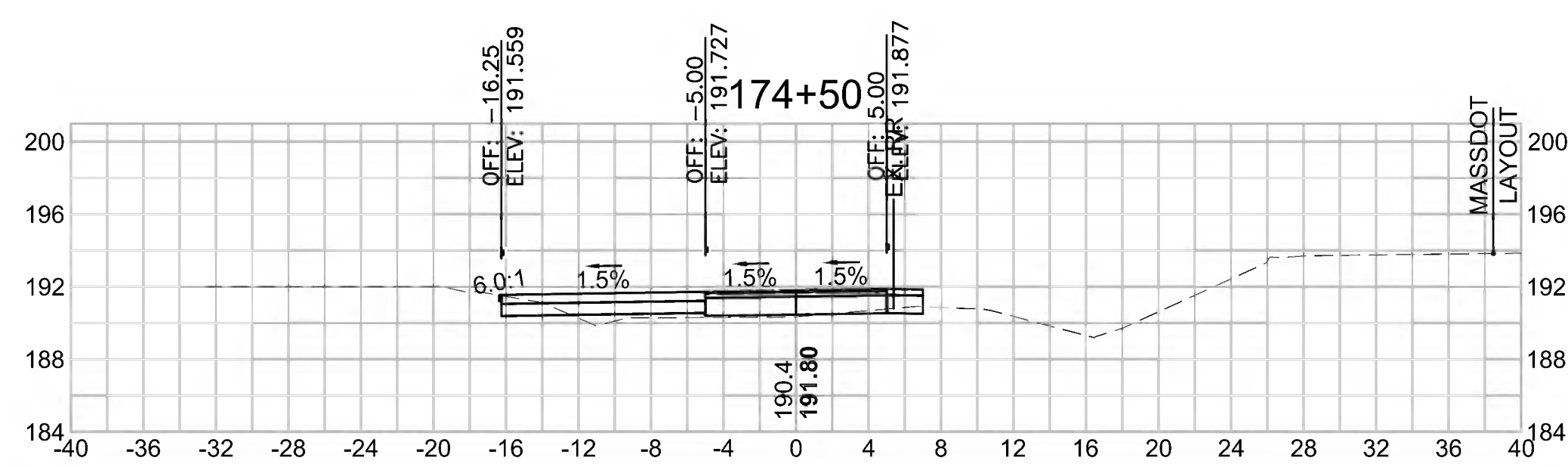
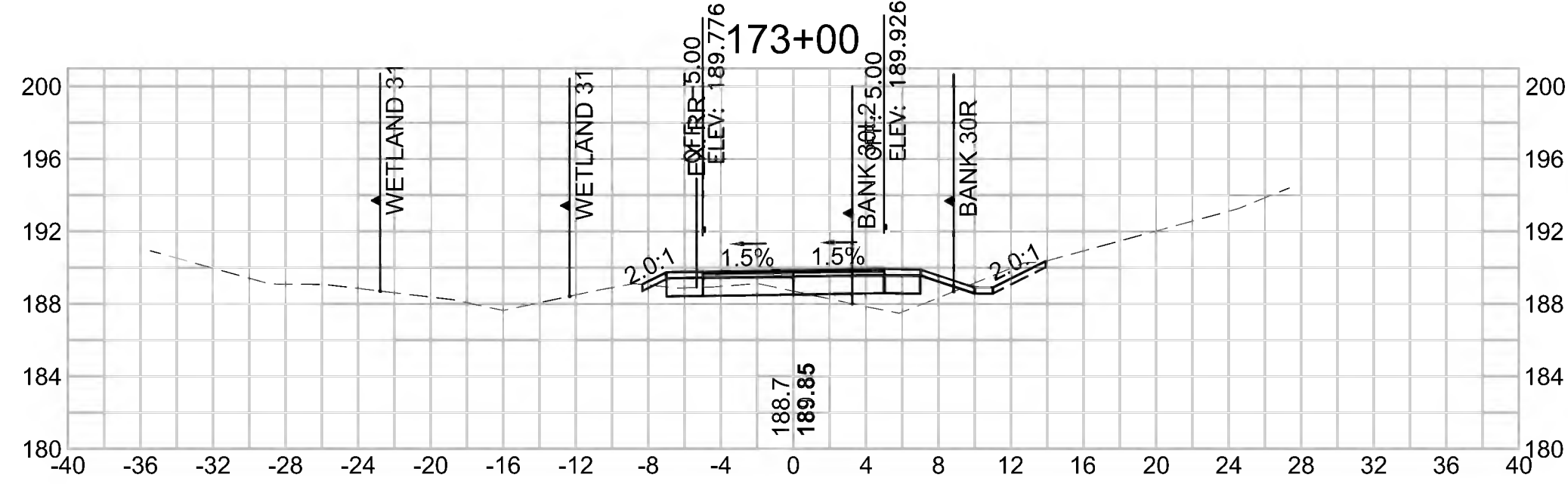
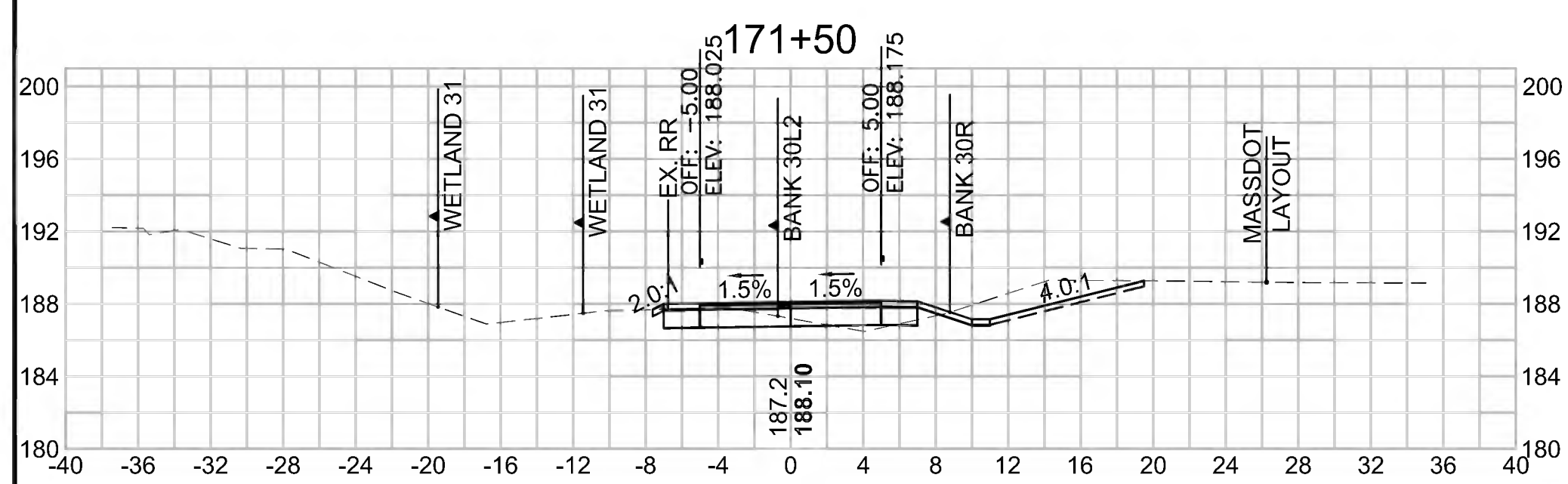
Total Volume at Station 175+00.00	
Cut Area (SF)	22,279
Fill Area (SF)	0,000
Cut Vol (CF)	24.0
Fill Vol (CF)	2.6
Cum Cut Vol (CF)	4806.6
Cum Fill Vol (CF)	3556.4
Net Vol (CF)	1250.2



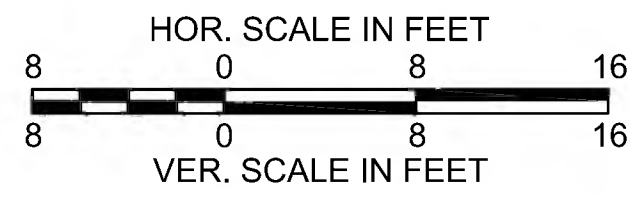
Total Volume at Station 171+50.00	
Cut Area (SF)	19,590
Fill Area (SF)	1,028
Cut Vol (CF)	35.1
Fill Vol (CF)	2.0
Cum Cut Vol (CF)	4686.8
Cum Fill Vol (CF)	3487.8
Net Vol (CF)	1199.0

Total Volume at Station 173+00.00	
Cut Area (SF)	6,878
Fill Area (SF)	5,789
Cut Vol (CF)	19.7
Fill Vol (CF)	7.1
Cum Cut Vol (CF)	4768.6
Cum Fill Vol (CF)	3498.9
Net Vol (CF)	1269.7

Total Volume at Station 174+50.00	
Cut Area (SF)	3,679
Fill Area (SF)	2,778
Cut Vol (CF)	3.6
Fill Vol (CF)	16.3
Cum Cut Vol (CF)	4782.5
Cum Fill Vol (CF)	3553.8
Net Vol (CF)	1228.7







SUDBURY  
 BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	263	319

PROJECT FILE NO. 608164

CROSS SECTIONS

**Total Volume at Station 177+00.00**

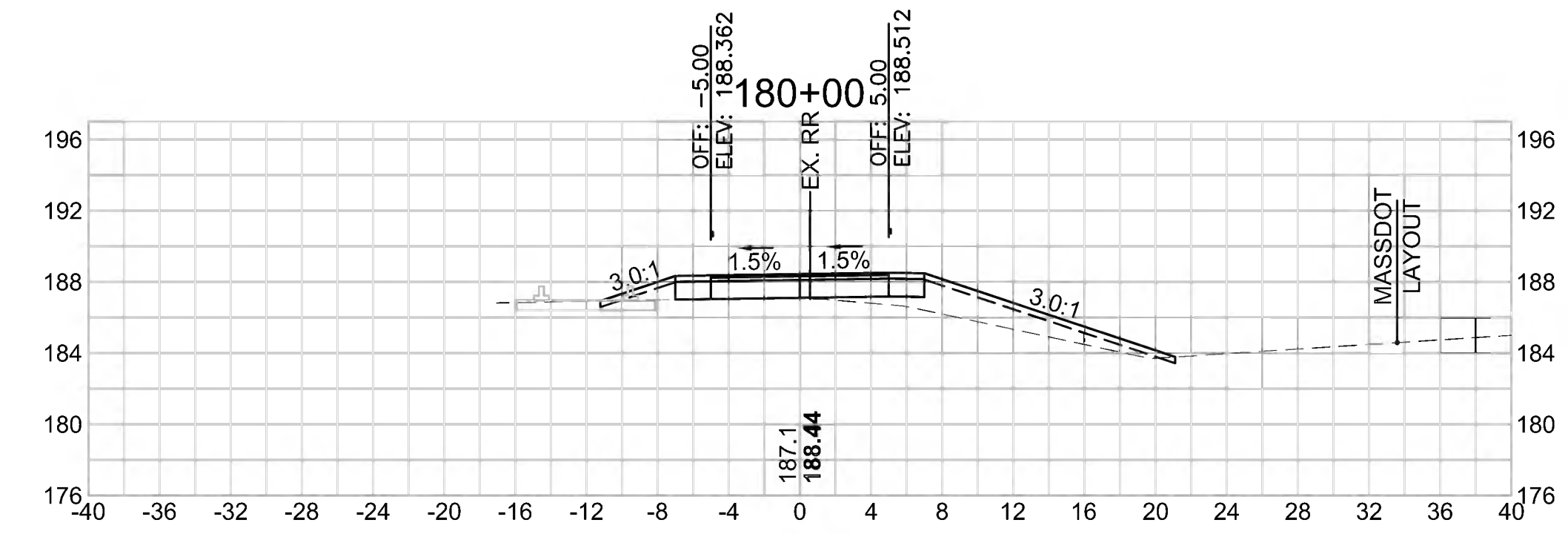
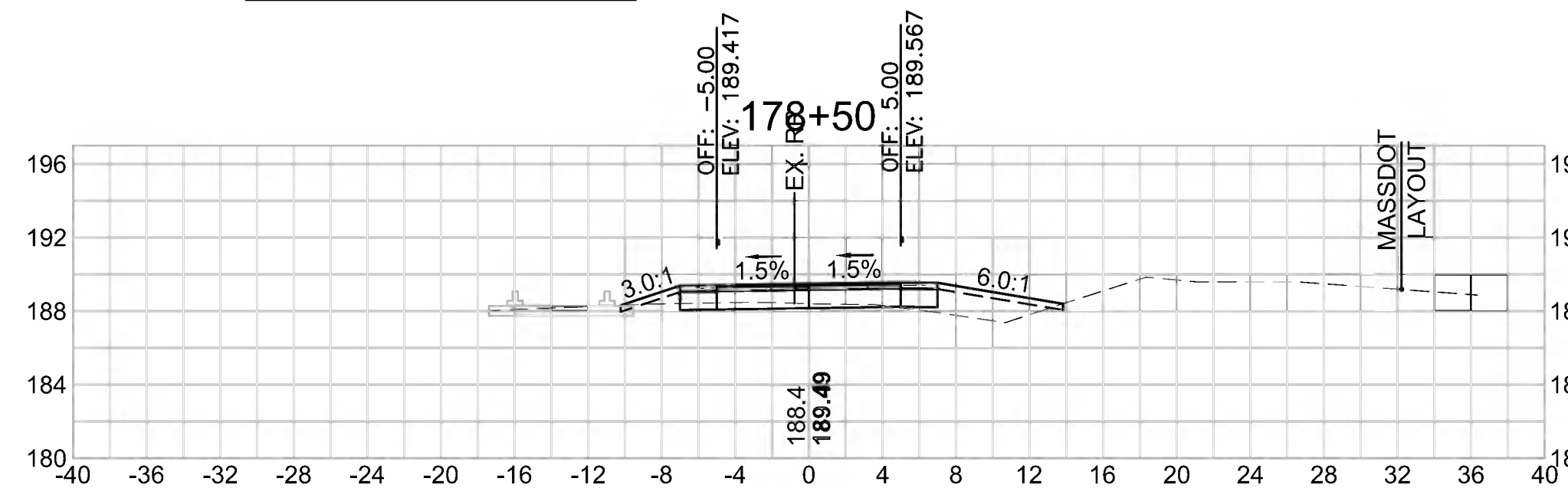
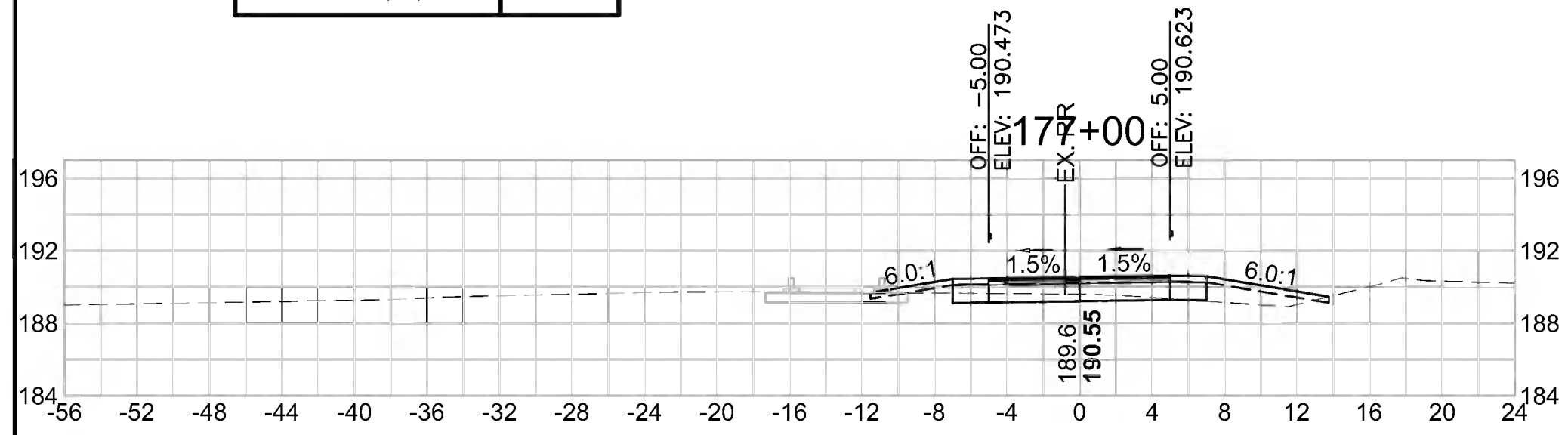
Cut Area (SF)	19.799
Fill Area (SF)	5.793
Cut Vol (CF)	47.2
Fill Vol (CF)	6.1
Cum Cut Vol (CF)	5096.2
Cum Fill Vol (CF)	3563.4
Net Vol (CF)	1532.9

**Total Volume at Station 178+50.00**

Cut Area (SF)	3.447
Fill Area (SF)	7.054
Cut Vol (CF)	7.8
Fill Vol (CF)	11.3
Cum Cut Vol (CF)	5136.6
Cum Fill Vol (CF)	3593.0
Net Vol (CF)	1543.6

**Total Volume at Station 180+00.00**

Cut Area (SF)	0.426
Fill Area (SF)	16.145
Cut Vol (CF)	1.9
Fill Vol (CF)	21.0
Cum Cut Vol (CF)	5148.2
Cum Fill Vol (CF)	3643.1
Net Vol (CF)	1505.1



**Total Volume at Station 176+50.00**

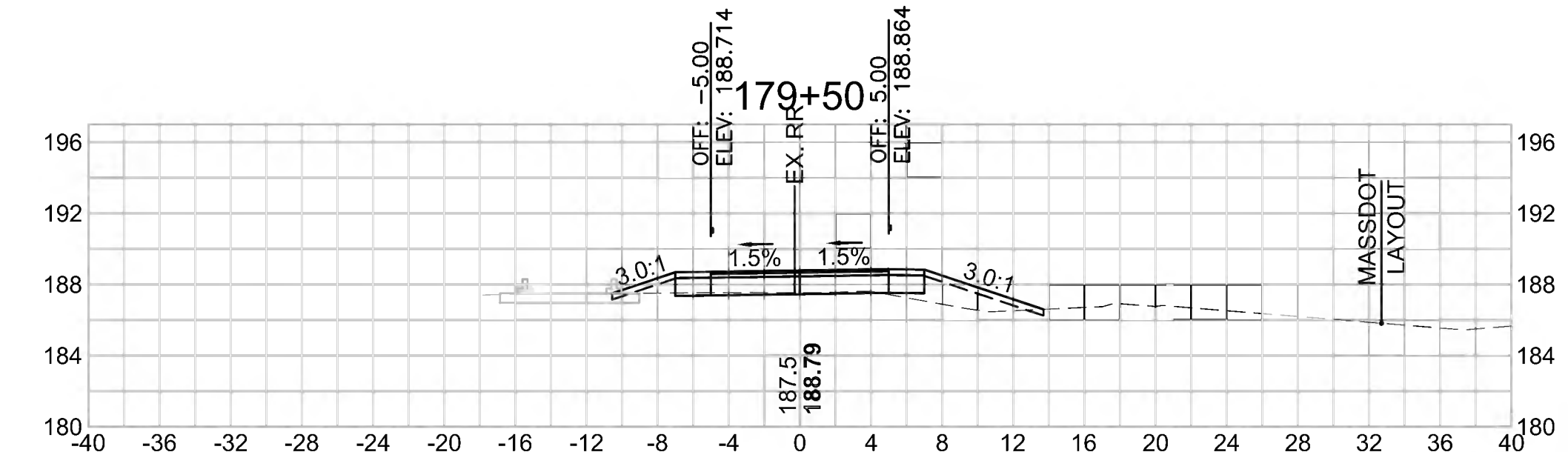
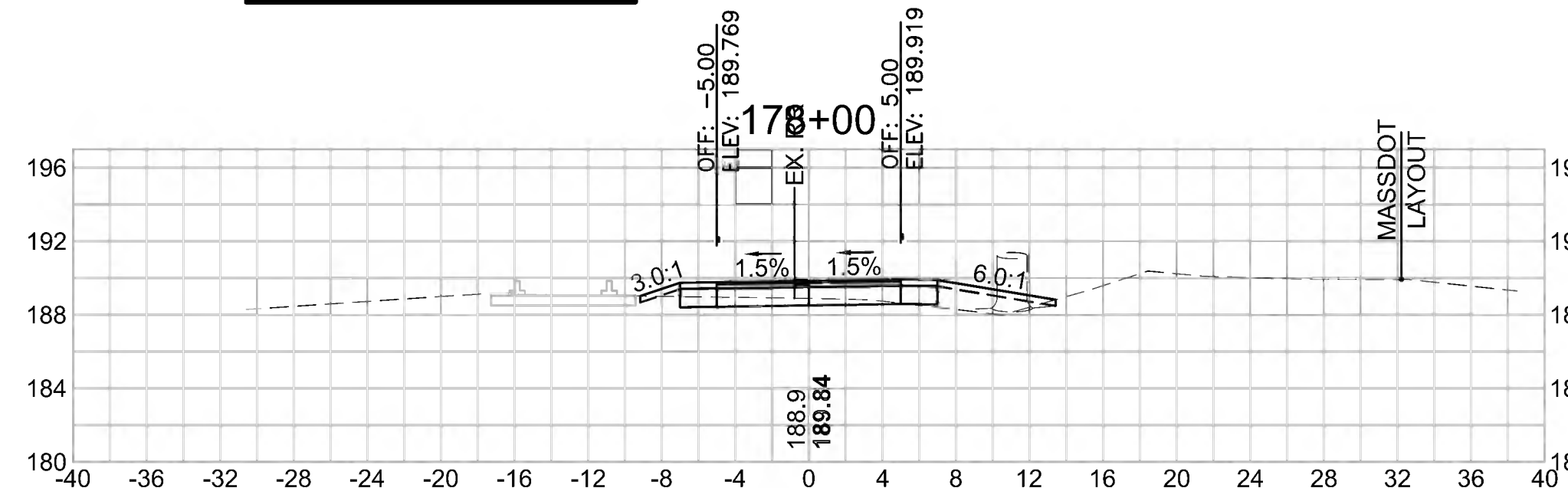
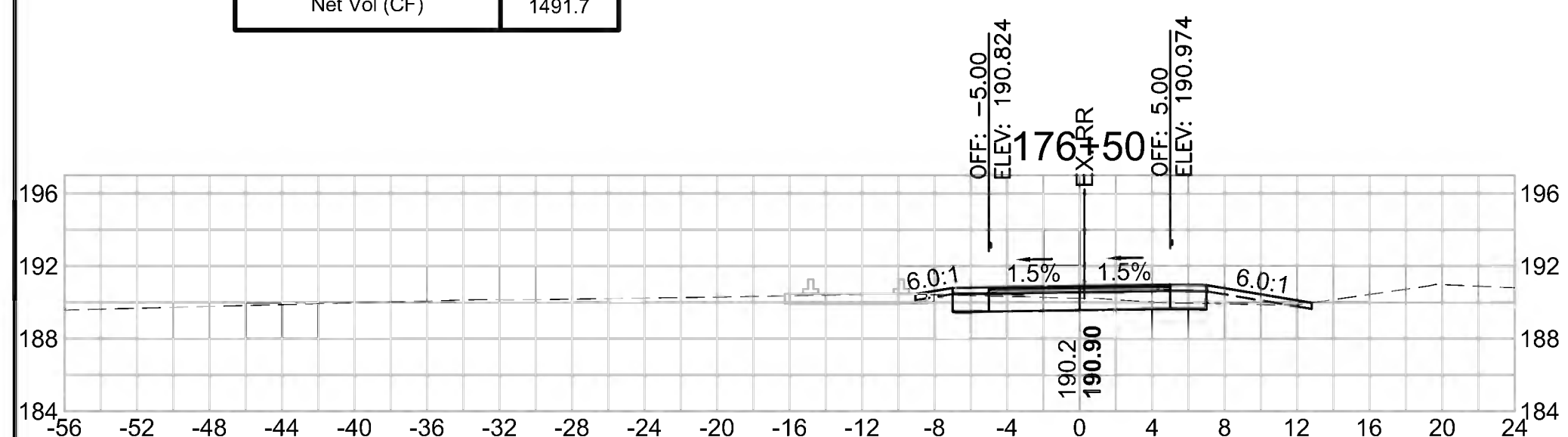
Cut Area (SF)	31.157
Fill Area (SF)	0.745
Cut Vol (CF)	67.8
Fill Vol (CF)	0.8
Cum Cut Vol (CF)	5049.1
Cum Fill Vol (CF)	3557.3
Net Vol (CF)	1491.7

**Total Volume at Station 178+00.00**

Cut Area (SF)	5.000
Fill Area (SF)	5.132
Cut Vol (CF)	9.4
Fill Vol (CF)	8.9
Cum Cut Vol (CF)	5128.7
Cum Fill Vol (CF)	3581.7
Net Vol (CF)	1547.0

**Total Volume at Station 179+50.00**

Cut Area (SF)	1.604
Fill Area (SF)	6.535
Cut Vol (CF)	4.0
Fill Vol (CF)	14.3
Cum Cut Vol (CF)	5146.3
Cum Fill Vol (CF)	3622.1
Net Vol (CF)	1524.2



**Total Volume at Station 176+00.00**

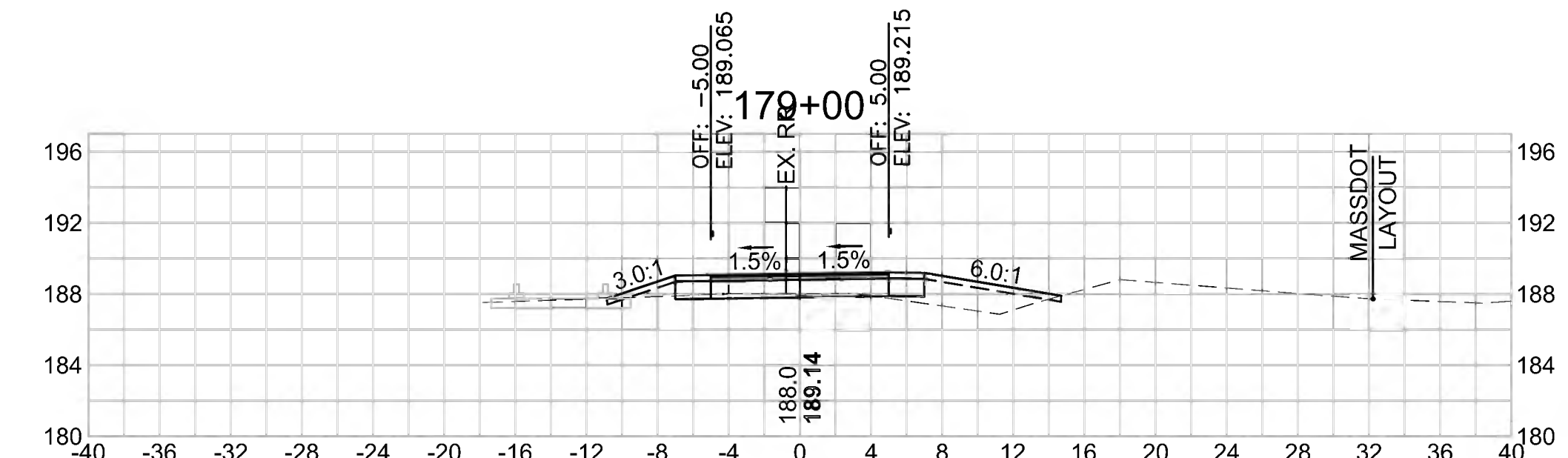
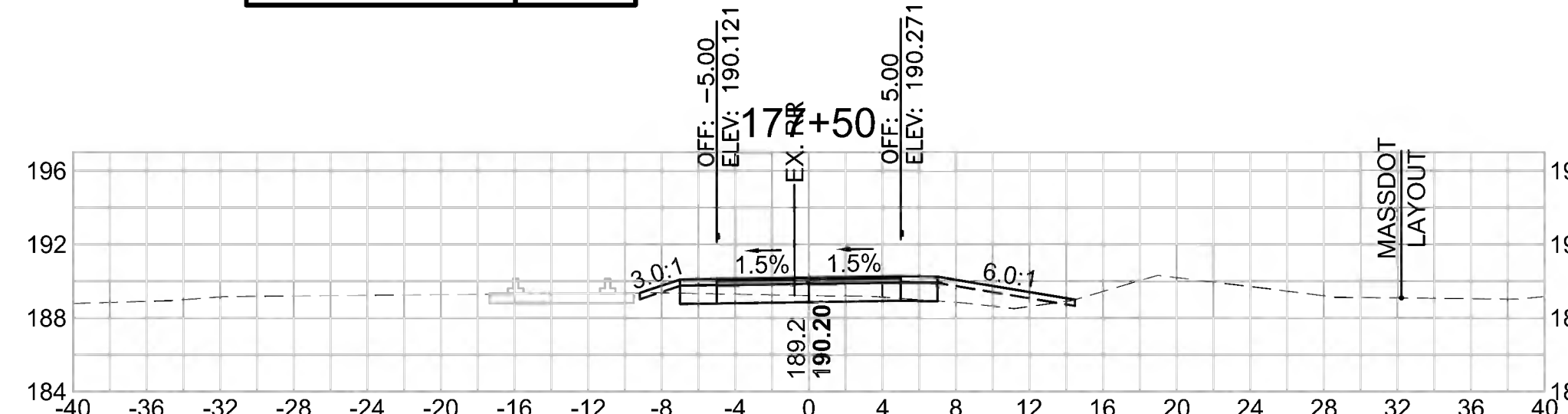
Cut Area (SF)	41.902
Fill Area (SF)	0.153
Cut Vol (CF)	96.5
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	4981.4
Cum Fill Vol (CF)	3556.5
Net Vol (CF)	1424.9

**Total Volume at Station 177+50.00**

Cut Area (SF)	5.150
Fill Area (SF)	4.434
Cut Vol (CF)	23.1
Fill Vol (CF)	9.5
Cum Cut Vol (CF)	5119.3
Cum Fill Vol (CF)	3572.9
Net Vol (CF)	1546.5

**Total Volume at Station 179+00.00**

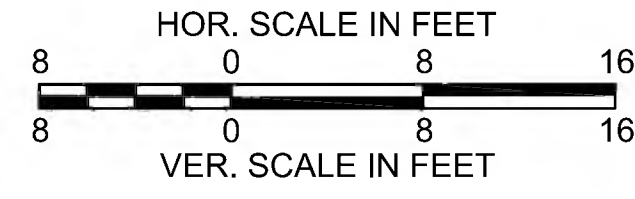
Cut Area (SF)	2.731
Fill Area (SF)	8.930
Cut Vol (CF)	5.7
Fill Vol (CF)	14.8
Cum Cut Vol (CF)	5142.3
Cum Fill Vol (CF)	3607.8
Net Vol (CF)	1534.5



SUDBURY  
BRUCE FREEMAN RAIL TRAIL

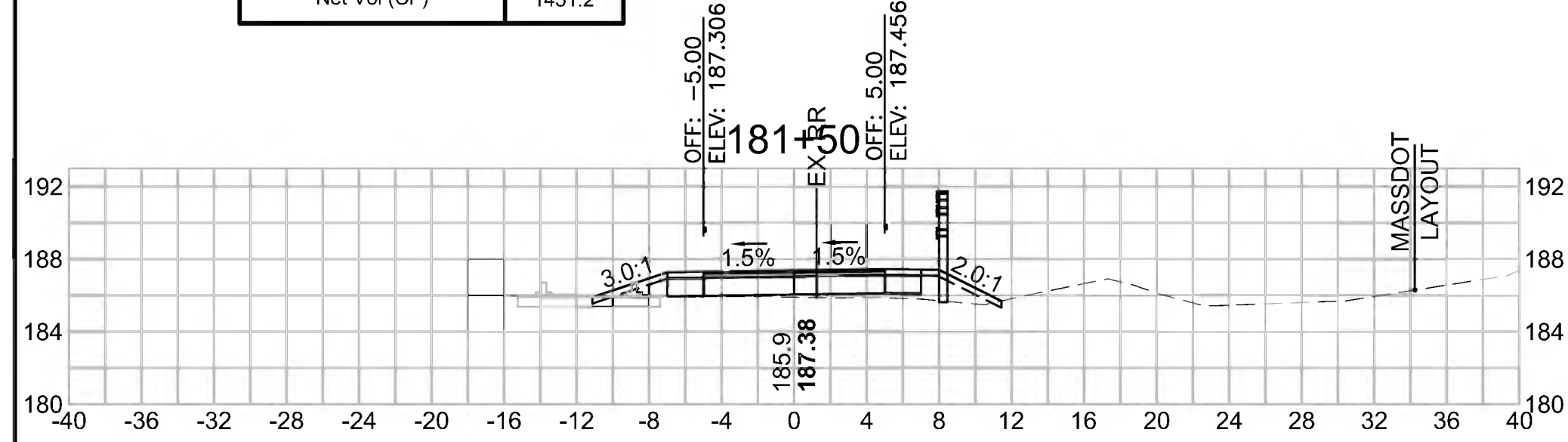
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	264	319
PROJECT FILE NO. 608164			

CROSS SECTIONS



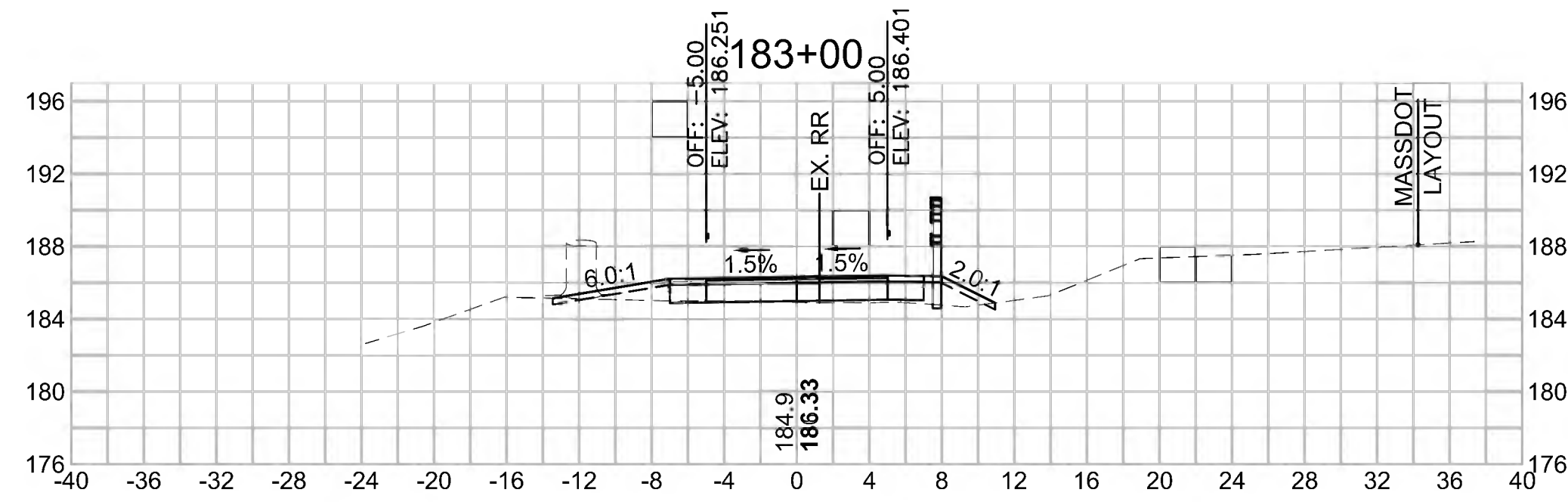
**Total Volume at Station 181+50.00**

Cut Area (SF)	0.278
Fill Area (SF)	6.999
Cut Vol (CF)	0.6
Fill Vol (CF)	16.1
Cum Cut Vol (CF)	5150.1
Cum Fill Vol (CF)	3698.8
Net Vol (CF)	1451.2



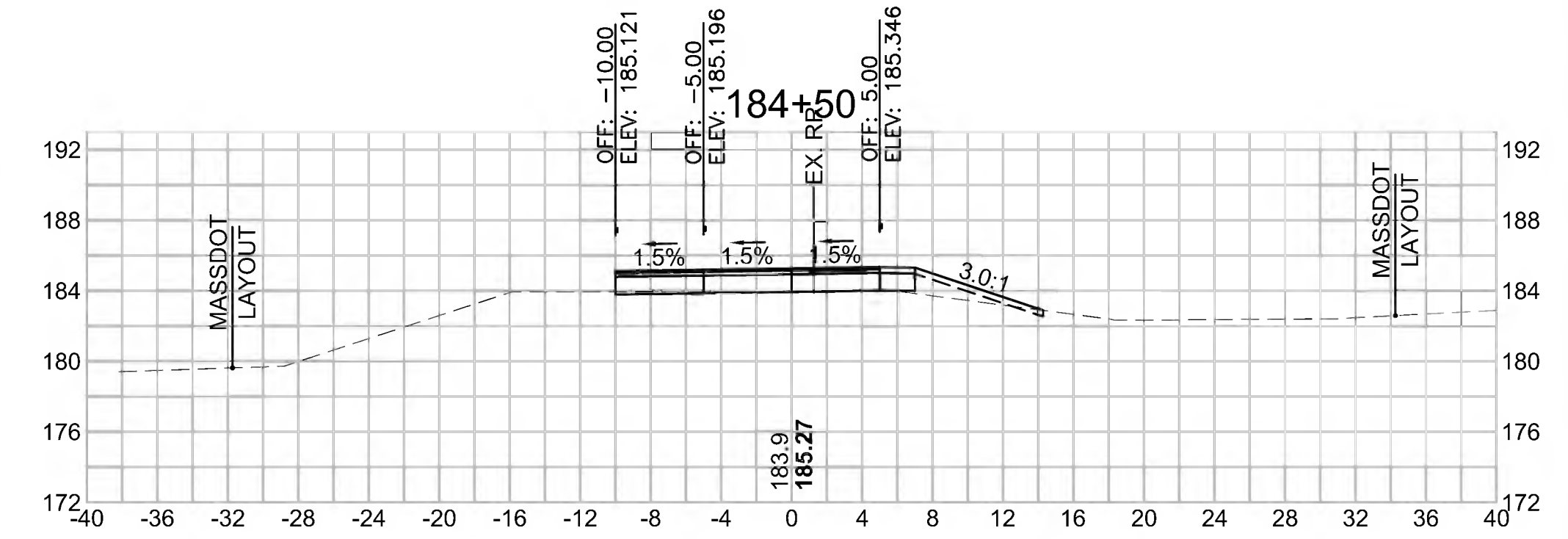
**Total Volume at Station 183+00.00**

Cut Area (SF)	0.791
Fill Area (SF)	5.820
Cut Vol (CF)	2.0
Fill Vol (CF)	10.3
Cum Cut Vol (CF)	5154.9
Cum Fill Vol (CF)	3732.4
Net Vol (CF)	1422.5



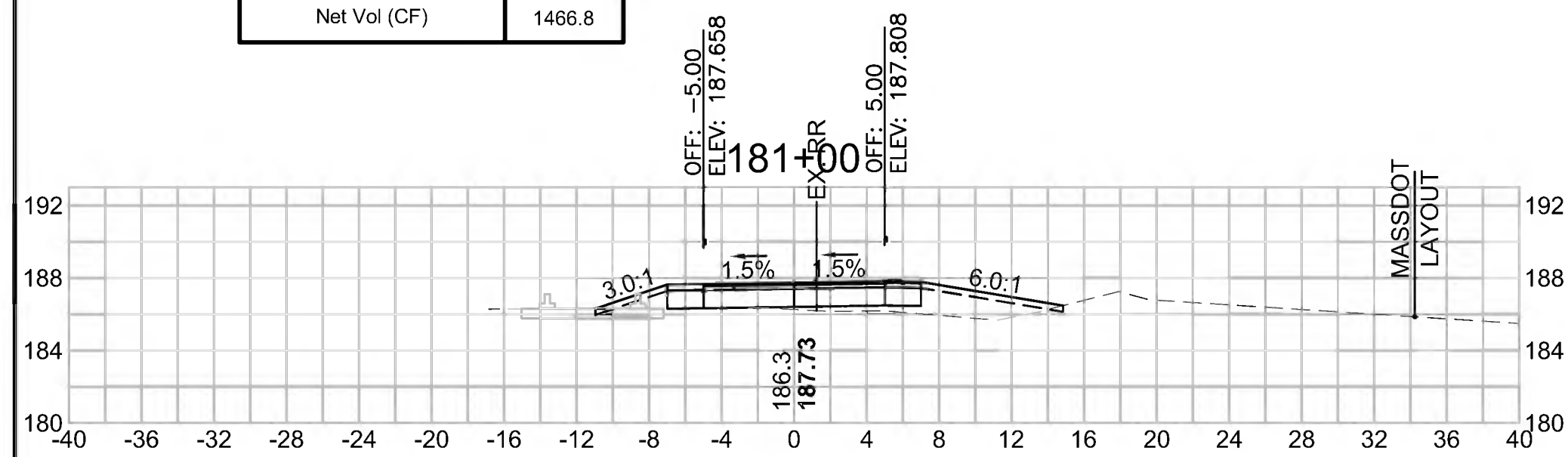
**Total Volume at Station 184+50.00**

Cut Area (SF)	1.145
Fill Area (SF)	3.314
Cut Vol (CF)	2.0
Fill Vol (CF)	8.8
Cum Cut Vol (CF)	5160.6
Cum Fill Vol (CF)	3763.1
Net Vol (CF)	1397.5



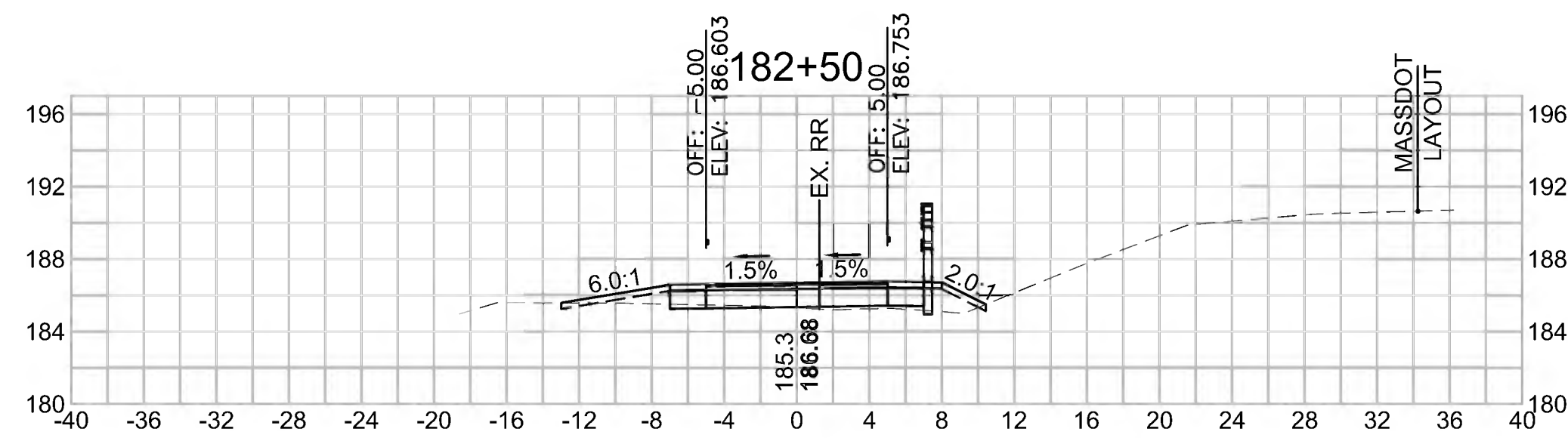
**Total Volume at Station 181+00.00**

Cut Area (SF)	0.334
Fill Area (SF)	10.418
Cut Vol (CF)	0.6
Fill Vol (CF)	17.1
Cum Cut Vol (CF)	5149.5
Cum Fill Vol (CF)	3682.7
Net Vol (CF)	1466.8



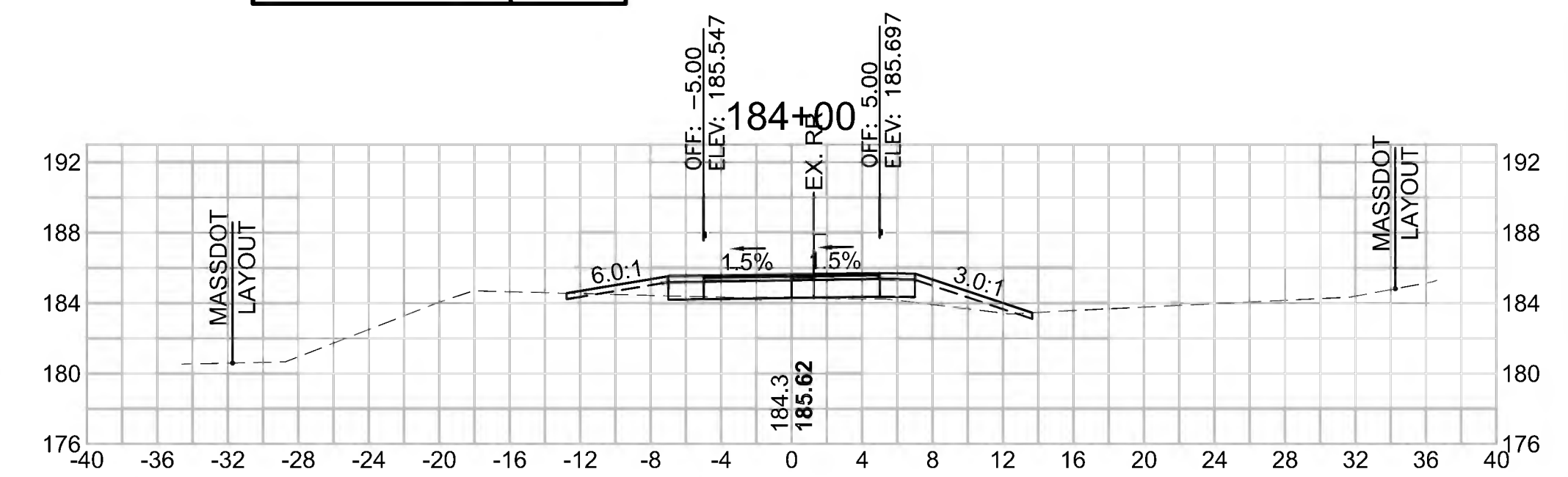
**Total Volume at Station 182+50.00**

Cut Area (SF)	1.337
Fill Area (SF)	5.296
Cut Vol (CF)	1.9
Fill Vol (CF)	10.9
Cum Cut Vol (CF)	5152.9
Cum Fill Vol (CF)	3722.2
Net Vol (CF)	1430.8



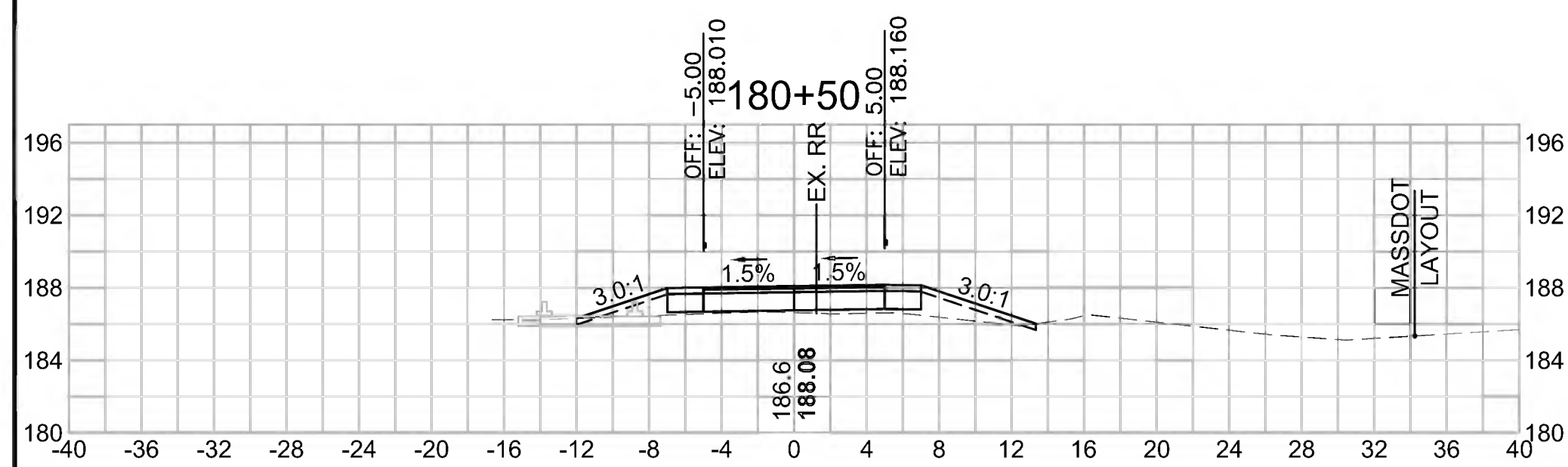
**Total Volume at Station 184+00.00**

Cut Area (SF)	1.053
Fill Area (SF)	6.216
Cut Vol (CF)	2.0
Fill Vol (CF)	11.1
Cum Cut Vol (CF)	5158.6
Cum Fill Vol (CF)	3754.3
Net Vol (CF)	1404.3



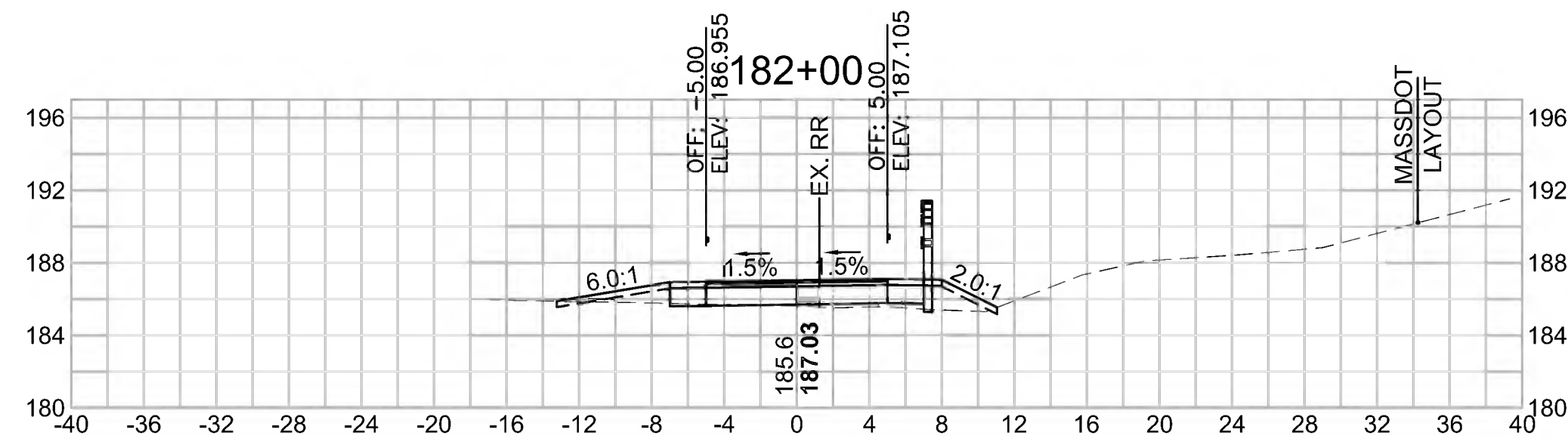
**Total Volume at Station 180+50.00**

Cut Area (SF)	0.335
Fill Area (SF)	8.098
Cut Vol (CF)	0.7
Fill Vol (CF)	22.4
Cum Cut Vol (CF)	5148.9
Cum Fill Vol (CF)	3665.6
Net Vol (CF)	1483.3



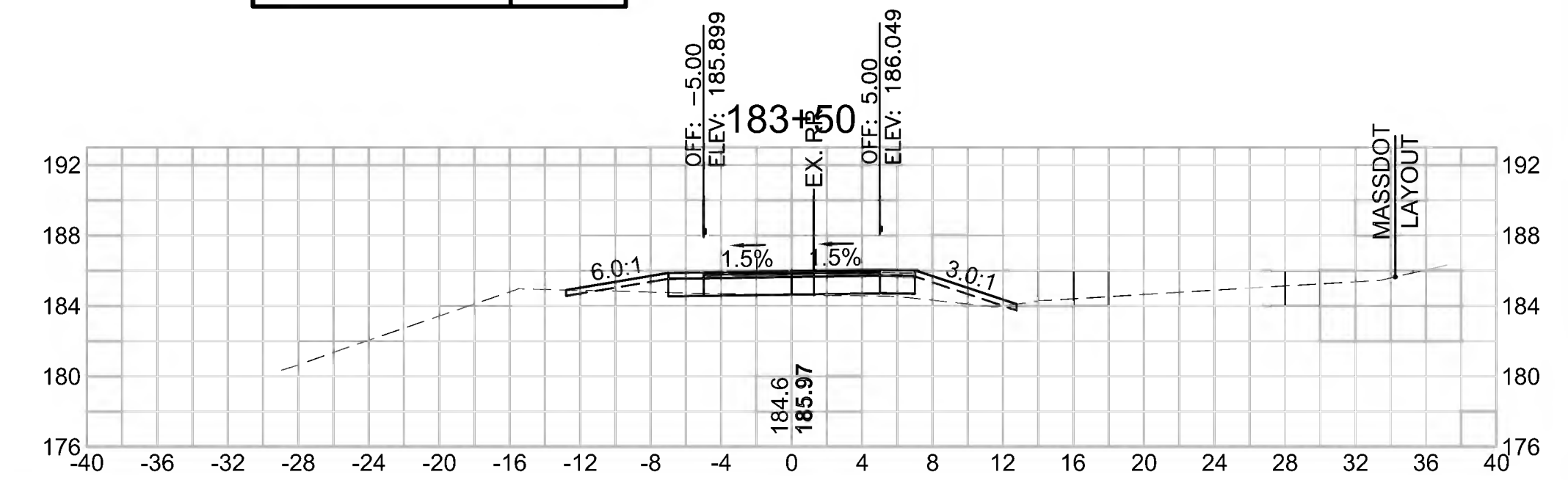
**Total Volume at Station 182+00.00**

Cut Area (SF)	0.744
Fill Area (SF)	6.447
Cut Vol (CF)	0.9
Fill Vol (CF)	12.4
Cum Cut Vol (CF)	5151.0
Cum Fill Vol (CF)	3711.3
Net Vol (CF)	1439.7



**Total Volume at Station 183+50.00**

Cut Area (SF)	1.072
Fill Area (SF)	5.768
Cut Vol (CF)	1.7
Fill Vol (CF)	10.7
Cum Cut Vol (CF)	5156.6
Cum Fill Vol (CF)	3743.2
Net Vol (CF)	1413.5





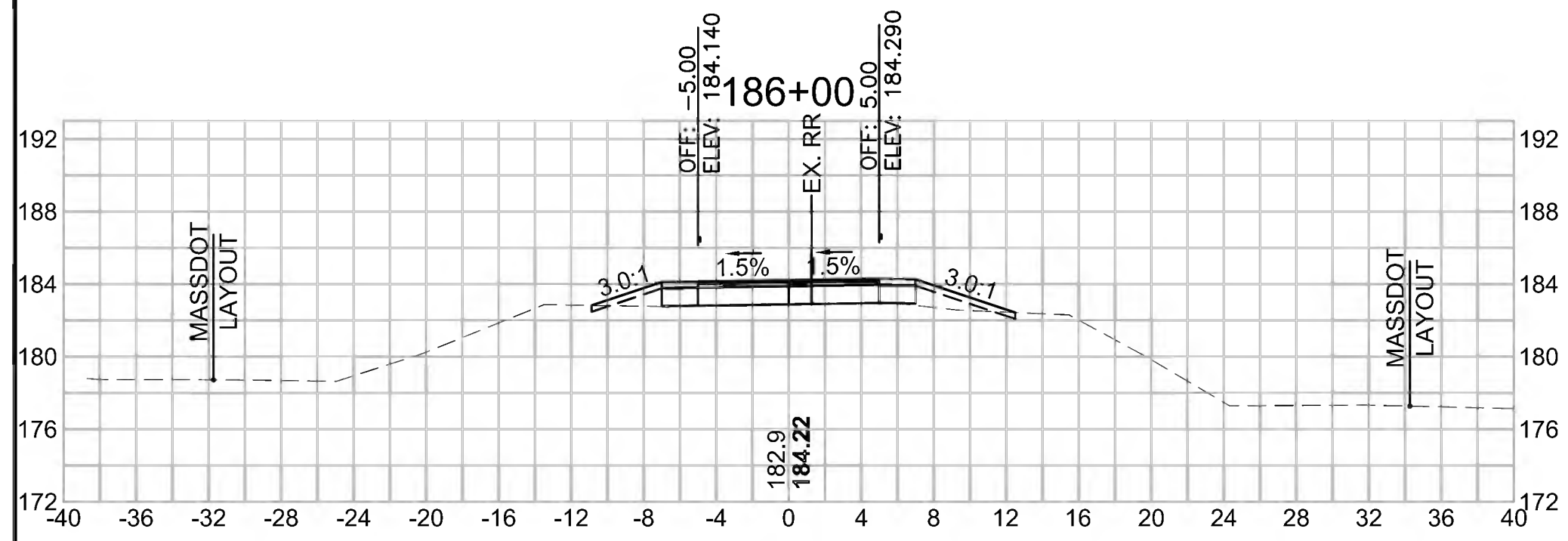
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	265	319
PROJECT FILE NO. 608164			

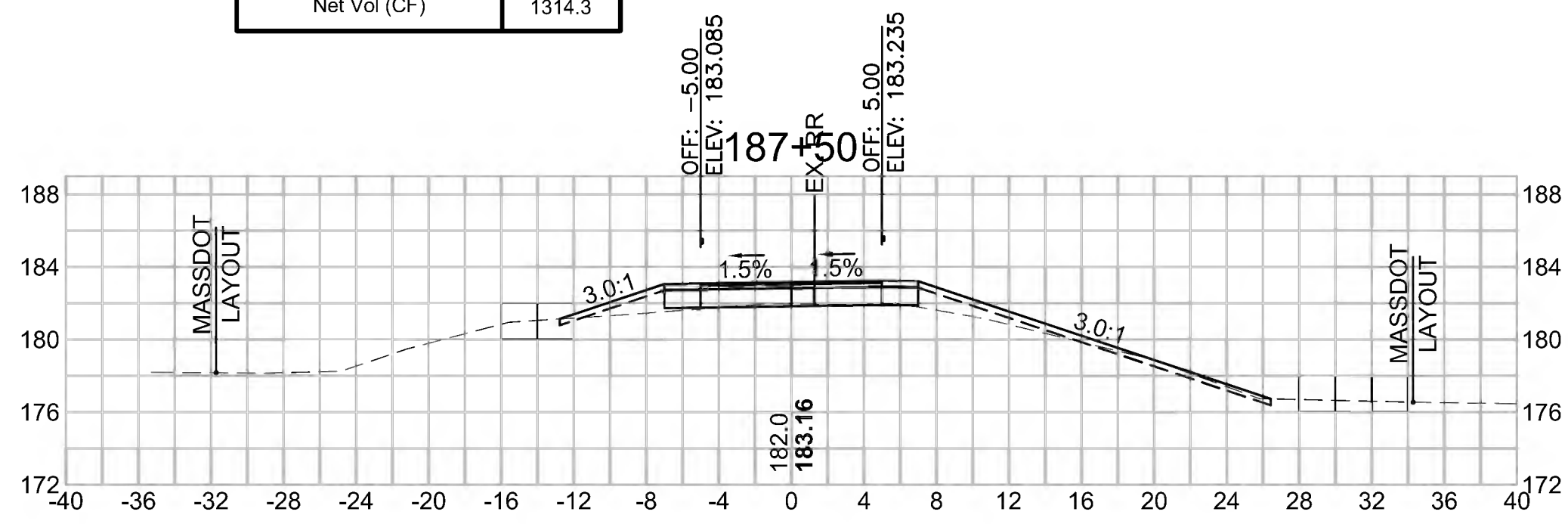
CROSS SECTIONS

608164\_XSEC(CROSS SECTION LAYOUTS).DWG 27-Jun-2022

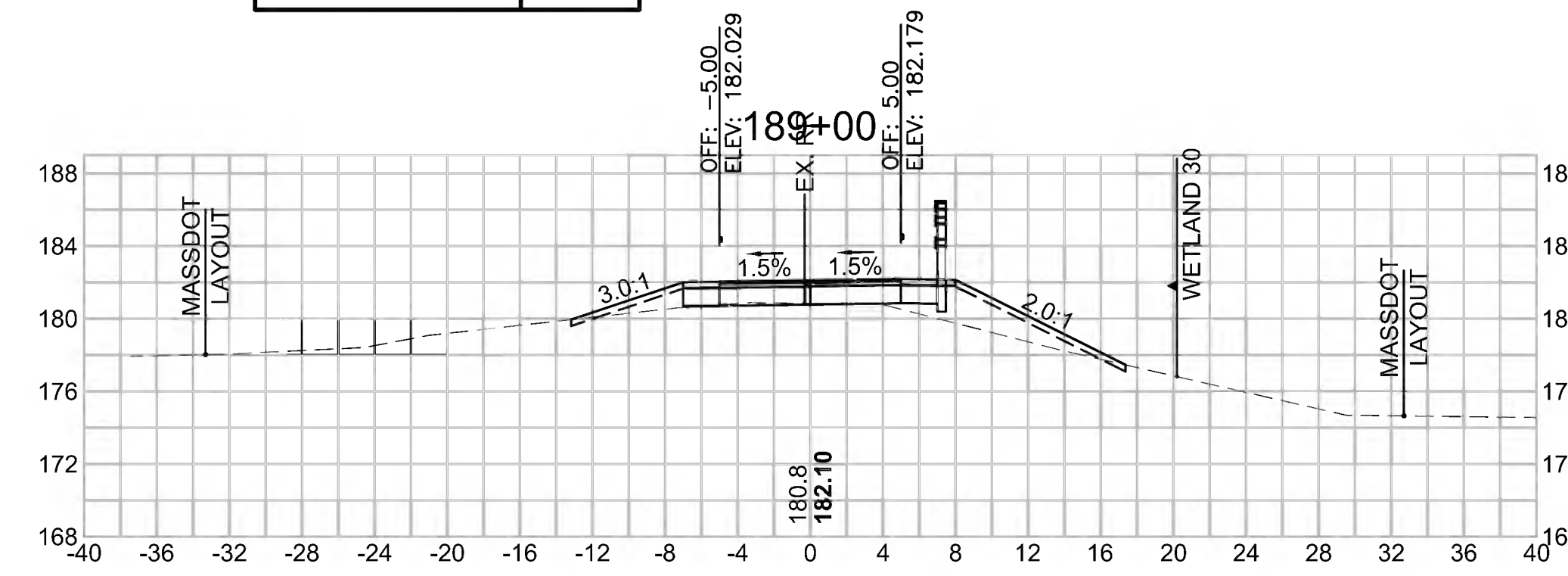
Total Volume at Station 186+00.00	
Cut Area (SF)	0.462
Fill Area (SF)	4.352
Cut Vol (CF)	1.6
Fill Vol (CF)	10.0
Cum Cut Vol (CF)	5168.1
Cum Fill Vol (CF)	3801.8
Net Vol (CF)	1366.3



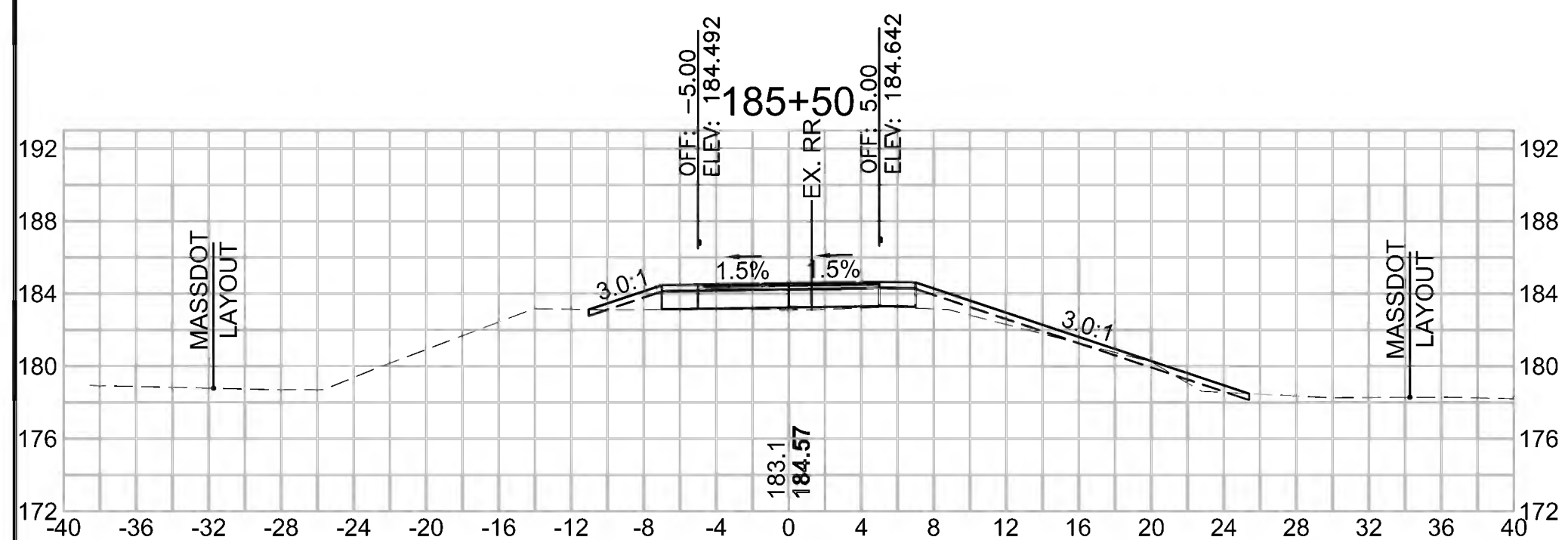
Total Volume at Station 187+50.00	
Cut Area (SF)	3.419
Fill Area (SF)	7.150
Cut Vol (CF)	4.6
Fill Vol (CF)	16.3
Cum Cut Vol (CF)	5175.4
Cum Fill Vol (CF)	3861.1
Net Vol (CF)	1314.3



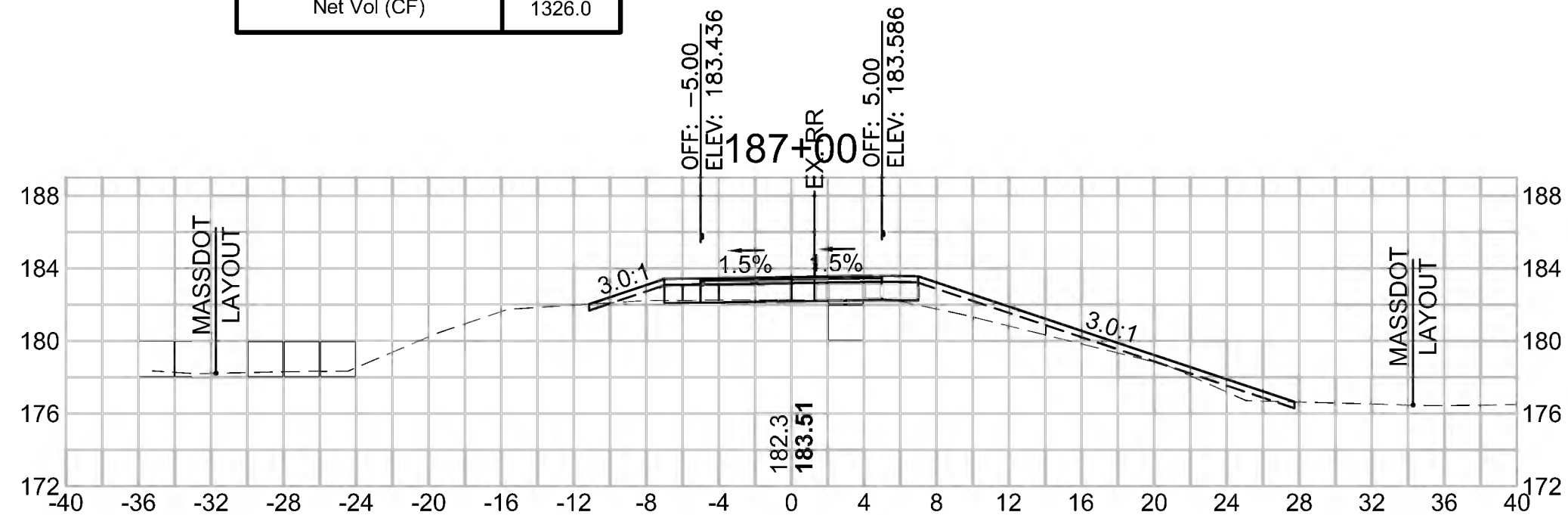
Total Volume at Station 189+00.00	
Cut Area (SF)	1.251
Fill Area (SF)	13.957
Cut Vol (CF)	2.2
Fill Vol (CF)	19.4
Cum Cut Vol (CF)	5184.6
Cum Fill Vol (CF)	3904.9
Net Vol (CF)	1279.7



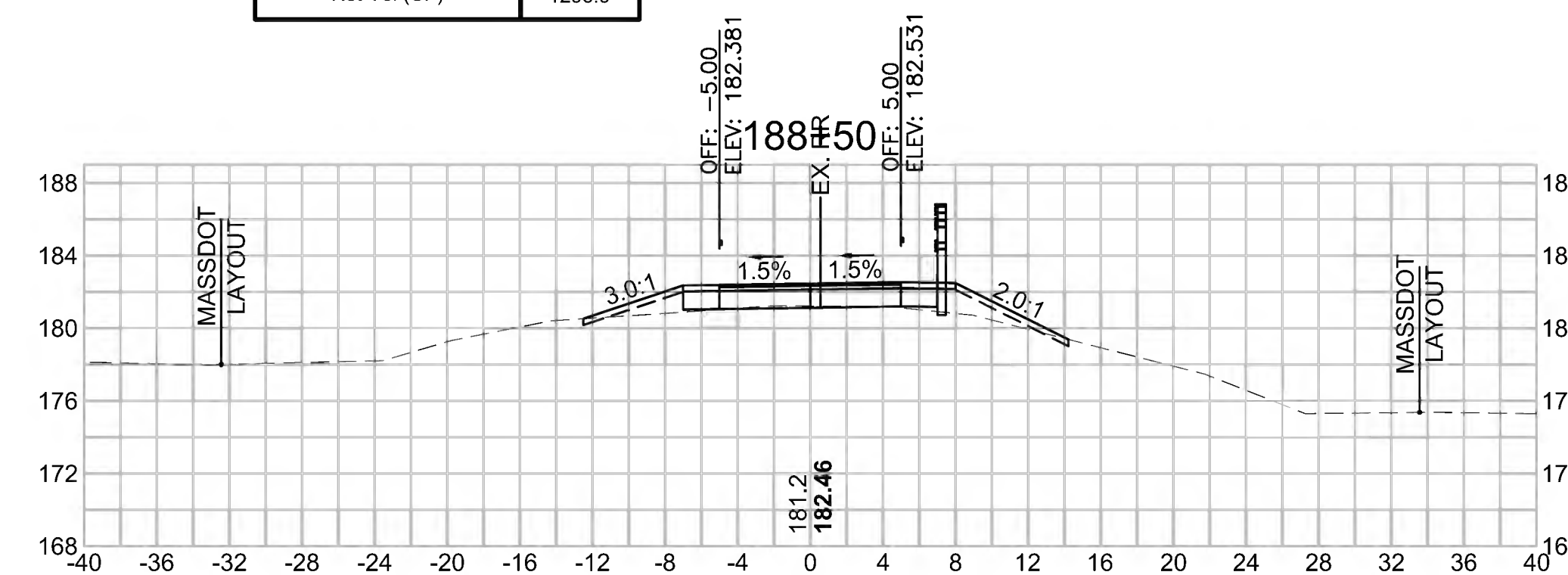
Total Volume at Station 185+50.00	
Cut Area (SF)	1.227
Fill Area (SF)	6.499
Cut Vol (CF)	3.0
Fill Vol (CF)	15.8
Cum Cut Vol (CF)	5166.5
Cum Fill Vol (CF)	3791.7
Net Vol (CF)	1374.8



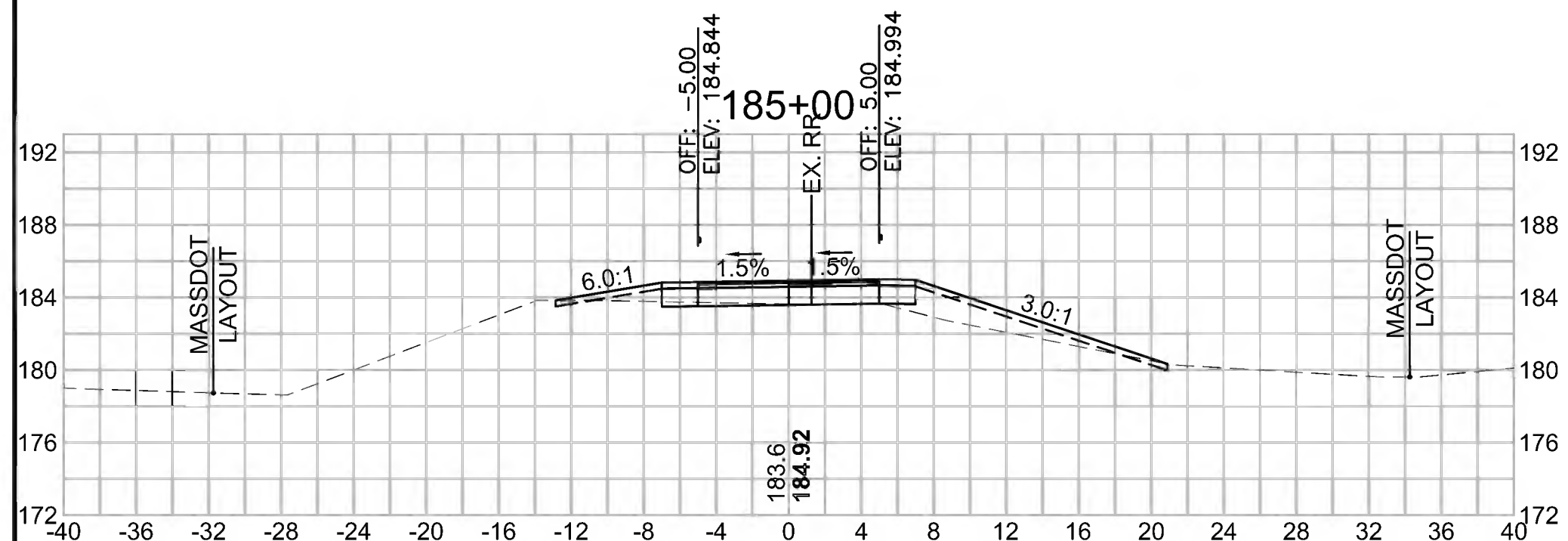
Total Volume at Station 187+00.00	
Cut Area (SF)	1.507
Fill Area (SF)	10.401
Cut Vol (CF)	1.9
Fill Vol (CF)	24.3
Cum Cut Vol (CF)	5170.9
Cum Fill Vol (CF)	3844.9
Net Vol (CF)	1326.0



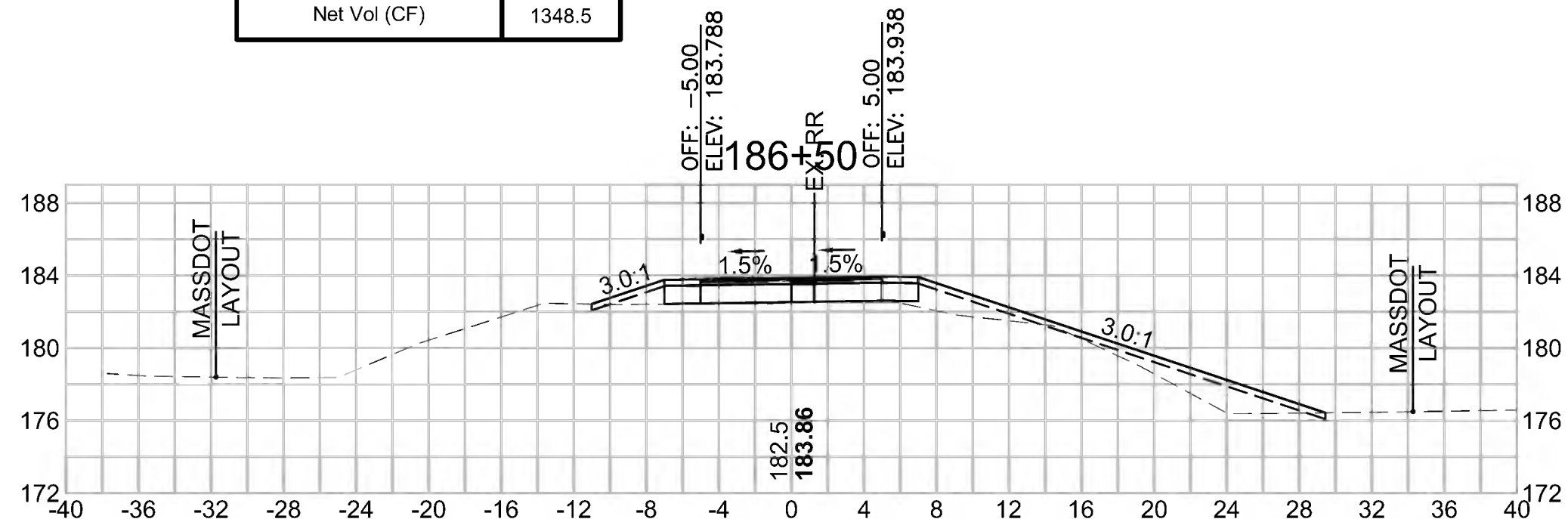
Total Volume at Station 188+50.00	
Cut Area (SF)	1.109
Fill Area (SF)	6.981
Cut Vol (CF)	2.4
Fill Vol (CF)	12.1
Cum Cut Vol (CF)	5182.5
Cum Fill Vol (CF)	3885.5
Net Vol (CF)	1296.9



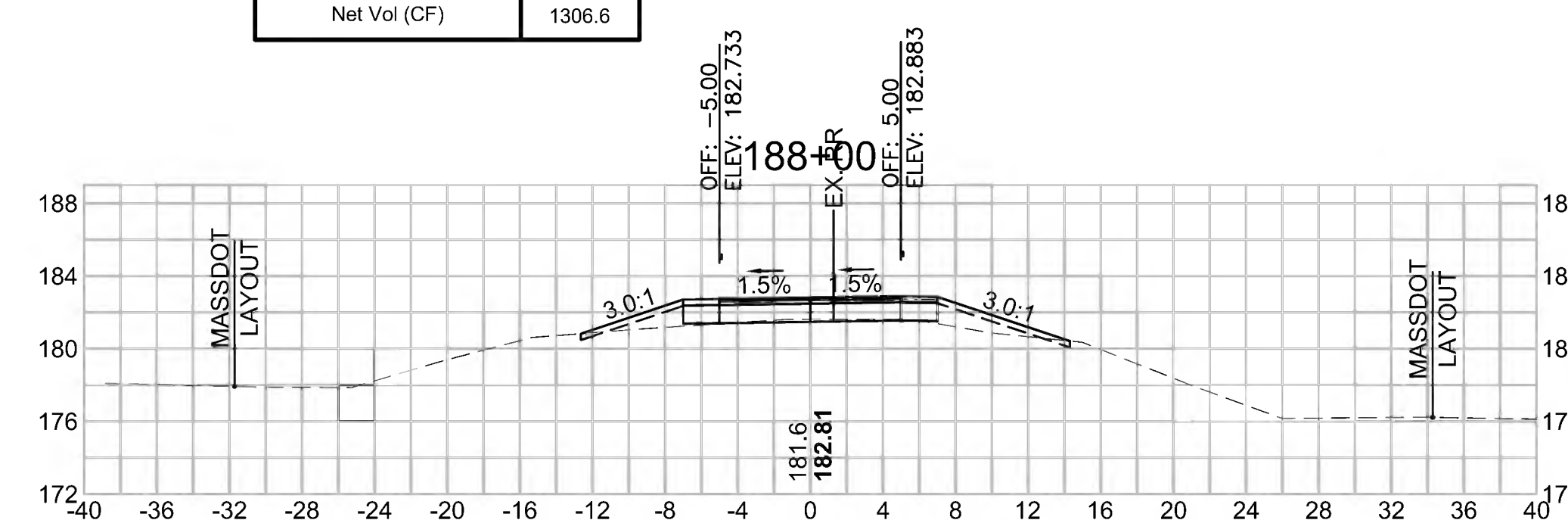
Total Volume at Station 185+00.00	
Cut Area (SF)	1.999
Fill Area (SF)	10.564
Cut Vol (CF)	2.9
Fill Vol (CF)	12.9
Cum Cut Vol (CF)	5163.6
Cum Fill Vol (CF)	3775.9
Net Vol (CF)	1387.6



Total Volume at Station 186+50.00	
Cut Area (SF)	0.508
Fill Area (SF)	15.875
Cut Vol (CF)	0.9
Fill Vol (CF)	18.7
Cum Cut Vol (CF)	5169.0
Cum Fill Vol (CF)	3820.5
Net Vol (CF)	1348.5



Total Volume at Station 188+00.00	
Cut Area (SF)	1.534
Fill Area (SF)	6.123
Cut Vol (CF)	4.6
Fill Vol (CF)	12.3
Cum Cut Vol (CF)	5180.0
Cum Fill Vol (CF)	3873.4
Net Vol (CF)	1306.6

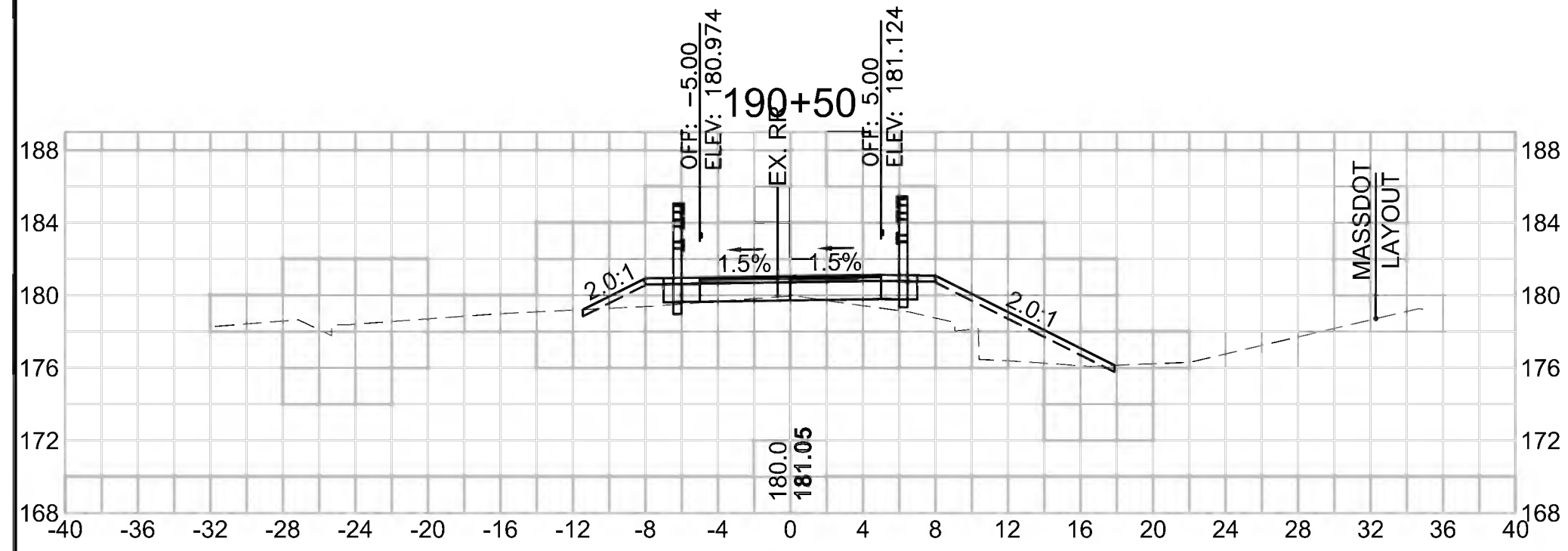


SUDBURY  
BRUCE FREEMAN RAIL TRAIL

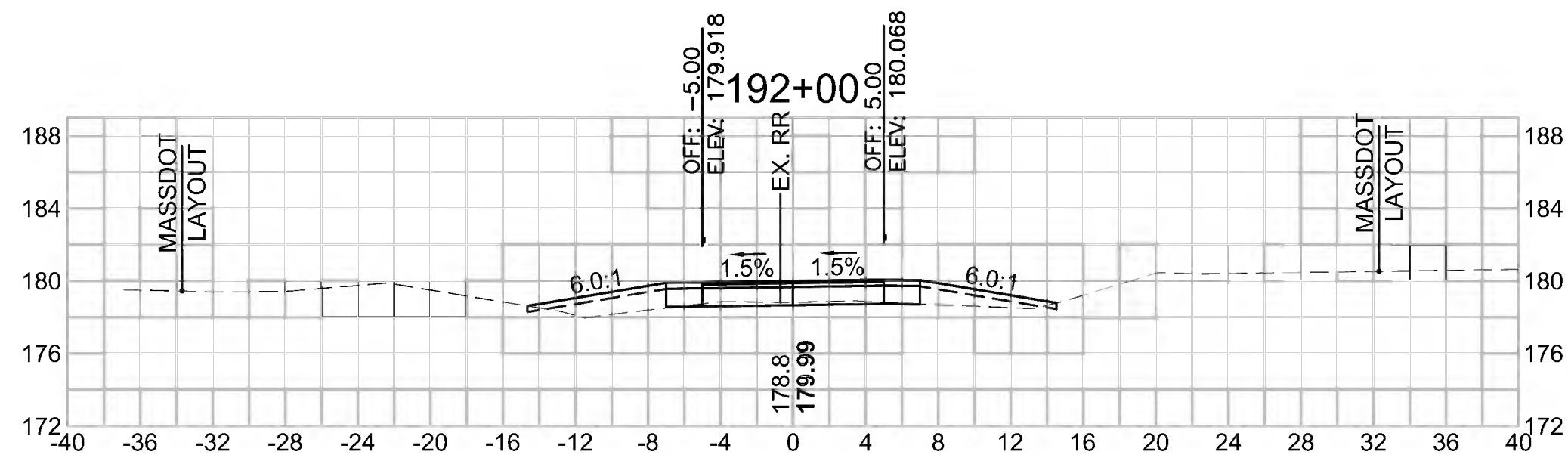
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	266	319
PROJECT FILE NO. 608164			

CROSS SECTIONS

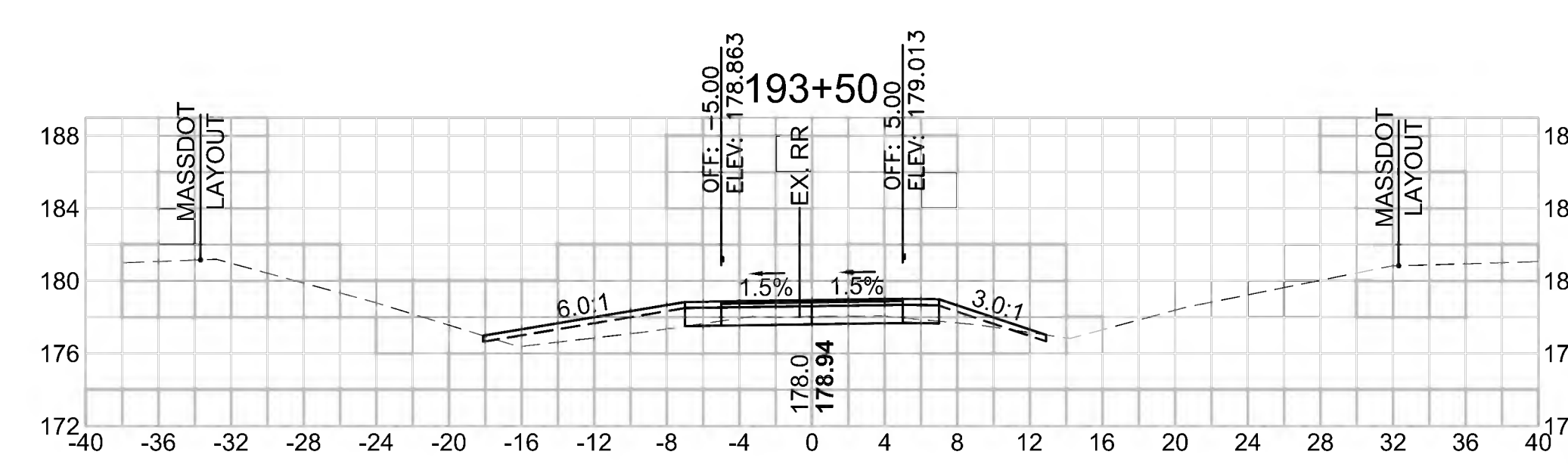
Total Volume at Station 190+50.00	
Cut Area (SF)	1,044
Fill Area (SF)	21,744
Cut Vol (CF)	1.9
Fill Vol (CF)	36.0
Cum Cut Vol (CF)	5190.9
Cum Fill Vol (CF)	4000.5
Net Vol (CF)	1190.5



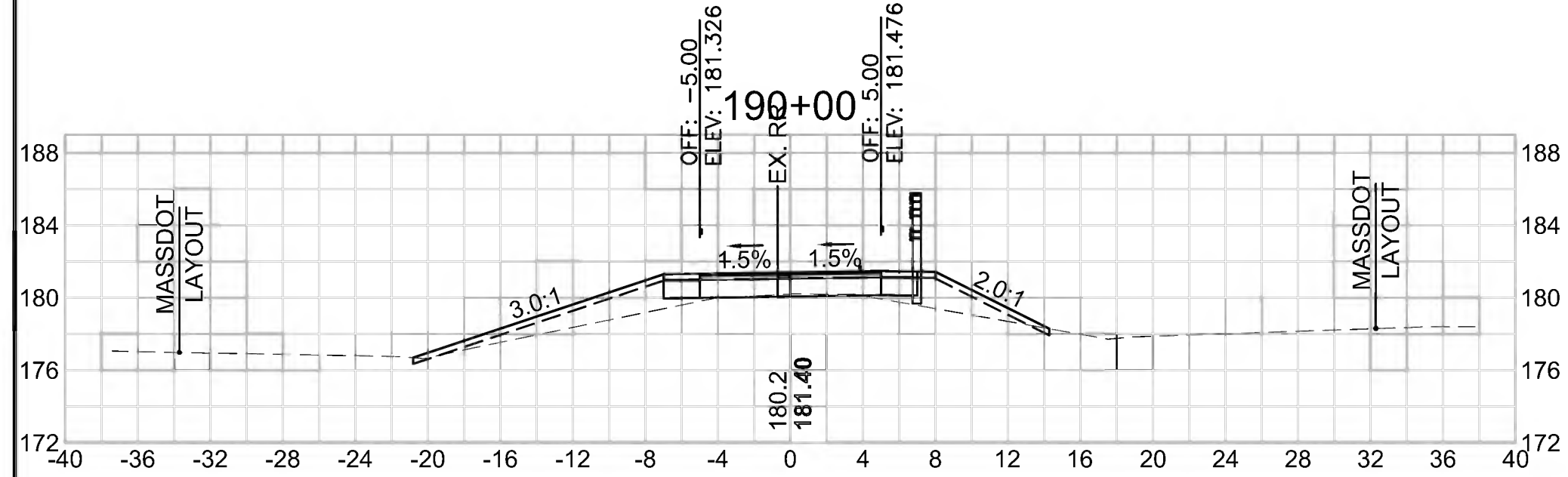
Total Volume at Station 192+00.00	
Cut Area (SF)	2,351
Fill Area (SF)	8,757
Cut Vol (CF)	4.1
Fill Vol (CF)	20.9
Cum Cut Vol (CF)	5201.8
Cum Fill Vol (CF)	4085.8
Net Vol (CF)	1116.0



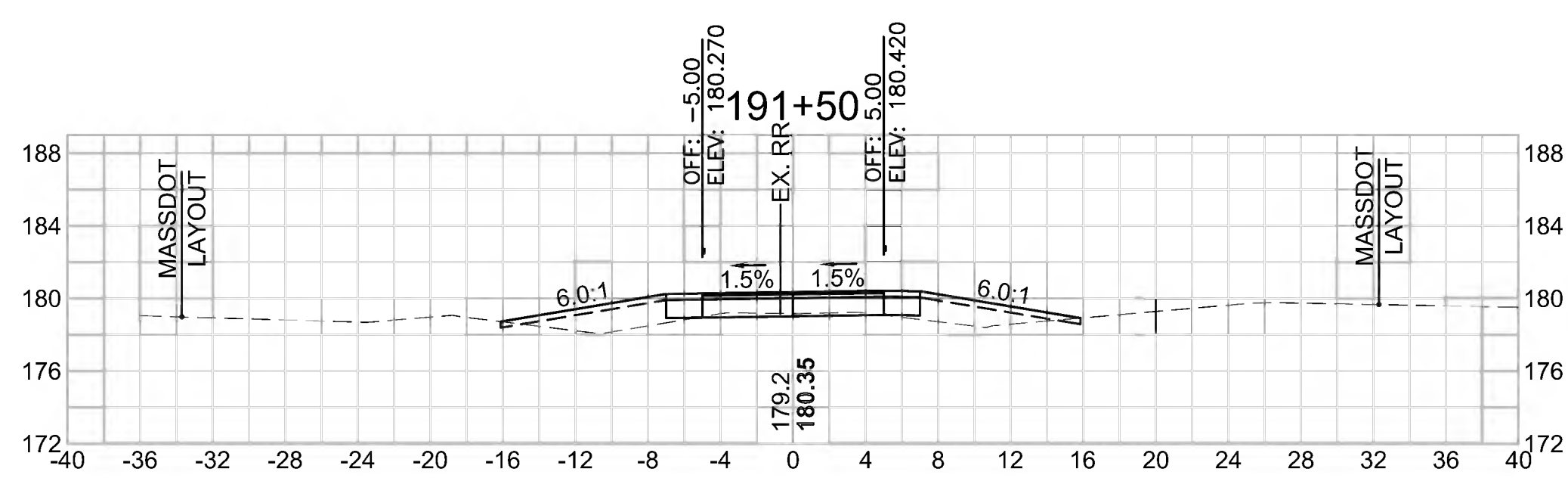
Total Volume at Station 193+50.00	
Cut Area (SF)	5,195
Fill Area (SF)	9,553
Cut Vol (CF)	8.1
Fill Vol (CF)	20.9
Cum Cut Vol (CF)	5222.1
Cum Fill Vol (CF)	4143.2
Net Vol (CF)	1079.0



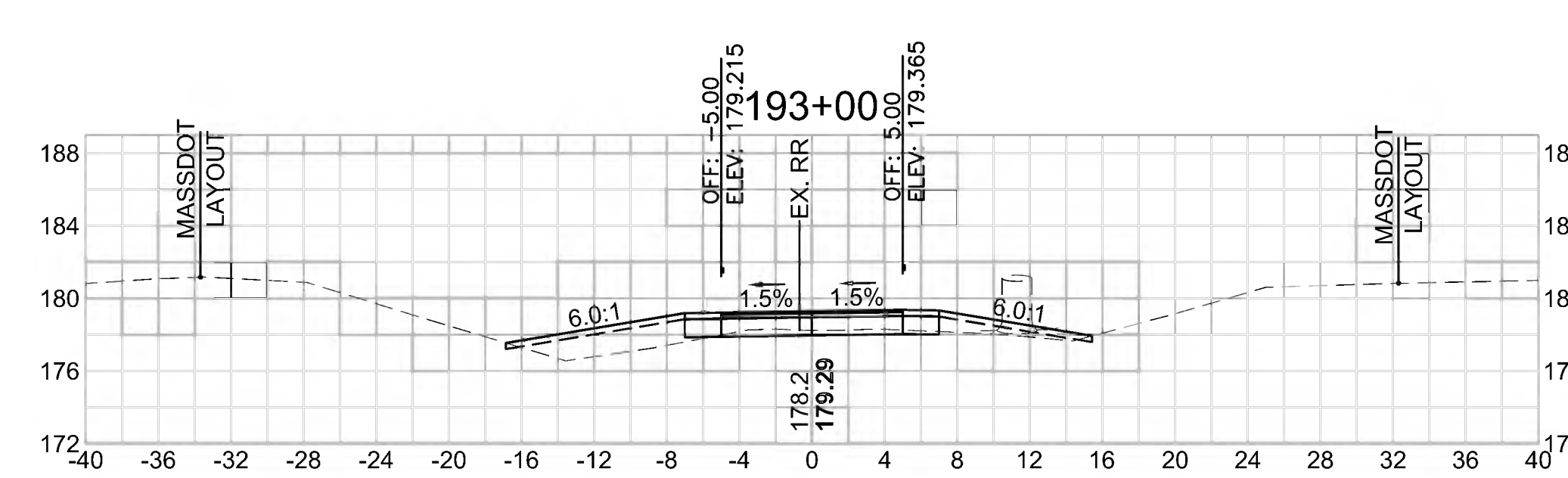
Total Volume at Station 190+00.00	
Cut Area (SF)	0,993
Fill Area (SF)	17,137
Cut Vol (CF)	2.1
Fill Vol (CF)	31.2
Cum Cut Vol (CF)	5189.0
Cum Fill Vol (CF)	3964.5
Net Vol (CF)	1224.6



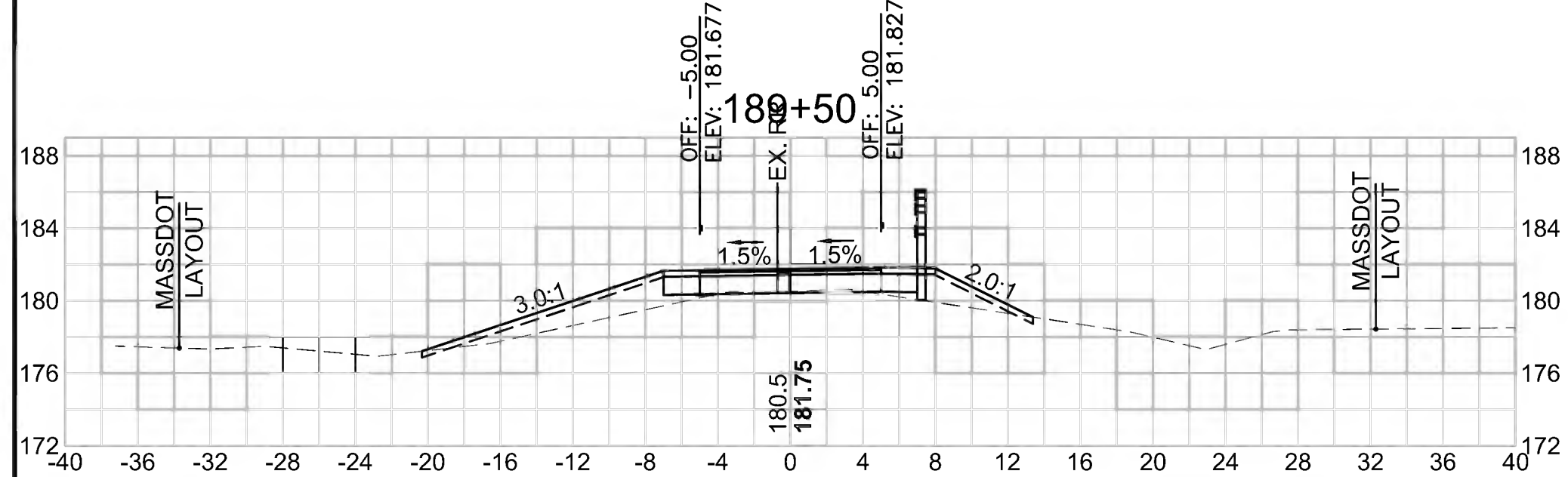
Total Volume at Station 191+50.00	
Cut Area (SF)	2,027
Fill Area (SF)	13,777
Cut Vol (CF)	3.9
Fill Vol (CF)	28.6
Cum Cut Vol (CF)	5197.7
Cum Fill Vol (CF)	4065.0
Net Vol (CF)	1132.8



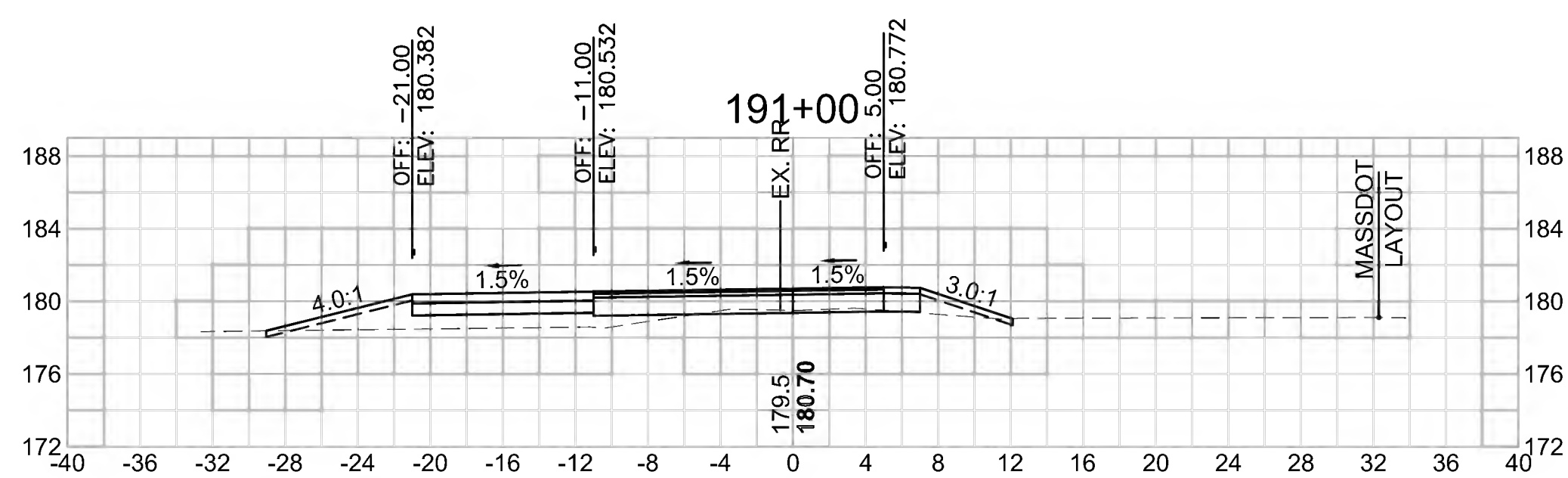
Total Volume at Station 193+00.00	
Cut Area (SF)	3,586
Fill Area (SF)	13,067
Cut Vol (CF)	6.7
Fill Vol (CF)	20.2
Cum Cut Vol (CF)	5214.0
Cum Fill Vol (CF)	4122.2
Net Vol (CF)	1091.8



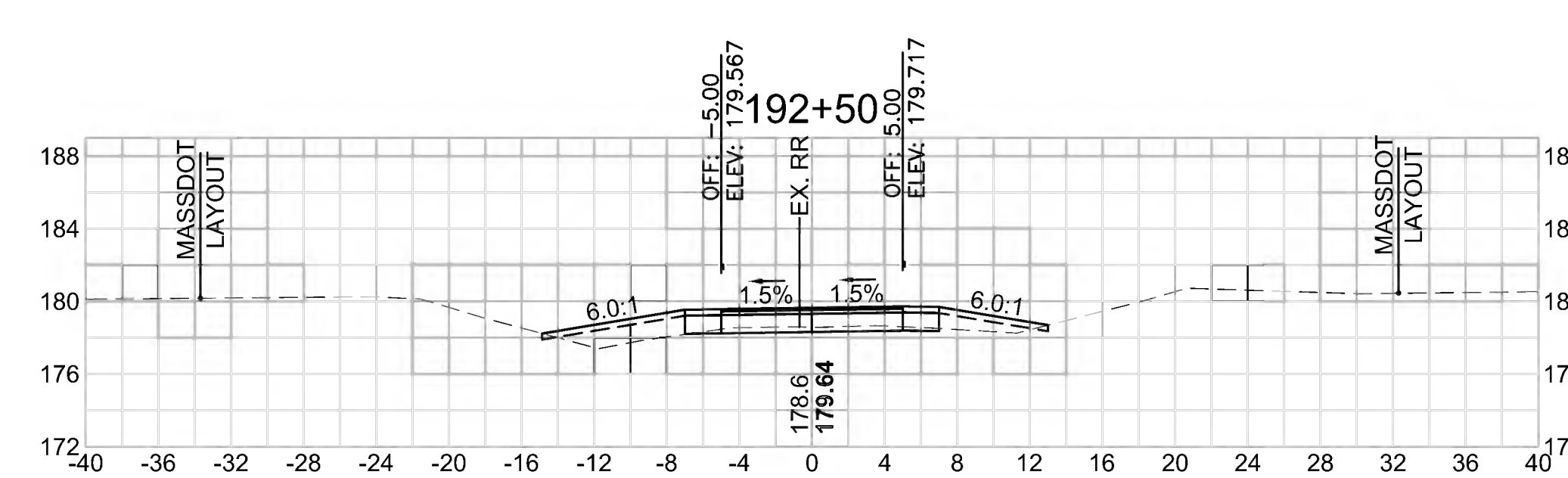
Total Volume at Station 189+50.00	
Cut Area (SF)	1,247
Fill Area (SF)	16,603
Cut Vol (CF)	2.3
Fill Vol (CF)	28.3
Cum Cut Vol (CF)	5187.0
Cum Fill Vol (CF)	3933.2
Net Vol (CF)	1253.8



Total Volume at Station 191+00.00	
Cut Area (SF)	2,143
Fill Area (SF)	17,079
Cut Vol (CF)	3.0
Fill Vol (CF)	35.9
Cum Cut Vol (CF)	5193.9
Cum Fill Vol (CF)	4036.4
Net Vol (CF)	1157.5



Total Volume at Station 192+50.00	
Cut Area (SF)	3,617
Fill Area (SF)	8,735
Cut Vol (CF)	5.5
Fill Vol (CF)	16.2
Cum Cut Vol (CF)	5207.3
Cum Fill Vol (CF)	4102.0
Net Vol (CF)	1105.3





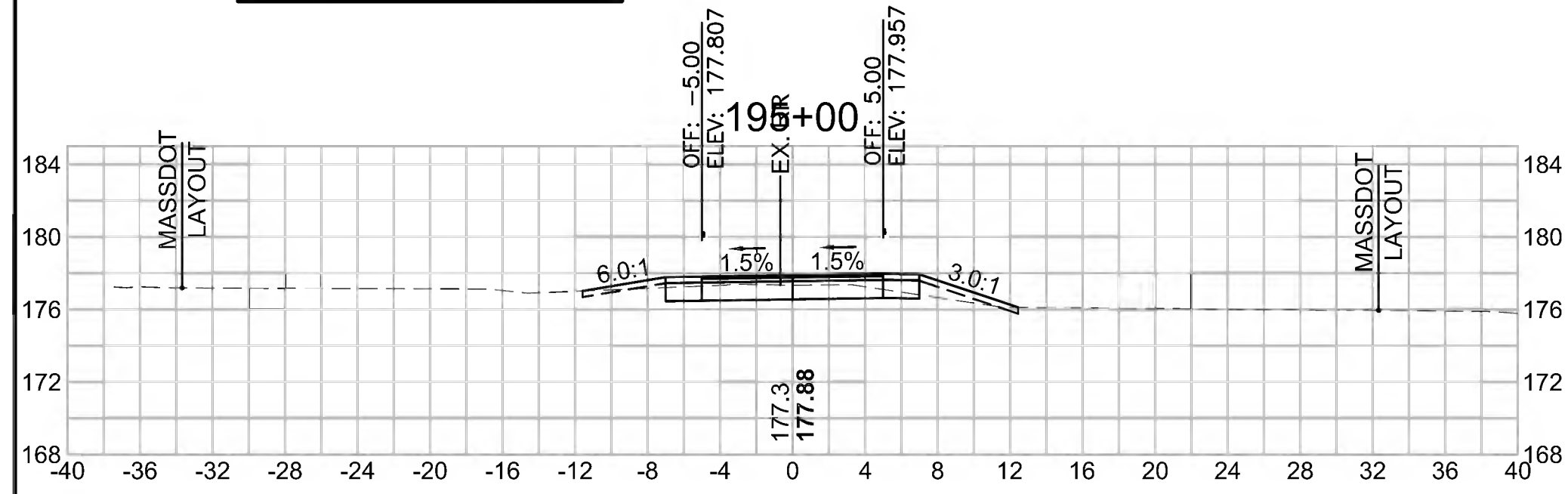
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	267	319
PROJECT FILE NO. 608164			

CROSS SECTIONS

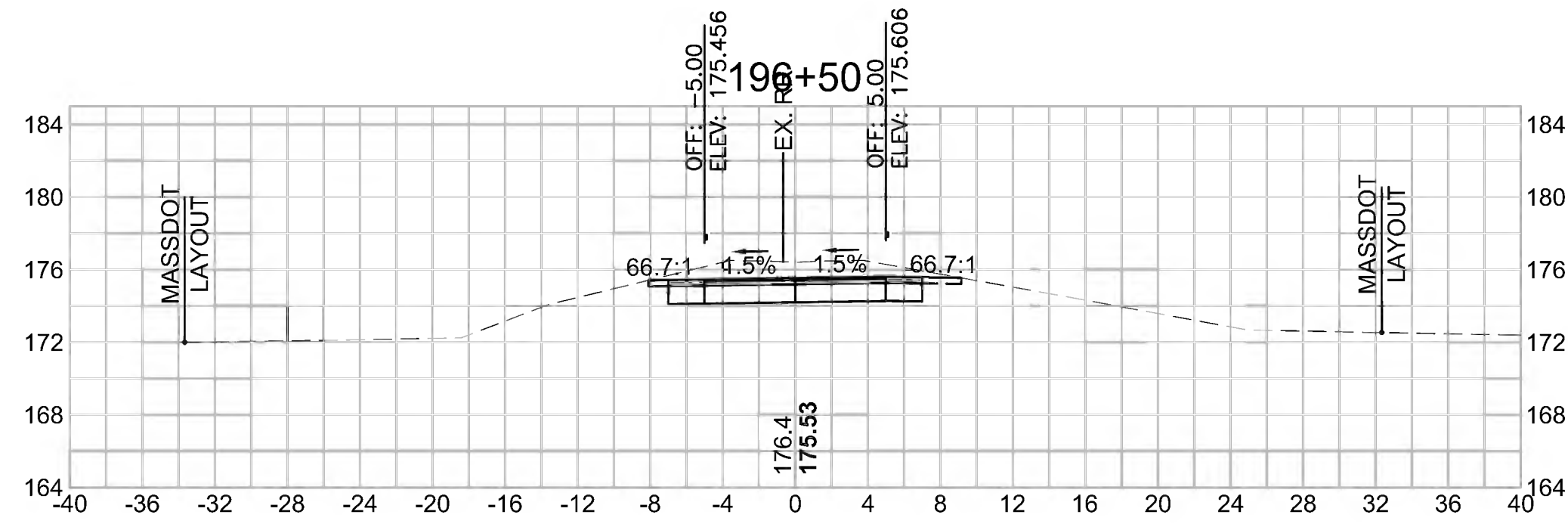
**Total Volume at Station 195+00.00**

Cut Area (SF)	10.625
Fill Area (SF)	1.877
Cut Vol (CF)	15.3
Fill Vol (CF)	11.2
Cum Cut Vol (CF)	5259.9
Cum Fill Vol (CF)	4185.8
Net Vol (CF)	1074.1



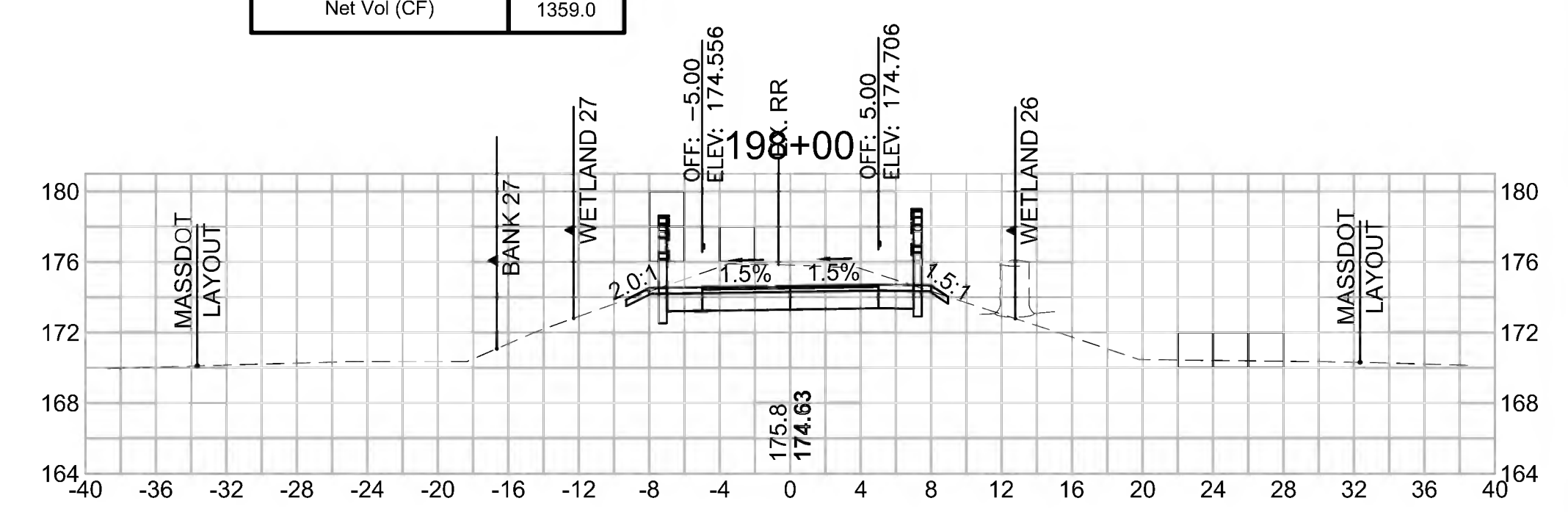
**Total Volume at Station 196+50.00**

Cut Area (SF)	31.301
Fill Area (SF)	0.000
Cut Vol (CF)	47.3
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	5356.9
Cum Fill Vol (CF)	4191.7
Net Vol (CF)	1165.2



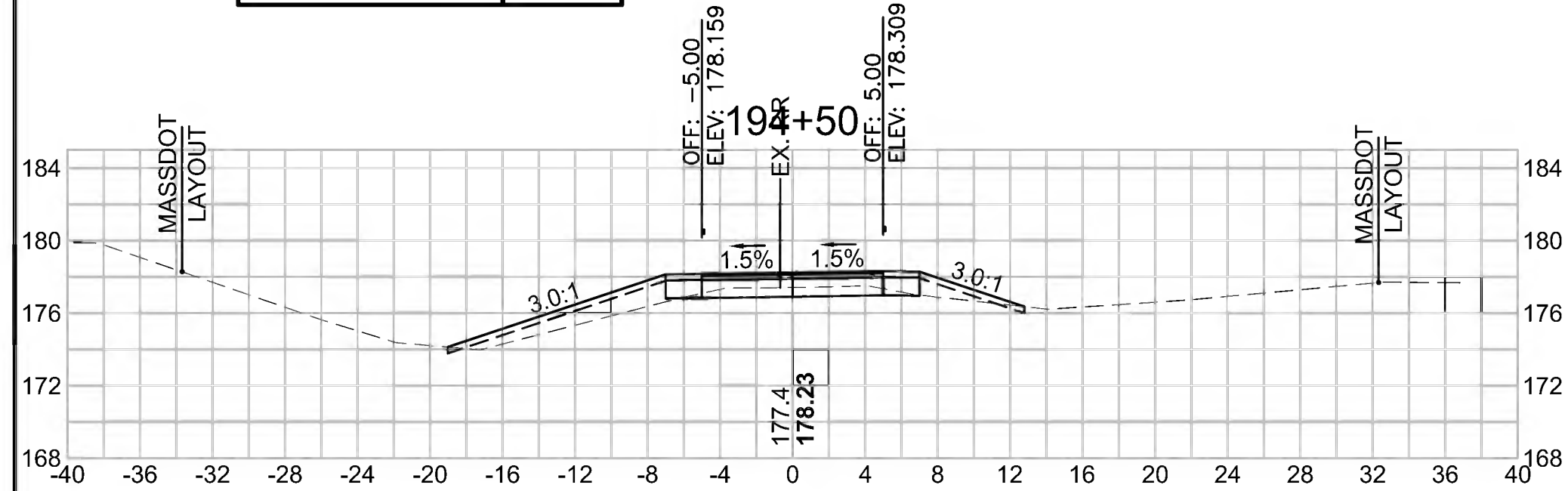
**Total Volume at Station 198+00.00**

Cut Area (SF)	32.247
Fill Area (SF)	0.000
Cut Vol (CF)	62.7
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	5550.7
Cum Fill Vol (CF)	4191.7
Net Vol (CF)	1359.0



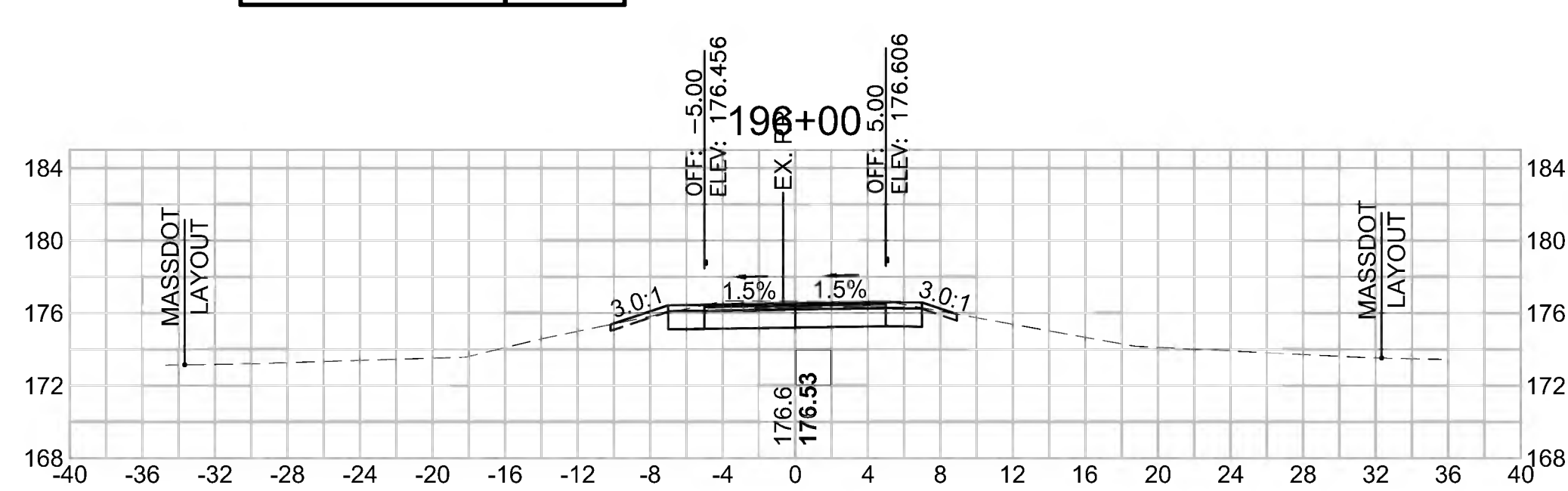
**Total Volume at Station 194+50.00**

Cut Area (SF)	5.936
Fill Area (SF)	10.223
Cut Vol (CF)	11.6
Fill Vol (CF)	16.0
Cum Cut Vol (CF)	5244.6
Cum Fill Vol (CF)	4174.6
Net Vol (CF)	1070.0



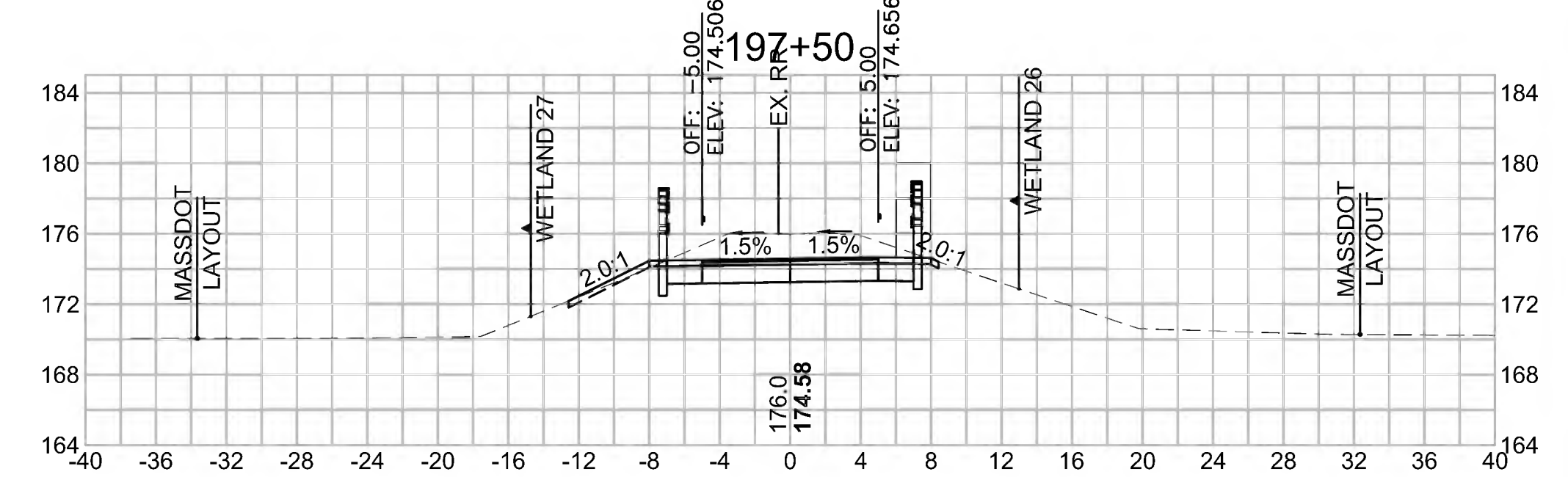
**Total Volume at Station 196+00.00**

Cut Area (SF)	19.737
Fill Area (SF)	0.012
Cut Vol (CF)	29.1
Fill Vol (CF)	2.1
Cum Cut Vol (CF)	5309.6
Cum Fill Vol (CF)	4191.7
Net Vol (CF)	1117.9



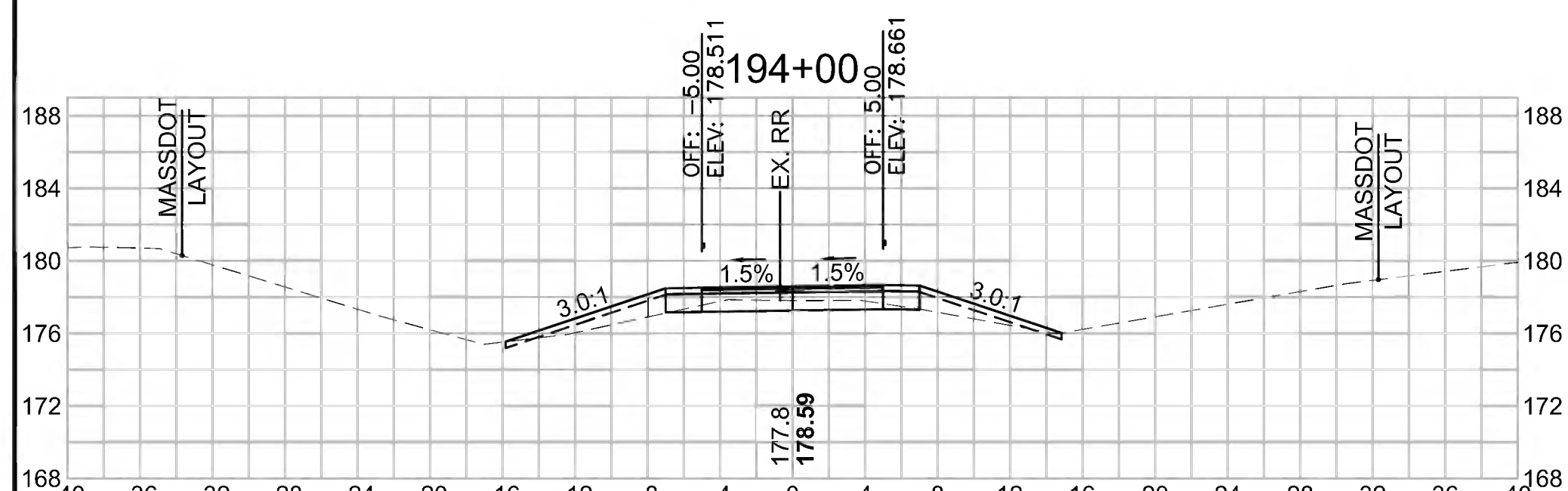
**Total Volume at Station 197+50.00**

Cut Area (SF)	35.520
Fill Area (SF)	0.012
Cut Vol (CF)	67.5
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	5488.0
Cum Fill Vol (CF)	4191.7
Net Vol (CF)	1296.3



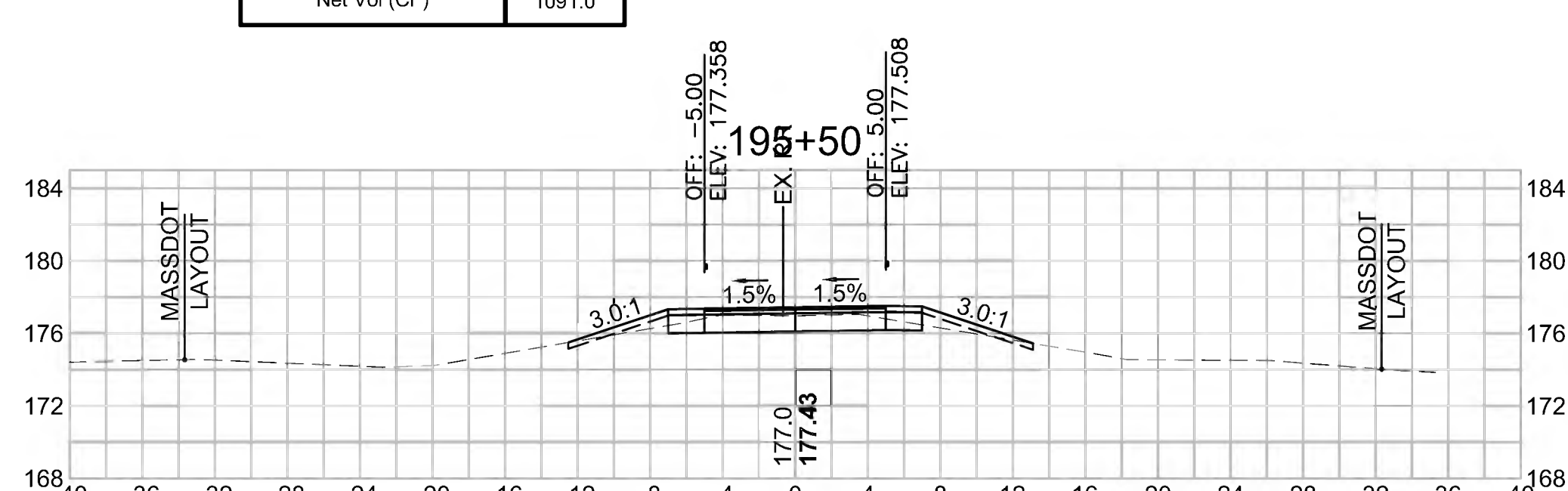
**Total Volume at Station 194+00.00**

Cut Area (SF)	6.552
Fill Area (SF)	7.062
Cut Vol (CF)	10.9
Fill Vol (CF)	15.4
Cum Cut Vol (CF)	5233.0
Cum Fill Vol (CF)	4158.5
Net Vol (CF)	1074.4



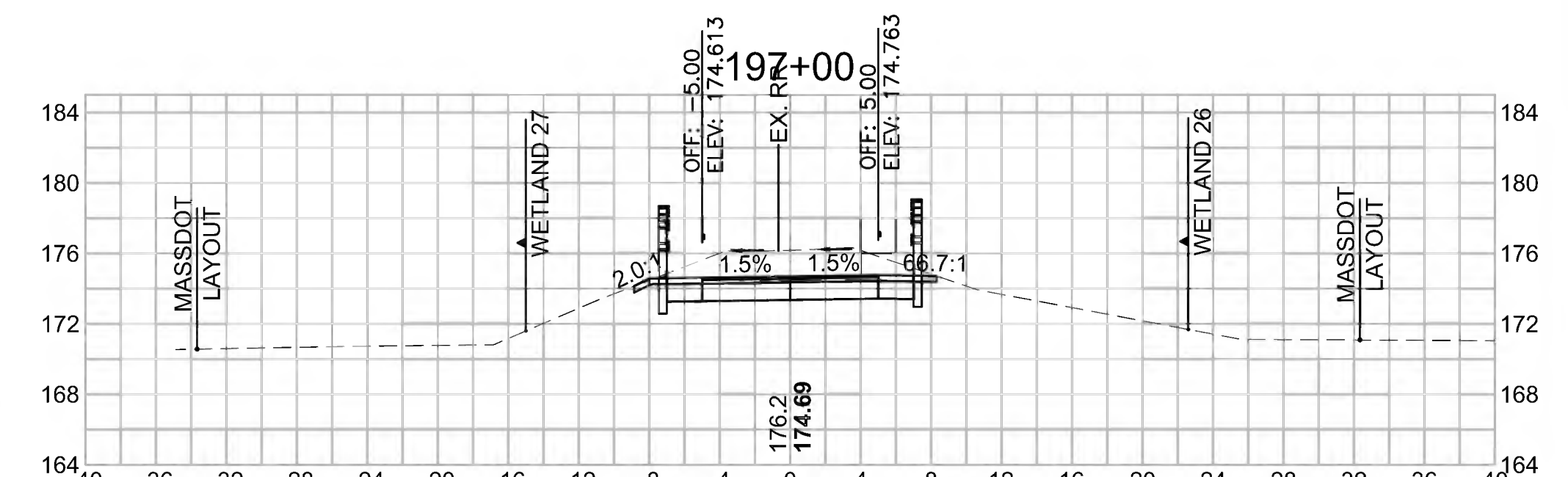
**Total Volume at Station 195+50.00**

Cut Area (SF)	11.672
Fill Area (SF)	2.250
Cut Vol (CF)	20.6
Fill Vol (CF)	3.8
Cum Cut Vol (CF)	5280.5
Cum Fill Vol (CF)	4189.6
Net Vol (CF)	1091.0



**Total Volume at Station 197+00.00**

Cut Area (SF)	37.377
Fill Area (SF)	0.000
Cut Vol (CF)	63.6
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	5420.5
Cum Fill Vol (CF)	4191.7
Net Vol (CF)	1228.8



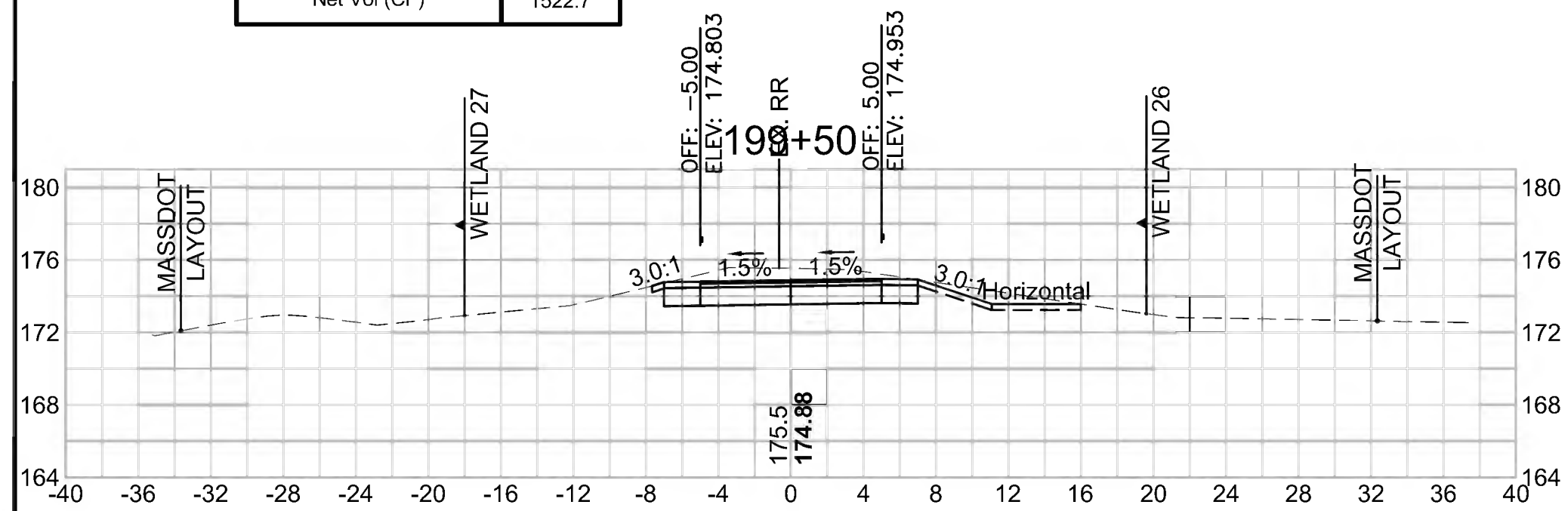
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	268	319

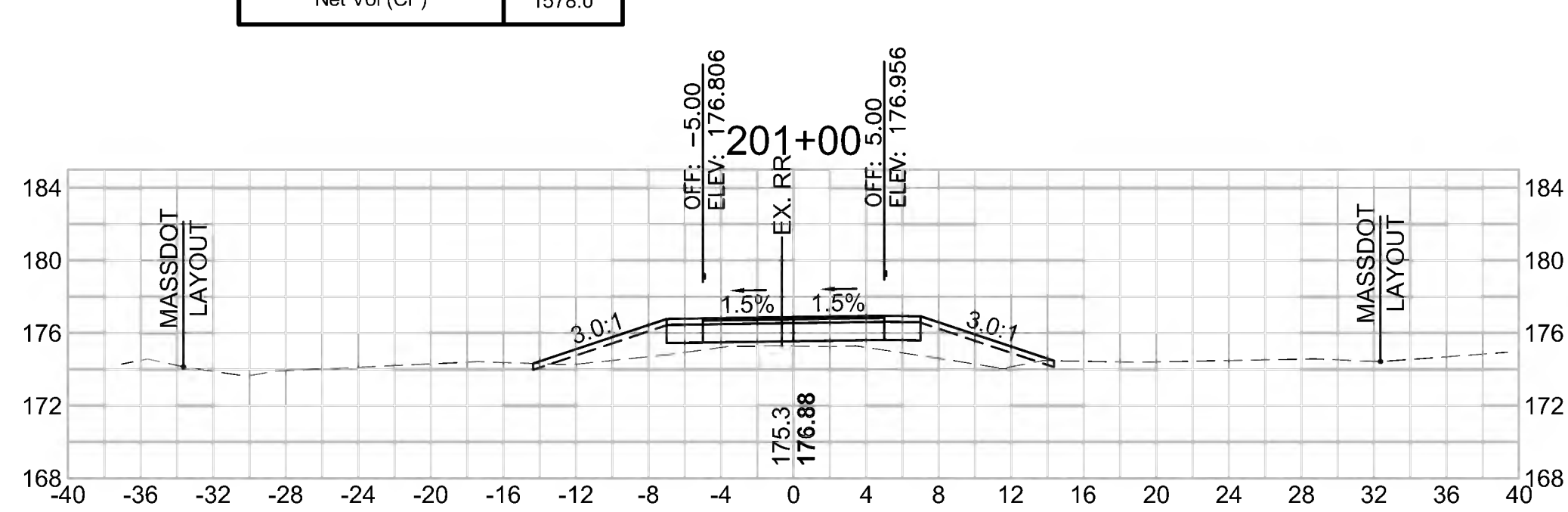
PROJECT FILE NO. 608164

CROSS SECTIONS

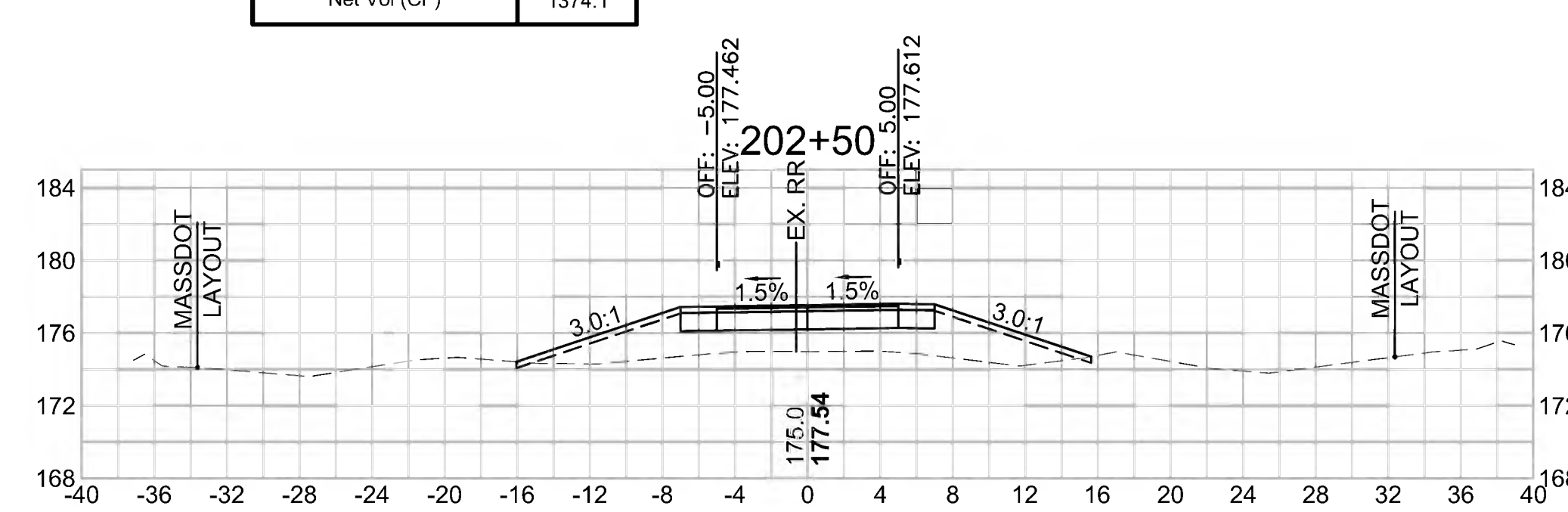
Total Volume at Station 199+50.00	
Cut Area (SF)	28.820
Fill Area (SF)	0.000
Cut Vol (CF)	52.5
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	5715.0
Cum Fill Vol (CF)	4192.2
Net Vol (CF)	1522.7



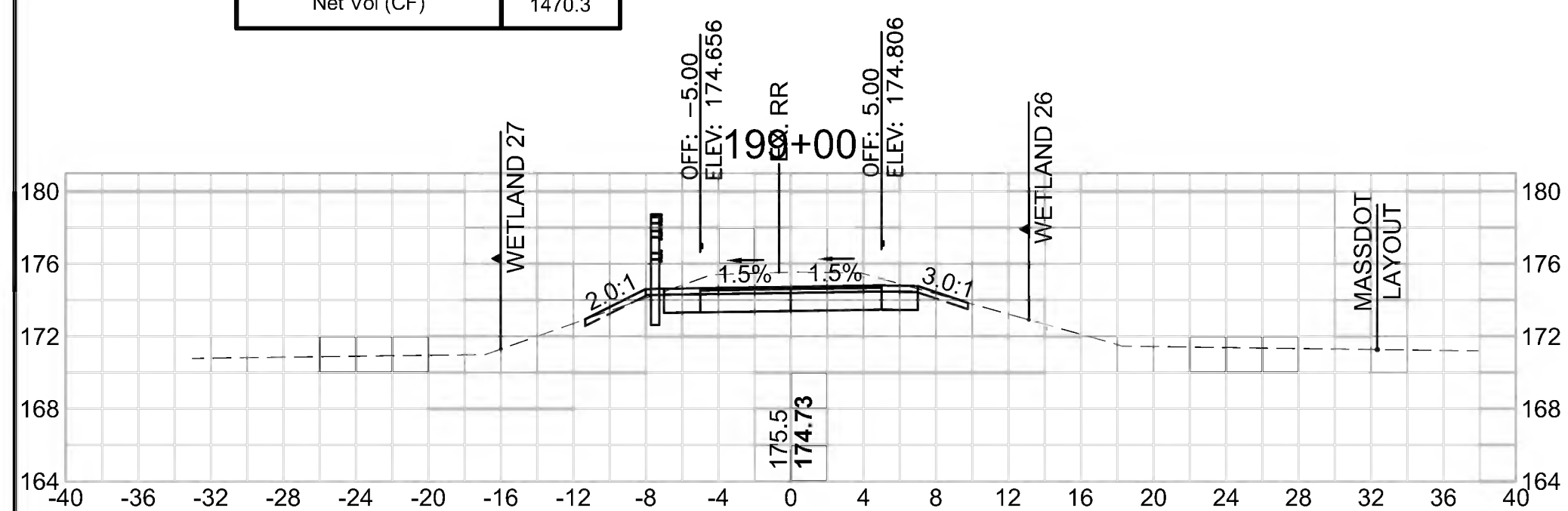
Total Volume at Station 201+00.00	
Cut Area (SF)	0.342
Fill Area (SF)	18.524
Cut Vol (CF)	6.7
Fill Vol (CF)	20.8
Cum Cut Vol (CF)	5796.3
Cum Fill Vol (CF)	4218.3
Net Vol (CF)	1578.0



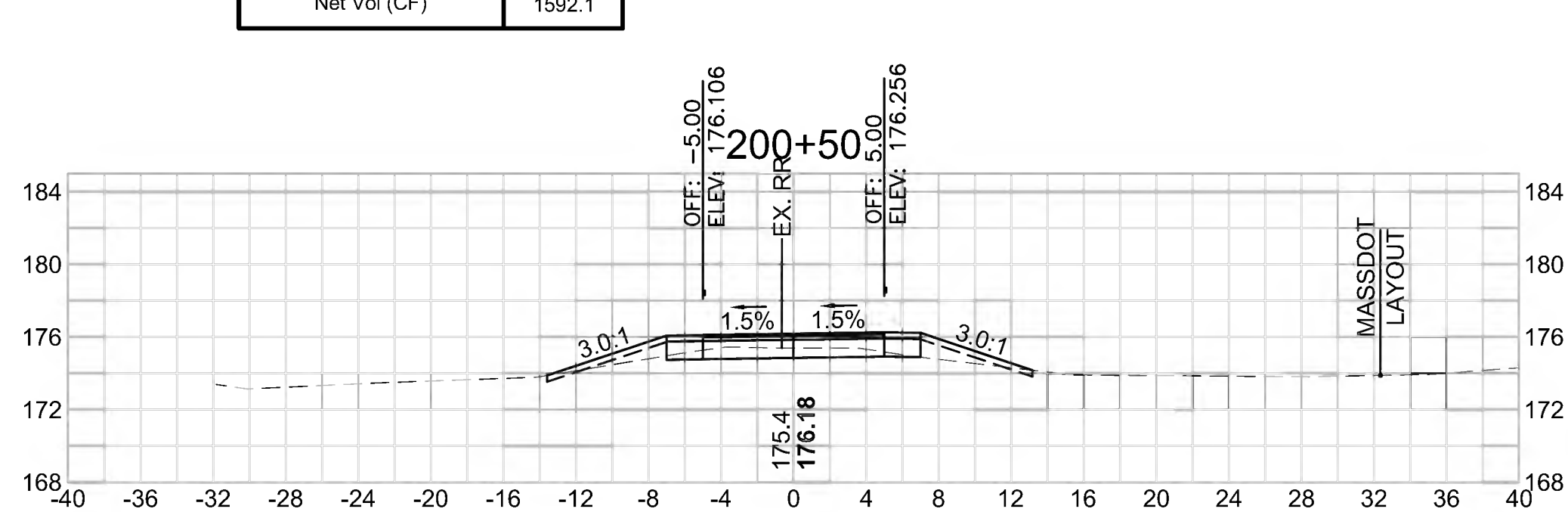
Total Volume at Station 202+50.00	
Cut Area (SF)	0.271
Fill Area (SF)	40.025
Cut Vol (CF)	0.5
Fill Vol (CF)	76.3
Cum Cut Vol (CF)	5798.0
Cum Fill Vol (CF)	4423.8
Net Vol (CF)	1374.1



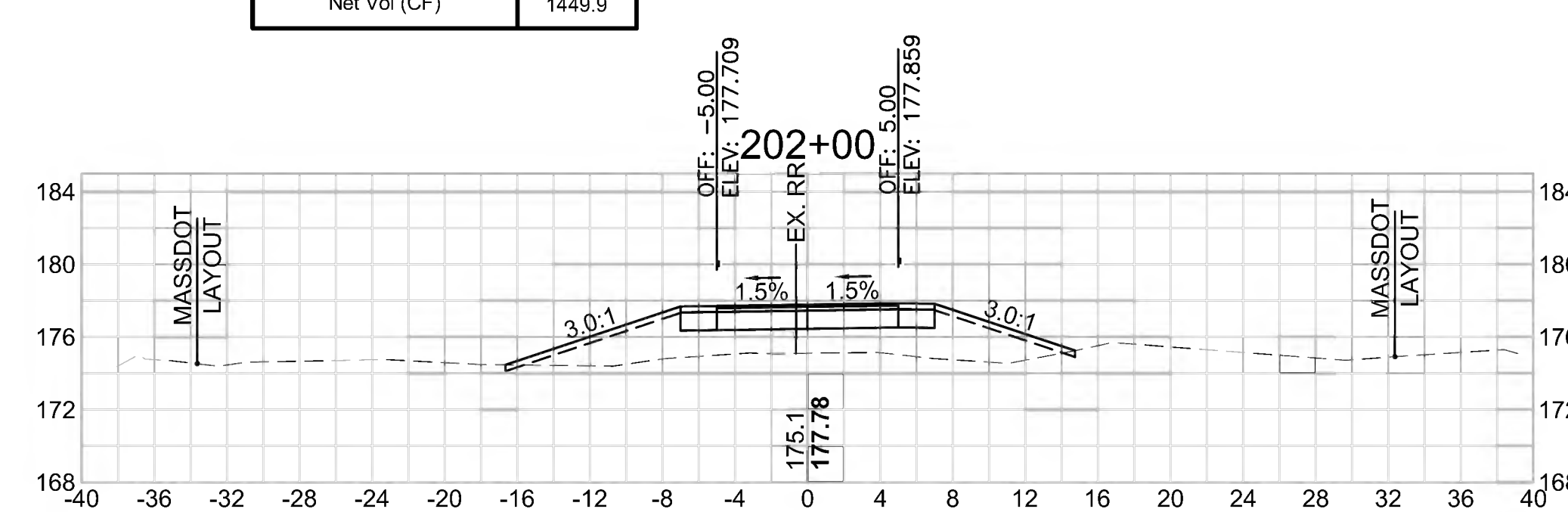
Total Volume at Station 199+00.00	
Cut Area (SF)	27.859
Fill Area (SF)	0.092
Cut Vol (CF)	53.9
Fill Vol (CF)	0.3
Cum Cut Vol (CF)	5662.5
Cum Fill Vol (CF)	4192.1
Net Vol (CF)	1470.3



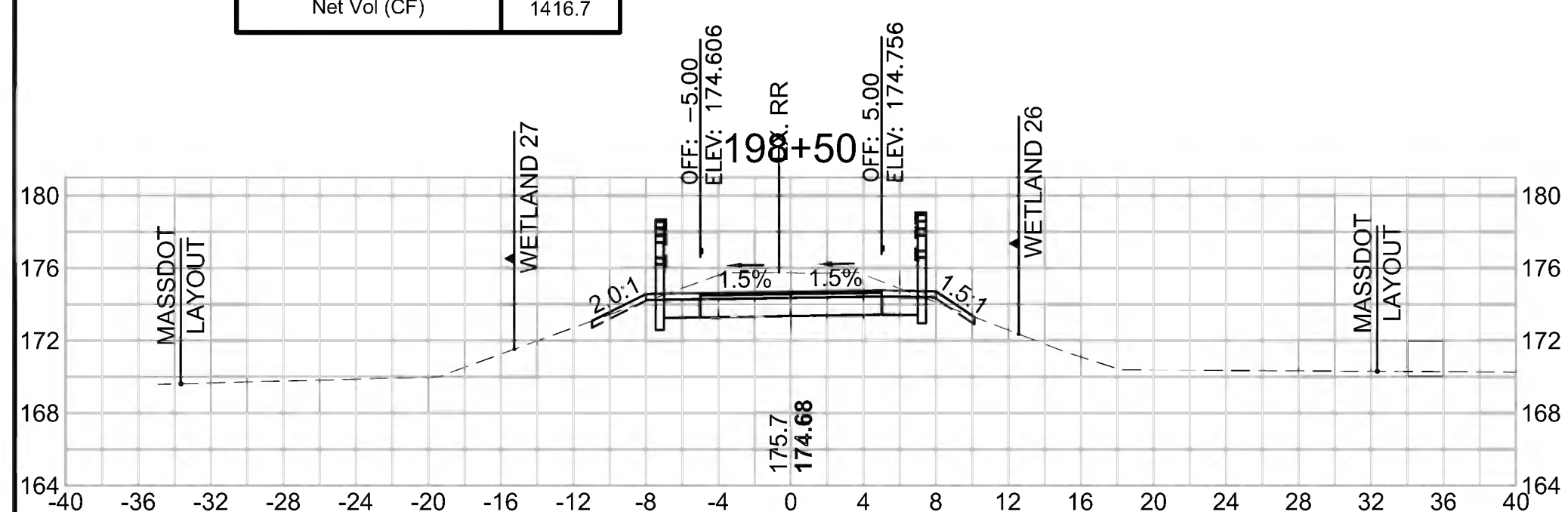
Total Volume at Station 200+50.00	
Cut Area (SF)	6.947
Fill Area (SF)	3.966
Cut Vol (CF)	27.2
Fill Vol (CF)	4.5
Cum Cut Vol (CF)	5789.6
Cum Fill Vol (CF)	4197.5
Net Vol (CF)	1592.1



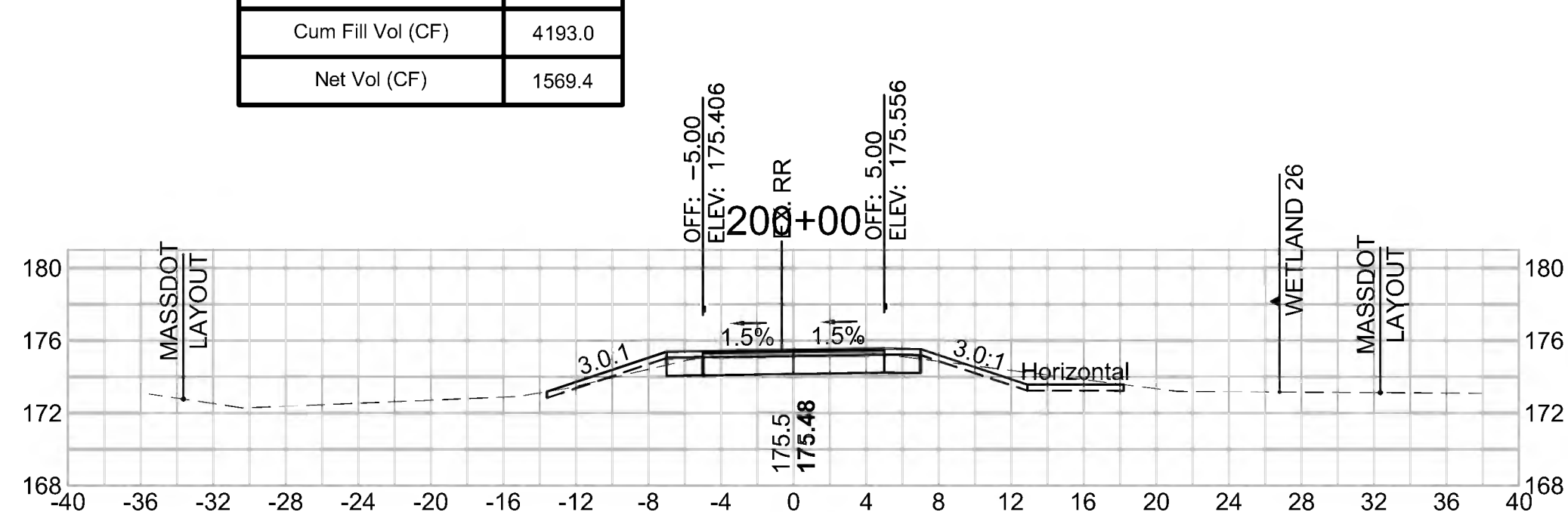
Total Volume at Station 202+00.00	
Cut Area (SF)	0.293
Fill Area (SF)	42.344
Cut Vol (CF)	0.5
Fill Vol (CF)	75.6
Cum Cut Vol (CF)	5797.4
Cum Fill Vol (CF)	4347.6
Net Vol (CF)	1449.9



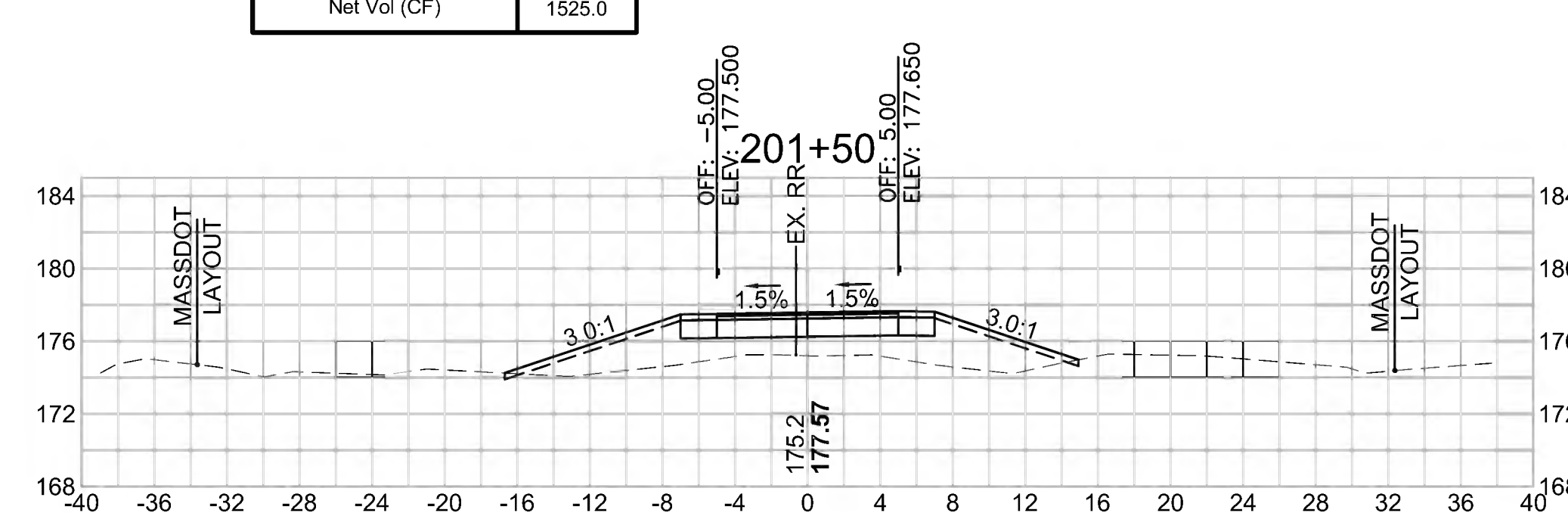
Total Volume at Station 198+50.00	
Cut Area (SF)	30.312
Fill Area (SF)	0.190
Cut Vol (CF)	57.9
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	5608.6
Cum Fill Vol (CF)	4191.9
Net Vol (CF)	1416.7



Total Volume at Station 200+00.00	
Cut Area (SF)	22.409
Fill Area (SF)	0.868
Cut Vol (CF)	47.4
Fill Vol (CF)	0.8
Cum Cut Vol (CF)	5762.4
Cum Fill Vol (CF)	4193.0
Net Vol (CF)	1569.4



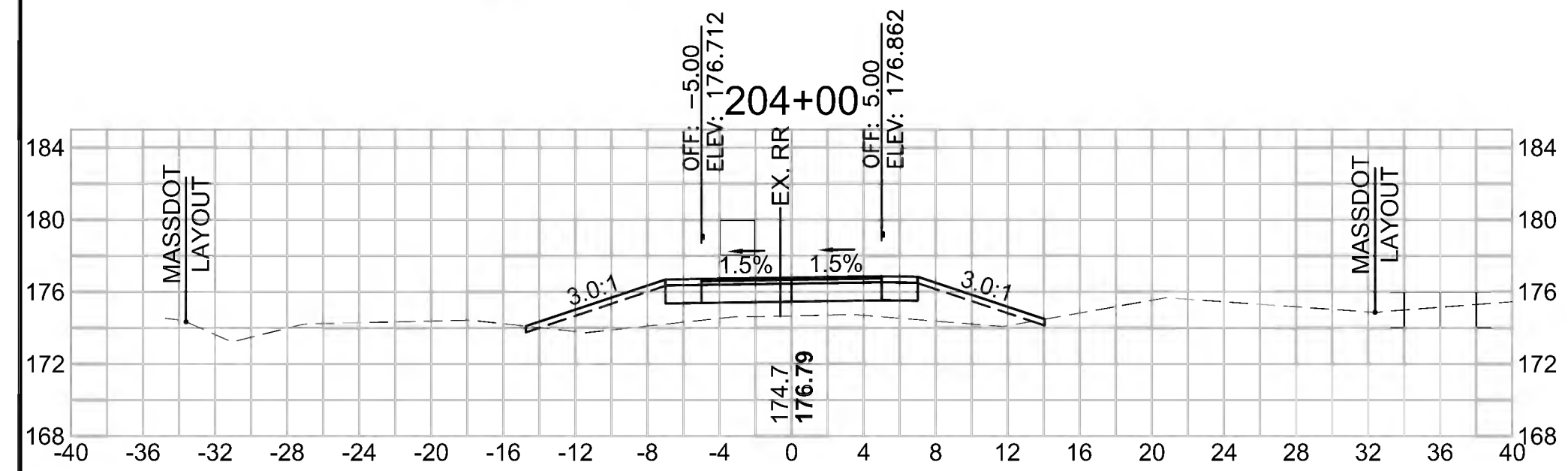
Total Volume at Station 201+50.00	
Cut Area (SF)	0.275
Fill Area (SF)	39.345
Cut Vol (CF)	0.6
Fill Vol (CF)	53.6
Cum Cut Vol (CF)	5796.9
Cum Fill Vol (CF)	4271.9
Net Vol (CF)	1525.0



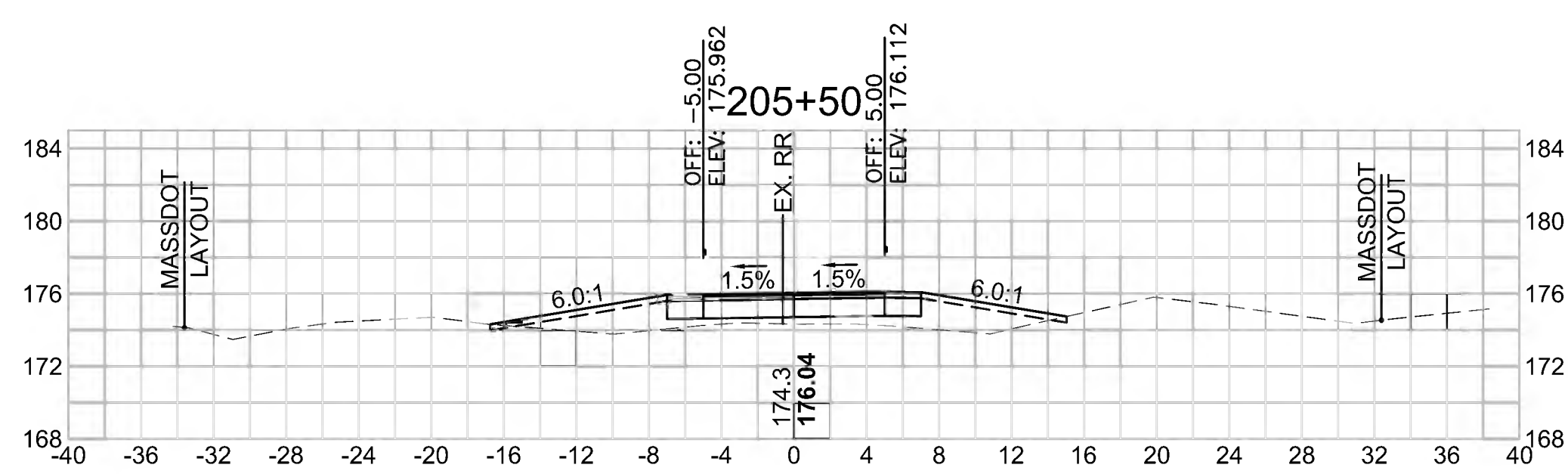


**CROSS SECTIONS**

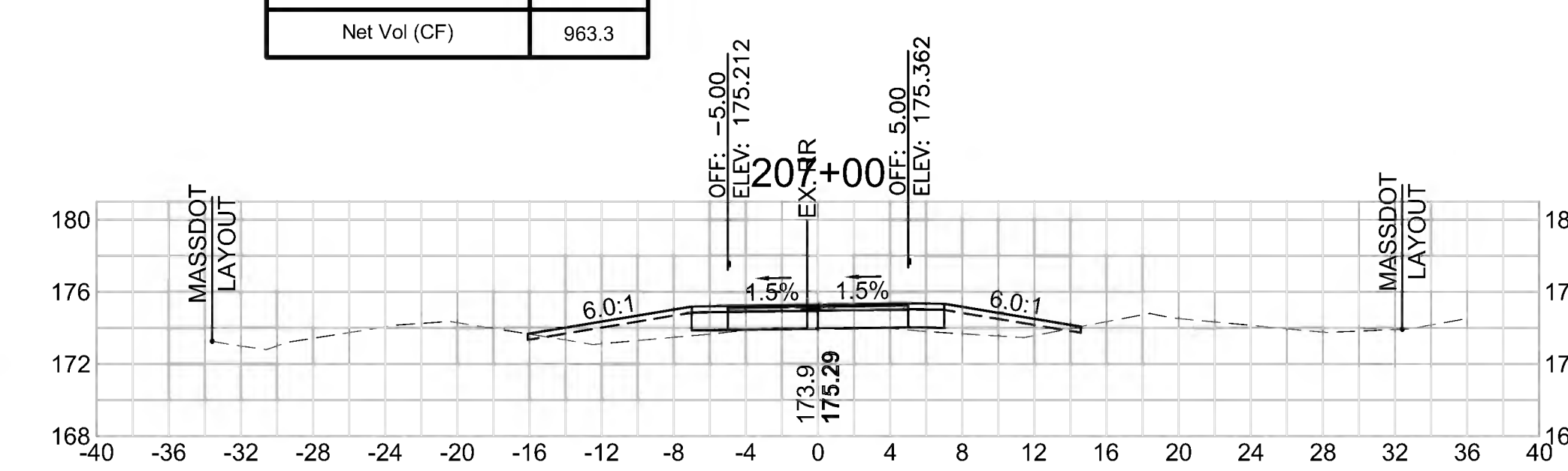
Total Volume at Station 204+00.00	
Cut Area (SF)	0.258
Fill Area (SF)	28.304
Cut Vol (CF)	0.5
Fill Vol (CF)	56.4
Cum Cut Vol (CF)	5799.7
Cum Fill Vol (CF)	4615.8
Net Vol (CF)	1184.0



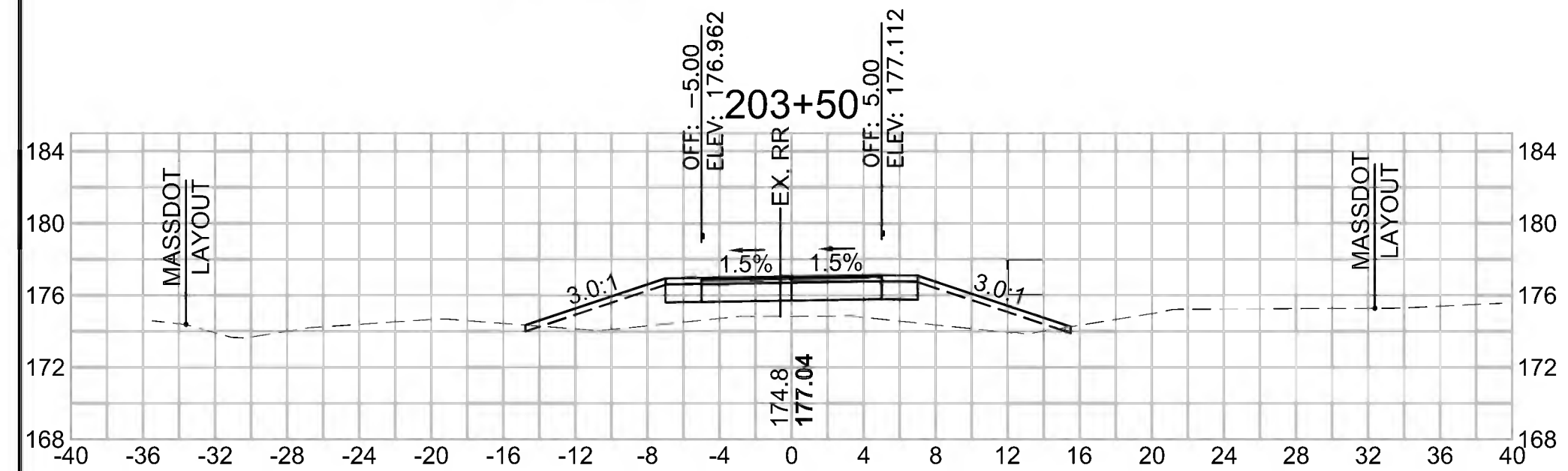
Total Volume at Station 205+50.00	
Cut Area (SF)	0.375
Fill Area (SF)	21.699
Cut Vol (CF)	0.7
Fill Vol (CF)	41.8
Cum Cut Vol (CF)	5801.5
Cum Fill Vol (CF)	4757.7
Net Vol (CF)	1043.8



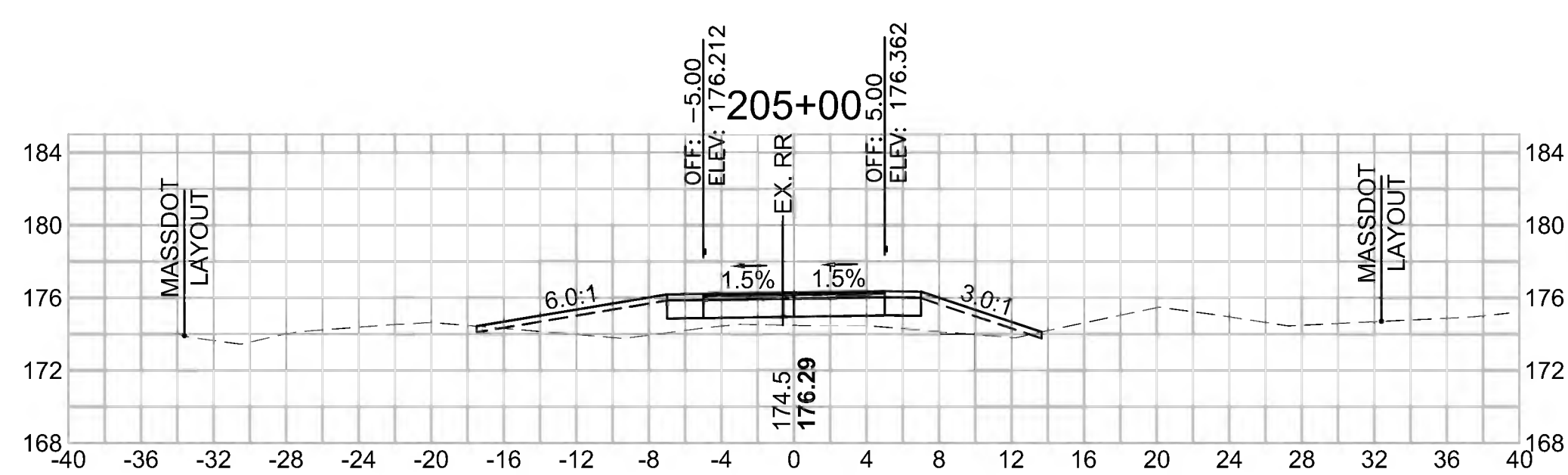
Total Volume at Station 207+00.00	
Cut Area (SF)	0.486
Fill Area (SF)	13.526
Cut Vol (CF)	0.8
Fill Vol (CF)	23.9
Cum Cut Vol (CF)	5803.7
Cum Fill Vol (CF)	4840.4
Net Vol (CF)	963.3



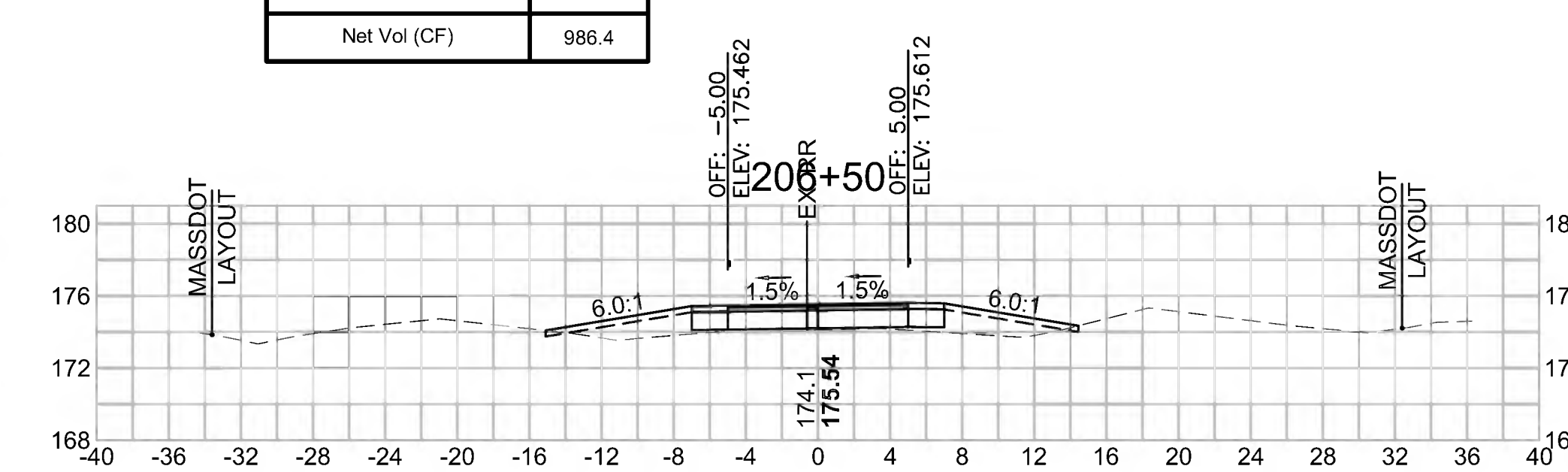
Total Volume at Station 203+50.00	
Cut Area (SF)	0.272
Fill Area (SF)	32.630
Cut Vol (CF)	0.6
Fill Vol (CF)	64.3
Cum Cut Vol (CF)	5799.2
Cum Fill Vol (CF)	4559.3
Net Vol (CF)	1239.9



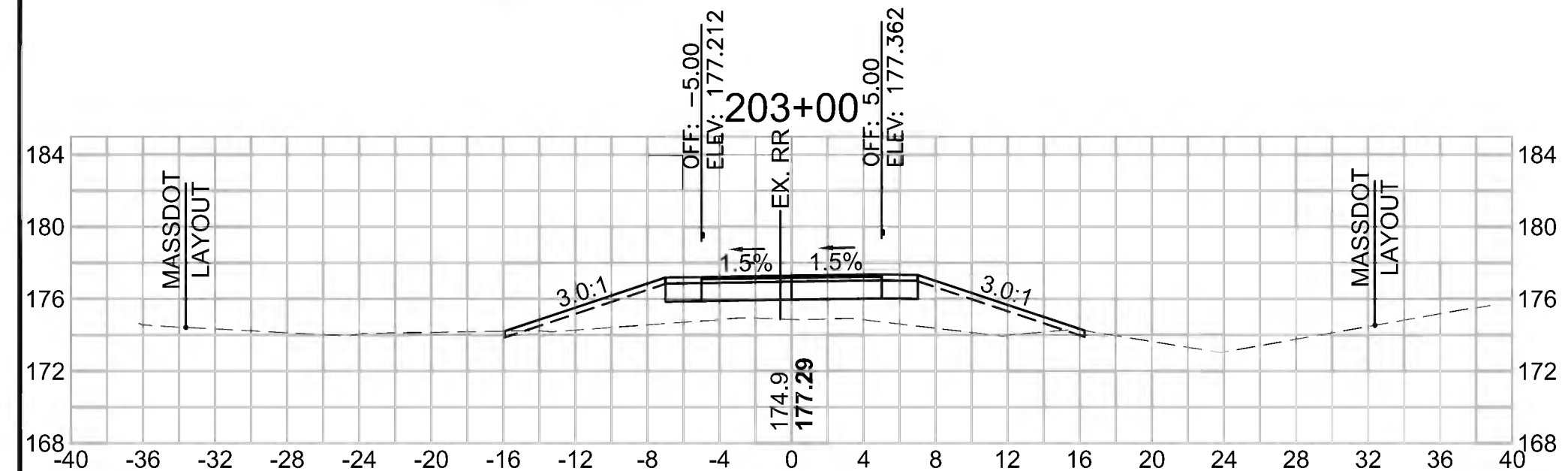
Total Volume at Station 205+00.00	
Cut Area (SF)	0.335
Fill Area (SF)	23.445
Cut Vol (CF)	0.6
Fill Vol (CF)	47.8
Cum Cut Vol (CF)	5800.8
Cum Fill Vol (CF)	4715.9
Net Vol (CF)	1084.9



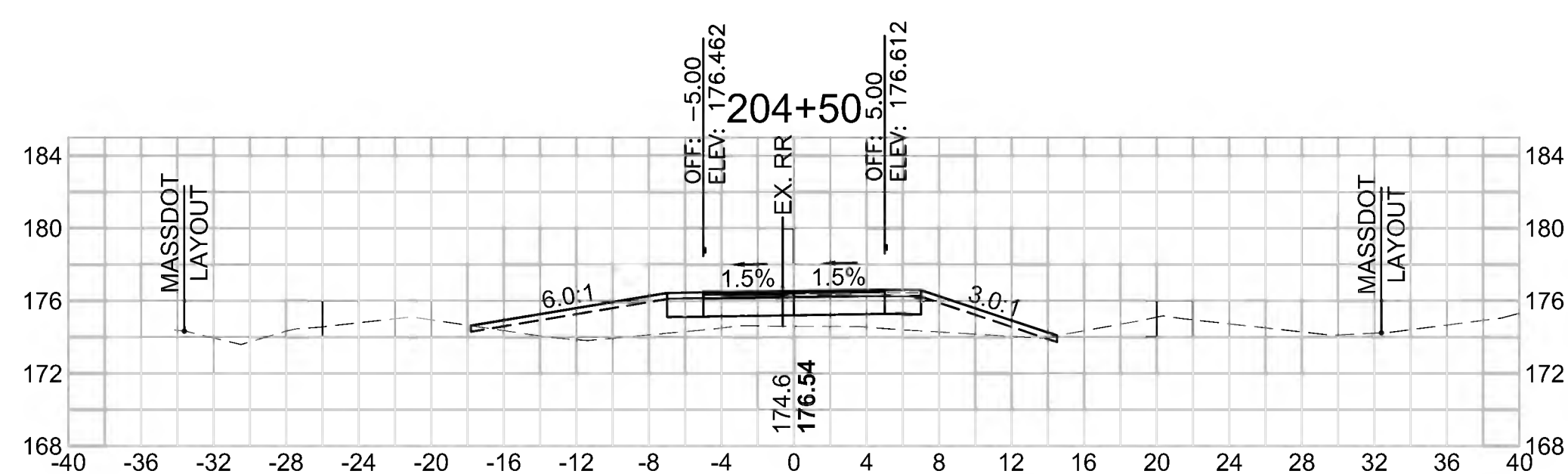
Total Volume at Station 206+50.00	
Cut Area (SF)	0.406
Fill Area (SF)	12.314
Cut Vol (CF)	0.7
Fill Vol (CF)	25.0
Cum Cut Vol (CF)	5802.8
Cum Fill Vol (CF)	4816.4
Net Vol (CF)	986.4



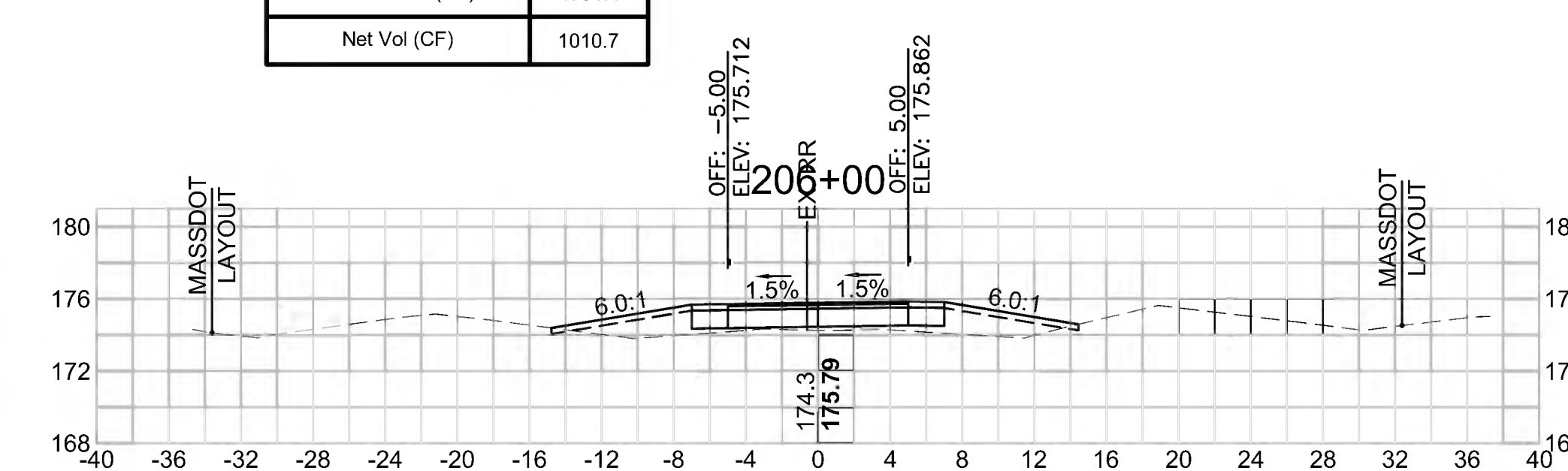
Total Volume at Station 203+00.00	
Cut Area (SF)	0.424
Fill Area (SF)	36.854
Cut Vol (CF)	0.6
Fill Vol (CF)	71.2
Cum Cut Vol (CF)	5798.6
Cum Fill Vol (CF)	4495.0
Net Vol (CF)	1303.6



Total Volume at Station 204+50.00	
Cut Area (SF)	0.298
Fill Area (SF)	28.213
Cut Vol (CF)	0.5
Fill Vol (CF)	52.3
Cum Cut Vol (CF)	5800.2
Cum Fill Vol (CF)	4668.1
Net Vol (CF)	1132.2



Total Volume at Station 206+00.00	
Cut Area (SF)	0.331
Fill Area (SF)	14.701
Cut Vol (CF)	0.7
Fill Vol (CF)	33.7
Cum Cut Vol (CF)	5802.1
Cum Fill Vol (CF)	4791.4
Net Vol (CF)	1010.7



SUDBURY  
BRUCE FREEMAN RAIL TRAIL

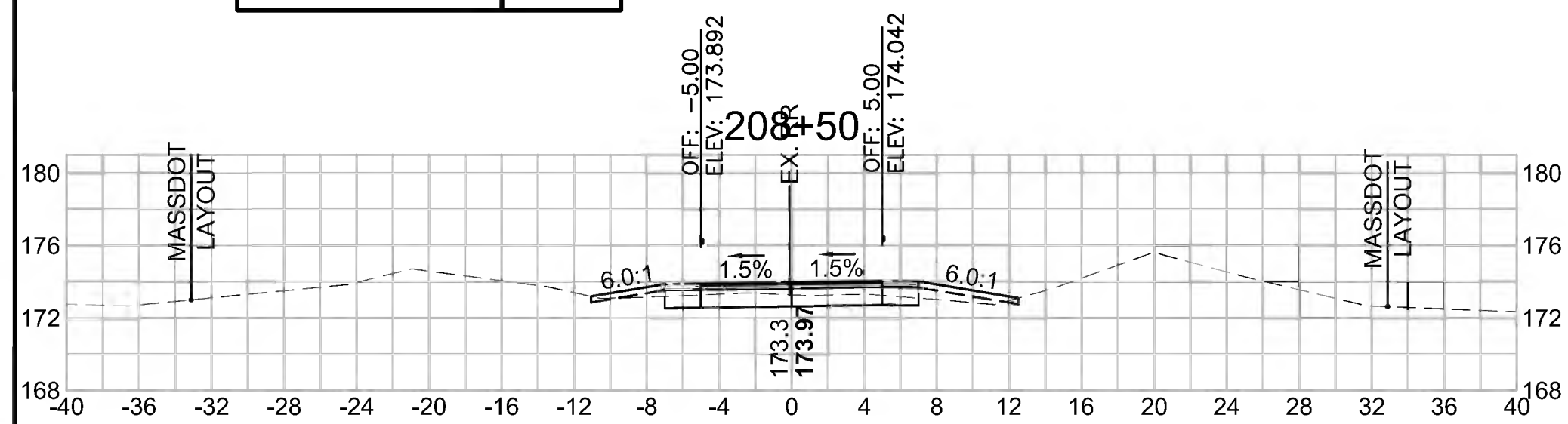
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	270	319

PROJECT FILE NO. 608164

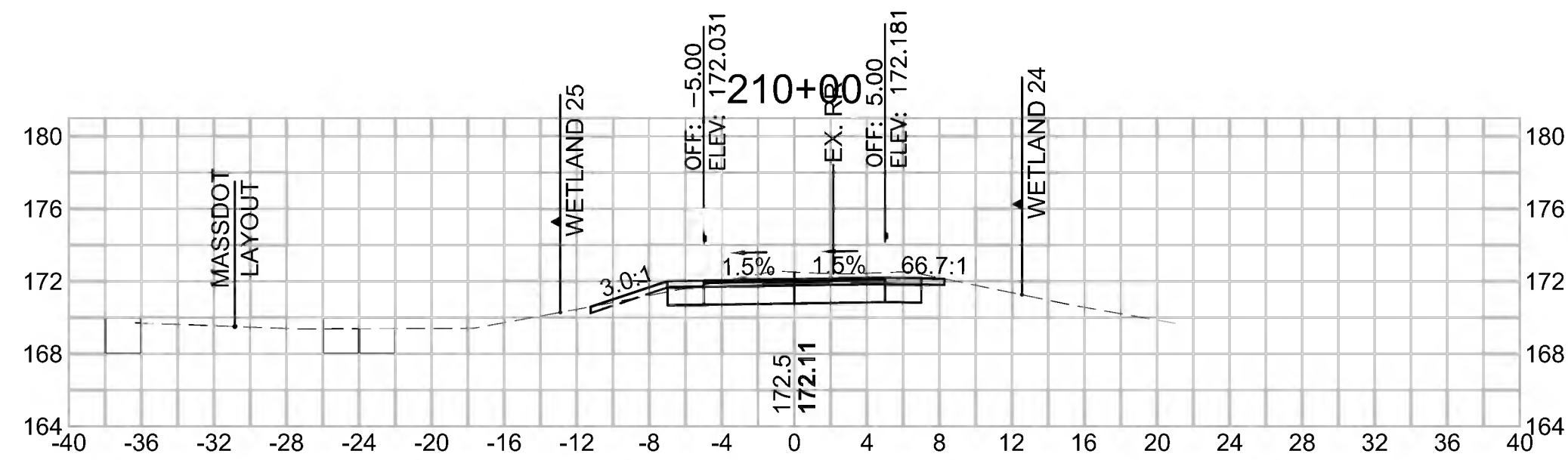
CROSS SECTIONS

608164\_XSEC(CROSS SECTION LAYOUTS).DWG 27-Jun-2022

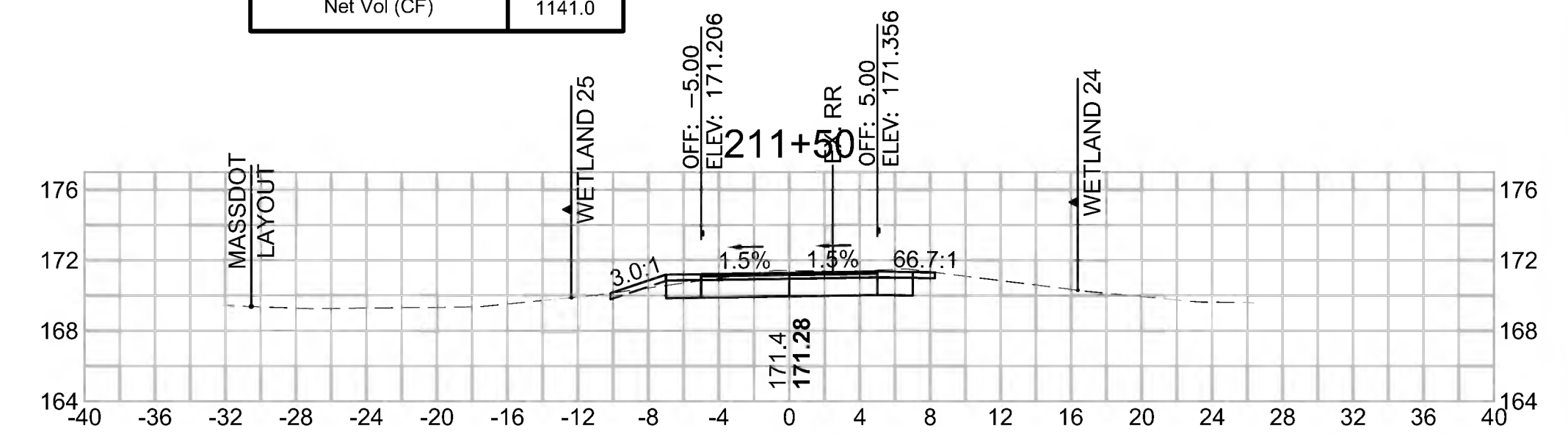
Total Volume at Station 208+50.00	
Cut Area (SF)	9.191
Fill Area (SF)	2.229
Cut Vol (CF)	11.7
Fill Vol (CF)	8.2
Cum Cut Vol (CF)	5820.7
Cum Fill Vol (CF)	4887.7
Net Vol (CF)	933.0



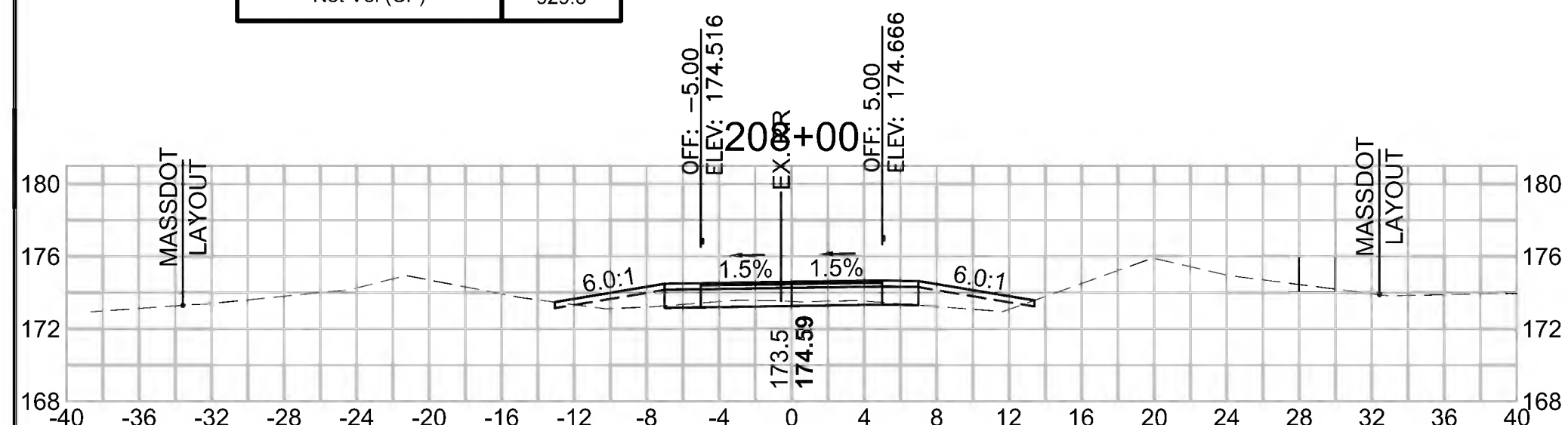
Total Volume at Station 210+00.00	
Cut Area (SF)	21.922
Fill Area (SF)	0.211
Cut Vol (CF)	37.4
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	5910.1
Cum Fill Vol (CF)	4890.6
Net Vol (CF)	1019.5



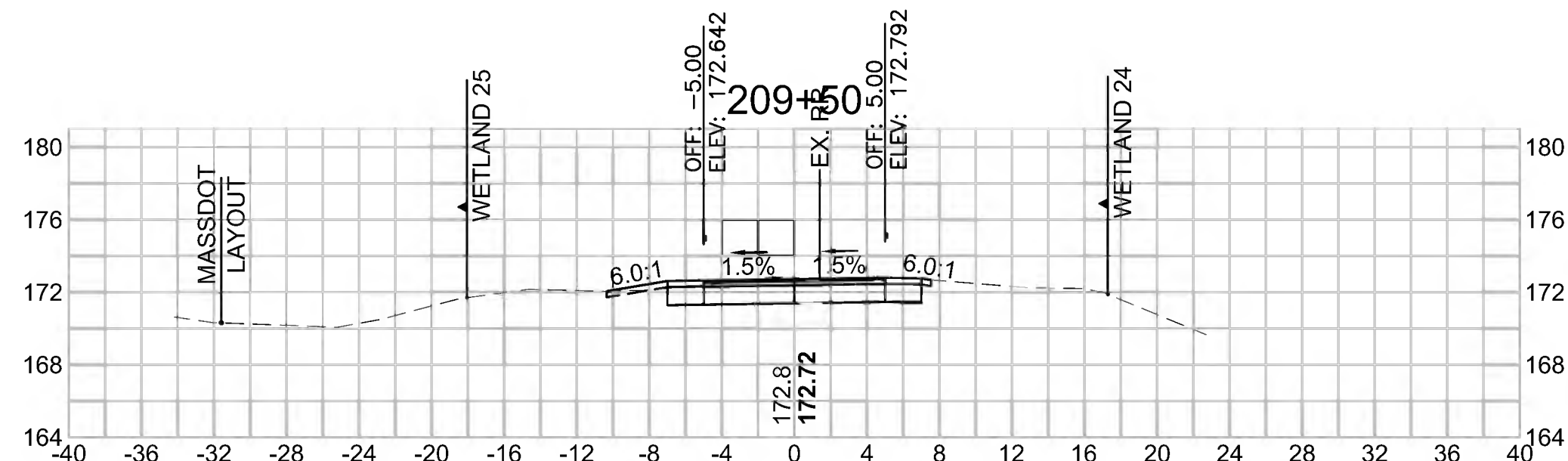
Total Volume at Station 211+50.00	
Cut Area (SF)	18.770
Fill Area (SF)	0.179
Cut Vol (CF)	38.1
Fill Vol (CF)	0.3
Cum Cut Vol (CF)	6032.4
Cum Fill Vol (CF)	4891.4
Net Vol (CF)	1141.0



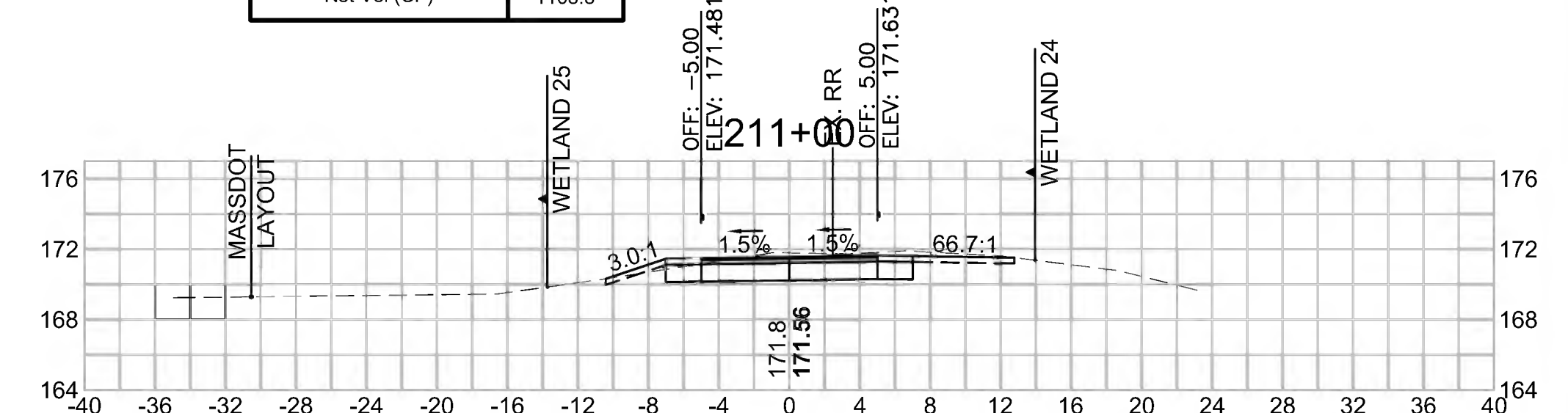
Total Volume at Station 208+00.00	
Cut Area (SF)	3.446
Fill Area (SF)	6.676
Cut Vol (CF)	4.0
Fill Vol (CF)	16.4
Cum Cut Vol (CF)	5809.0
Cum Fill Vol (CF)	4879.5
Net Vol (CF)	929.5



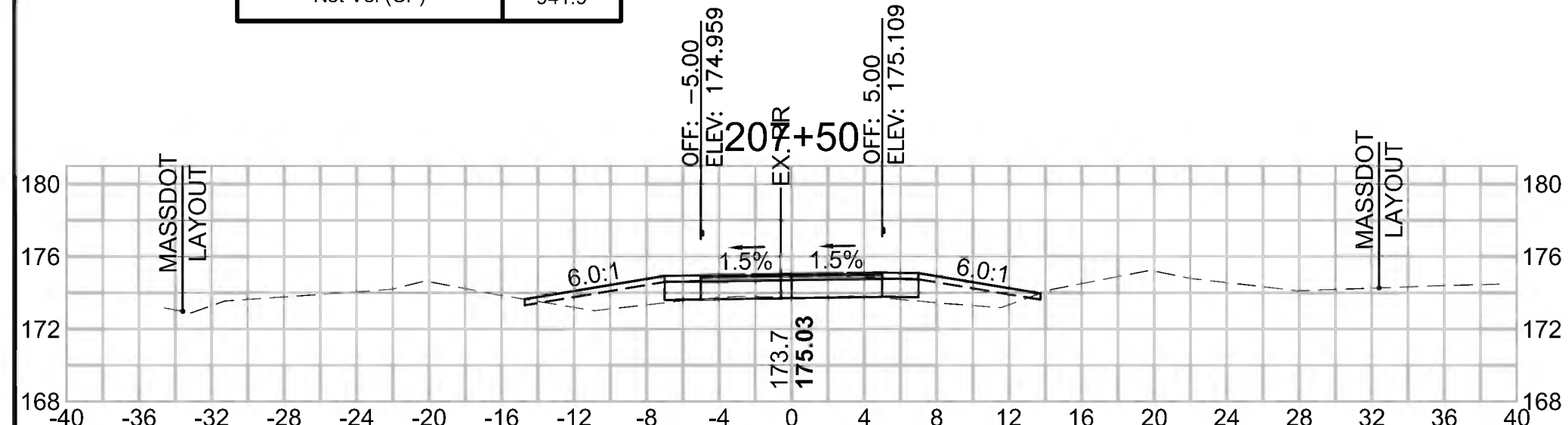
Total Volume at Station 209+50.00	
Cut Area (SF)	18.433
Fill Area (SF)	0.029
Cut Vol (CF)	30.3
Fill Vol (CF)	0.3
Cum Cut Vol (CF)	5872.7
Cum Fill Vol (CF)	4890.4
Net Vol (CF)	982.4



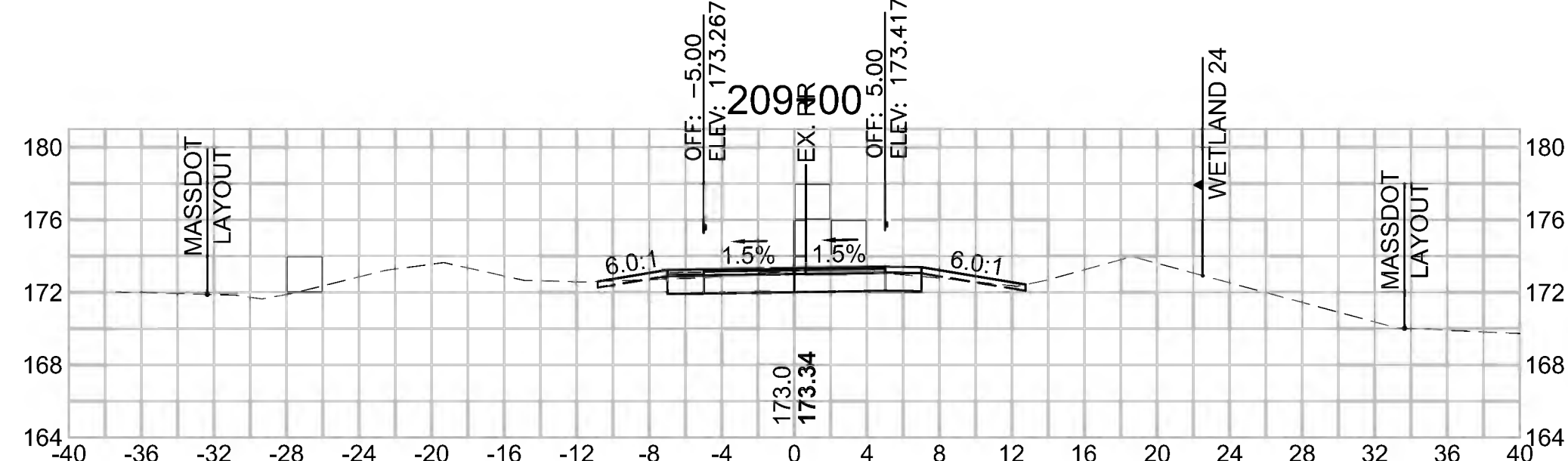
Total Volume at Station 211+00.00	
Cut Area (SF)	22.329
Fill Area (SF)	0.185
Cut Vol (CF)	42.3
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	5994.3
Cum Fill Vol (CF)	4891.1
Net Vol (CF)	1103.3



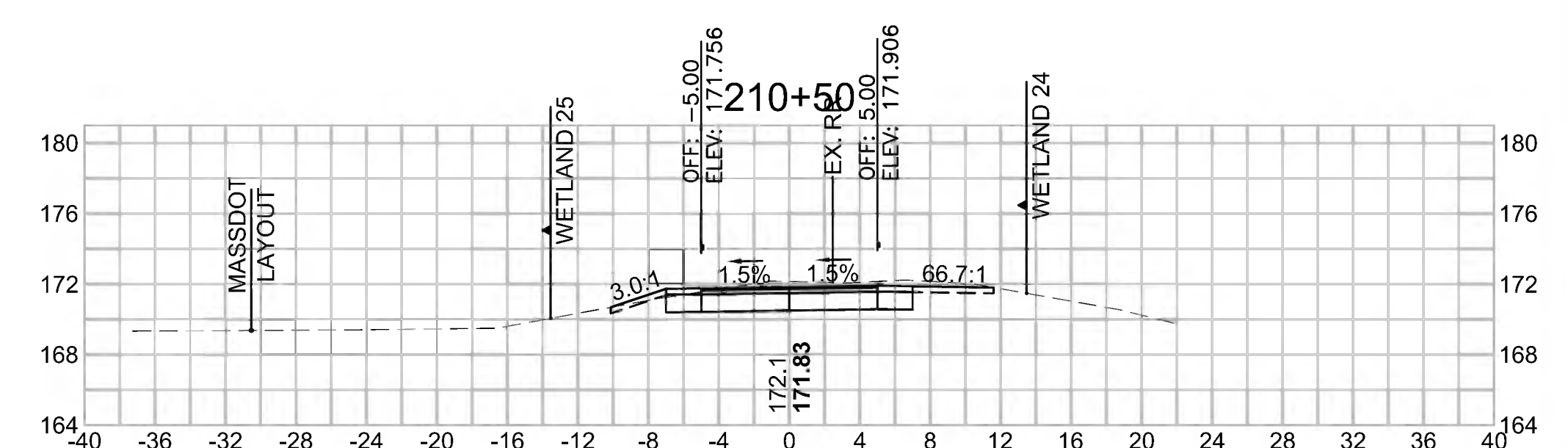
Total Volume at Station 207+50.00	
Cut Area (SF)	0.895
Fill Area (SF)	11.006
Cut Vol (CF)	1.3
Fill Vol (CF)	22.7
Cum Cut Vol (CF)	5804.9
Cum Fill Vol (CF)	4863.1
Net Vol (CF)	941.9



Total Volume at Station 209+00.00	
Cut Area (SF)	14.314
Fill Area (SF)	0.317
Cut Vol (CF)	21.8
Fill Vol (CF)	2.4
Cum Cut Vol (CF)	5842.4
Cum Fill Vol (CF)	4890.1
Net Vol (CF)	952.4



Total Volume at Station 210+50.00	
Cut Area (SF)	23.362
Fill Area (SF)	0.053
Cut Vol (CF)	41.9
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	5952.0
Cum Fill Vol (CF)	4890.8
Net Vol (CF)	1061.2





SUDBURY  
BRUCE FREEMAN RAIL TRAIL

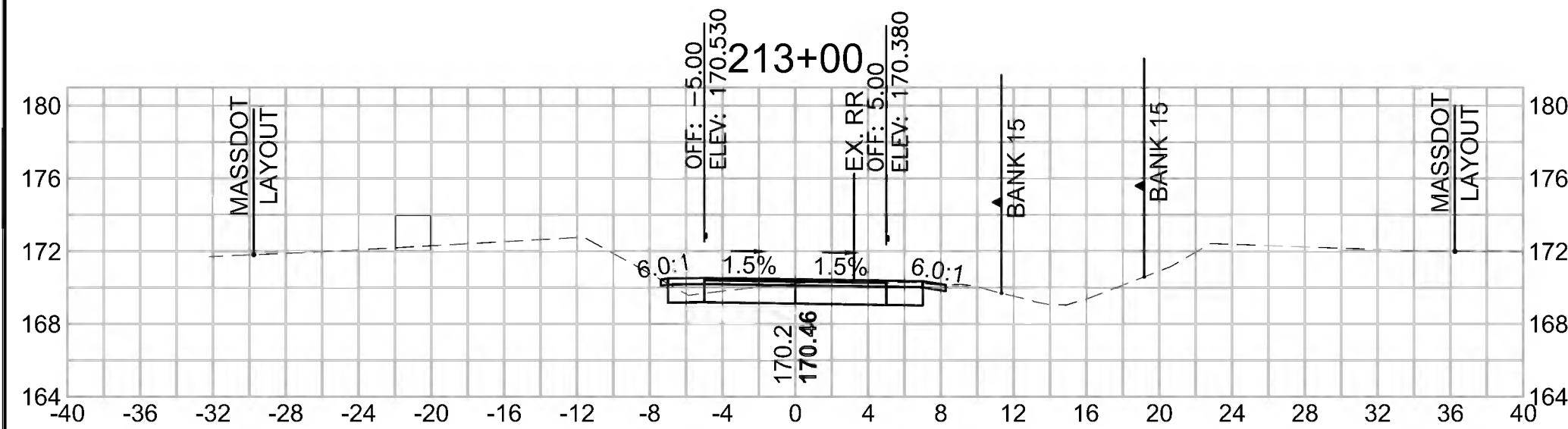
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	271	319

PROJECT FILE NO. 608164

CROSS SECTIONS

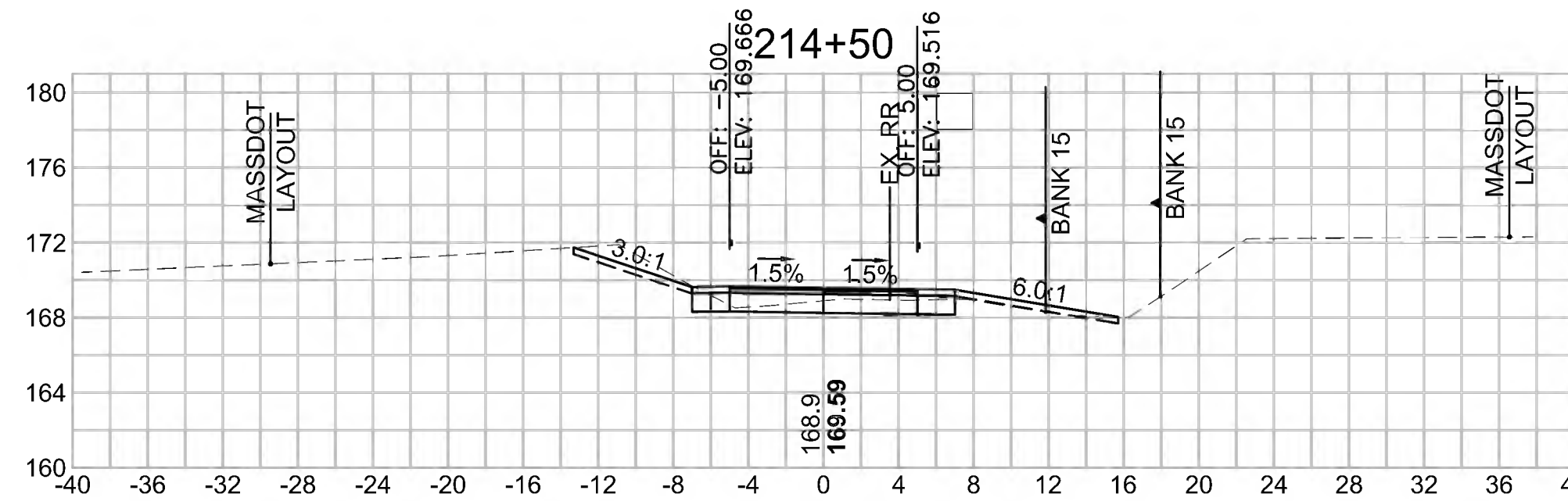
**Total Volume at Station 213+00.00**

Cut Area (SF)	14.065
Fill Area (SF)	0.000
Cut Vol (CF)	28.4
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	6126.7
Cum Fill Vol (CF)	4891.6
Net Vol (CF)	1235.1



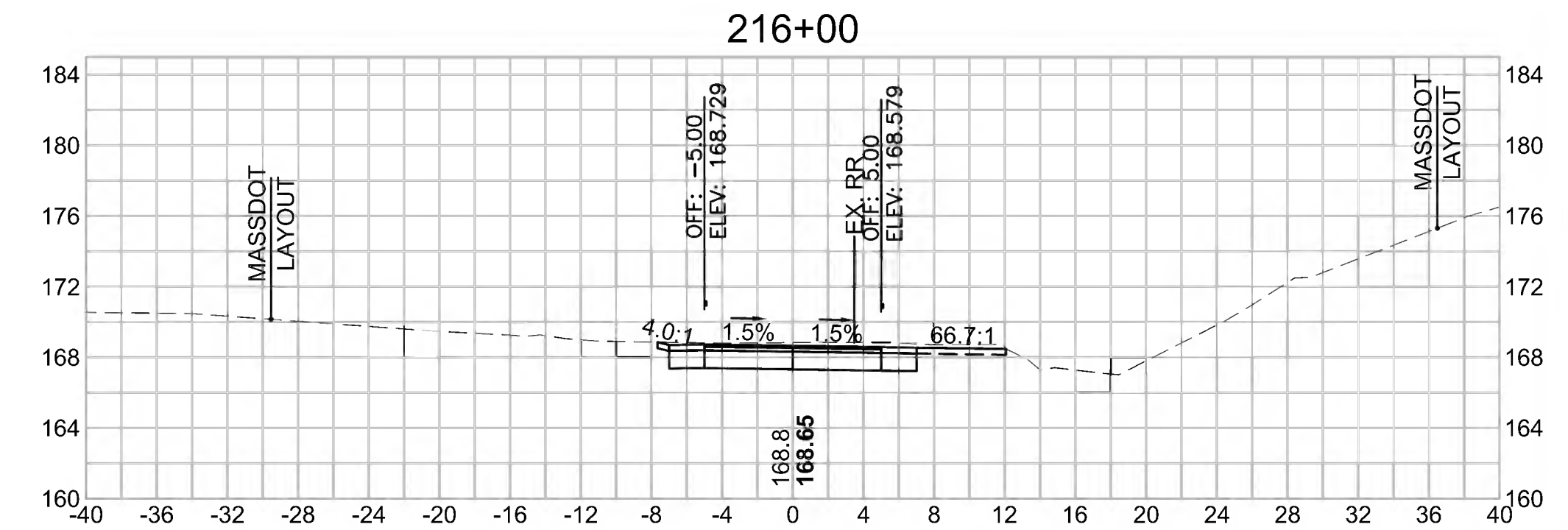
**Total Volume at Station 214+50.00**

Cut Area (SF)	14.677
Fill Area (SF)	0.356
Cut Vol (CF)	33.4
Fill Vol (CF)	0.3
Cum Cut Vol (CF)	6227.7
Cum Fill Vol (CF)	4891.9
Net Vol (CF)	1335.8



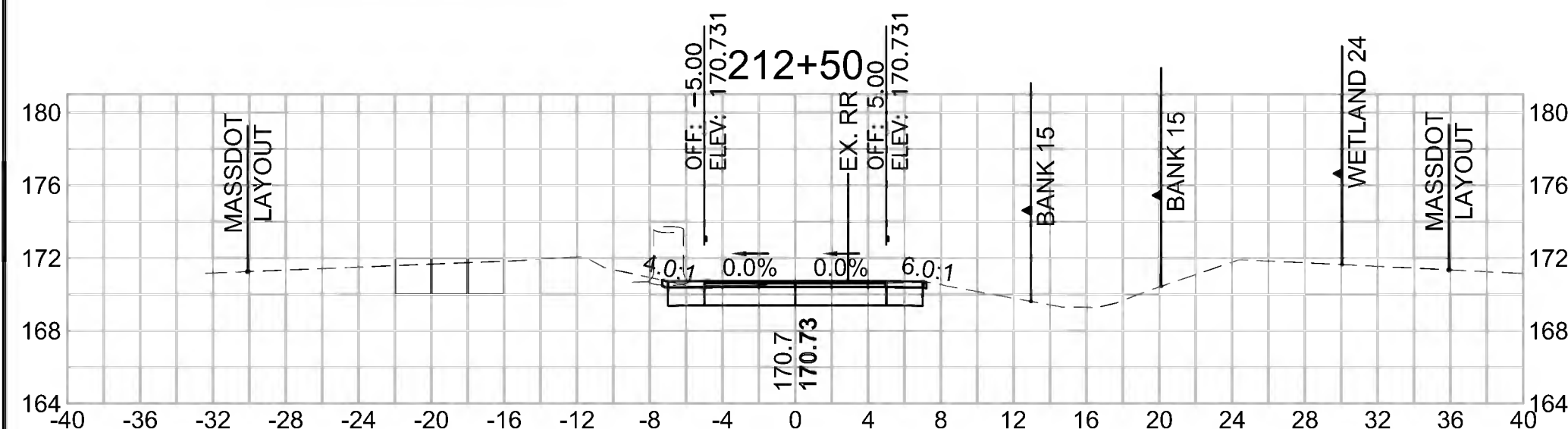
**Total Volume at Station 216+00.00**

Cut Area (SF)	24.110
Fill Area (SF)	0.000
Cut Vol (CF)	30.6
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	6294.4
Cum Fill Vol (CF)	4892.7
Net Vol (CF)	1401.7



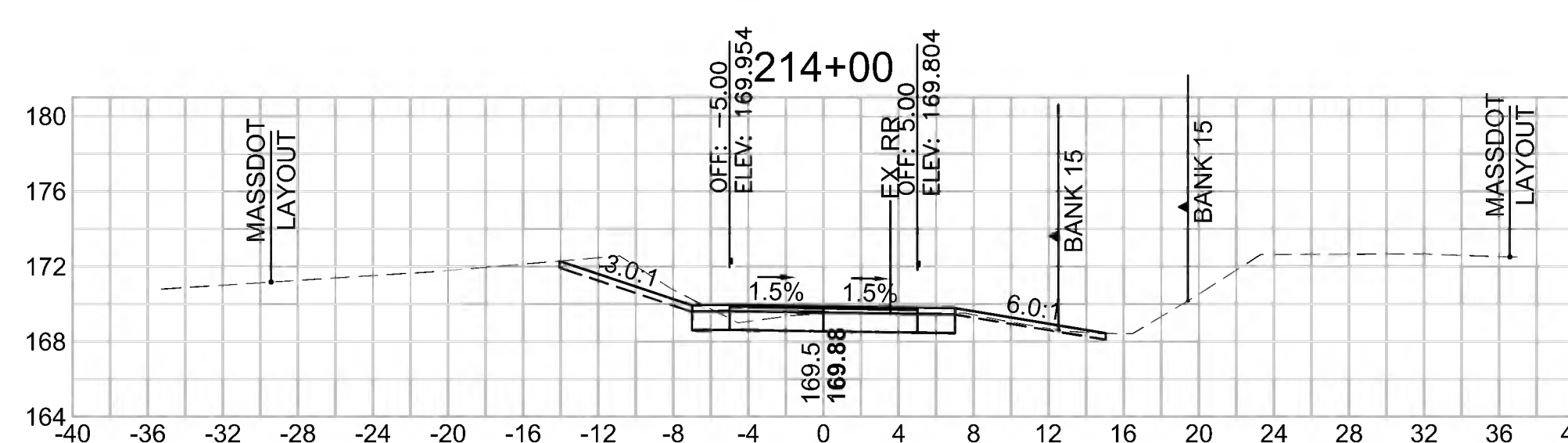
**Total Volume at Station 212+50.00**

Cut Area (SF)	16.643
Fill Area (SF)	0.000
Cut Vol (CF)	32.0
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	6098.3
Cum Fill Vol (CF)	4891.6
Net Vol (CF)	1206.7



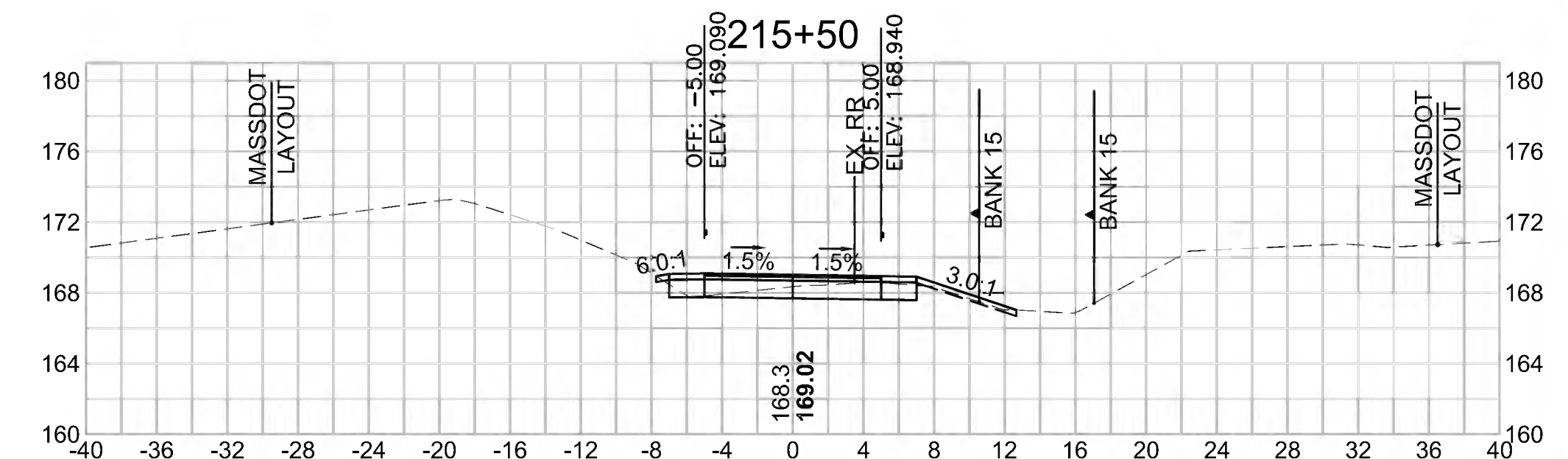
**Total Volume at Station 214+00.00**

Cut Area (SF)	21.365
Fill Area (SF)	0.000
Cut Vol (CF)	37.2
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	6194.3
Cum Fill Vol (CF)	4891.6
Net Vol (CF)	1302.7



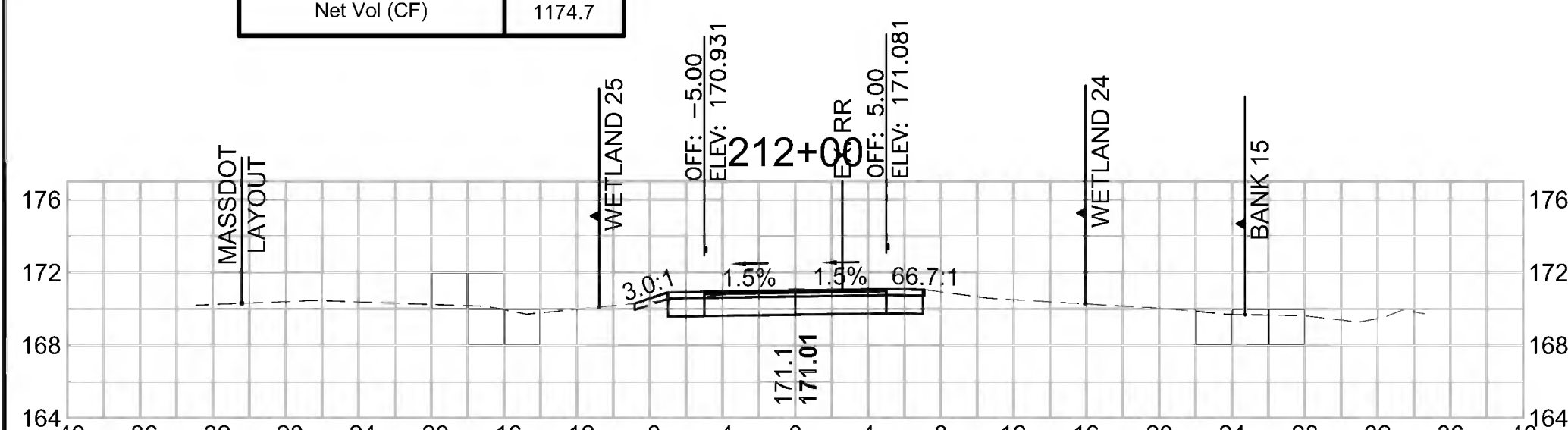
**Total Volume at Station 215+50.00**

Cut Area (SF)	8.933
Fill Area (SF)	0.083
Cut Vol (CF)	15.4
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	6263.8
Cum Fill Vol (CF)	4892.6
Net Vol (CF)	1371.2



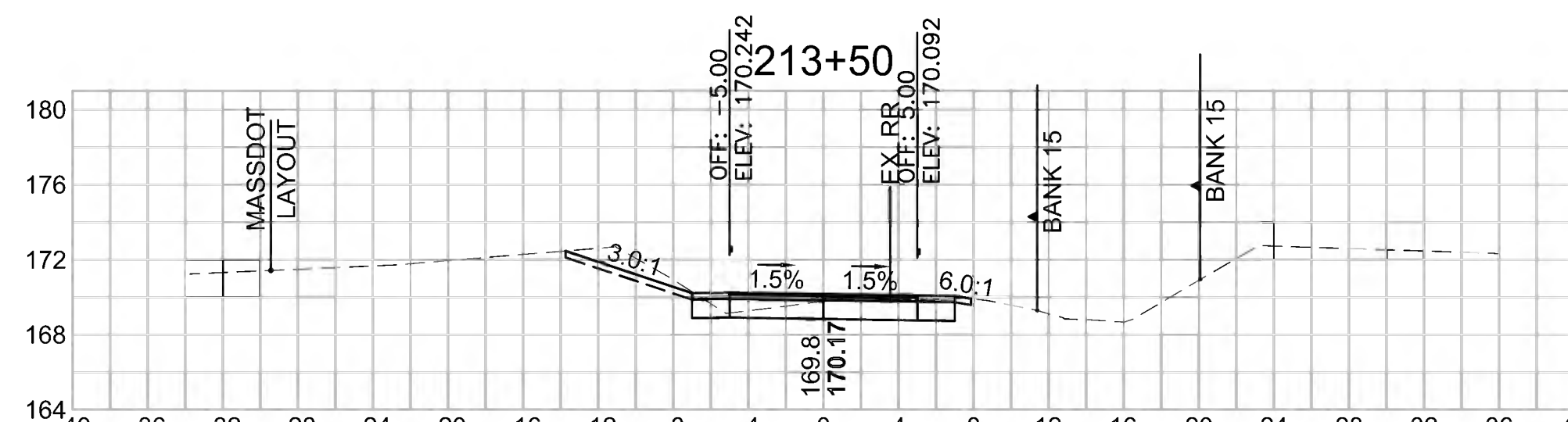
**Total Volume at Station 212+00.00**

Cut Area (SF)	17.865
Fill Area (SF)	0.014
Cut Vol (CF)	33.9
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	6066.3
Cum Fill Vol (CF)	4891.6
Net Vol (CF)	1174.7



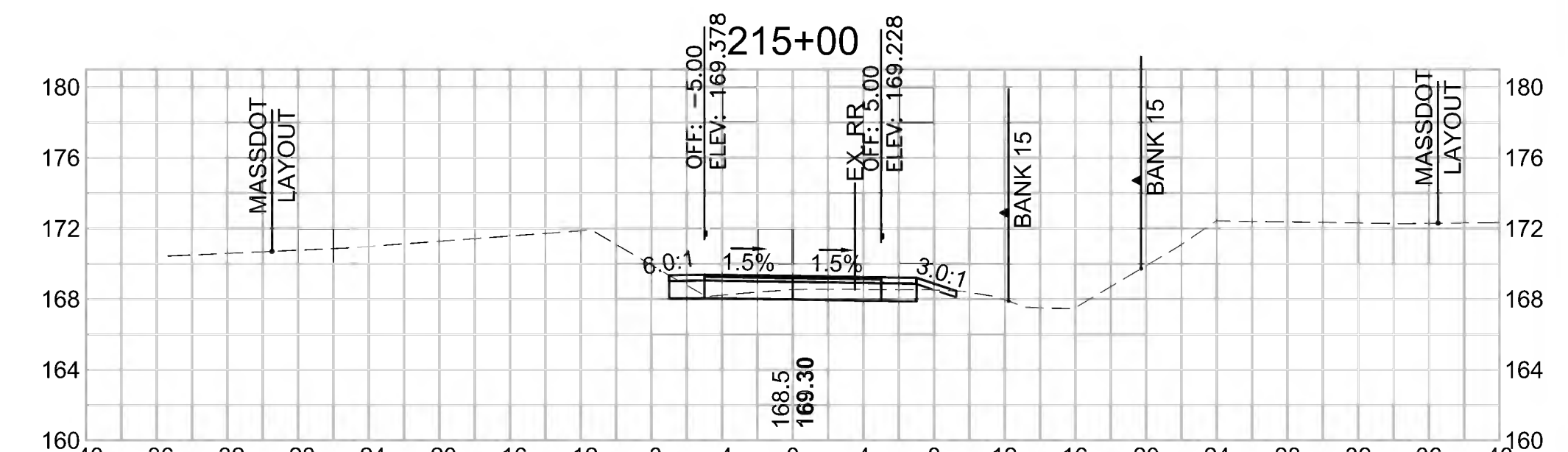
**Total Volume at Station 213+50.00**

Cut Area (SF)	18.793
Fill Area (SF)	0.000
Cut Vol (CF)	30.4
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	6157.1
Cum Fill Vol (CF)	4891.6
Net Vol (CF)	1265.5



**Total Volume at Station 215+00.00**

Cut Area (SF)	7.704
Fill Area (SF)	0.152
Cut Vol (CF)	20.7
Fill Vol (CF)	0.5
Cum Cut Vol (CF)	6248.4
Cum Fill Vol (CF)	4892.4
Net Vol (CF)	1356.0

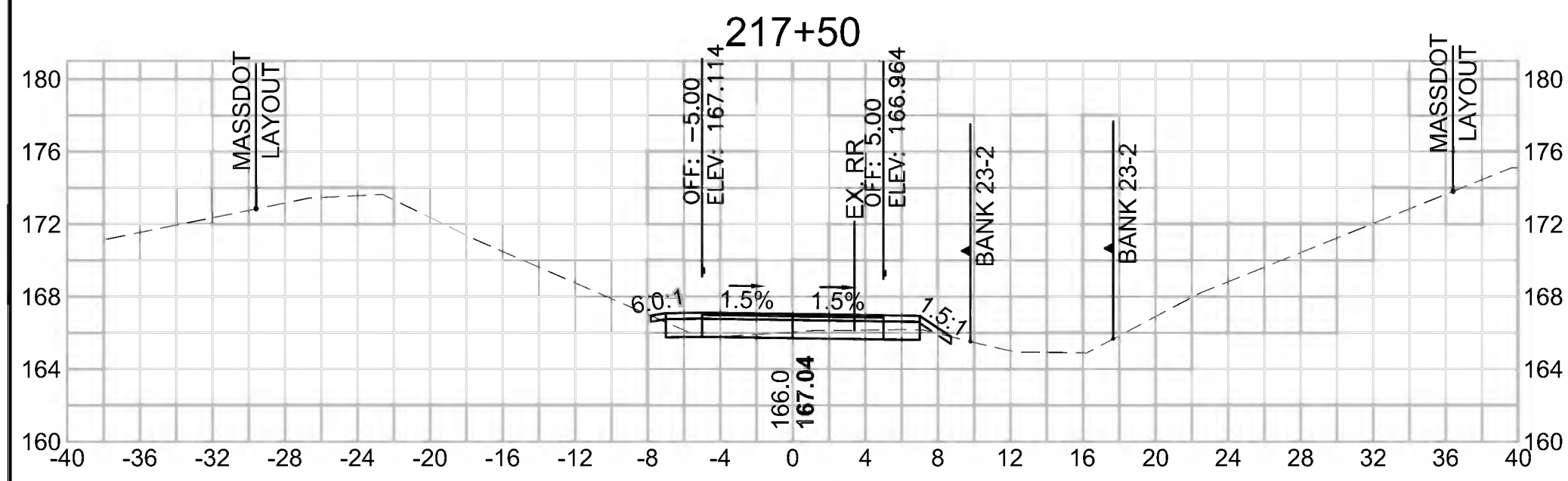


SUDBURY  
BRUCE FREEMAN RAIL TRAIL

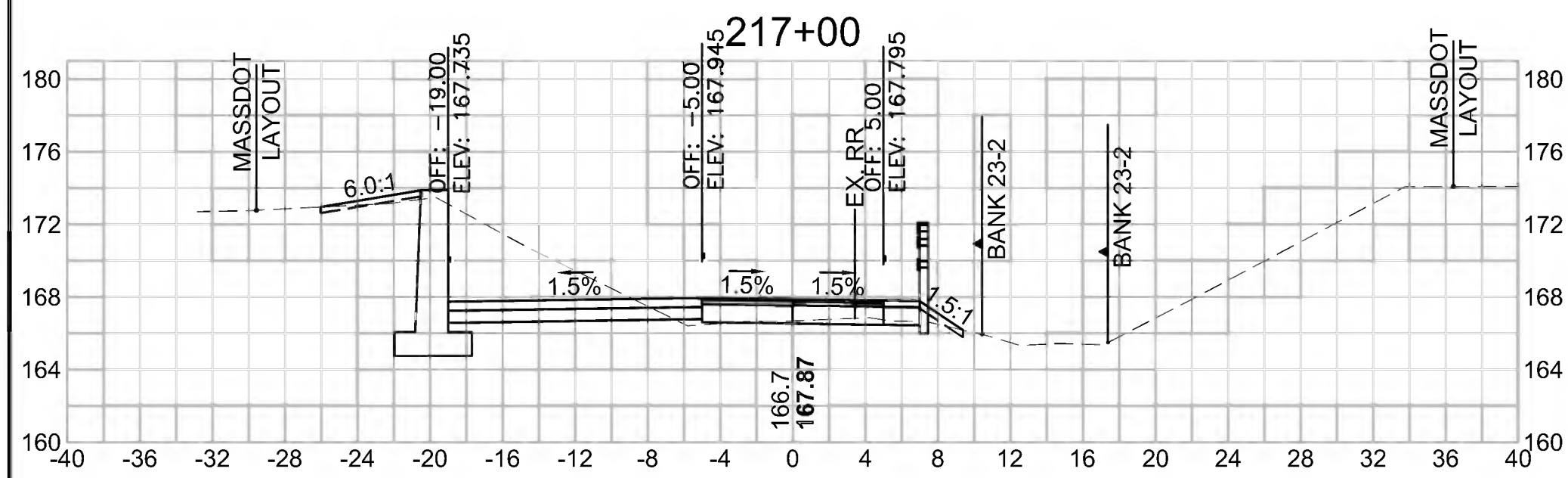
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	272	319
PROJECT FILE NO. 608164			

CROSS SECTIONS

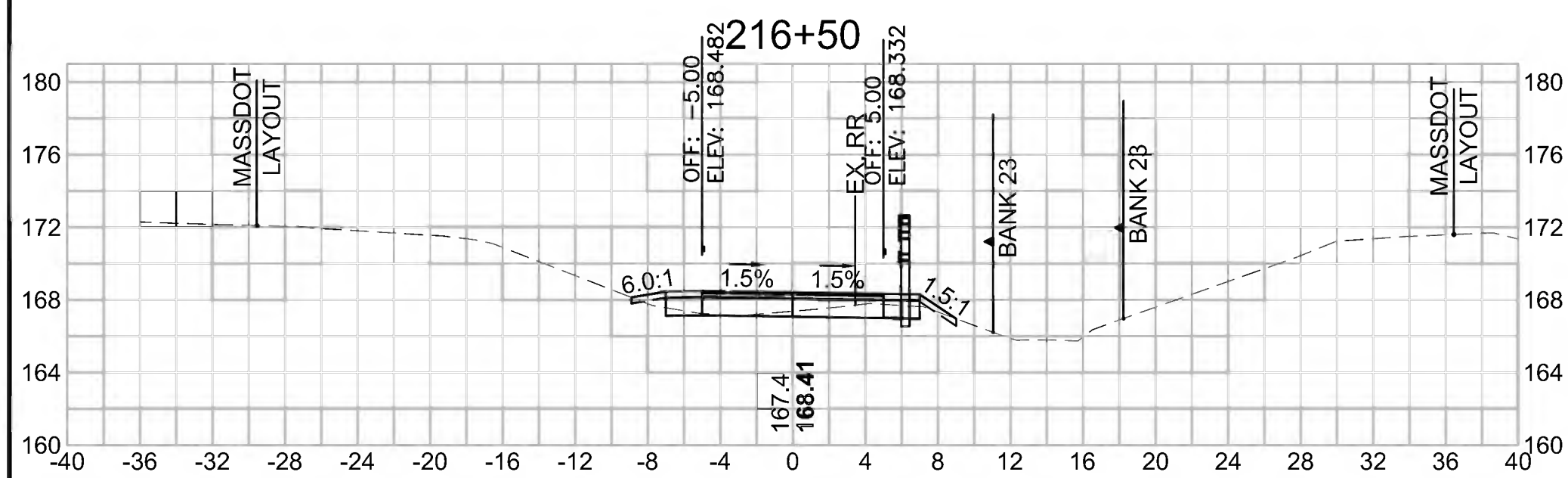
Total Volume at Station 217+50.00	
Cut Area (SF)	5,141
Fill Area (SF)	0,179
Cut Vol (CF)	48.7
Fill Vol (CF)	1.2
Cum Cut Vol (CF)	6419.8
Cum Fill Vol (CF)	4895.7
Net Vol (CF)	1524.0



Total Volume at Station 217+00.00	
Cut Area (SF)	47,403
Fill Area (SF)	1,077
Cut Vol (CF)	49.1
Fill Vol (CF)	1.4
Cum Cut Vol (CF)	6371.1
Cum Fill Vol (CF)	4894.6
Net Vol (CF)	1476.5



Total Volume at Station 216+50.00	
Cut Area (SF)	5,672
Fill Area (SF)	0,482
Cut Vol (CF)	27.6
Fill Vol (CF)	0.4
Cum Cut Vol (CF)	6322.0
Cum Fill Vol (CF)	4893.1
Net Vol (CF)	1428.8





SUDBURY  
BRUCE FREEMAN RAIL TRAIL

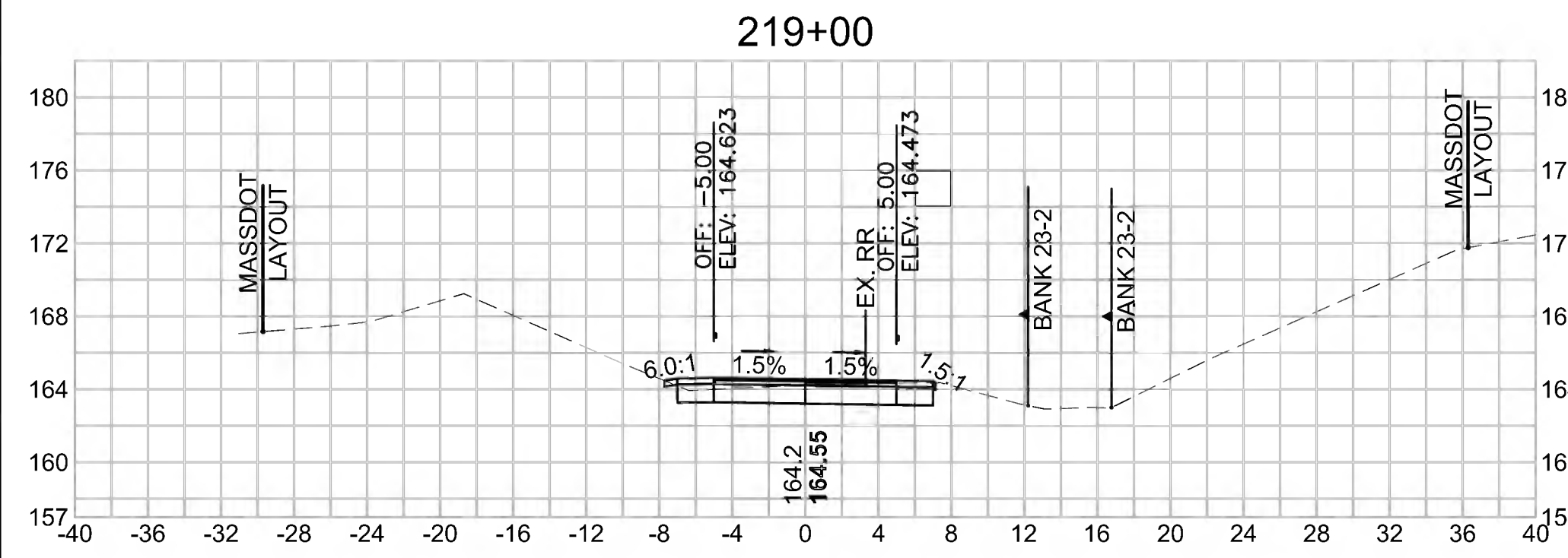
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	273	319

PROJECT FILE NO. 608164

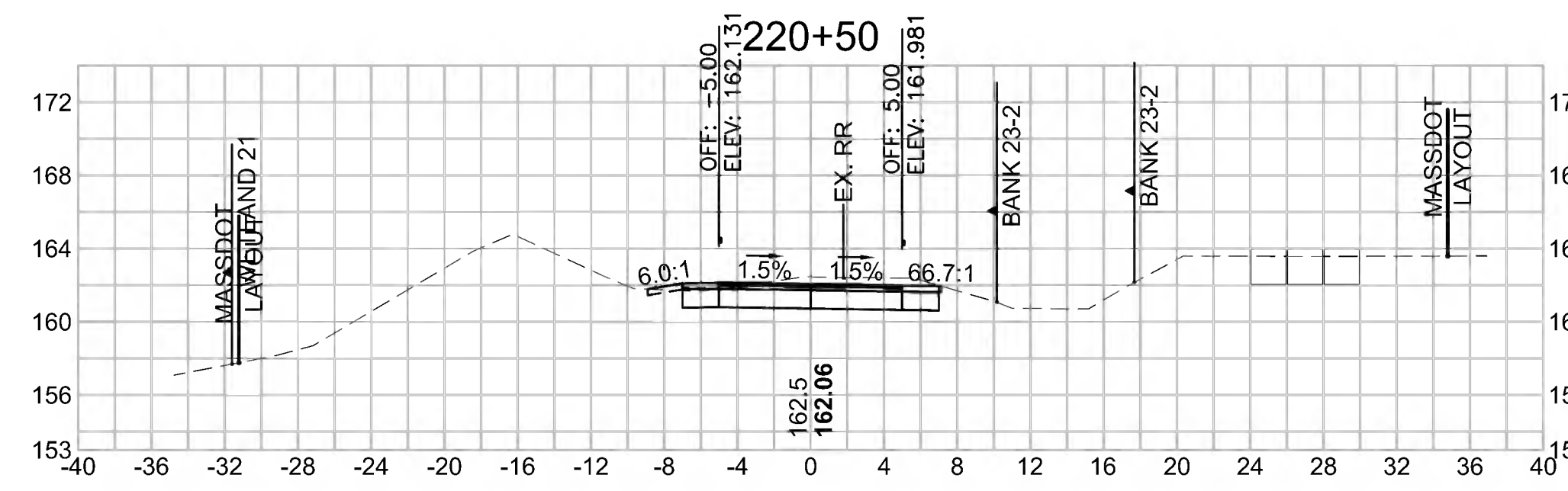
CROSS SECTIONS

608164\_XSEC(CROSS SECTION LAYOUTS).DWG 27-Jun-2022

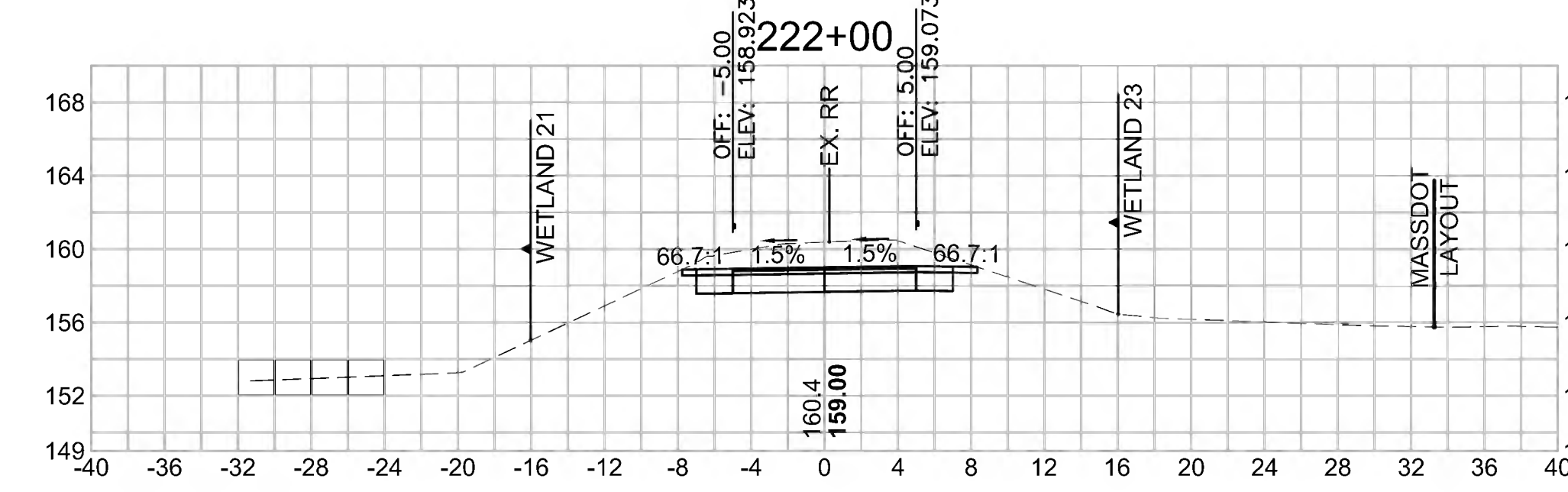
Total Volume at Station 219+00.00	
Cut Area (SF)	13,950
Fill Area (SF)	0.005
Cut Vol (CF)	22.5
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	6465.9
Cum Fill Vol (CF)	4896.1
Net Vol (CF)	1569.8



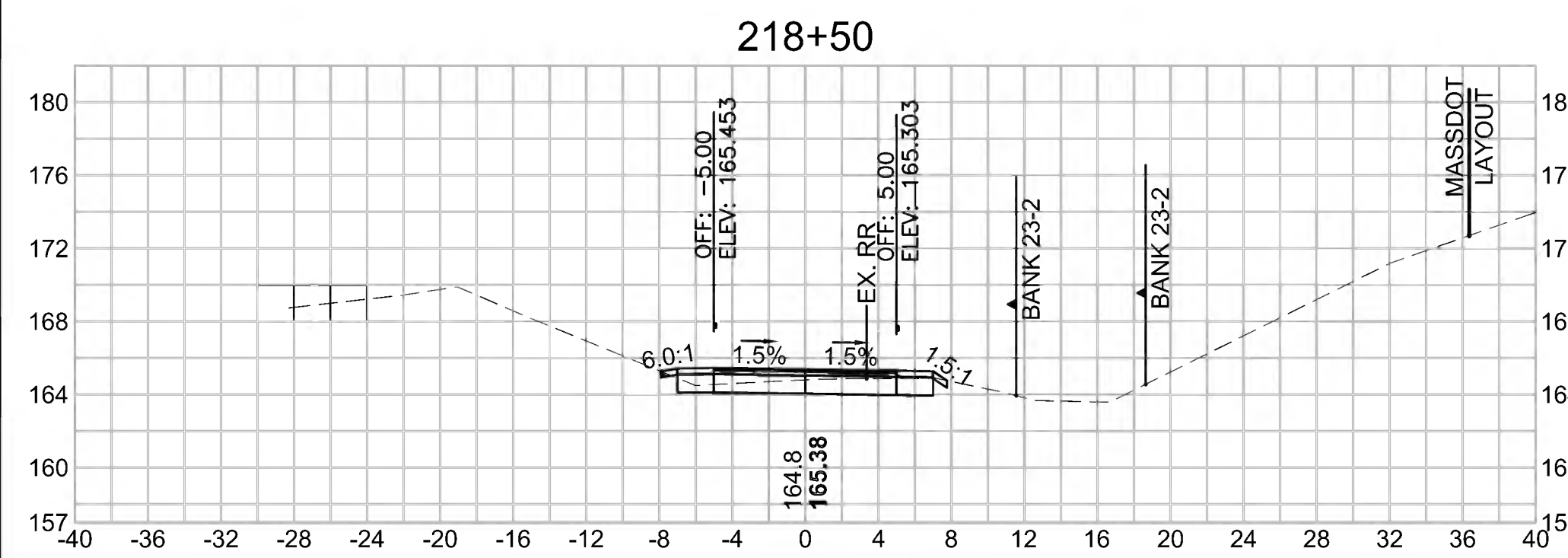
Total Volume at Station 220+50.00	
Cut Area (SF)	20,886
Fill Area (SF)	0.009
Cut Vol (CF)	38.0
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	6568.8
Cum Fill Vol (CF)	4896.2
Net Vol (CF)	1672.6



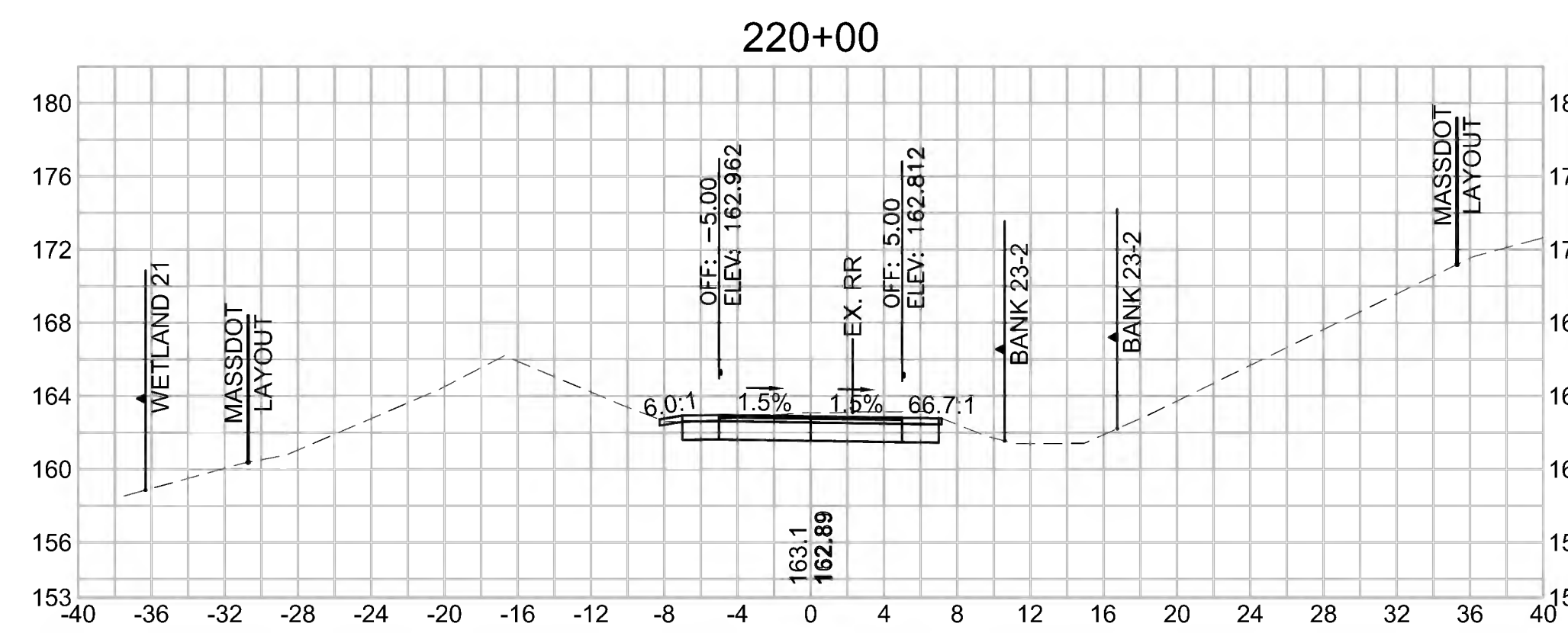
Total Volume at Station 222+00.00	
Cut Area (SF)	36,279
Fill Area (SF)	0.043
Cut Vol (CF)	60.3
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	6722.4
Cum Fill Vol (CF)	4896.2
Net Vol (CF)	1826.2



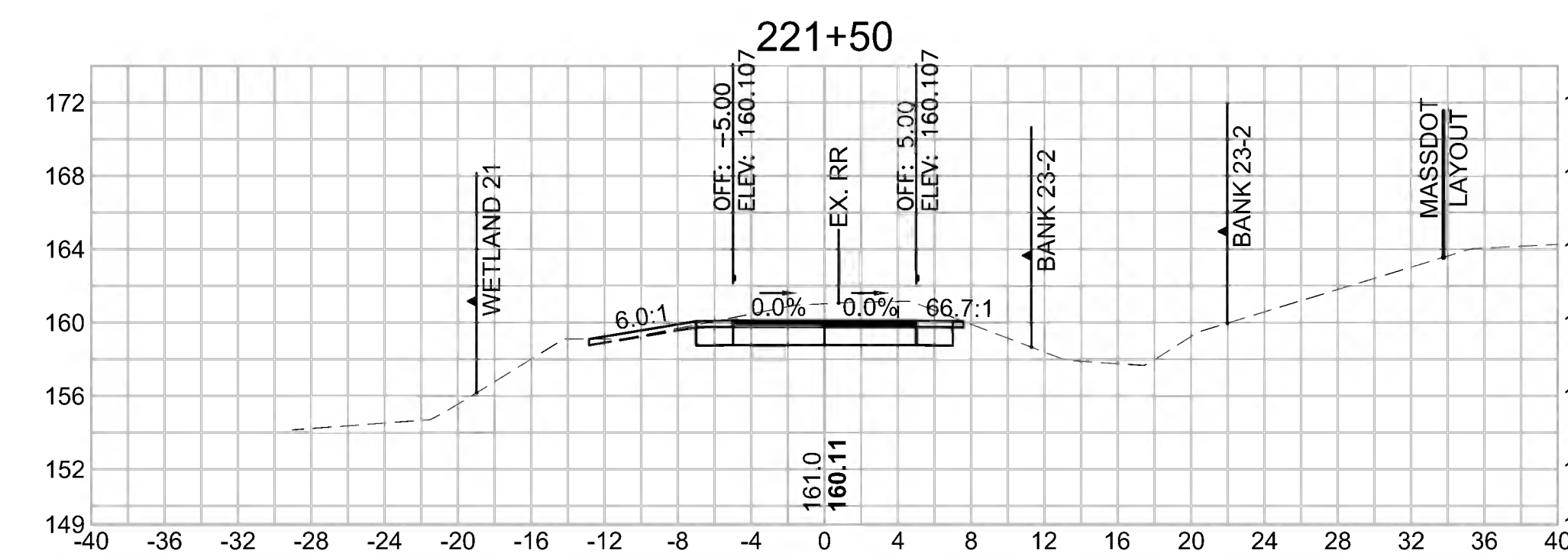
Total Volume at Station 218+50.00	
Cut Area (SF)	10,300
Fill Area (SF)	0.030
Cut Vol (CF)	17.8
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	6443.5
Cum Fill Vol (CF)	4896.1
Net Vol (CF)	1547.4



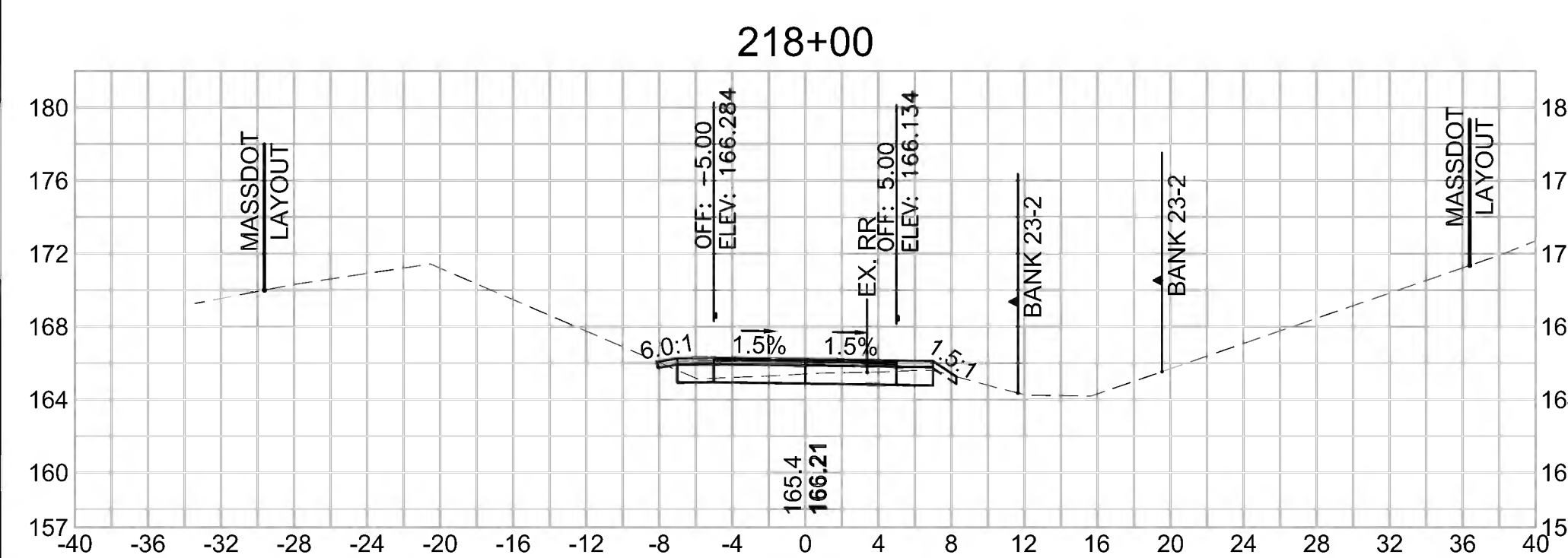
Total Volume at Station 220+00.00	
Cut Area (SF)	20,136
Fill Area (SF)	0.001
Cut Vol (CF)	35.3
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	6530.8
Cum Fill Vol (CF)	4896.2
Net Vol (CF)	1634.6



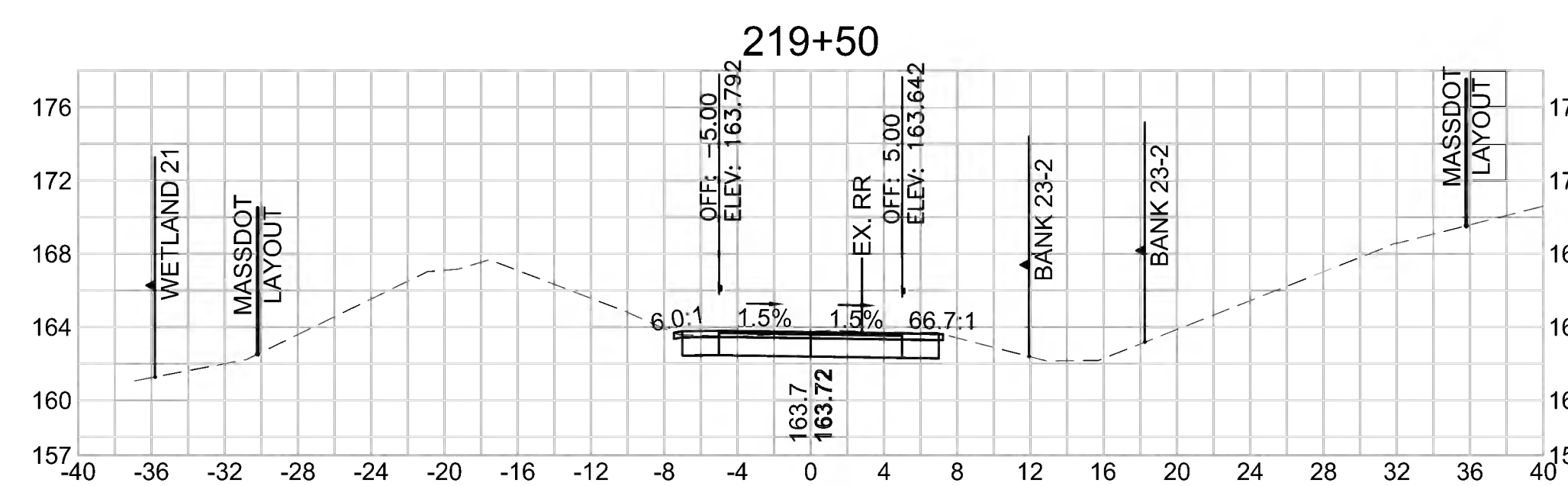
Total Volume at Station 221+50.00	
Cut Area (SF)	28,856
Fill Area (SF)	0.000
Cut Vol (CF)	50.3
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	6662.1
Cum Fill Vol (CF)	4896.2
Net Vol (CF)	1765.9



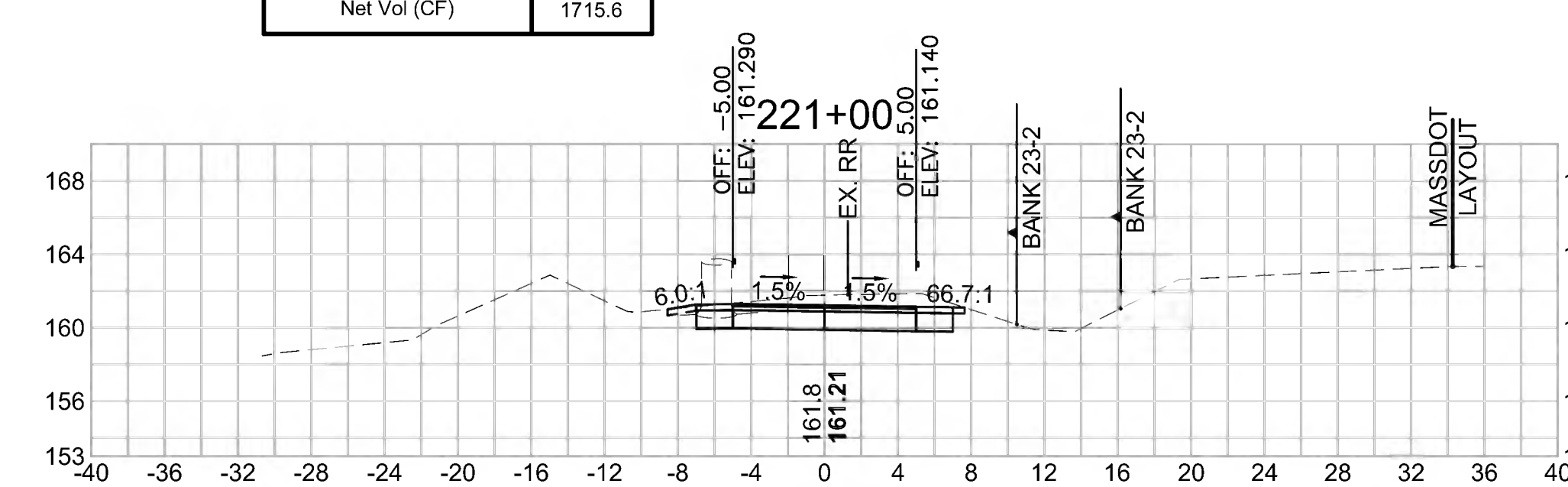
Total Volume at Station 218+00.00	
Cut Area (SF)	8,908
Fill Area (SF)	0.096
Cut Vol (CF)	13.0
Fill Vol (CF)	0.3
Cum Cut Vol (CF)	6425.7
Cum Fill Vol (CF)	4896.0
Net Vol (CF)	1529.7



Total Volume at Station 219+50.00	
Cut Area (SF)	17,969
Fill Area (SF)	0.000
Cut Vol (CF)	29.6
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	6495.5
Cum Fill Vol (CF)	4896.2
Net Vol (CF)	1599.4



Total Volume at Station 221+00.00	
Cut Area (SF)	25,513
Fill Area (SF)	0.000
Cut Vol (CF)	43.0
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	6611.7
Cum Fill Vol (CF)	4896.2
Net Vol (CF)	1715.6



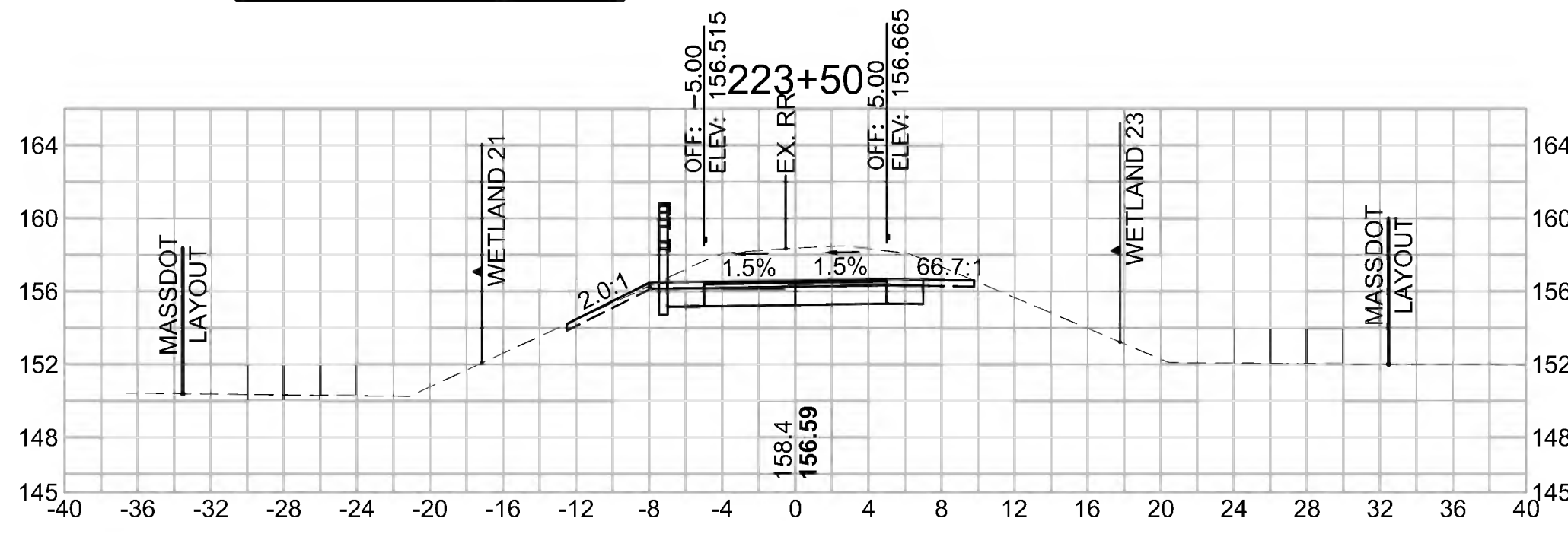
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	274	319
PROJECT FILE NO. 608164			

CROSS SECTIONS

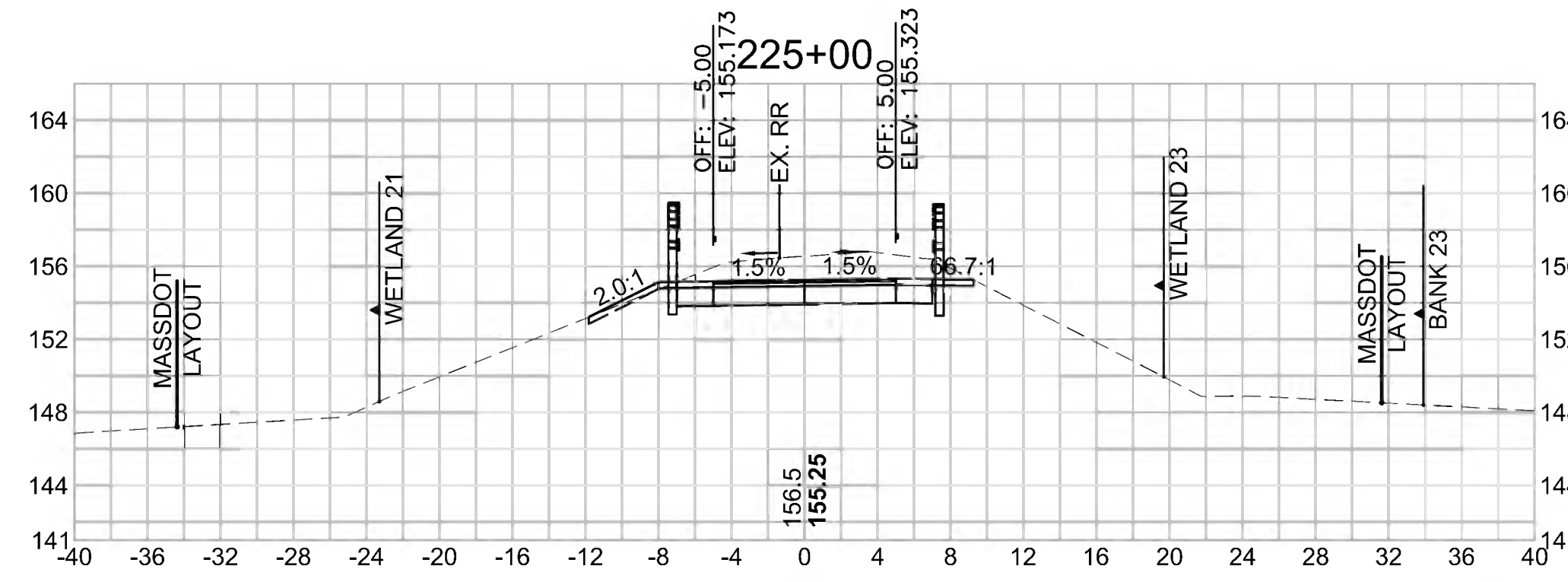
**Total Volume at Station 223+50.00**

Cut Area (SF)	43.892
Fill Area (SF)	0.000
Cut Vol (CF)	76.7
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	6937.4
Cum Fill Vol (CF)	4896.7
Net Vol (CF)	2040.7



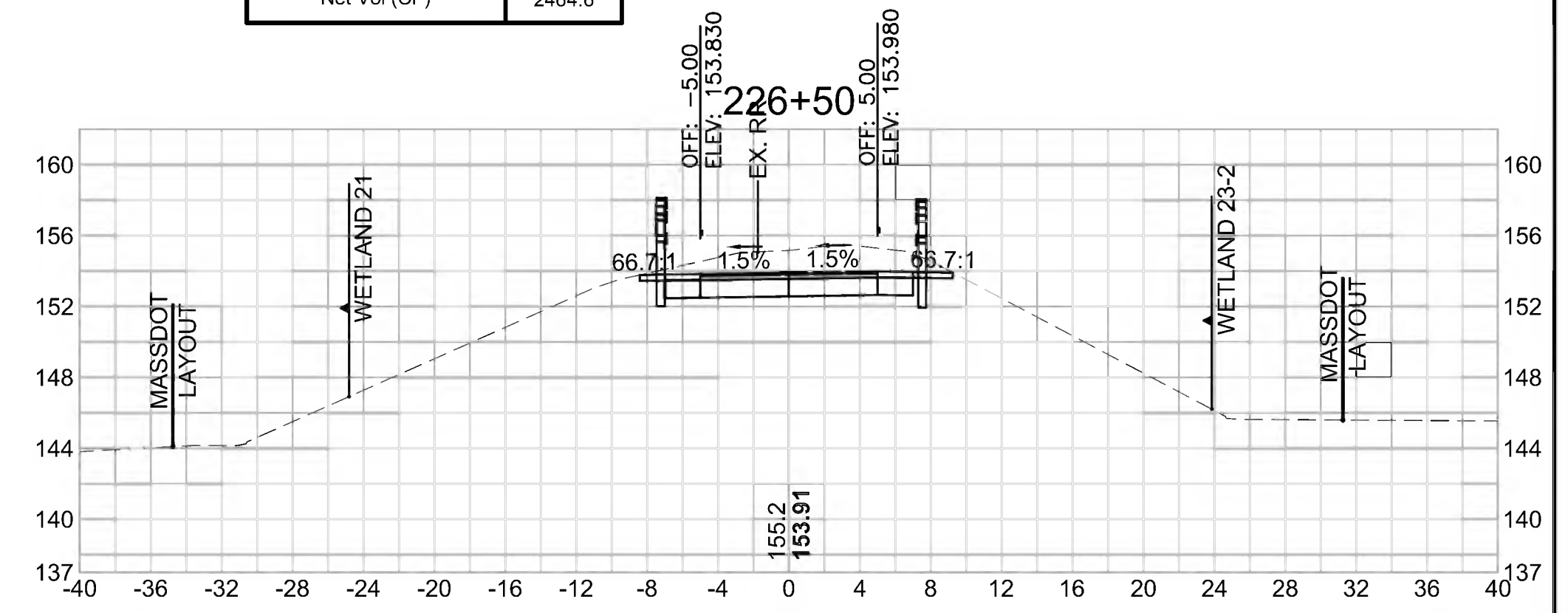
**Total Volume at Station 225+00.00**

Cut Area (SF)	37.322
Fill Area (SF)	0.005
Cut Vol (CF)	69.9
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	7152.6
Cum Fill Vol (CF)	4896.7
Net Vol (CF)	2255.9



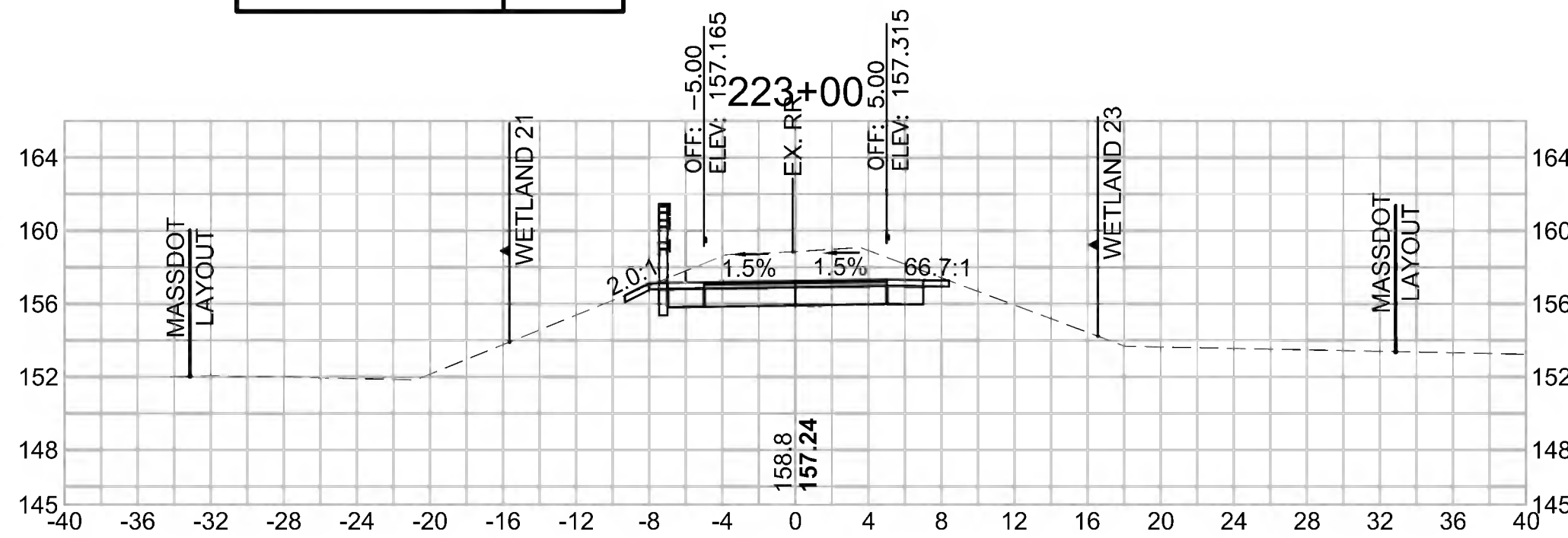
**Total Volume at Station 226+50.00**

Cut Area (SF)	37.298
Fill Area (SF)	0.000
Cut Vol (CF)	68.5
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	7361.3
Cum Fill Vol (CF)	4896.7
Net Vol (CF)	2464.6



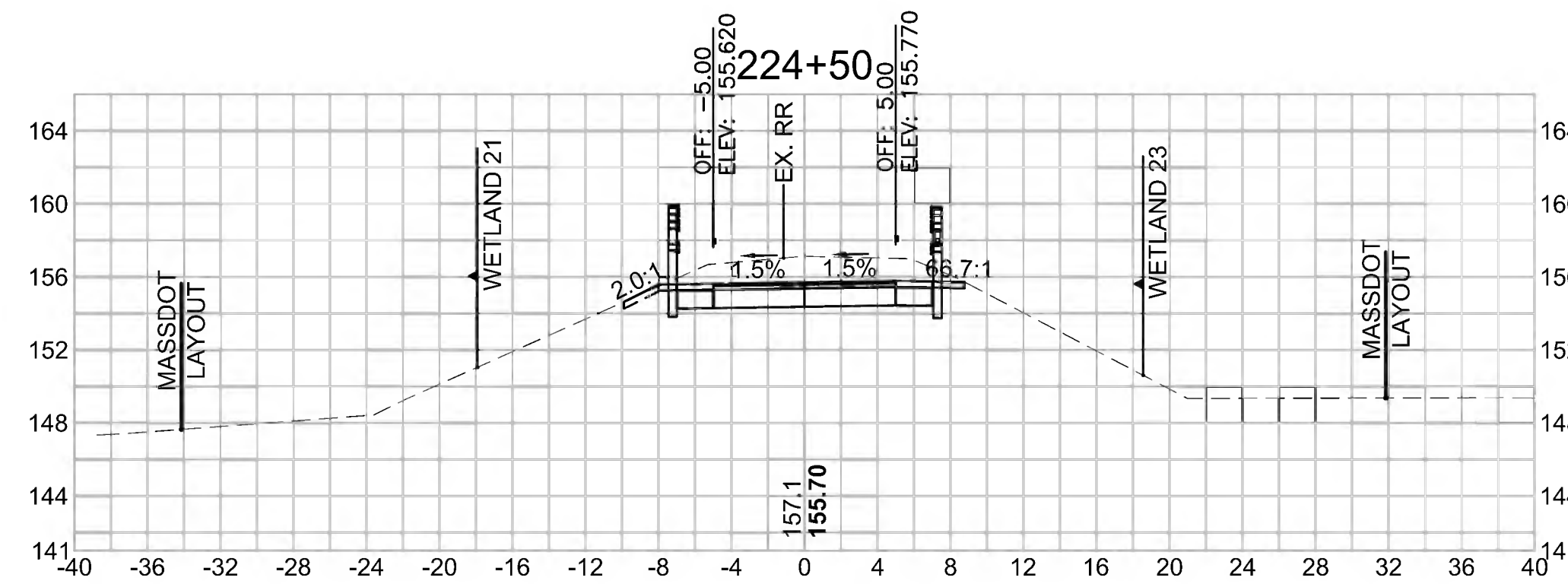
**Total Volume at Station 223+00.00**

Cut Area (SF)	38.930
Fill Area (SF)	0.000
Cut Vol (CF)	70.4
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	6860.7
Cum Fill Vol (CF)	4896.7
Net Vol (CF)	1964.0



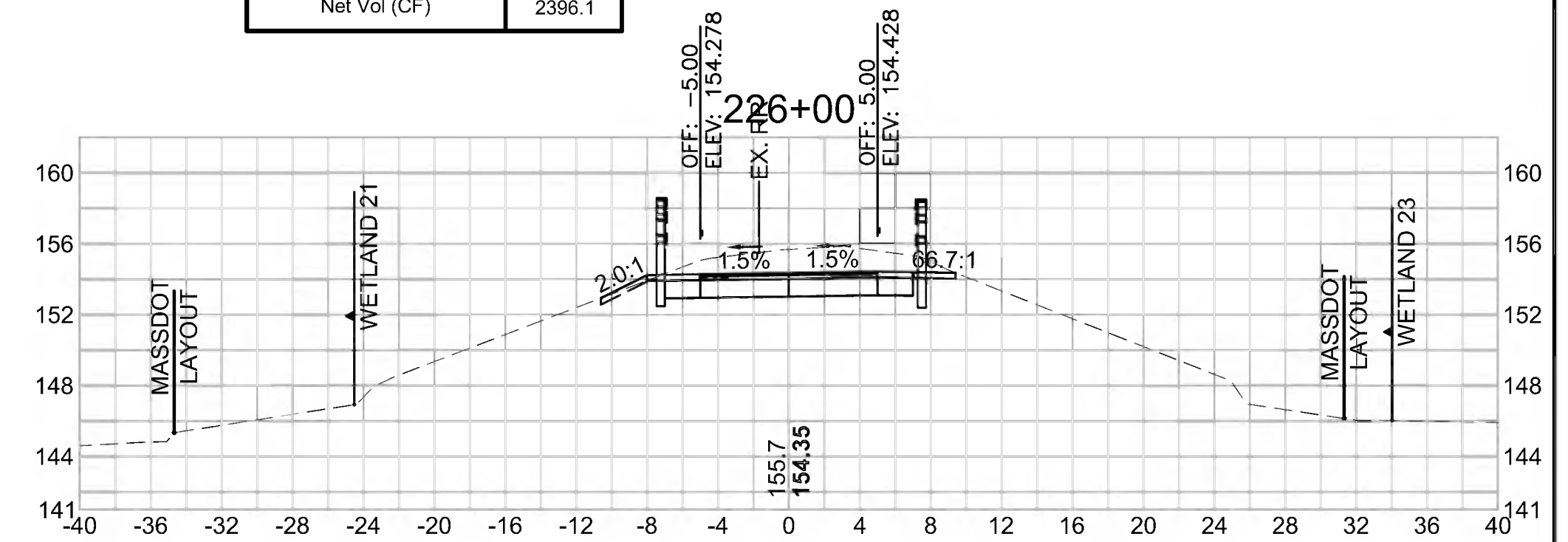
**Total Volume at Station 224+50.00**

Cut Area (SF)	38.133
Fill Area (SF)	0.000
Cut Vol (CF)	70.0
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	7082.8
Cum Fill Vol (CF)	4896.7
Net Vol (CF)	2186.0



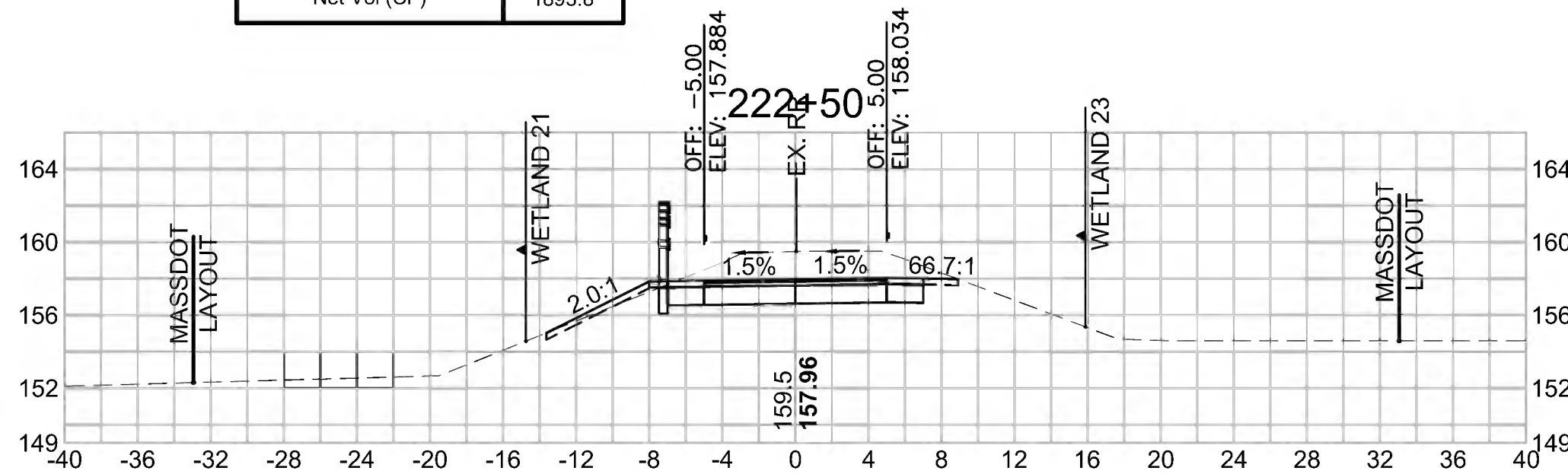
**Total Volume at Station 226+00.00**

Cut Area (SF)	36.682
Fill Area (SF)	0.000
Cut Vol (CF)	69.8
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	7292.8
Cum Fill Vol (CF)	4896.7
Net Vol (CF)	2396.1



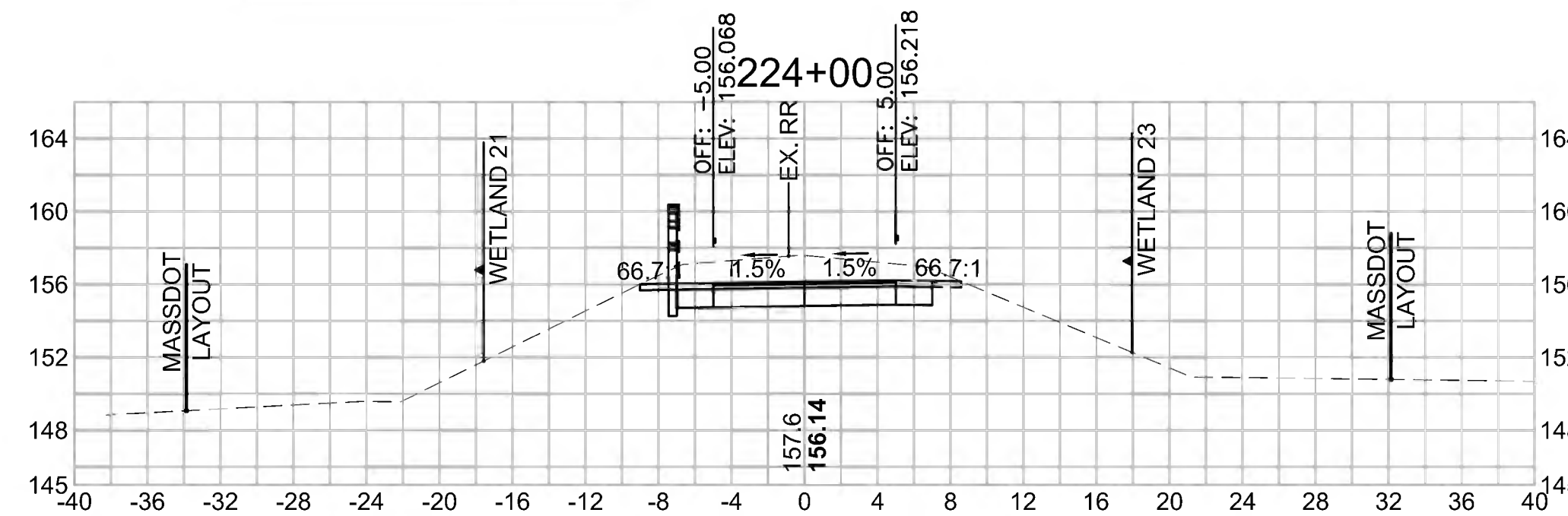
**Total Volume at Station 222+50.00**

Cut Area (SF)	37.086
Fill Area (SF)	0.261
Cut Vol (CF)	67.9
Fill Vol (CF)	0.3
Cum Cut Vol (CF)	6790.3
Cum Fill Vol (CF)	4896.5
Net Vol (CF)	1893.8



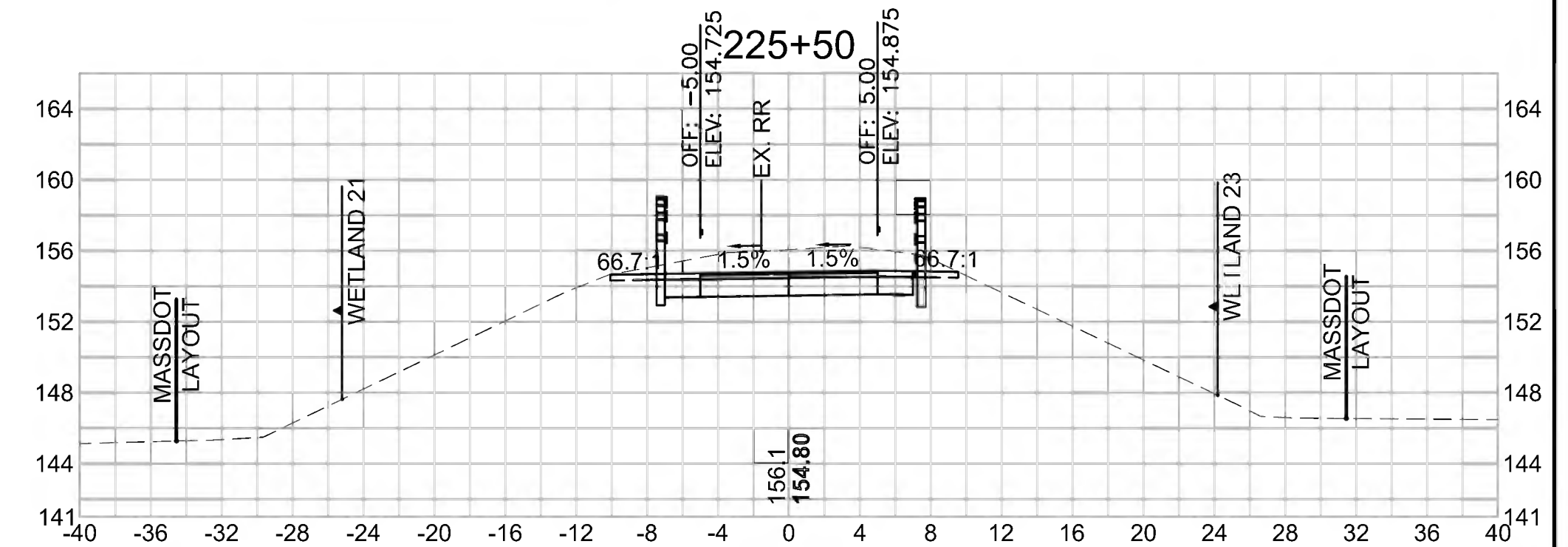
**Total Volume at Station 224+00.00**

Cut Area (SF)	37.492
Fill Area (SF)	0.000
Cut Vol (CF)	75.4
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	7012.7
Cum Fill Vol (CF)	4896.7
Net Vol (CF)	2116.0



**Total Volume at Station 225+00.00**

Cut Area (SF)	38.695
Fill Area (SF)	0.000
Cut Vol (CF)	70.4
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	7223.0
Cum Fill Vol (CF)	4896.7
Net Vol (CF)	2326.3





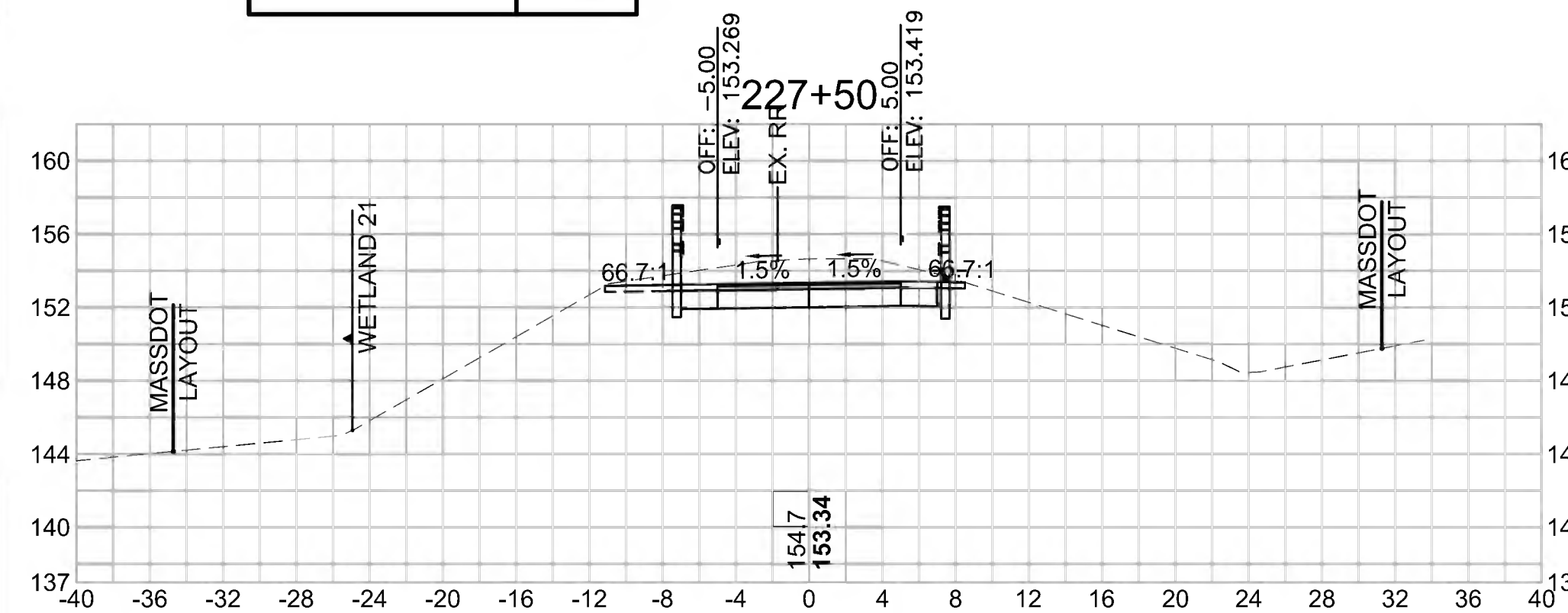
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	275	319
PROJECT FILE NO. 608164			

CROSS SECTIONS

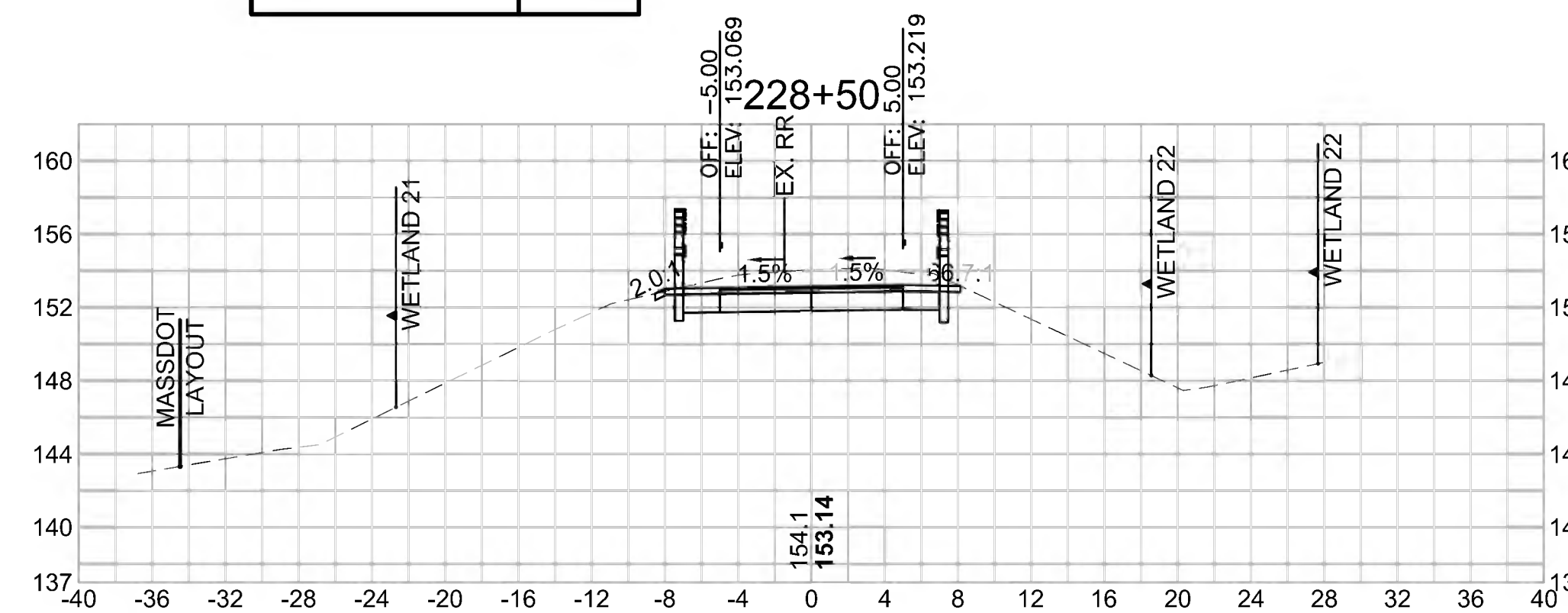
**Total Volume at Station 227+50.00**

Cut Area (SF)	37.191
Fill Area (SF)	0.000
Cut Vol (CF)	70.9
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	7503.2
Cum Fill Vol (CF)	4896.7
Net Vol (CF)	2606.4



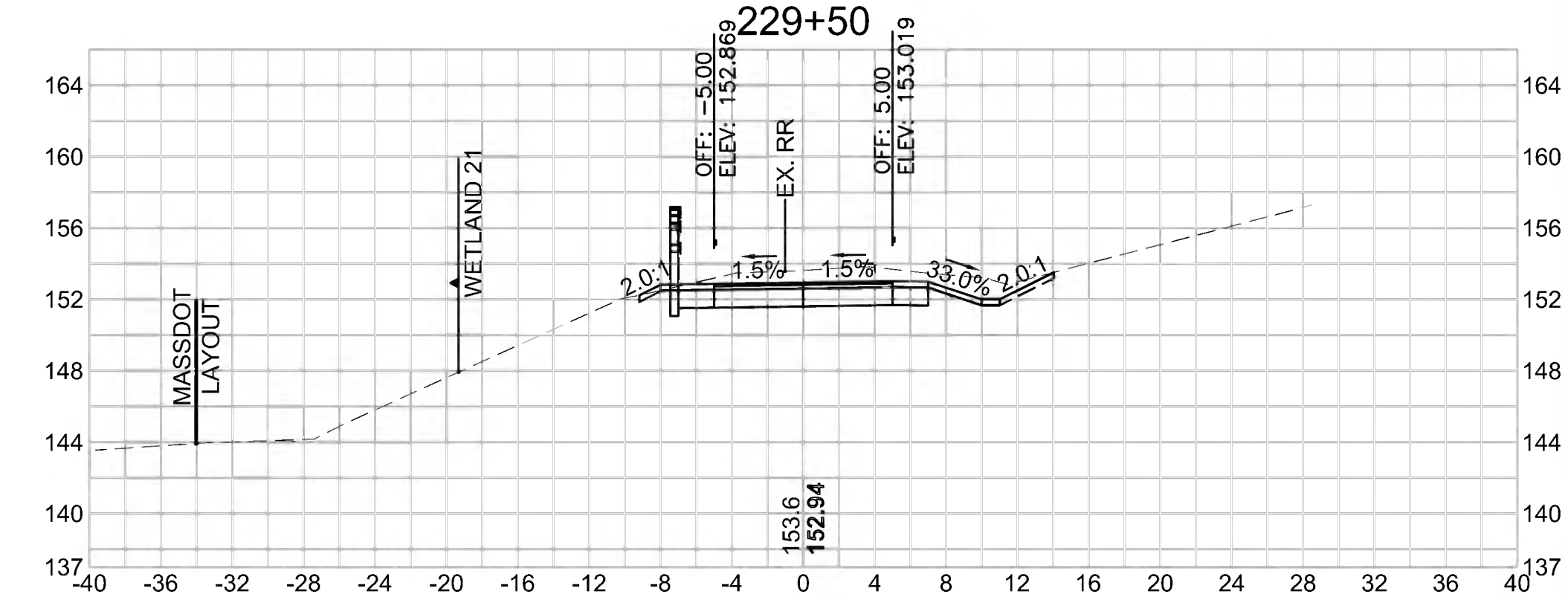
**Total Volume at Station 228+50.00**

Cut Area (SF)	29.980
Fill Area (SF)	0.000
Cut Vol (CF)	59.8
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	7629.5
Cum Fill Vol (CF)	4896.7
Net Vol (CF)	2732.7



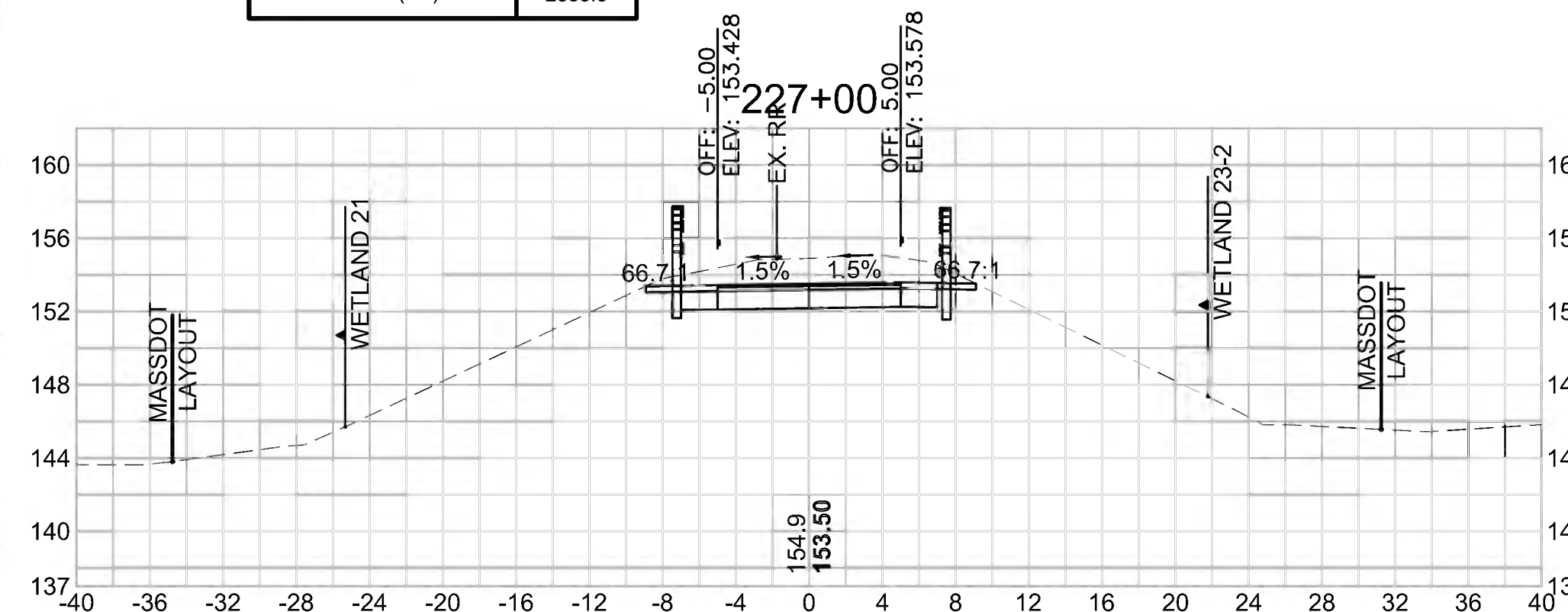
**Total Volume at Station 229+50.00**

Cut Area (SF)	34.762
Fill Area (SF)	0.000
Cut Vol (CF)	58.5
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	7742.1
Cum Fill Vol (CF)	4896.7
Net Vol (CF)	2845.3



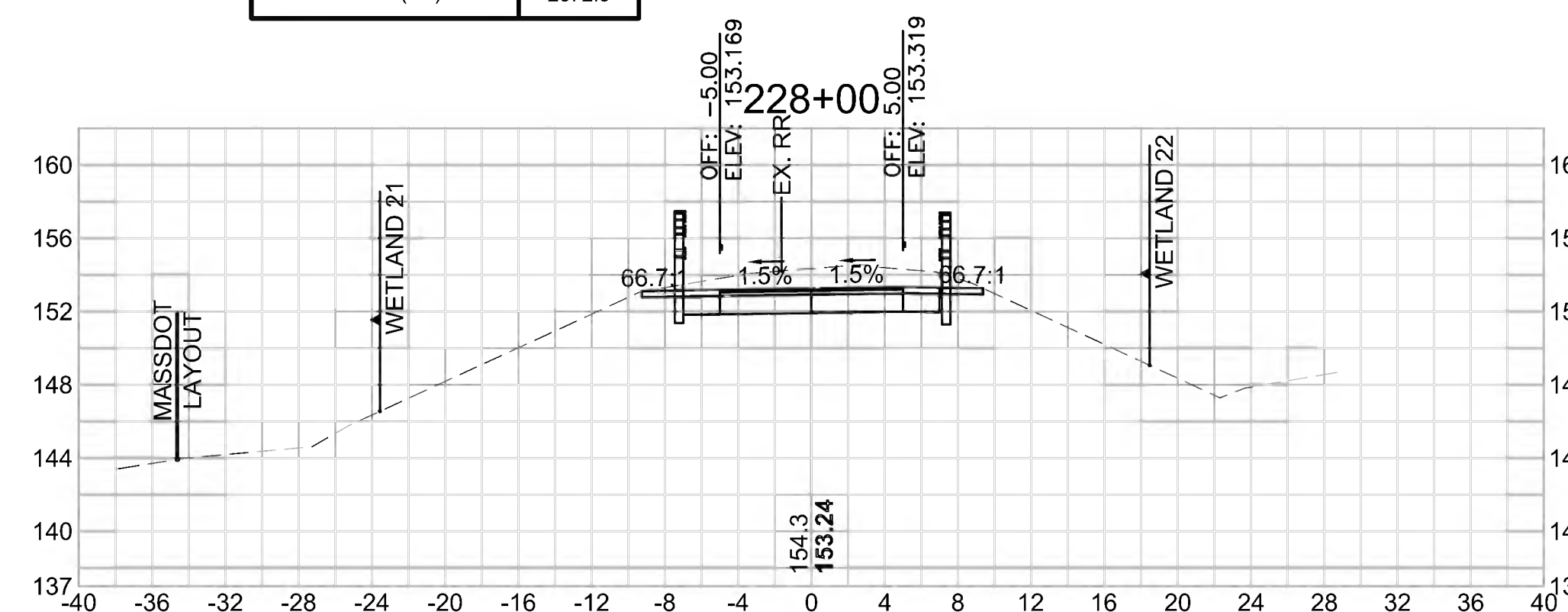
**Total Volume at Station 227+00.00**

Cut Area (SF)	39.361
Fill Area (SF)	0.000
Cut Vol (CF)	71.0
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	7432.3
Cum Fill Vol (CF)	4896.7
Net Vol (CF)	2535.5



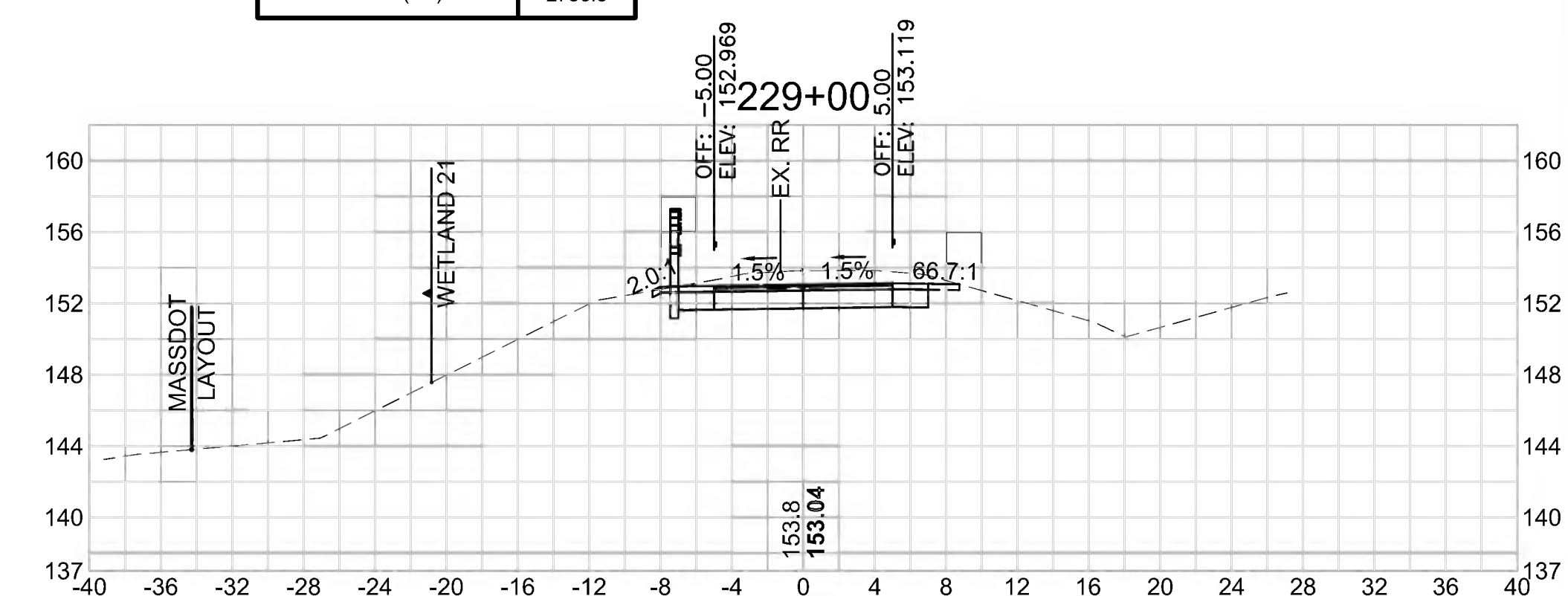
**Total Volume at Station 228+00.00**

Cut Area (SF)	34.618
Fill Area (SF)	0.000
Cut Vol (CF)	66.5
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	7569.7
Cum Fill Vol (CF)	4896.7
Net Vol (CF)	2672.9



**Total Volume at Station 229+00.00**

Cut Area (SF)	28.437
Fill Area (SF)	0.000
Cut Vol (CF)	54.1
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	7683.6
Cum Fill Vol (CF)	4896.7
Net Vol (CF)	2786.8



SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	276	319
PROJECT FILE NO. 608164			

CROSS SECTIONS

608164.XSEC(CROSS SECTION LAYOUTS).DWG 27-Jun-2022

**Total Volume at Station 230+50.00**

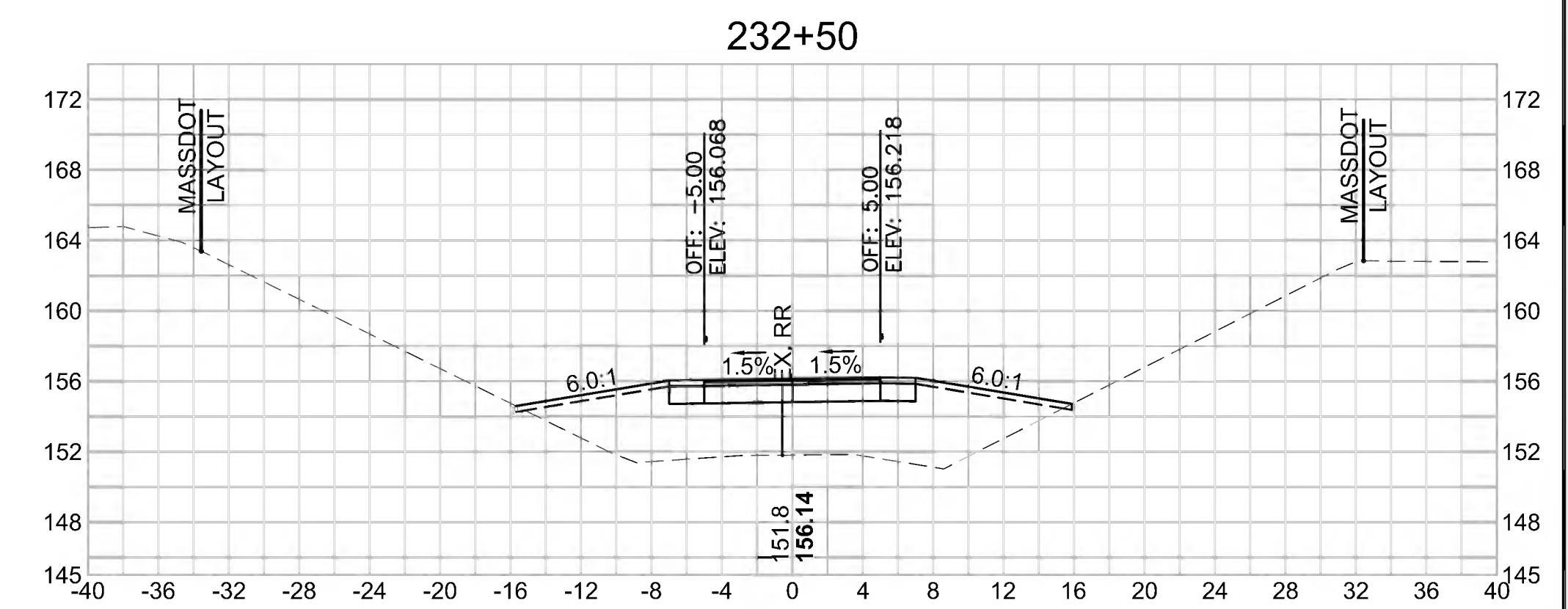
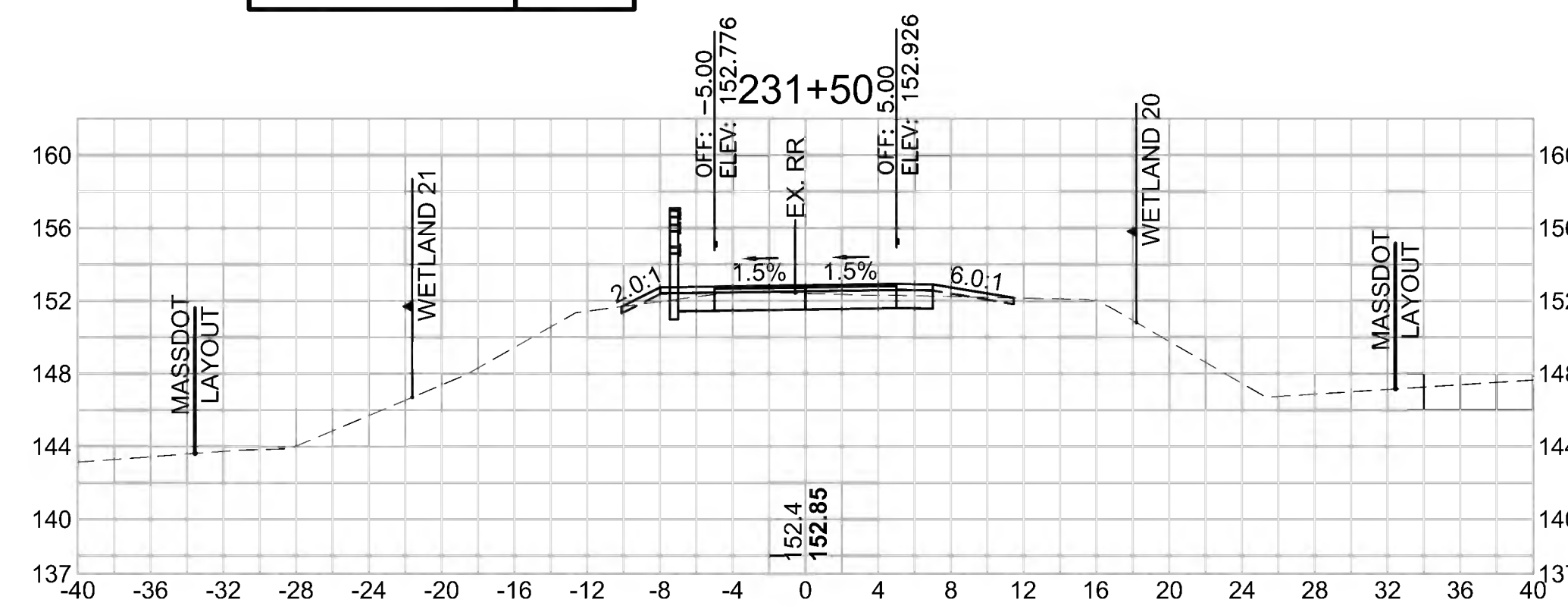
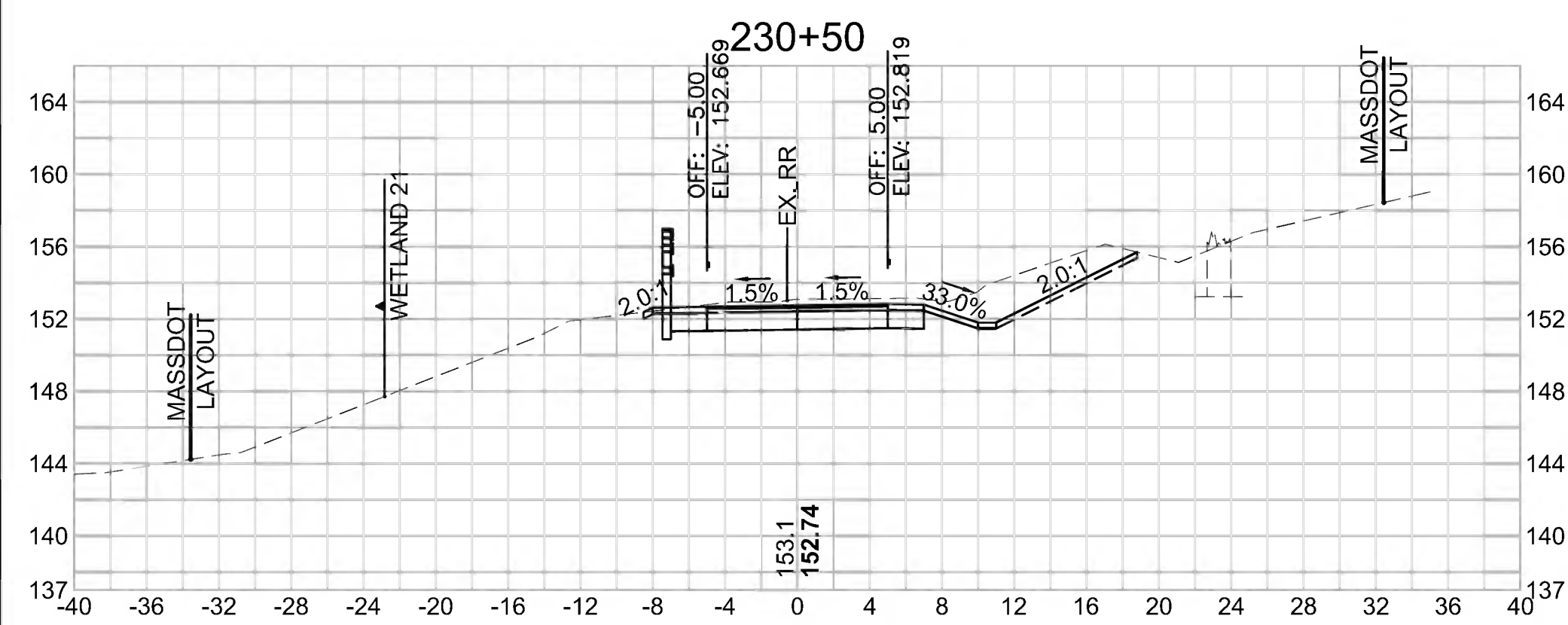
Cut Area (SF)	42.910
Fill Area (SF)	0.000
Cut Vol (CF)	79.0
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	7892.4
Cum Fill Vol (CF)	4897.2
Net Vol (CF)	2995.3

**Total Volume at Station 231+50.00**

Cut Area (SF)	15.865
Fill Area (SF)	0.944
Cut Vol (CF)	35.9
Fill Vol (CF)	0.9
Cum Cut Vol (CF)	7989.4
Cum Fill Vol (CF)	4898.1
Net Vol (CF)	3091.3

**Total Volume at Station 232+50.00**

Cut Area (SF)	0.170
Fill Area (SF)	86.992
Cut Vol (CF)	0.7
Fill Vol (CF)	112.3
Cum Cut Vol (CF)	8005.4
Cum Fill Vol (CF)	5043.0
Net Vol (CF)	2962.3



**Total Volume at Station 230+00.00**

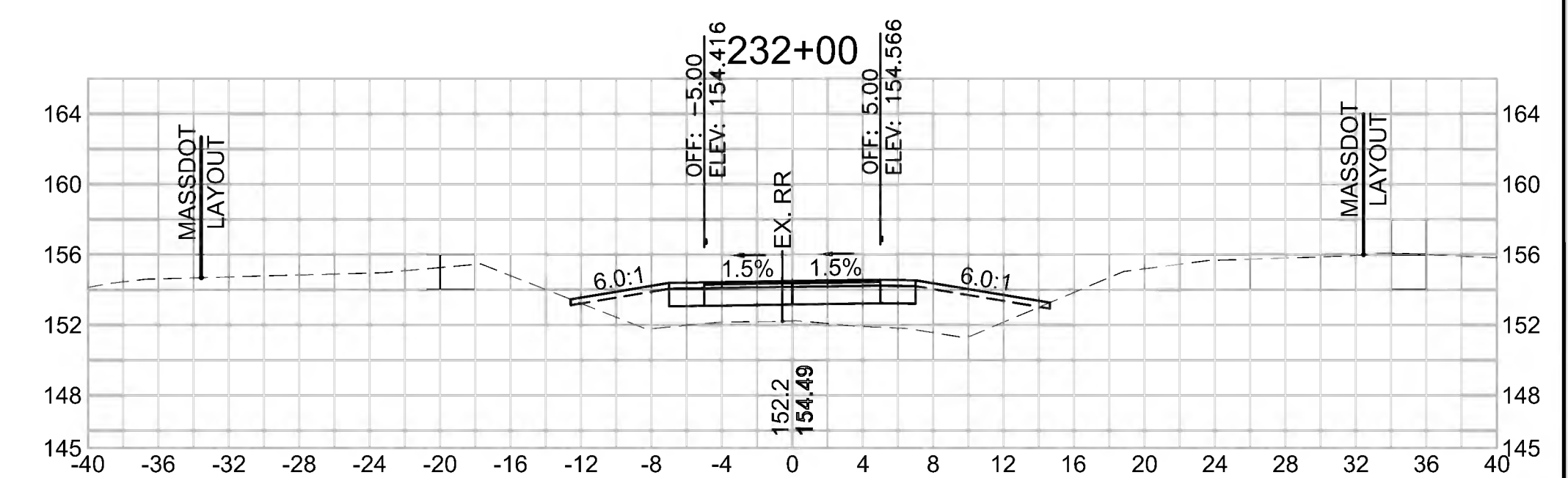
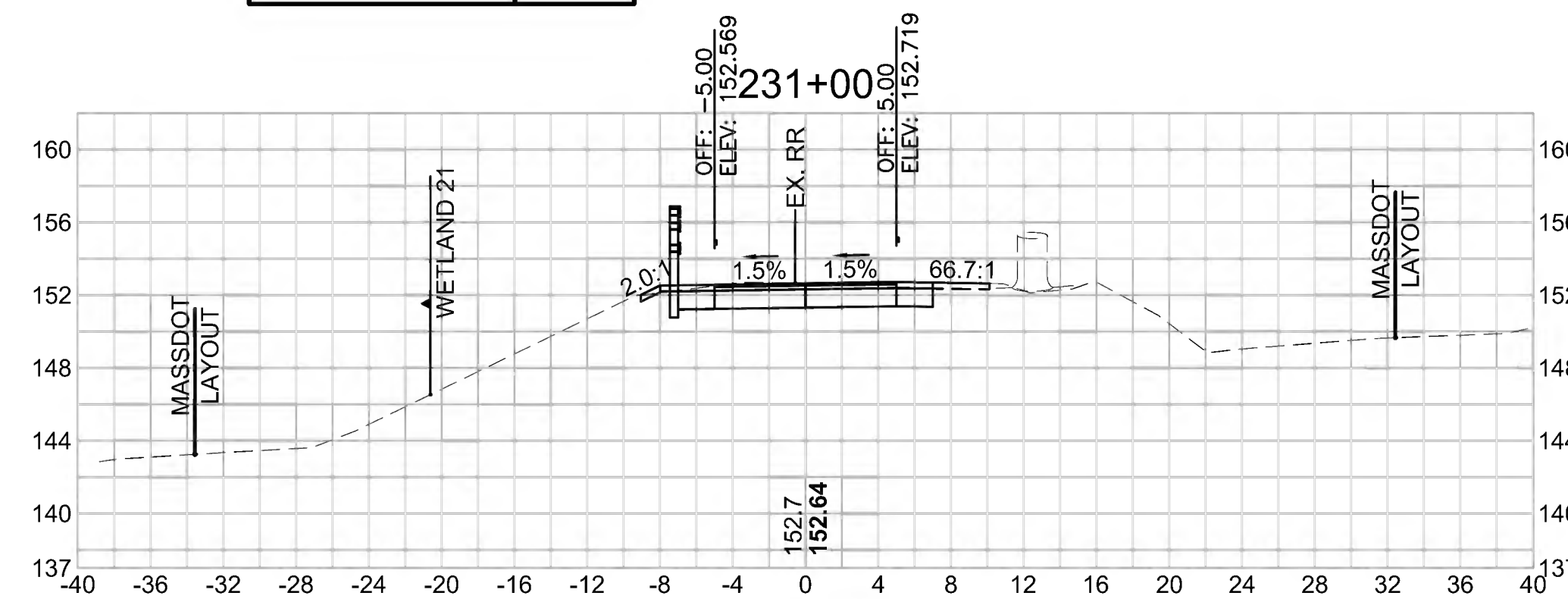
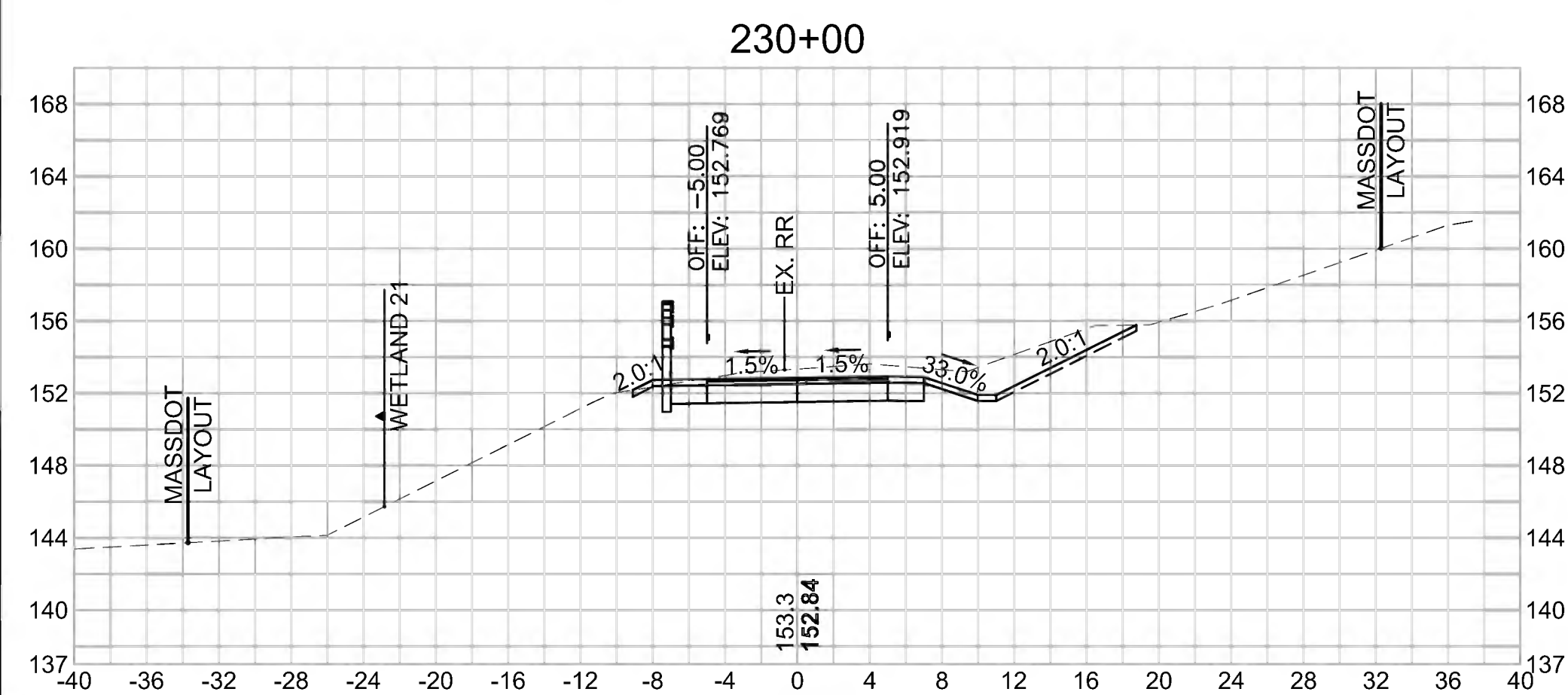
Cut Area (SF)	42.357
Fill Area (SF)	0.240
Cut Vol (CF)	71.4
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	7813.5
Cum Fill Vol (CF)	4897.0
Net Vol (CF)	2916.5

**Total Volume at Station 231+00.00**

Cut Area (SF)	22.956
Fill Area (SF)	0.022
Cut Vol (CF)	61.0
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	7953.4
Cum Fill Vol (CF)	4897.2
Net Vol (CF)	3056.2

**Total Volume at Station 232+00.00**

Cut Area (SF)	0.632
Fill Area (SF)	34.305
Cut Vol (CF)	15.3
Fill Vol (CF)	32.6
Cum Cut Vol (CF)	8004.6
Cum Fill Vol (CF)	4930.7
Net Vol (CF)	3073.9



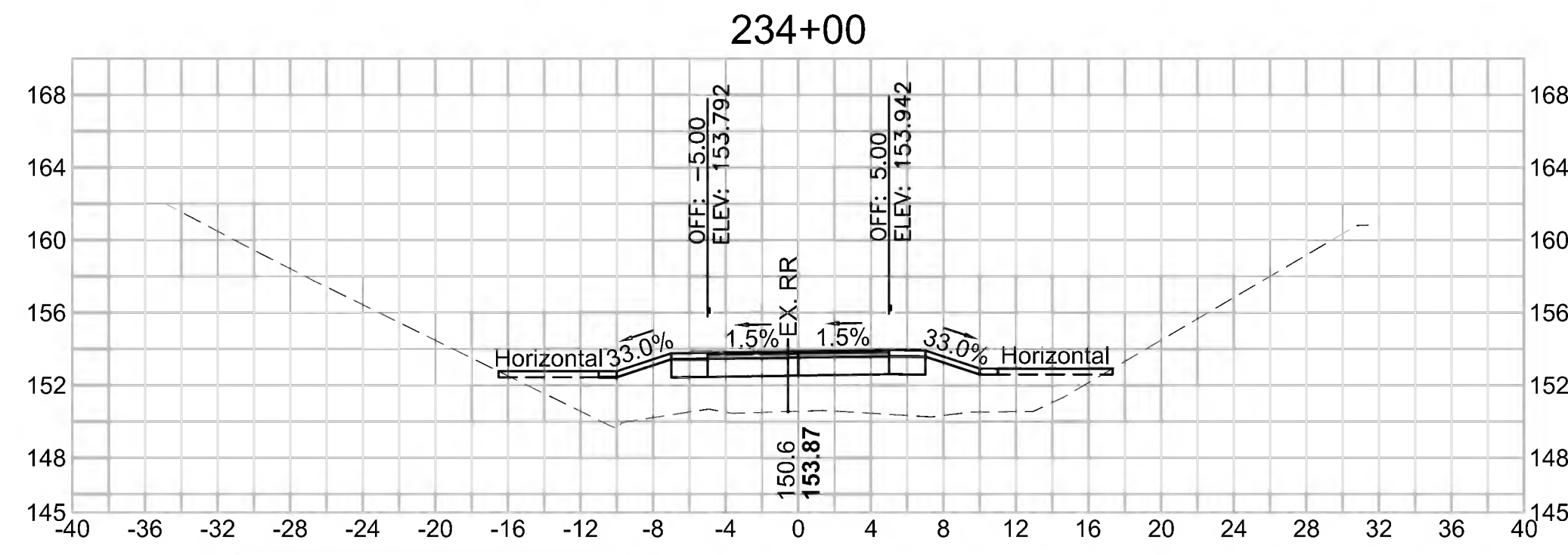


SUDBURY  
BRUCE FREEMAN RAIL TRAIL

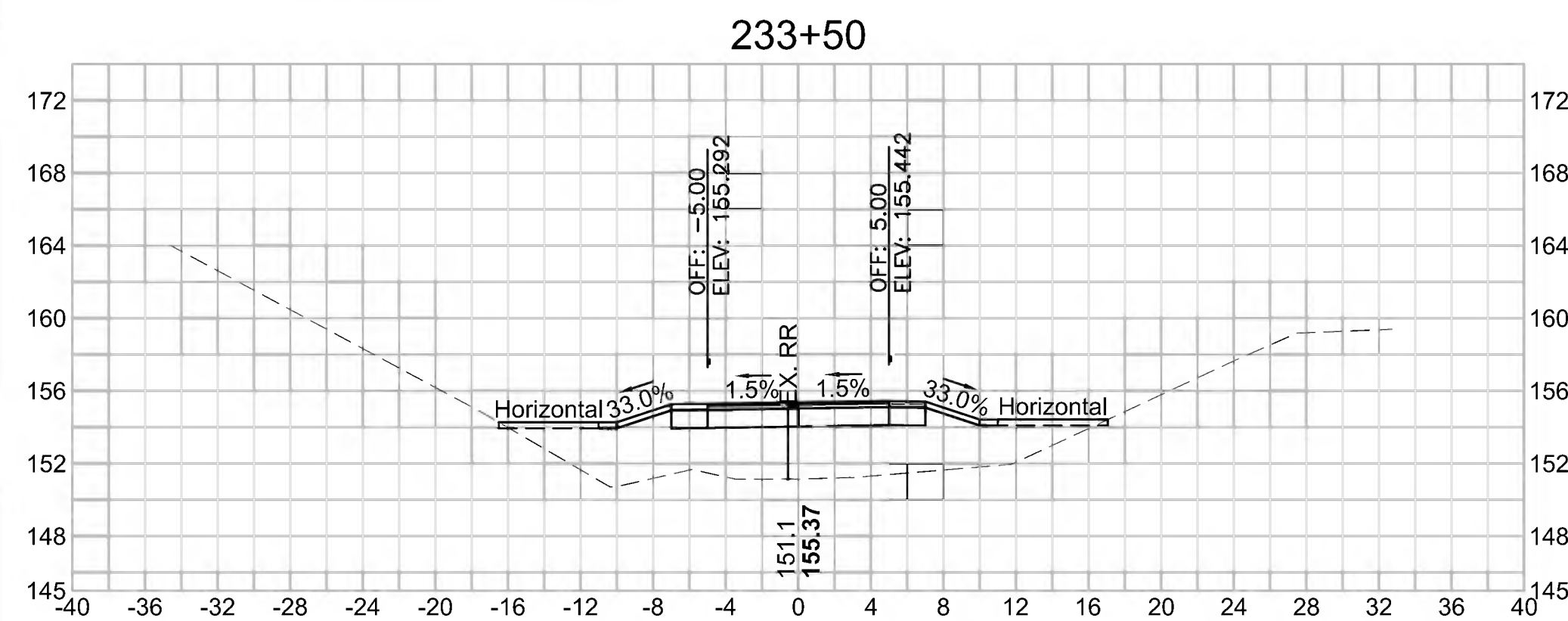
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	277	319
PROJECT FILE NO. 608164			

CROSS SECTIONS

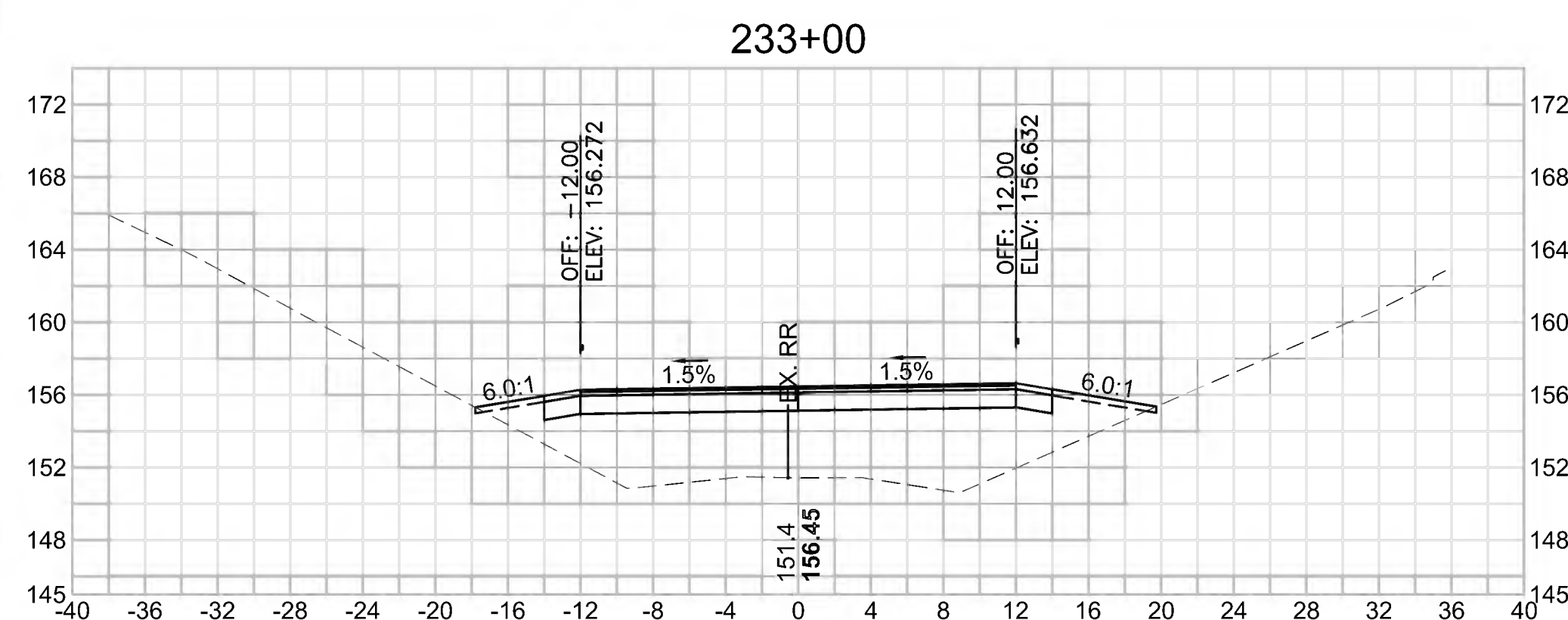
Total Volume at Station 234+00.00	
Cut Area (SF)	0.204
Fill Area (SF)	63.421
Cut Vol (CF)	0.6
Fill Vol (CF)	129.1
Cum Cut Vol (CF)	8006.8
Cum Fill Vol (CF)	5534.7
Net Vol (CF)	2472.1



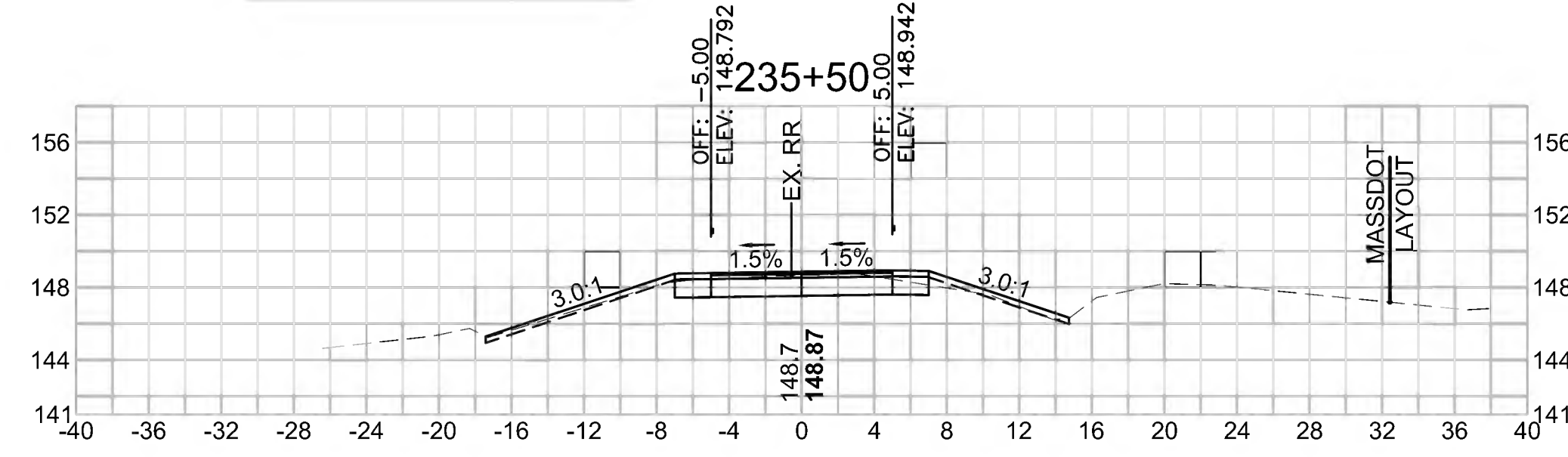
Total Volume at Station 233+50.00	
Cut Area (SF)	0.425
Fill Area (SF)	76.015
Cut Vol (CF)	0.6
Fill Vol (CF)	176.2
Cum Cut Vol (CF)	8006.3
Cum Fill Vol (CF)	5405.6
Net Vol (CF)	2600.6



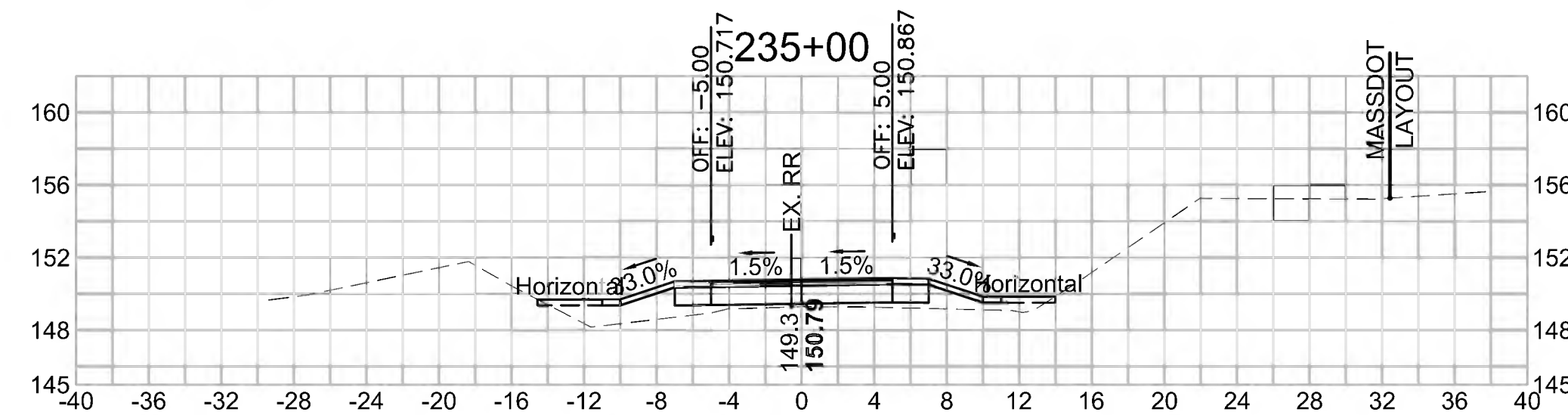
Total Volume at Station 233+00.00	
Cut Area (SF)	0.174
Fill Area (SF)	114.285
Cut Vol (CF)	0.3
Fill Vol (CF)	186.4
Cum Cut Vol (CF)	8005.7
Cum Fill Vol (CF)	5229.4
Net Vol (CF)	2776.3



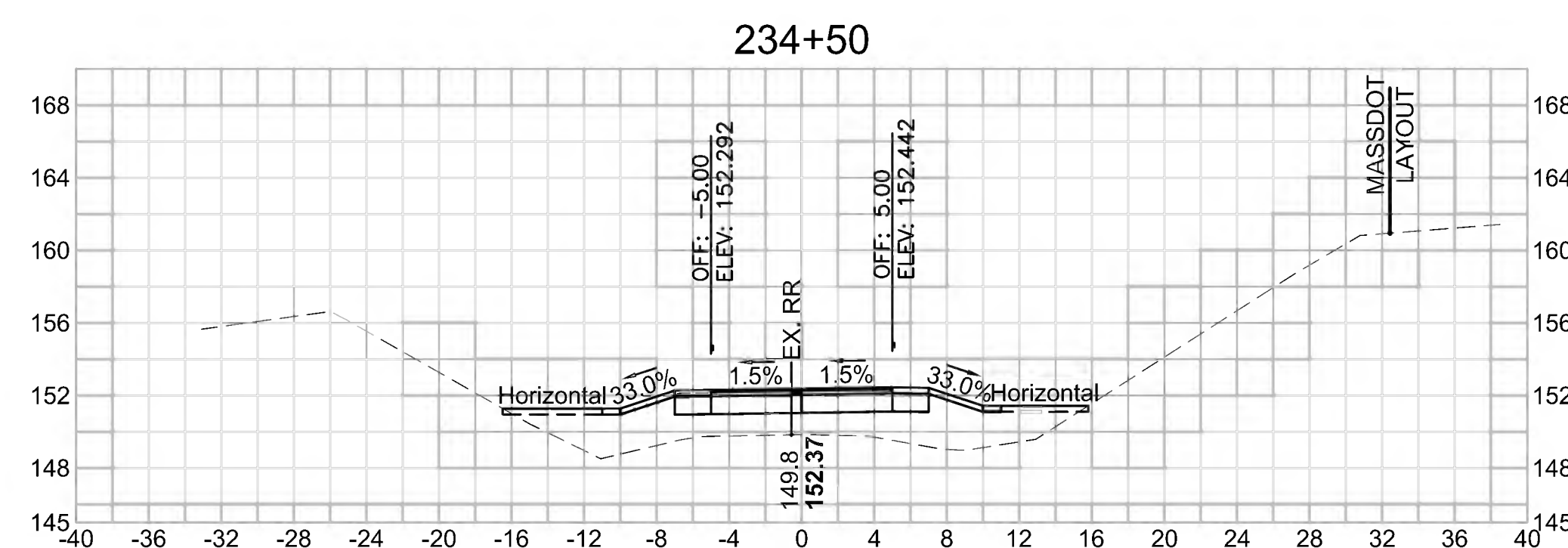
Total Volume at Station 235+50.00	
Cut Area (SF)	16.354
Fill Area (SF)	0.584
Cut Vol (CF)	16.3
Fill Vol (CF)	14.4
Cum Cut Vol (CF)	8024.8
Cum Fill Vol (CF)	5711.9
Net Vol (CF)	2312.9



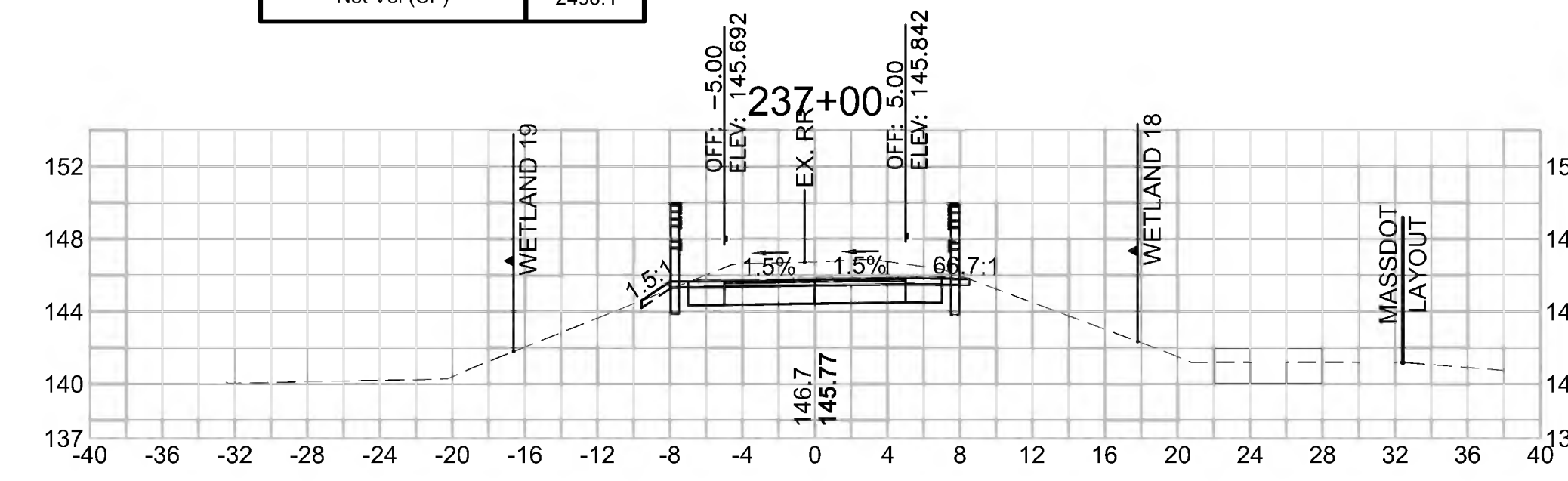
Total Volume at Station 235+00.00	
Cut Area (SF)	1.240
Fill Area (SF)	14.979
Cut Vol (CF)	1.3
Fill Vol (CF)	59.0
Cum Cut Vol (CF)	8008.5
Cum Fill Vol (CF)	5697.5
Net Vol (CF)	2311.0



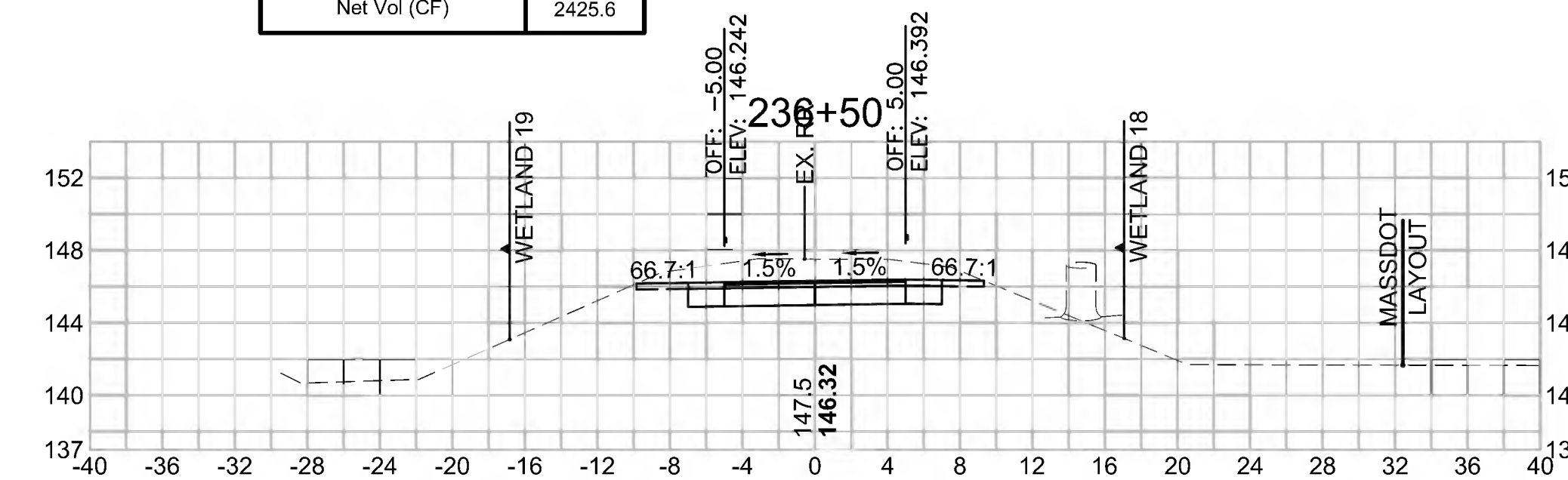
Total Volume at Station 234+50.00	
Cut Area (SF)	0.181
Fill Area (SF)	48.716
Cut Vol (CF)	0.4
Fill Vol (CF)	103.8
Cum Cut Vol (CF)	8007.2
Cum Fill Vol (CF)	5638.6
Net Vol (CF)	2368.6



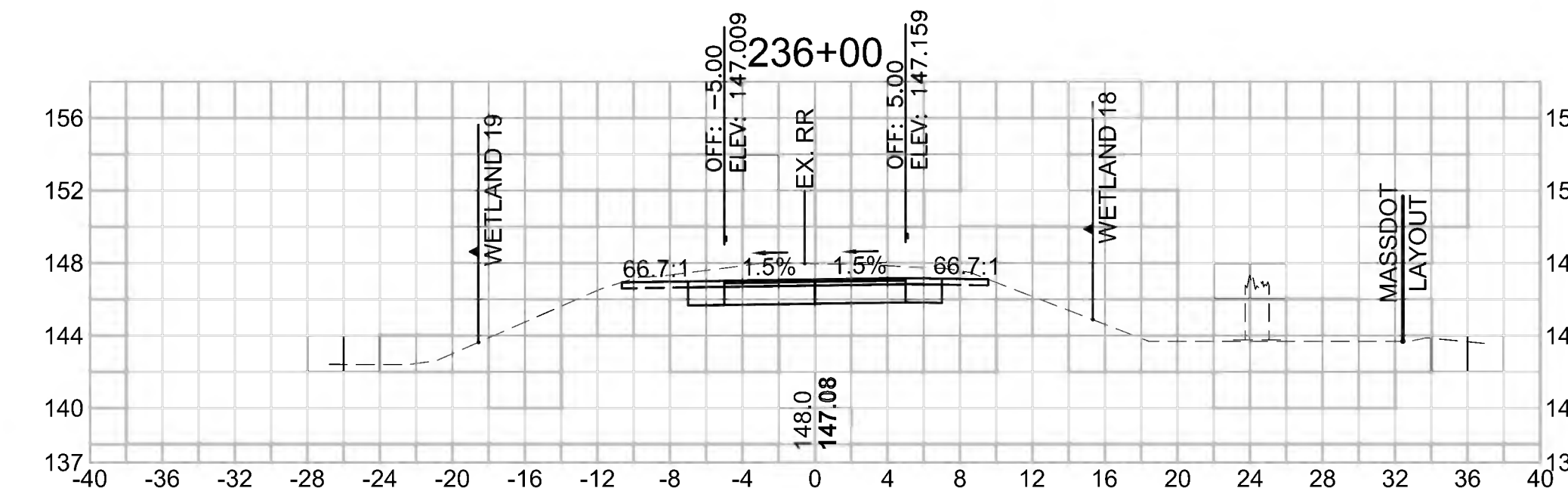
Total Volume at Station 237+00.00	
Cut Area (SF)	31.543
Fill Area (SF)	0.012
Cut Vol (CF)	64.5
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	8202.6
Cum Fill Vol (CF)	5712.5
Net Vol (CF)	2490.1



Total Volume at Station 236+50.00	
Cut Area (SF)	38.158
Fill Area (SF)	0.000
Cut Vol (CF)	66.7
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	8138.0
Cum Fill Vol (CF)	5712.5
Net Vol (CF)	2425.6



Total Volume at Station 236+00.00	
Cut Area (SF)	33.891
Fill Area (SF)	0.000
Cut Vol (CF)	46.5
Fill Vol (CF)	0.5
Cum Cut Vol (CF)	8071.3
Cum Fill Vol (CF)	5712.5
Net Vol (CF)	2358.8



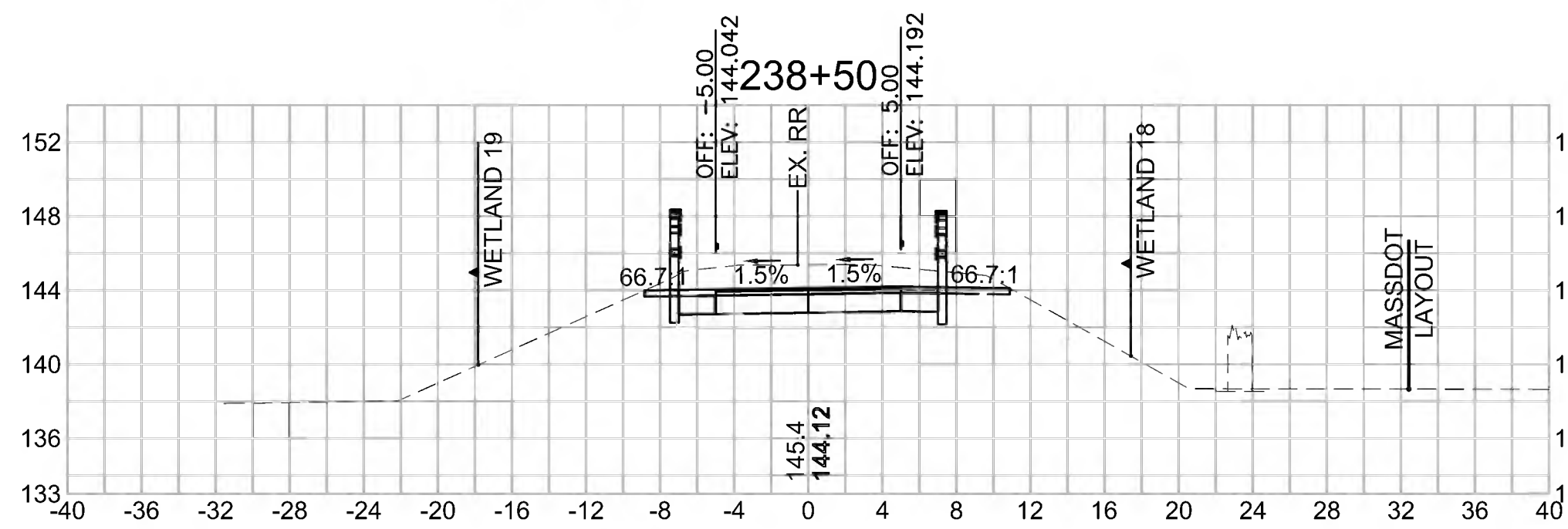
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	278	319

CROSS SECTIONS

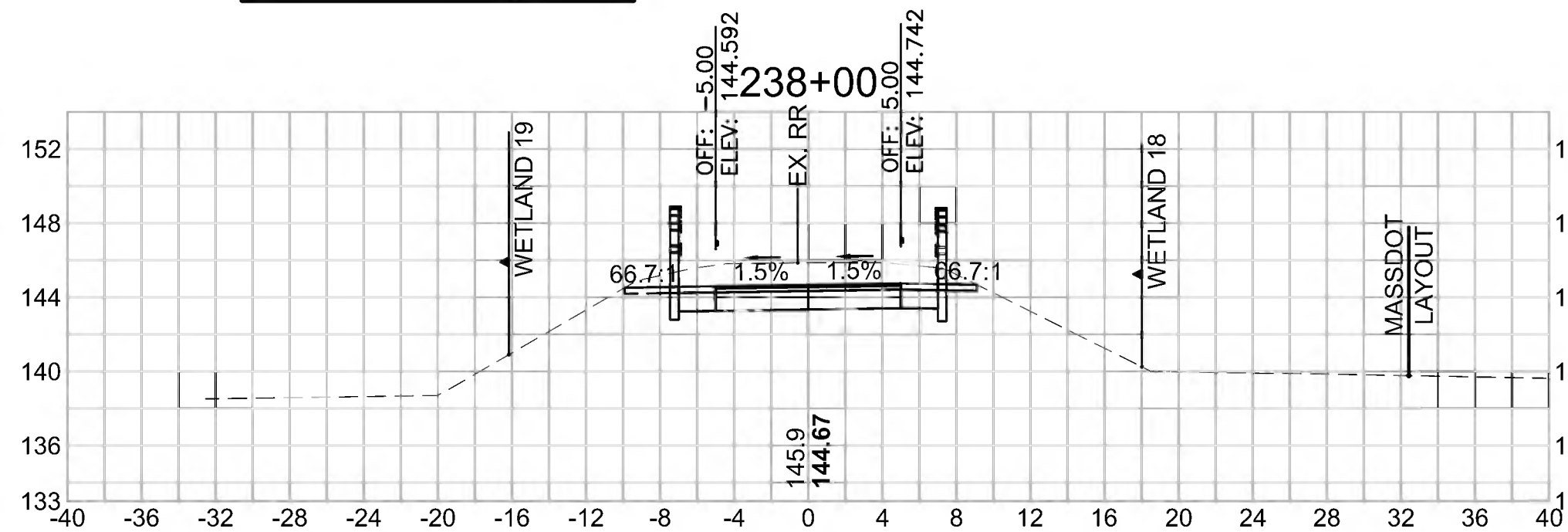
**Total Volume at Station 238+50.00**

Cut Area (SF)	40.123
Fill Area (SF)	0.000
Cut Vol (CF)	72.8
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	8403.8
Cum Fill Vol (CF)	5712.5
Net Vol (CF)	2691.3



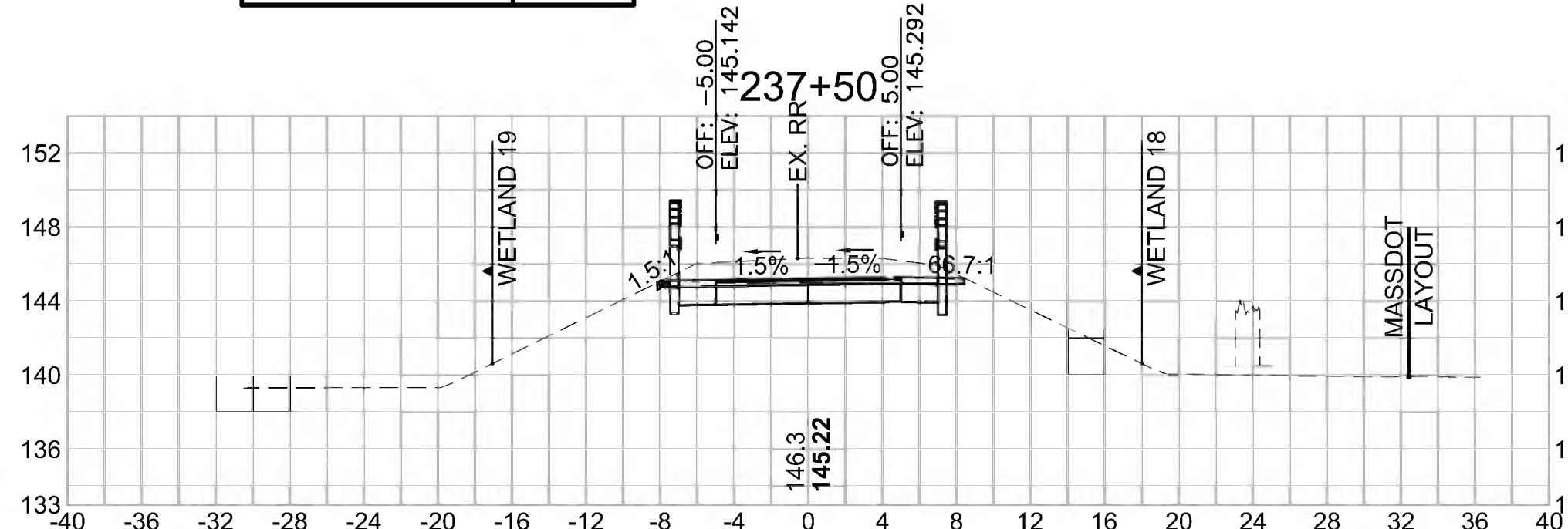
**Total Volume at Station 238+00.00**

Cut Area (SF)	38.481
Fill Area (SF)	0.000
Cut Vol (CF)	67.4
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	8331.0
Cum Fill Vol (CF)	5712.5
Net Vol (CF)	2618.5



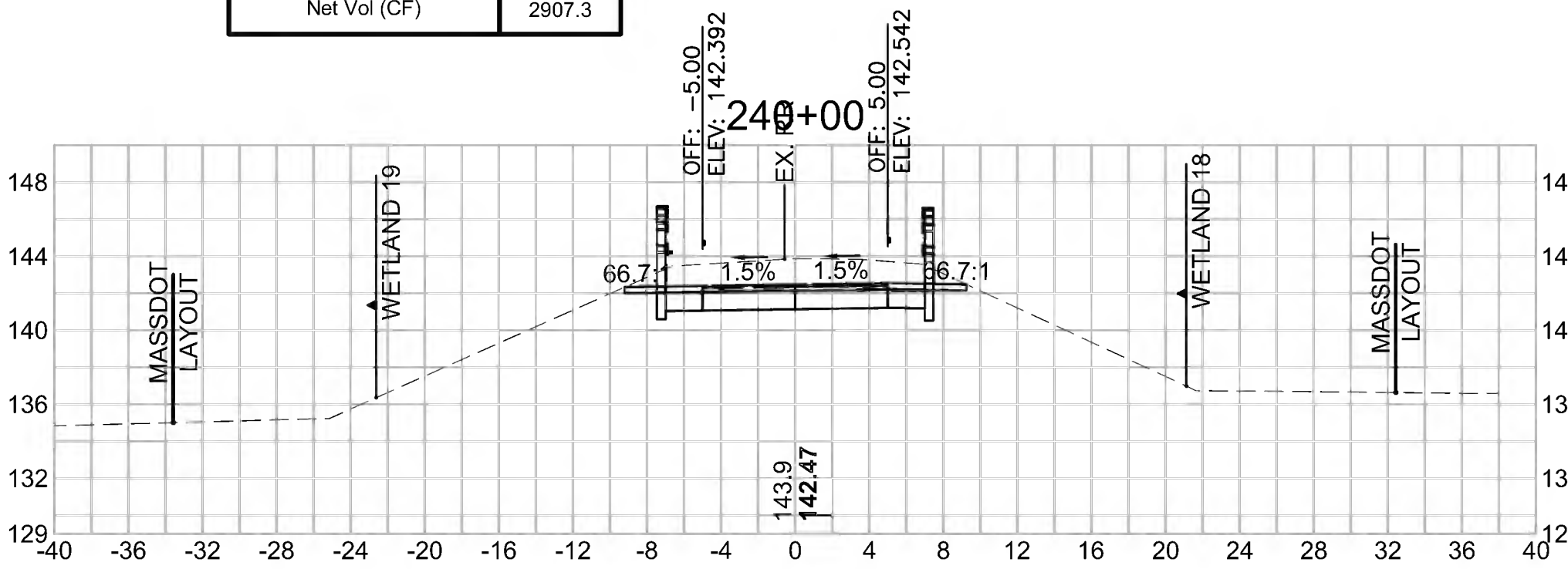
**Total Volume at Station 237+50.00**

Cut Area (SF)	34.340
Fill Area (SF)	0.000
Cut Vol (CF)	61.0
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	8263.6
Cum Fill Vol (CF)	5712.5
Net Vol (CF)	2551.1



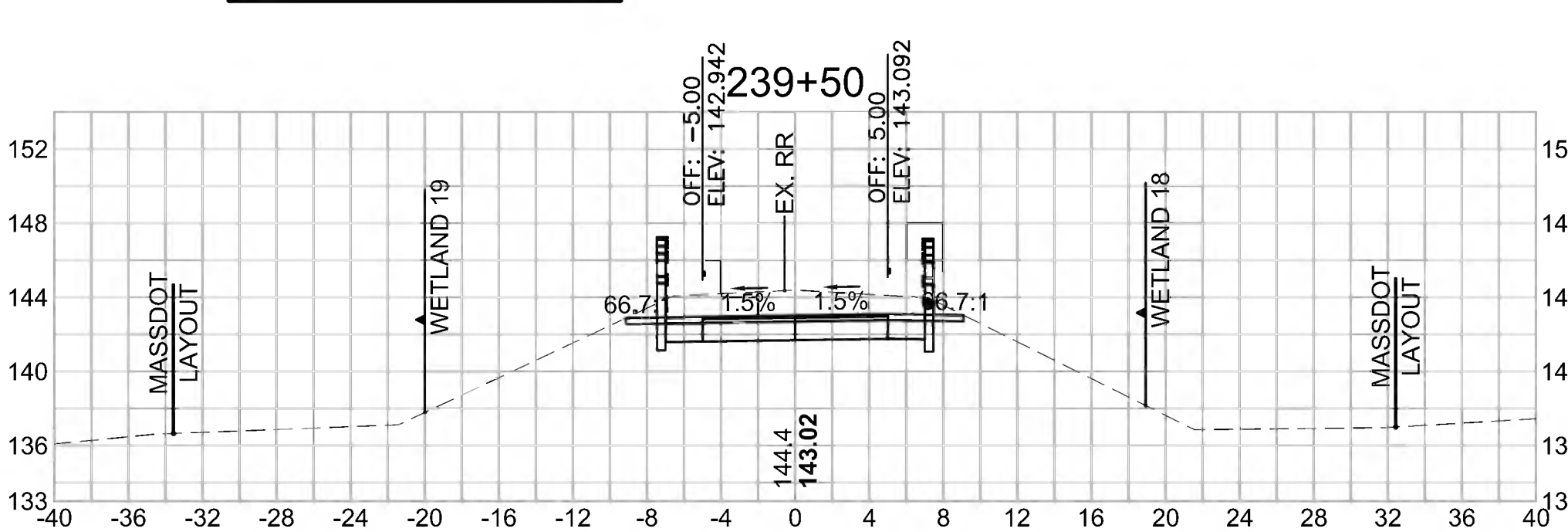
**Total Volume at Station 240+00.00**

Cut Area (SF)	39.826
Fill Area (SF)	0.000
Cut Vol (CF)	72.7
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	8619.8
Cum Fill Vol (CF)	5712.5
Net Vol (CF)	2907.3



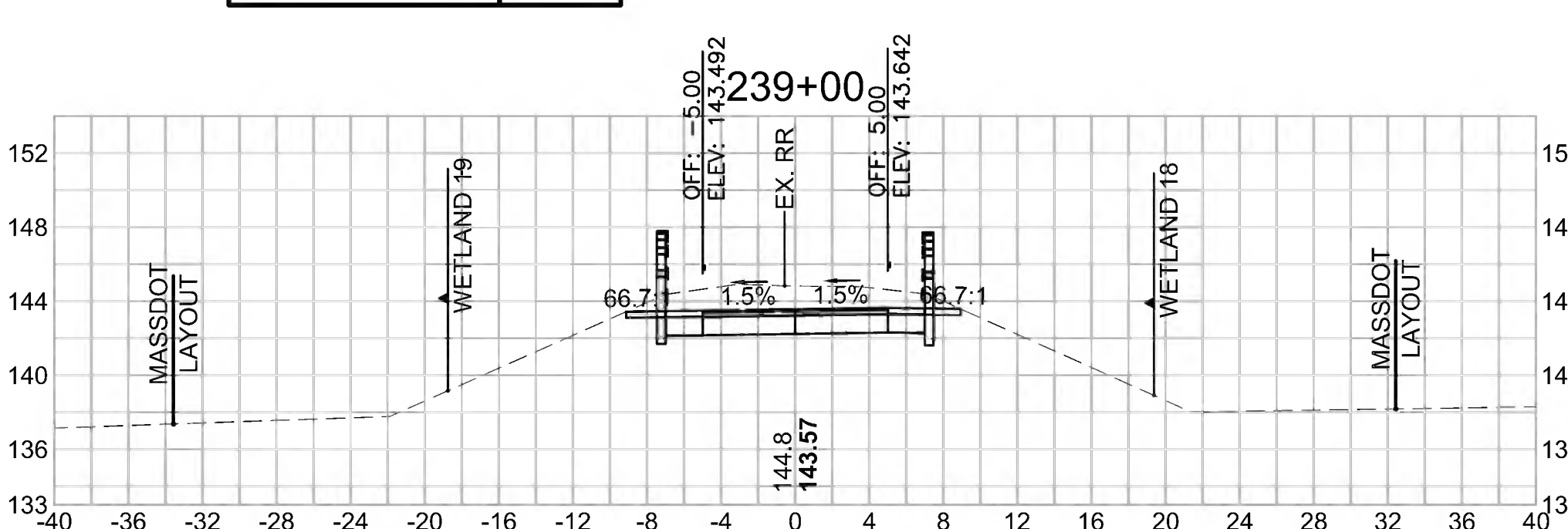
**Total Volume at Station 239+50.00**

Cut Area (SF)	38.714
Fill Area (SF)	0.000
Cut Vol (CF)	71.0
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	8547.1
Cum Fill Vol (CF)	5712.5
Net Vol (CF)	2834.6



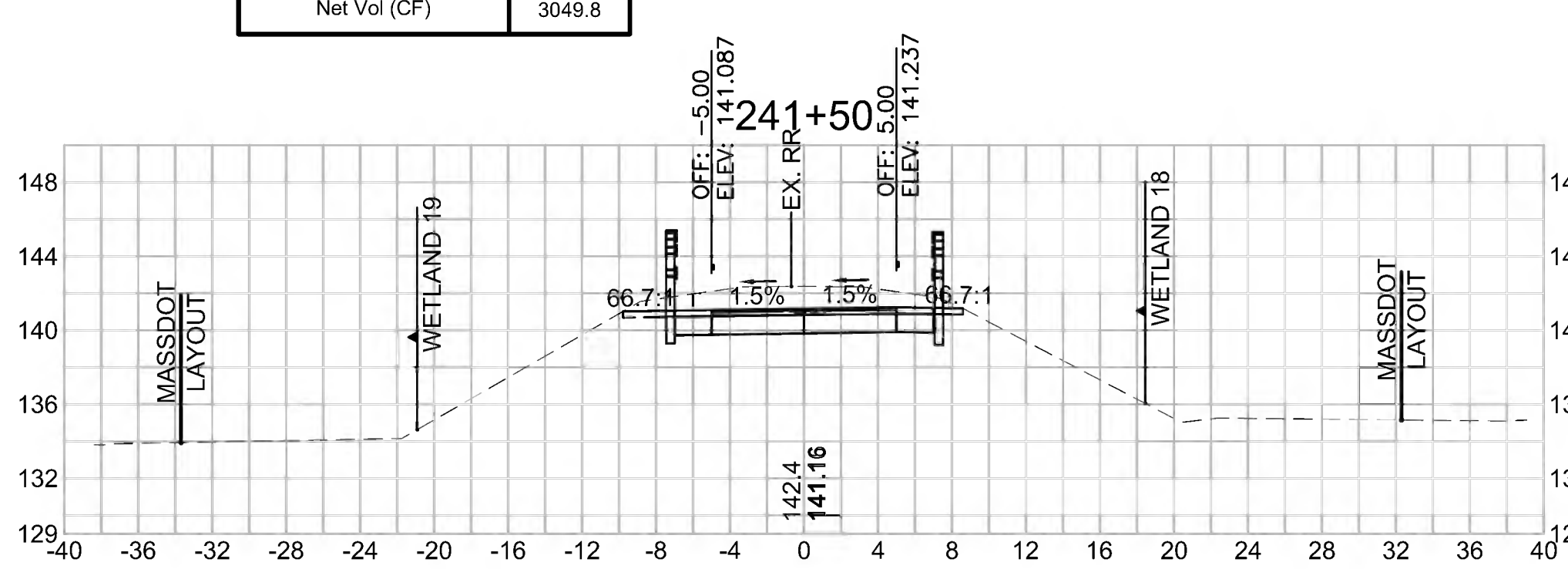
**Total Volume at Station 239+00.00**

Cut Area (SF)	37.978
Fill Area (SF)	0.000
Cut Vol (CF)	72.3
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	8476.1
Cum Fill Vol (CF)	5712.5
Net Vol (CF)	2763.6



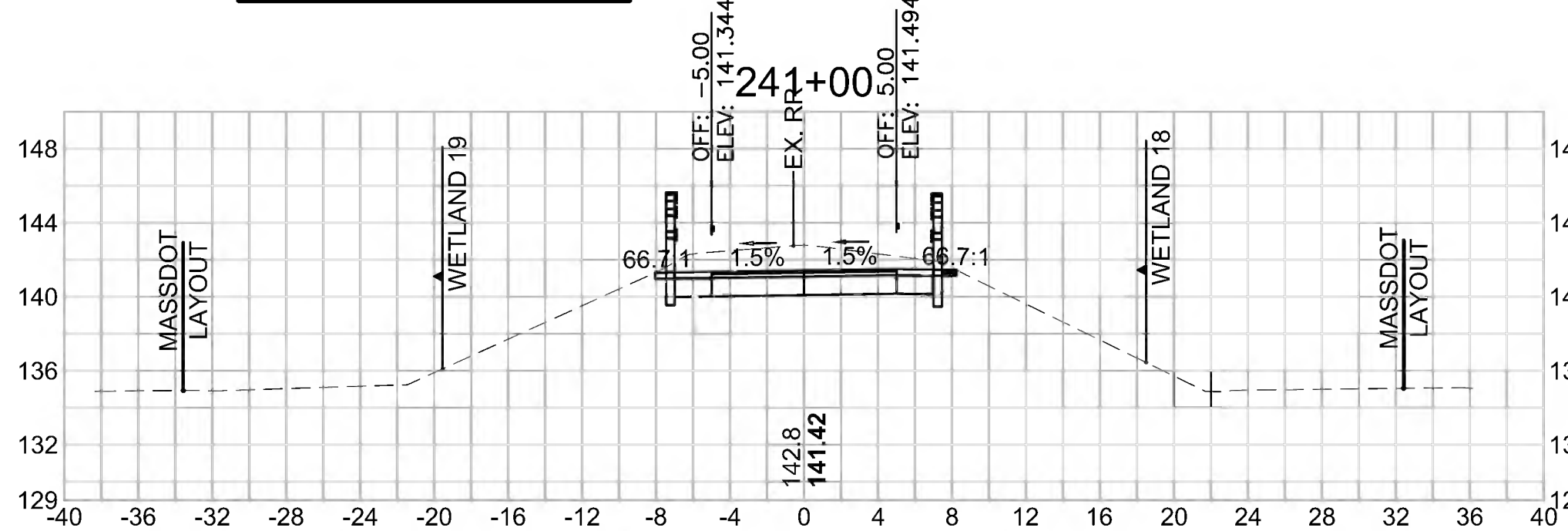
**Total Volume at Station 241+50.00**

Cut Area (SF)	36.860
Fill Area (SF)	58.543
Cut Vol (CF)	66.2
Fill Vol (CF)	60.7
Cum Cut Vol (CF)	8829.6
Cum Fill Vol (CF)	5779.7
Net Vol (CF)	3049.8



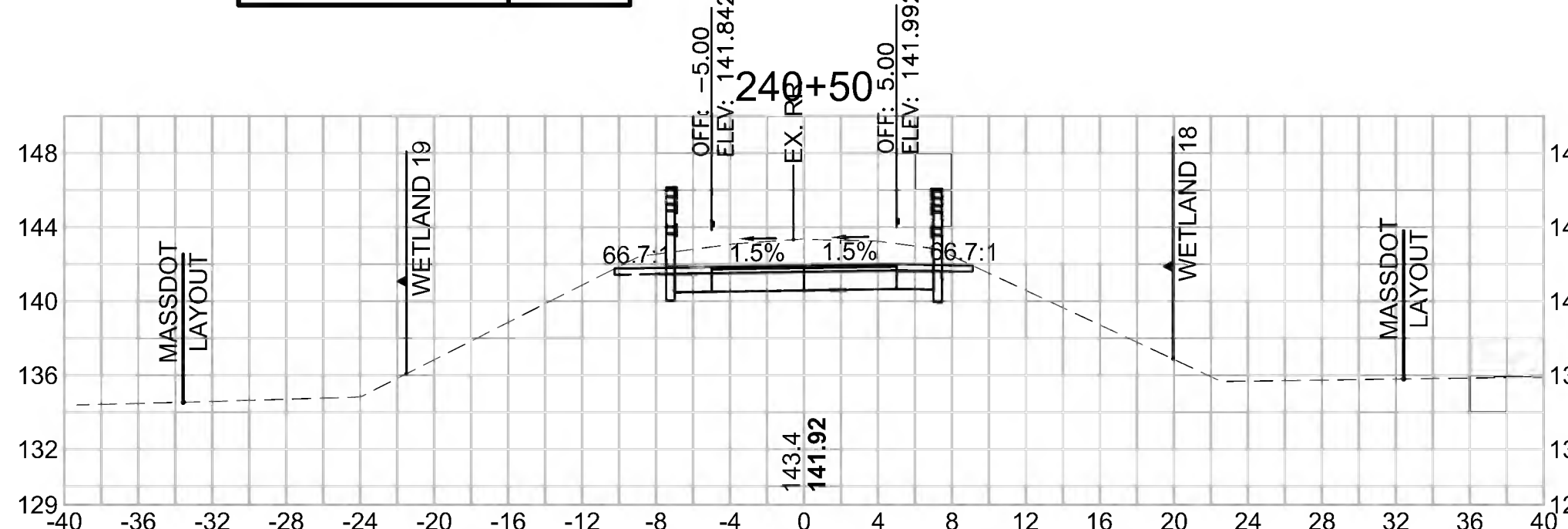
**Total Volume at Station 241+00.00**

Cut Area (SF)	34.587
Fill Area (SF)	7.031
Cut Vol (CF)	69.4
Fill Vol (CF)	6.5
Cum Cut Vol (CF)	8763.4
Cum Fill Vol (CF)	5719.0
Net Vol (CF)	3044.4



**Total Volume at Station 240+50.00**

Cut Area (SF)	40.318
Fill Area (SF)	0.000
Cut Vol (CF)	74.2
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	8694.0
Cum Fill Vol (CF)	5712.5
Net Vol (CF)	2981.5





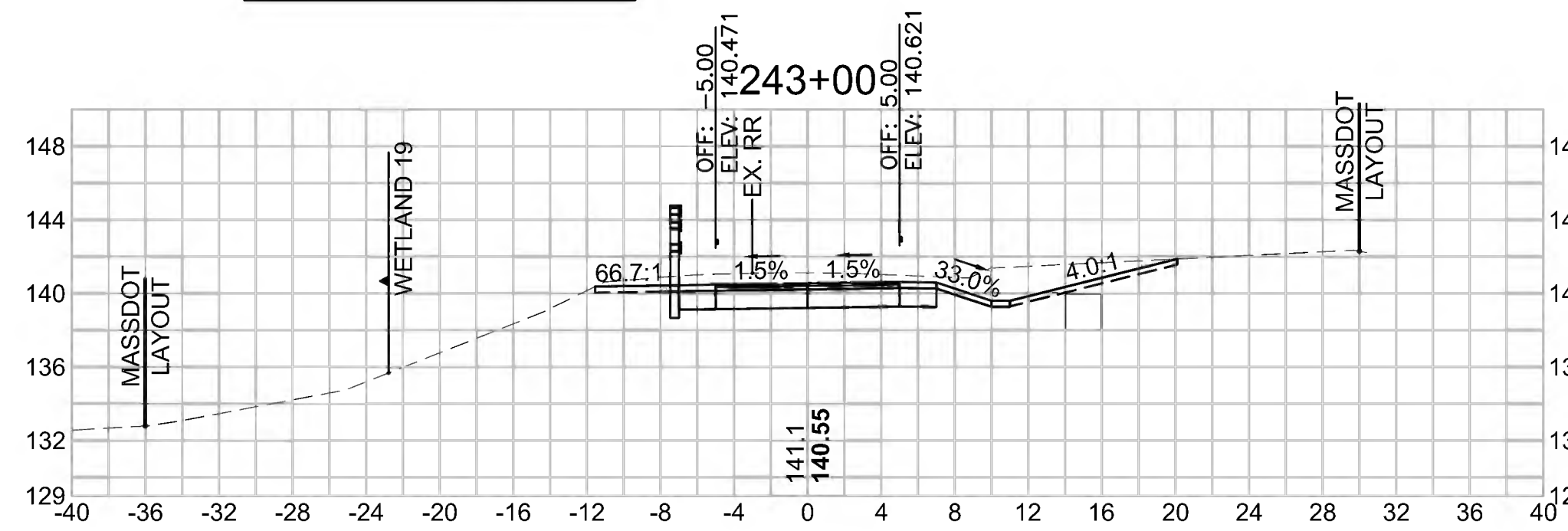
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	279	319
PROJECT FILE NO. 608164			

CROSS SECTIONS

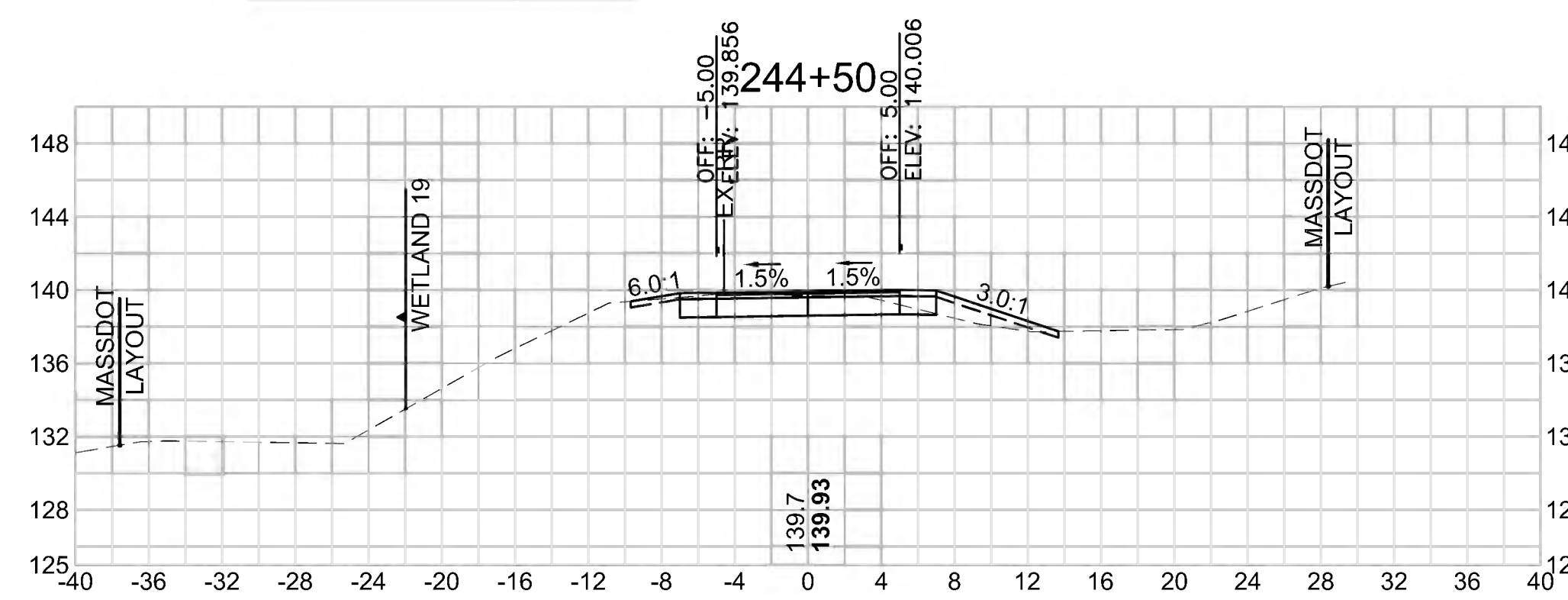
**Total Volume at Station 243+00.00**

Cut Area (SF)	46,014
Fill Area (SF)	9,458
Cut Vol (CF)	95.3
Fill Vol (CF)	18.8
Cum Cut Vol (CF)	9086.8
Cum Fill Vol (CF)	5894.2
Net Vol (CF)	3192.6



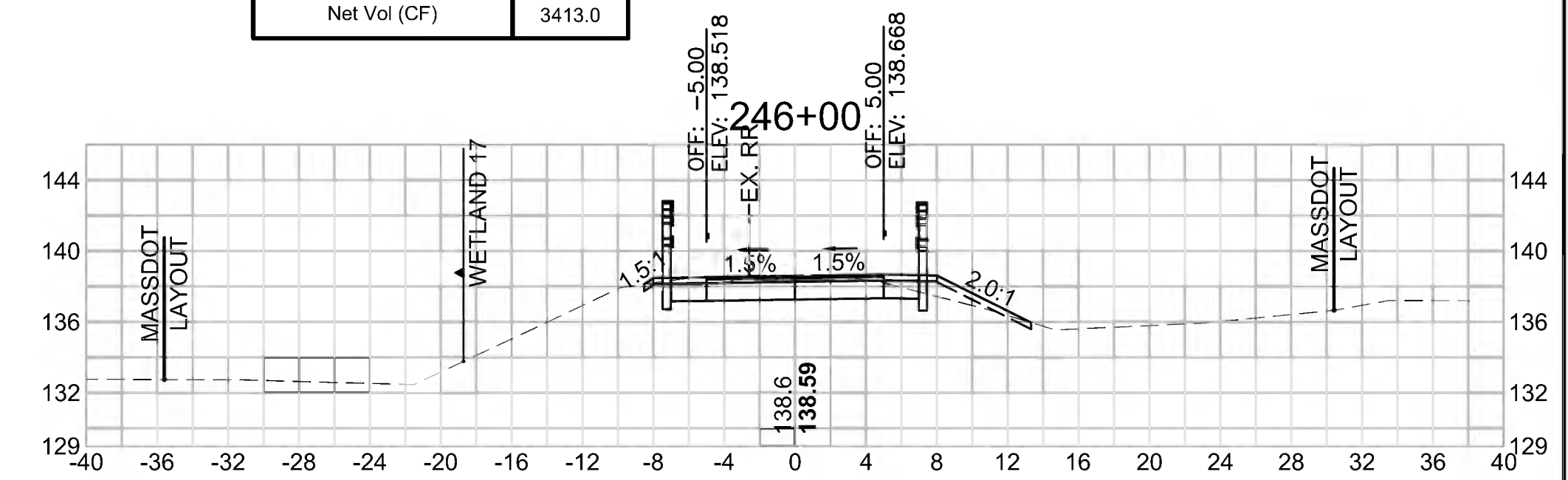
**Total Volume at Station 244+50.00**

Cut Area (SF)	14,460
Fill Area (SF)	3,195
Cut Vol (CF)	32.6
Fill Vol (CF)	3.1
Cum Cut Vol (CF)	9259.5
Cum Fill Vol (CF)	5906.2
Net Vol (CF)	3353.3



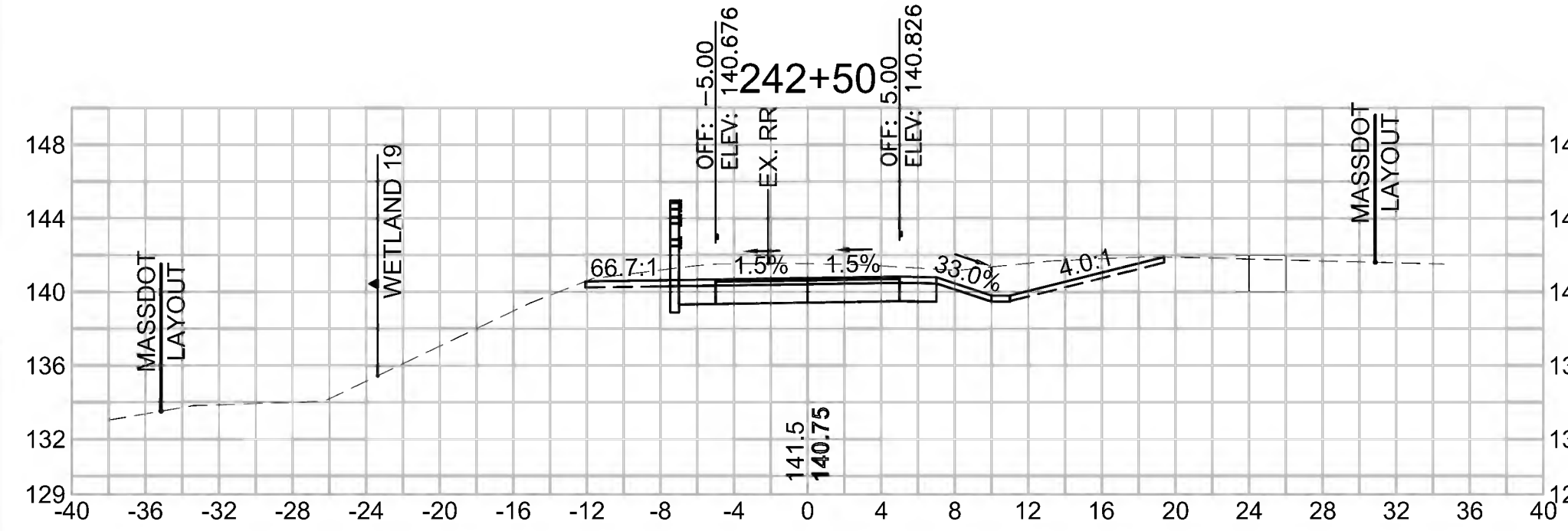
**Total Volume at Station 246+00.00**

Cut Area (SF)	17,273
Fill Area (SF)	2,105
Cut Vol (CF)	27.2
Fill Vol (CF)	10.7
Cum Cut Vol (CF)	9343.4
Cum Fill Vol (CF)	5930.3
Net Vol (CF)	3413.0



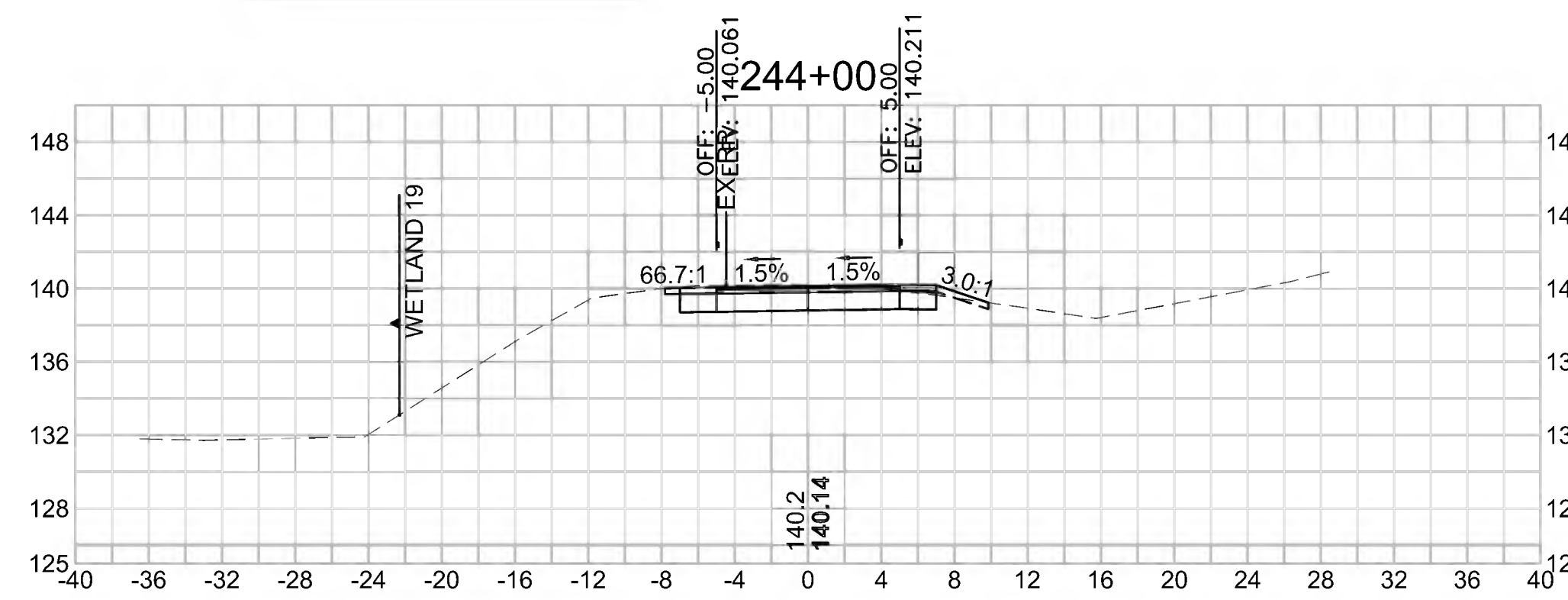
**Total Volume at Station 242+50.00**

Cut Area (SF)	56,932
Fill Area (SF)	10,847
Cut Vol (CF)	90.3
Fill Vol (CF)	25.8
Cum Cut Vol (CF)	8991.5
Cum Fill Vol (CF)	5875.4
Net Vol (CF)	3116.0



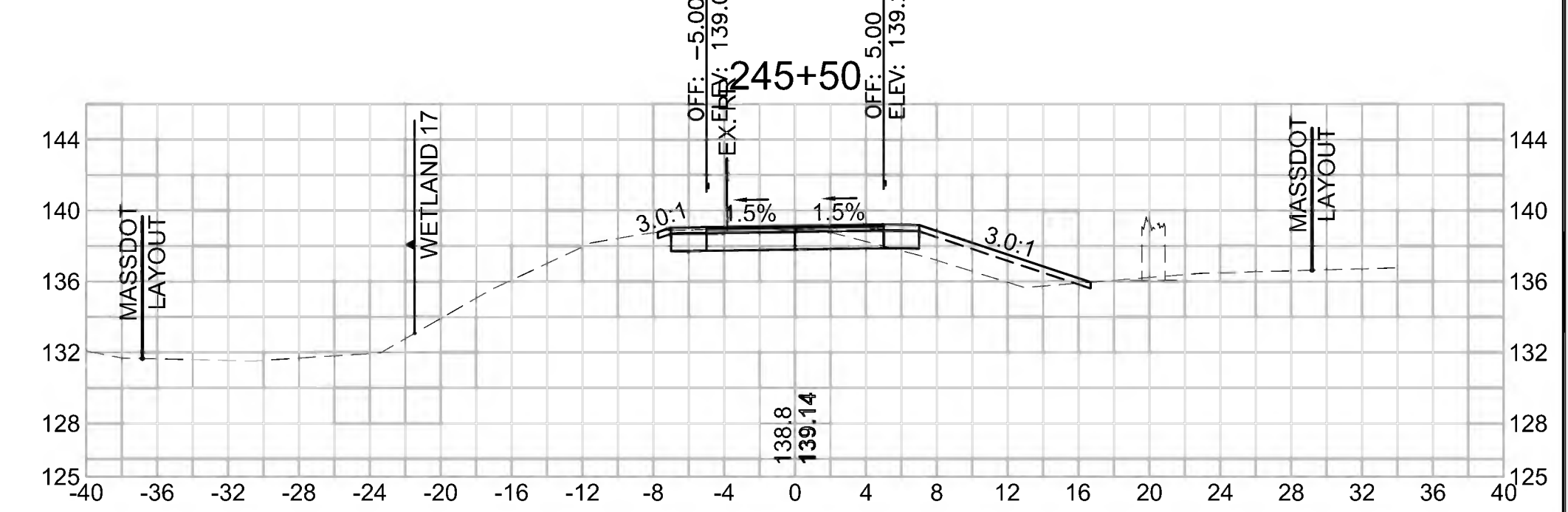
**Total Volume at Station 244+00.00**

Cut Area (SF)	20,739
Fill Area (SF)	0,105
Cut Vol (CF)	58.3
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	9226.9
Cum Fill Vol (CF)	5903.1
Net Vol (CF)	3323.8



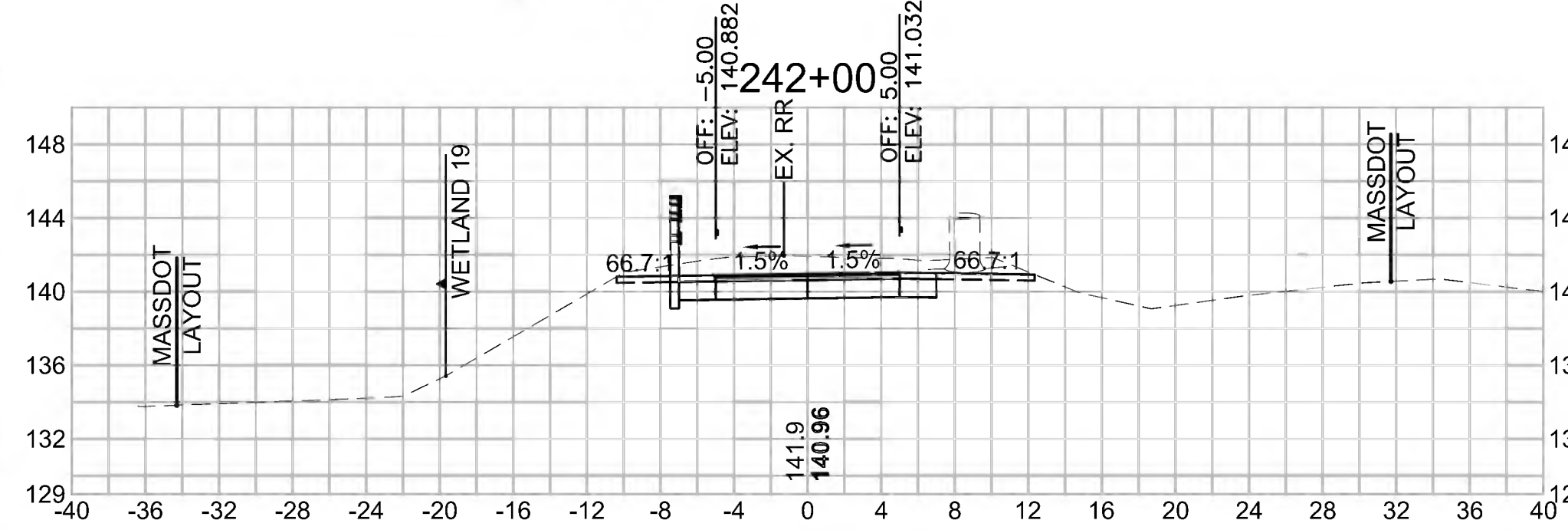
**Total Volume at Station 245+50.00**

Cut Area (SF)	12,126
Fill Area (SF)	9,499
Cut Vol (CF)	27.3
Fill Vol (CF)	9.6
Cum Cut Vol (CF)	9316.1
Cum Fill Vol (CF)	5919.6
Net Vol (CF)	3396.6



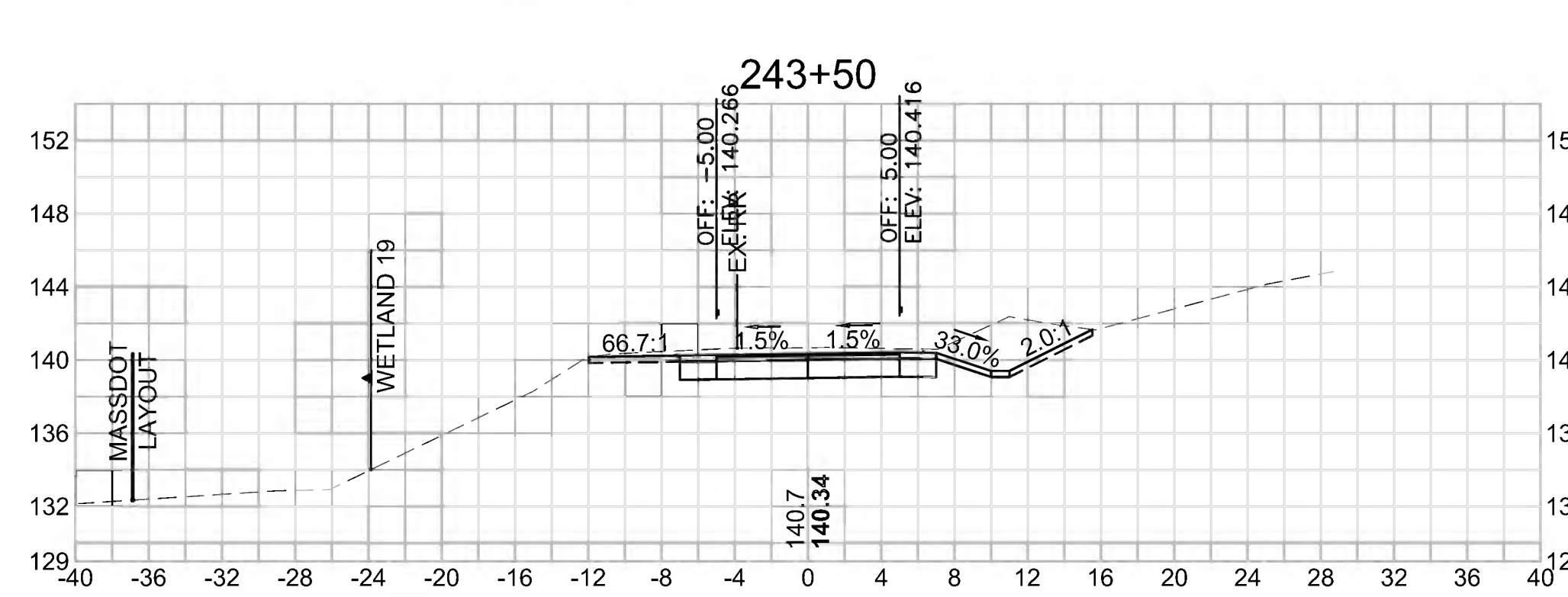
**Total Volume at Station 242+00.00**

Cut Area (SF)	40,540
Fill Area (SF)	16,985
Cut Vol (CF)	71.7
Fill Vol (CF)	69.9
Cum Cut Vol (CF)	8901.2
Cum Fill Vol (CF)	5849.7
Net Vol (CF)	3051.6



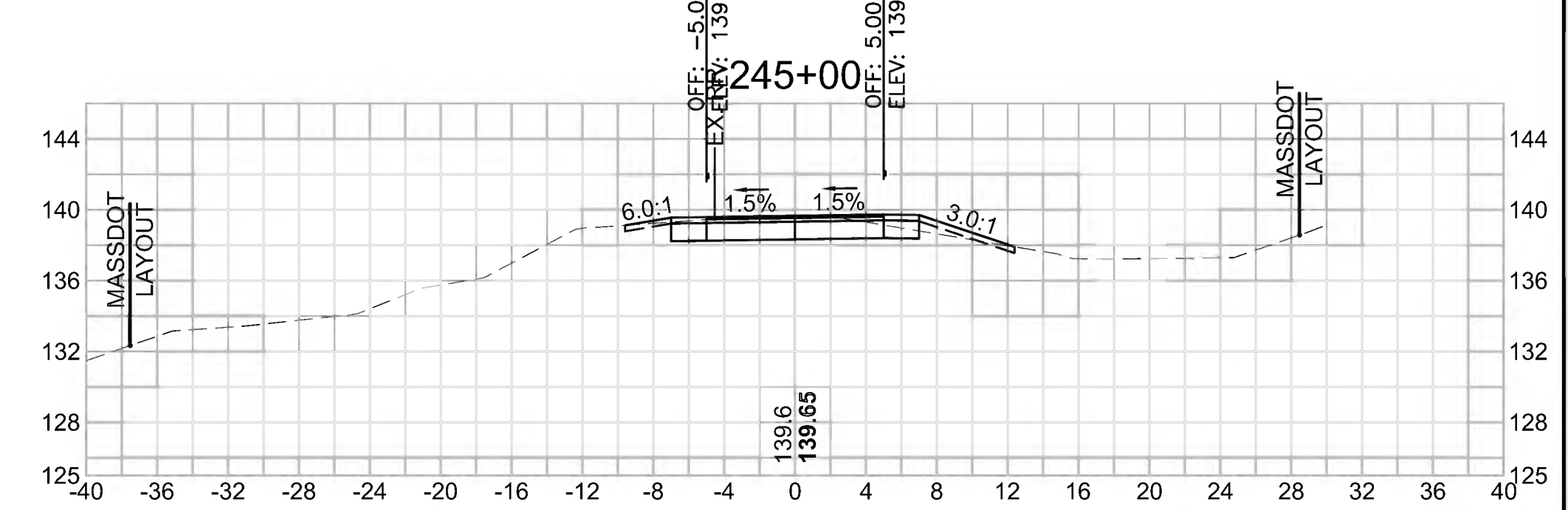
**Total Volume at Station 243+50.00**

Cut Area (SF)	42,264
Fill Area (SF)	0,003
Cut Vol (CF)	81.7
Fill Vol (CF)	8.8
Cum Cut Vol (CF)	9168.5
Cum Fill Vol (CF)	5903.0
Net Vol (CF)	3265.5



**Total Volume at Station 245+00.00**

Cut Area (SF)	17,312
Fill Area (SF)	0,900
Cut Vol (CF)	29.4
Fill Vol (CF)	3.8
Cum Cut Vol (CF)	9288.9
Cum Fill Vol (CF)	5909.9
Net Vol (CF)	3378.9



SUDBURY  
BRUCE FREEMAN RAIL TRAIL

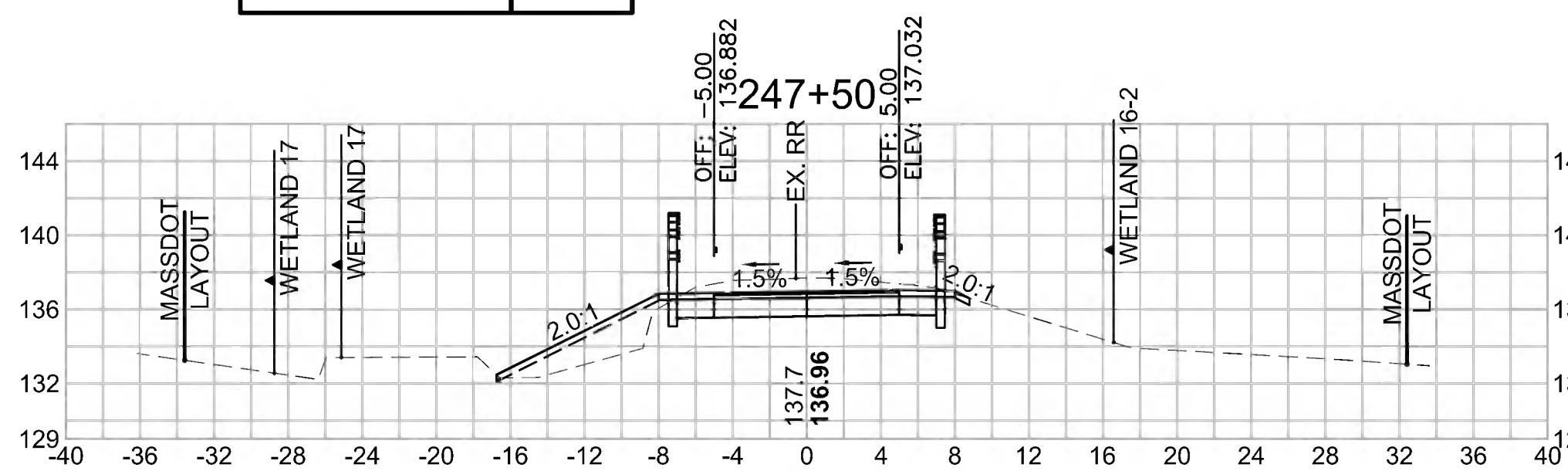
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	280	319

PROJECT FILE NO. 608164

CROSS SECTIONS

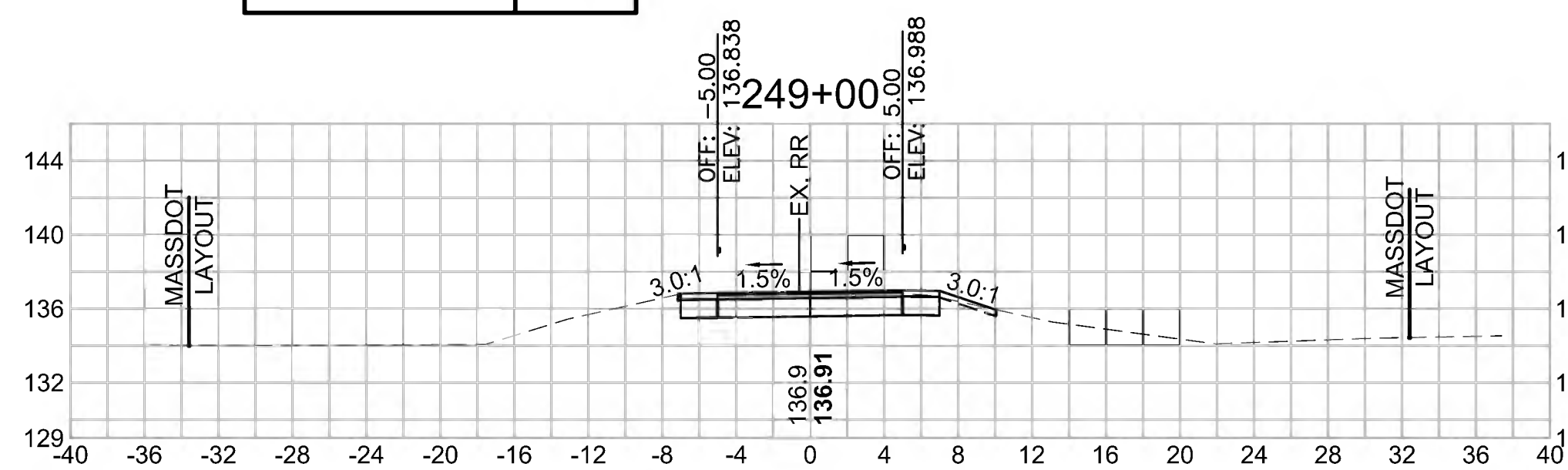
**Total Volume at Station 247+50.00**

Cut Area (SF)	27.970
Fill Area (SF)	10.437
Cut Vol (CF)	51.2
Fill Vol (CF)	9.7
Cum Cut Vol (CF)	9476.2
Cum Fill Vol (CF)	5942.0
Net Vol (CF)	3534.3



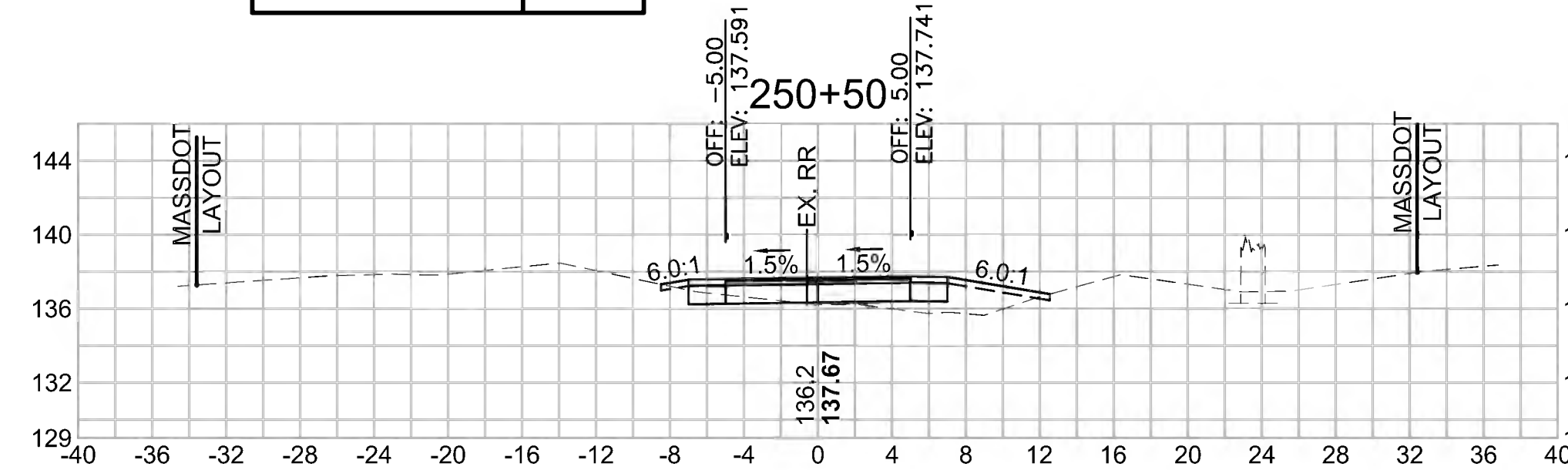
**Total Volume at Station 249+00.00**

Cut Area (SF)	19.014
Fill Area (SF)	0.000
Cut Vol (CF)	41.9
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	9630.6
Cum Fill Vol (CF)	5951.6
Net Vol (CF)	3679.0



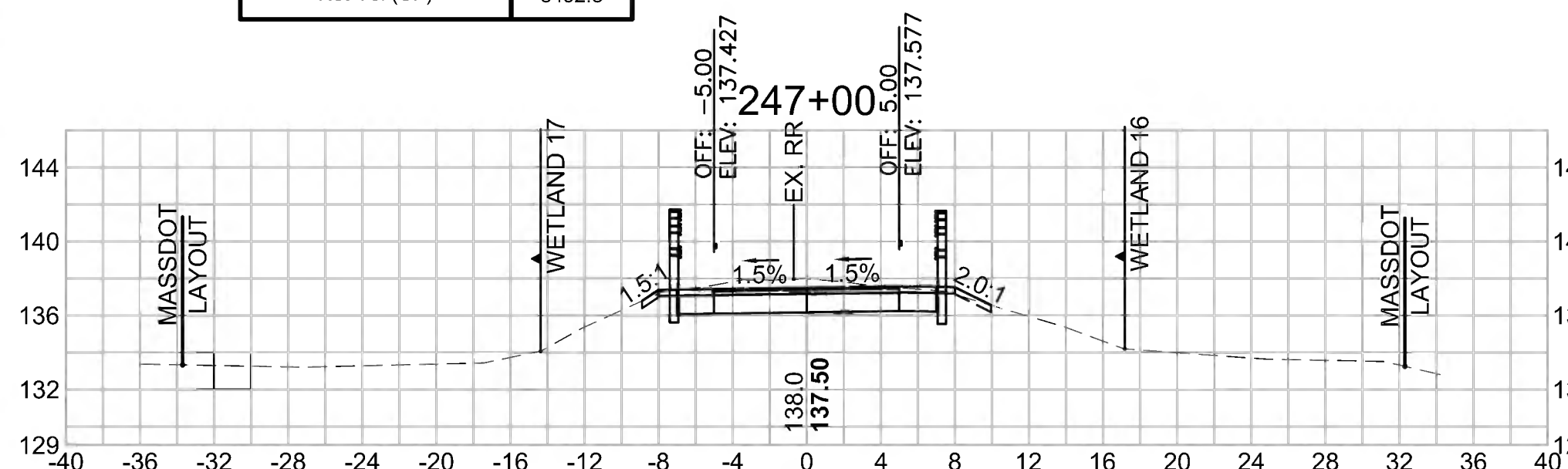
**Total Volume at Station 250+50.00**

Cut Area (SF)	18.871
Fill Area (SF)	7.482
Cut Vol (CF)	25.1
Fill Vol (CF)	8.6
Cum Cut Vol (CF)	9704.8
Cum Fill Vol (CF)	5962.2
Net Vol (CF)	3742.6



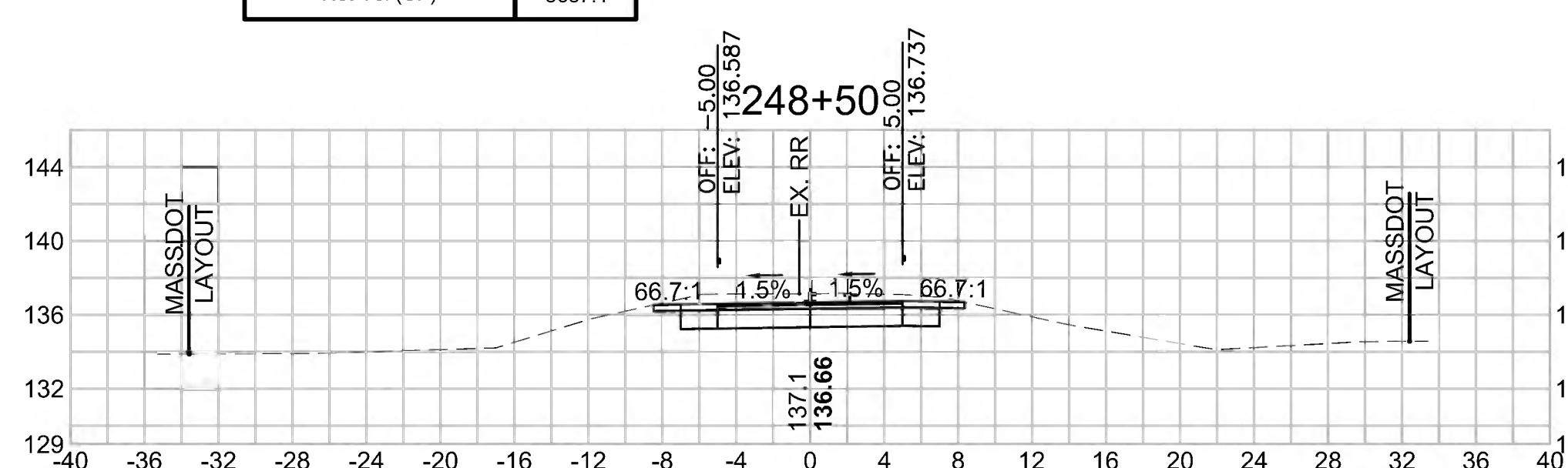
**Total Volume at Station 247+00.00**

Cut Area (SF)	27.272
Fill Area (SF)	0.011
Cut Vol (CF)	45.5
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	9425.1
Cum Fill Vol (CF)	5932.3
Net Vol (CF)	3492.8



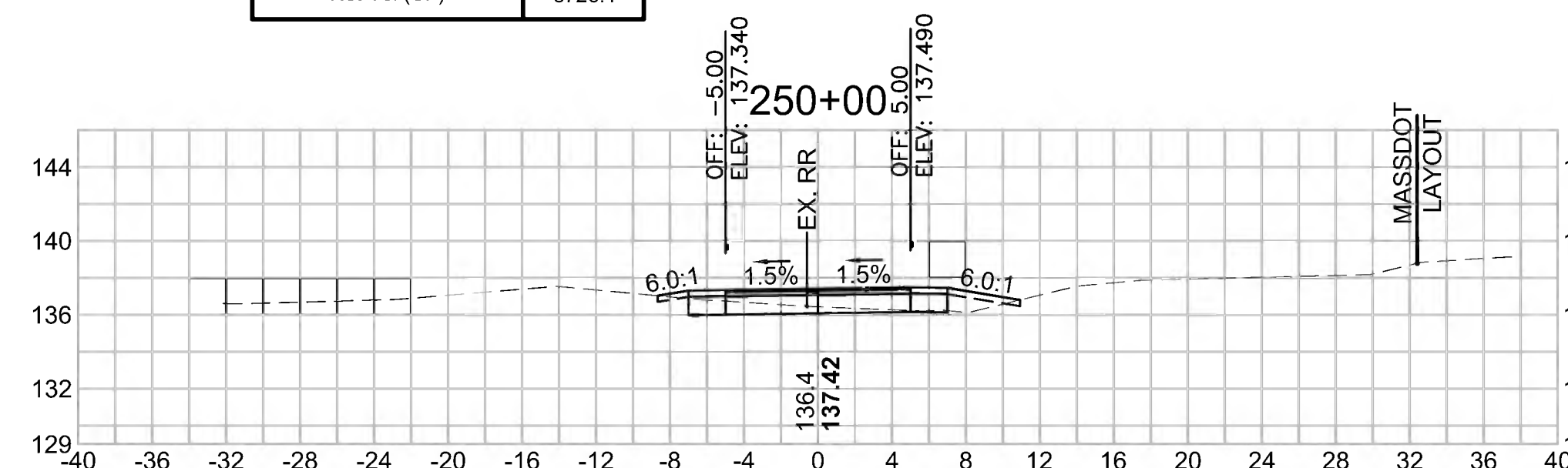
**Total Volume at Station 248+50.00**

Cut Area (SF)	26.248
Fill Area (SF)	0.000
Cut Vol (CF)	55.4
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	9588.7
Cum Fill Vol (CF)	5951.6
Net Vol (CF)	3637.1



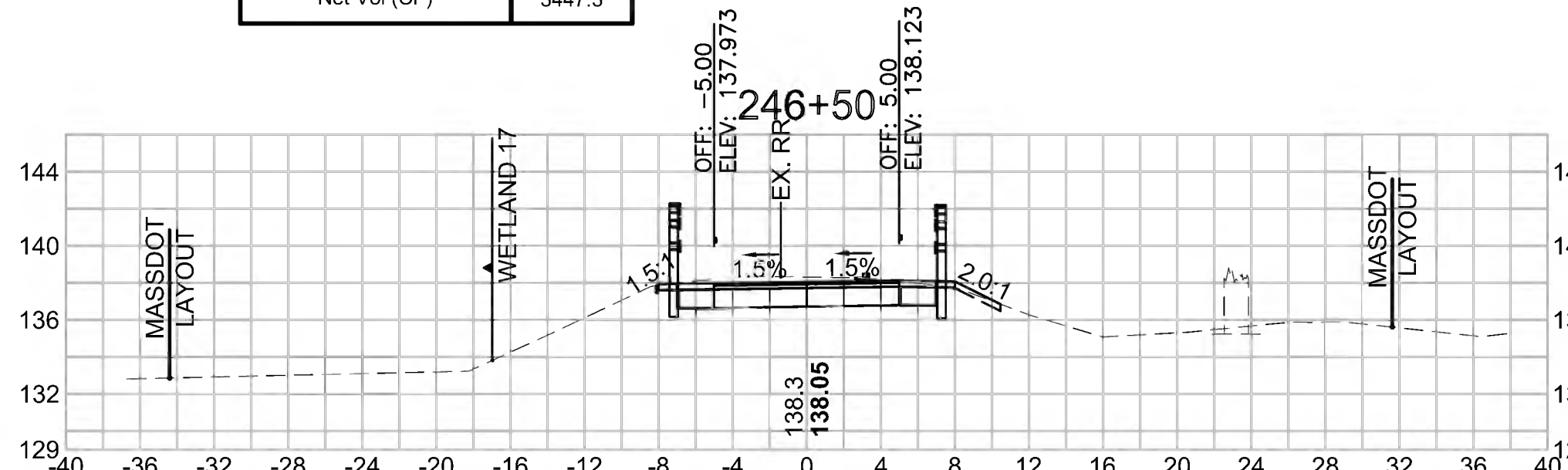
**Total Volume at Station 250+00.00**

Cut Area (SF)	8.194
Fill Area (SF)	1.778
Cut Vol (CF)	19.6
Fill Vol (CF)	1.8
Cum Cut Vol (CF)	9679.7
Cum Fill Vol (CF)	5953.6
Net Vol (CF)	3726.1



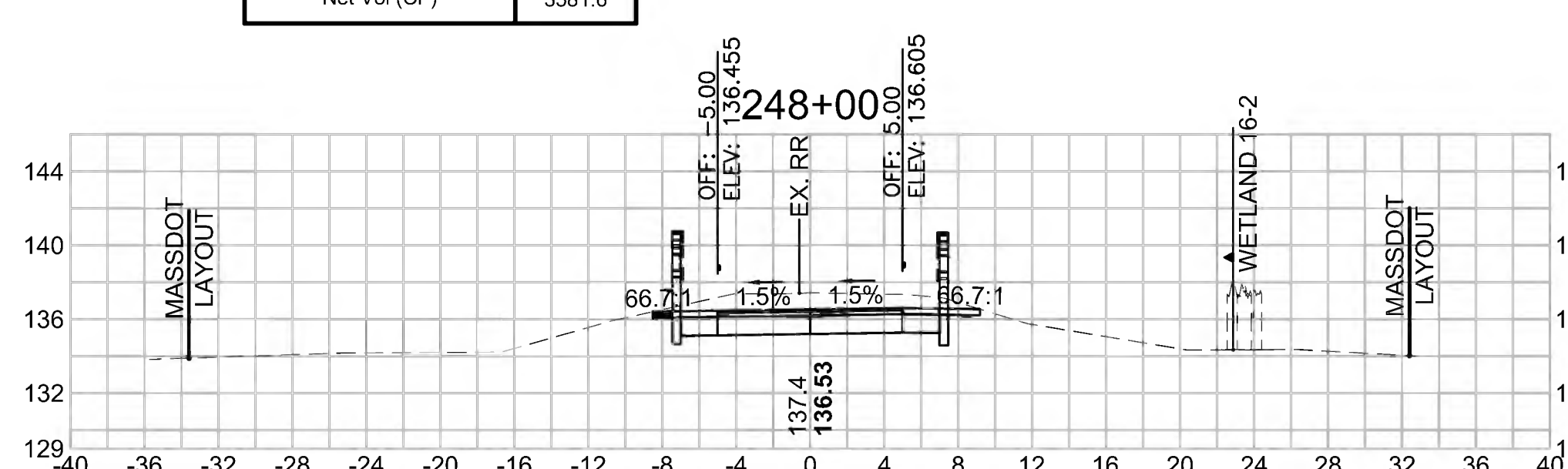
**Total Volume at Station 246+50.00**

Cut Area (SF)	21.860
Fill Area (SF)	0.001
Cut Vol (CF)	36.2
Fill Vol (CF)	1.9
Cum Cut Vol (CF)	9379.6
Cum Fill Vol (CF)	5932.3
Net Vol (CF)	3447.3



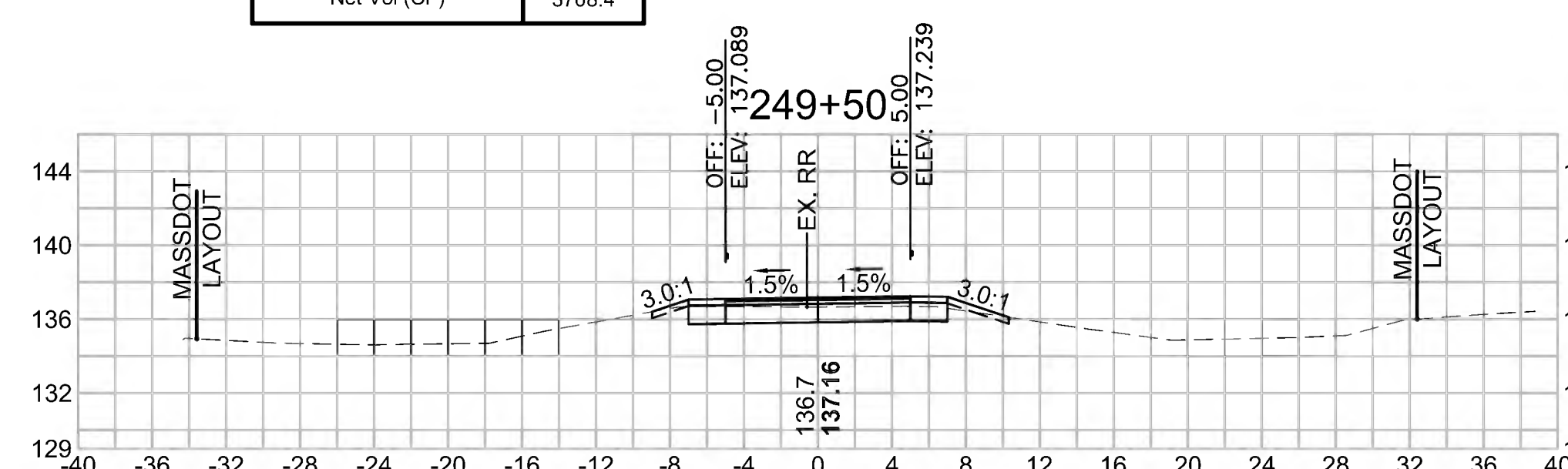
**Total Volume at Station 248+00.00**

Cut Area (SF)	33.601
Fill Area (SF)	0.000
Cut Vol (CF)	57.0
Fill Vol (CF)	9.7
Cum Cut Vol (CF)	9533.3
Cum Fill Vol (CF)	5951.6
Net Vol (CF)	3581.6



**Total Volume at Station 249+50.00**

Cut Area (SF)	12.926
Fill Area (SF)	0.194
Cut Vol (CF)	29.6
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	9660.1
Cum Fill Vol (CF)	5951.8
Net Vol (CF)	3708.4





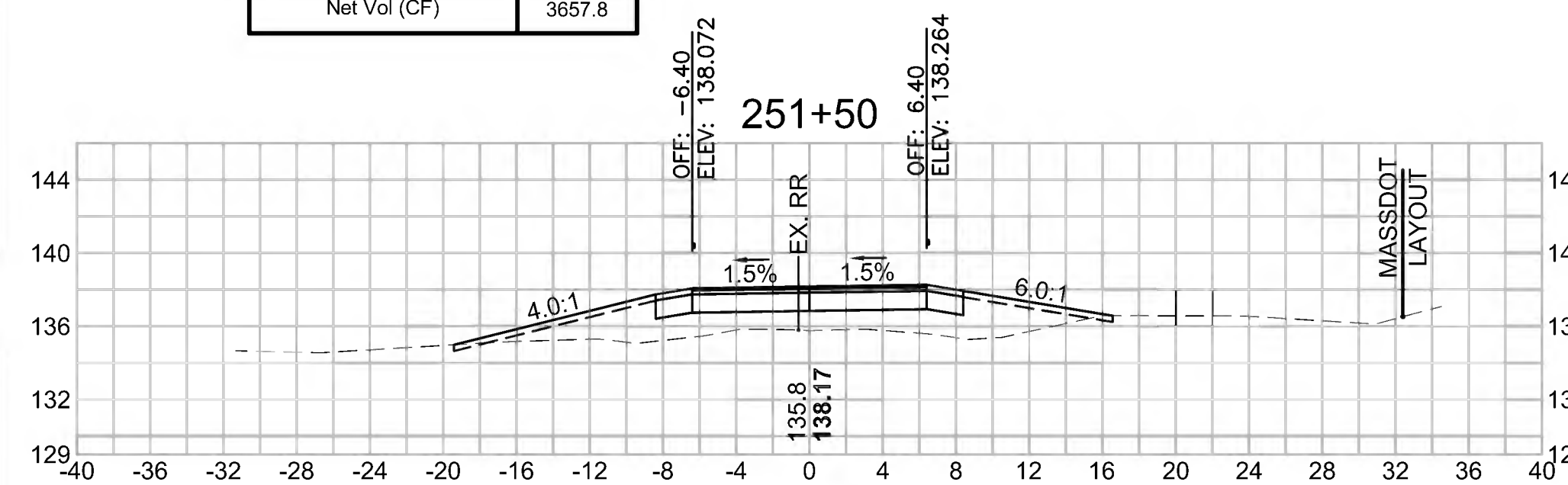
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	281	319
PROJECT FILE NO. 608164			

CROSS SECTIONS

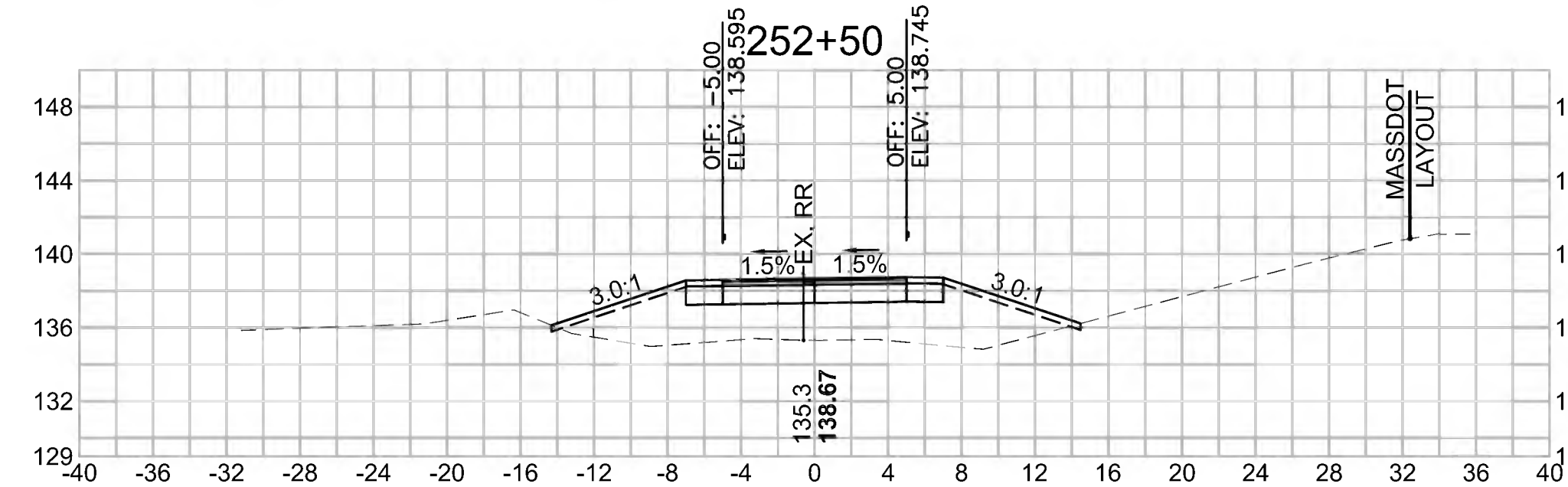
**Total Volume at Station 251+50.00**

Cut Area (SF)	3.142
Fill Area (SF)	37.729
Cut Vol (CF)	4.2
Fill Vol (CF)	67.9
Cum Cut Vol (CF)	9727.7
Cum Fill Vol (CF)	6069.9
Net Vol (CF)	3657.8



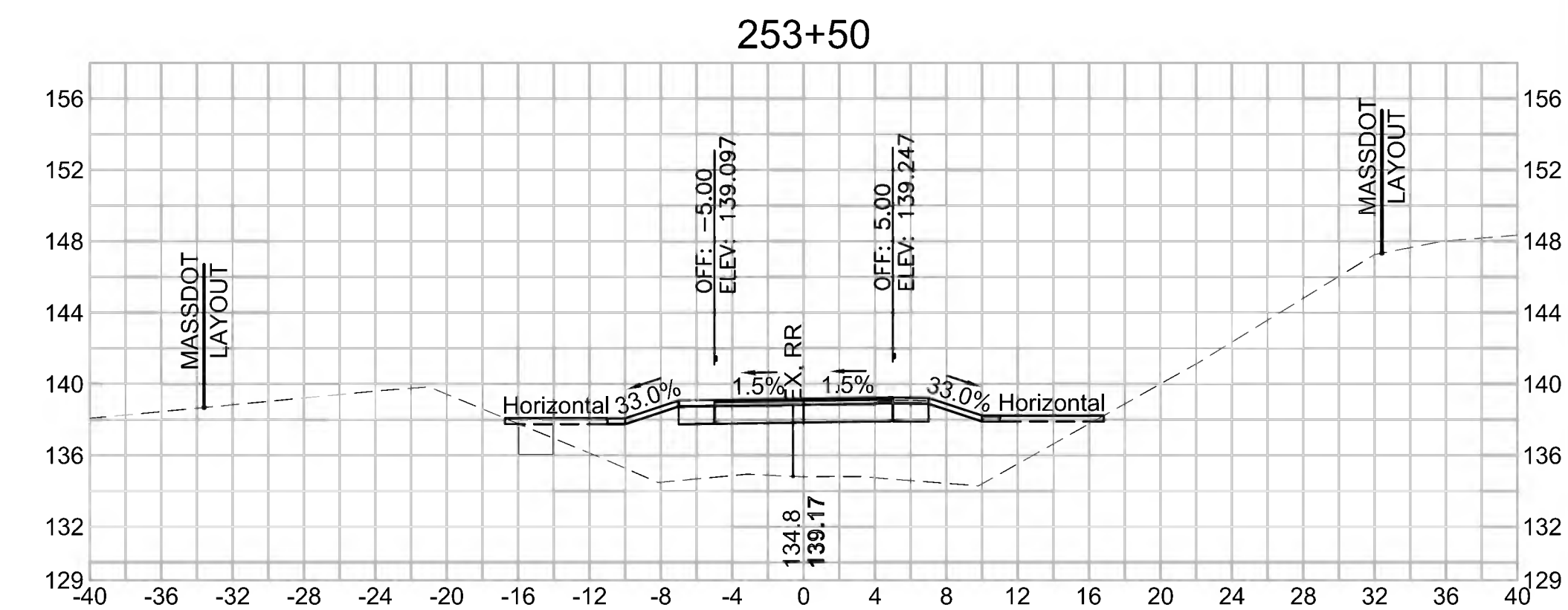
**Total Volume at Station 252+50.00**

Cut Area (SF)	0.898
Fill Area (SF)	54.414
Cut Vol (CF)	1.4
Fill Vol (CF)	92.2
Cum Cut Vol (CF)	9732.6
Cum Fill Vol (CF)	6238.8
Net Vol (CF)	3493.9



**Total Volume at Station 253+50.00**

Cut Area (SF)	0.229
Fill Area (SF)	83.655
Cut Vol (CF)	0.5
Fill Vol (CF)	144.9
Cum Cut Vol (CF)	9734.2
Cum Fill Vol (CF)	6501.4
Net Vol (CF)	3232.8



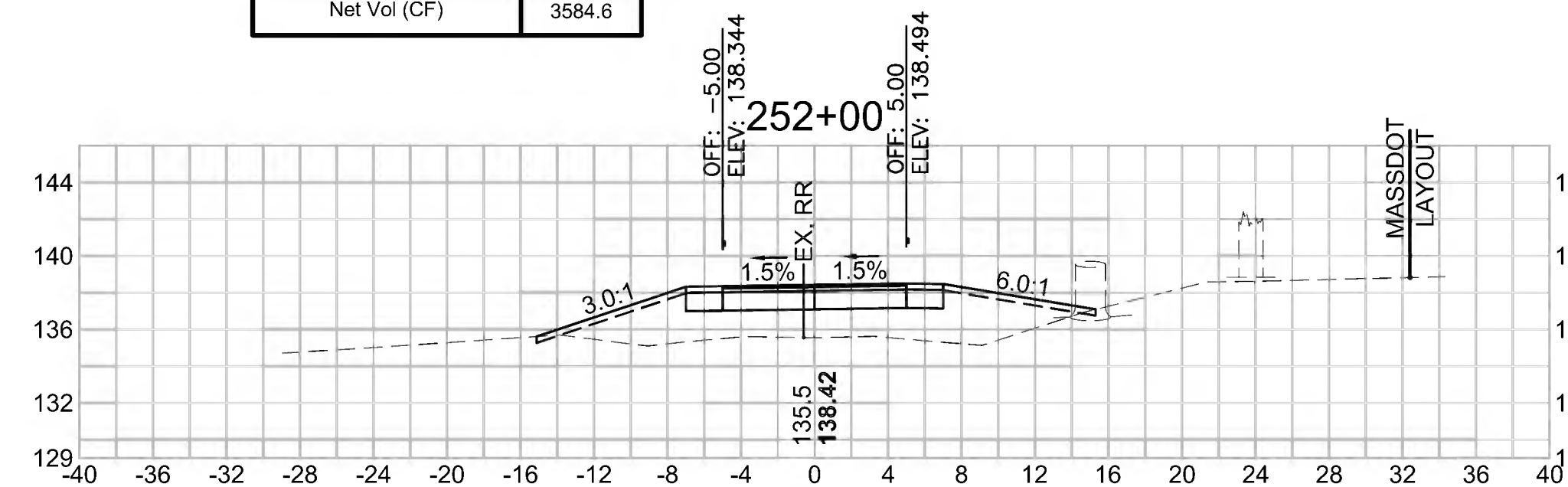
**Total Volume at Station 251+00.00**

Cut Area (SF)	1.399
Fill Area (SF)	35.563
Cut Vol (CF)	18.8
Fill Vol (CF)	39.9
Cum Cut Vol (CF)	9723.5
Cum Fill Vol (CF)	6002.1
Net Vol (CF)	3721.5



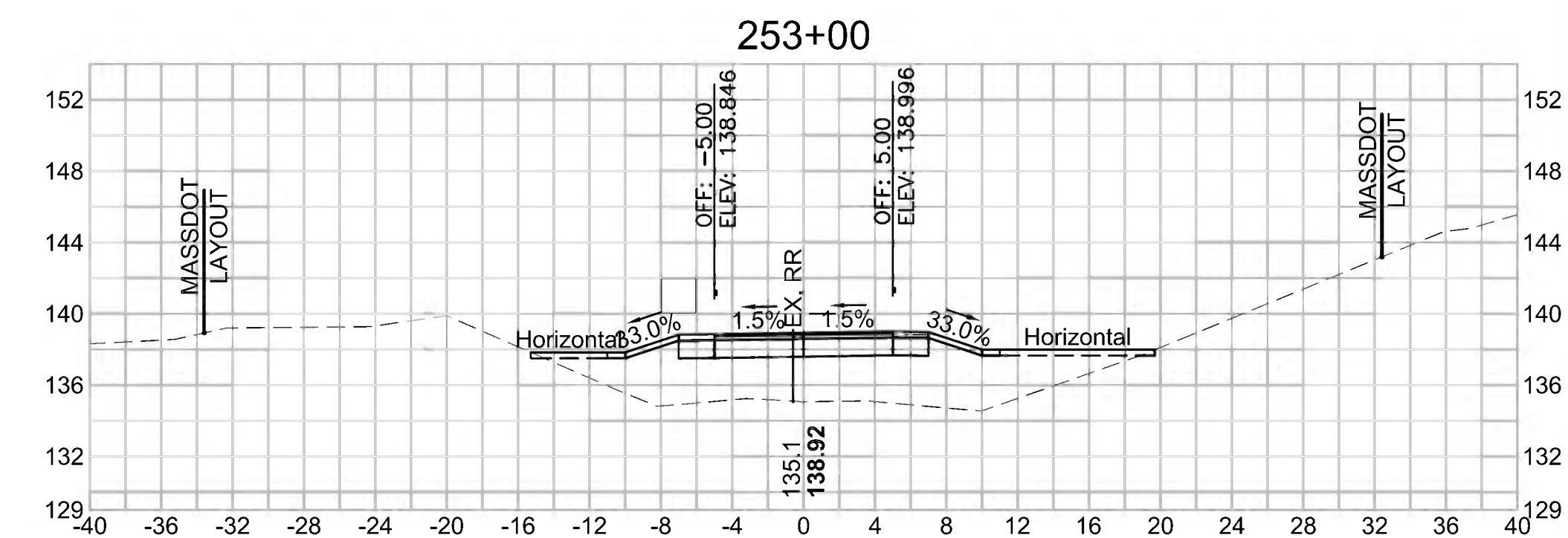
**Total Volume at Station 252+00.00**

Cut Area (SF)	0.630
Fill Area (SF)	45.112
Cut Vol (CF)	3.5
Fill Vol (CF)	76.7
Cum Cut Vol (CF)	9731.2
Cum Fill Vol (CF)	6146.6
Net Vol (CF)	3584.6



**Total Volume at Station 253+00.00**

Cut Area (SF)	0.259
Fill Area (SF)	72.794
Cut Vol (CF)	1.1
Fill Vol (CF)	117.8
Cum Cut Vol (CF)	9733.7
Cum Fill Vol (CF)	6356.6
Net Vol (CF)	3377.2



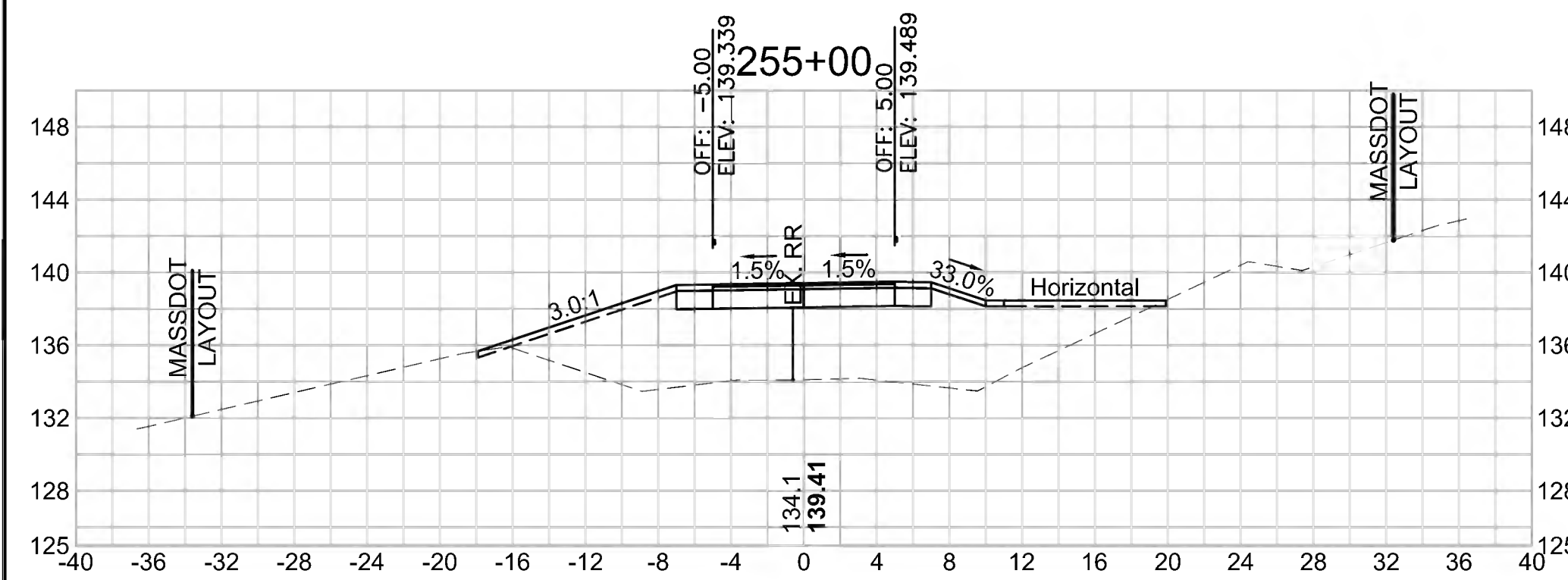
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	282	319
PROJECT FILE NO. 608164			

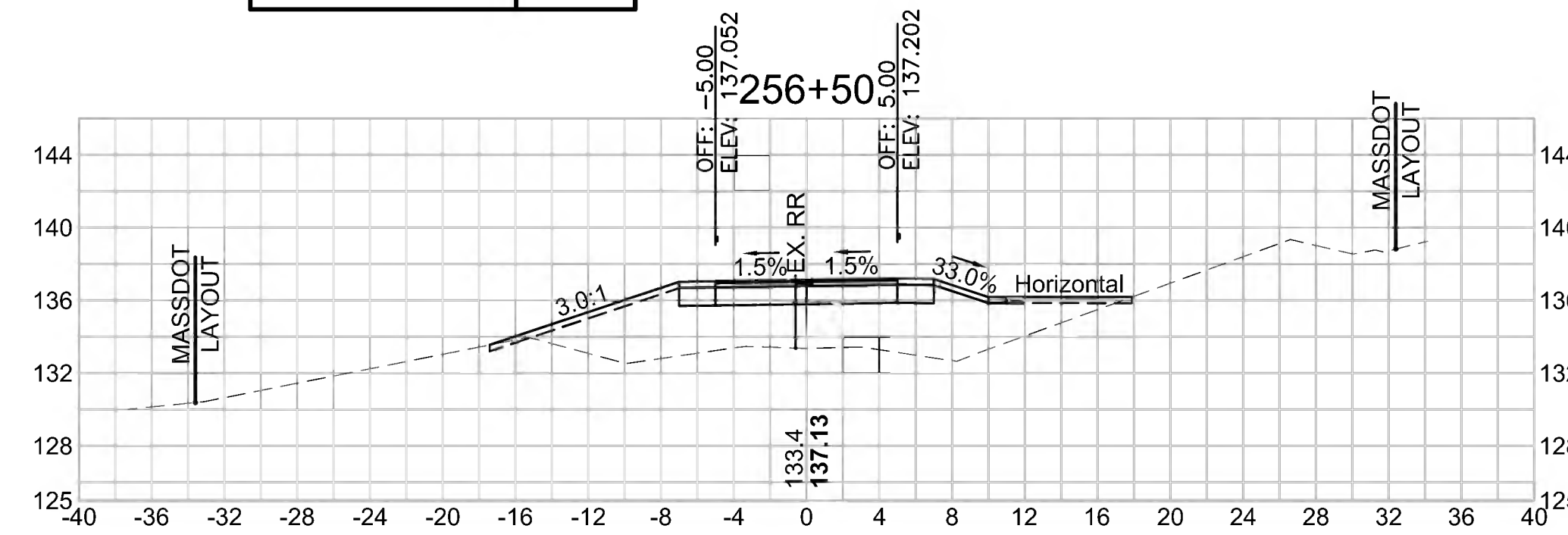
CROSS SECTIONS

608164\_XSEC(CROSS SECTION LAYOUTS).DWG 27-Jun-2022

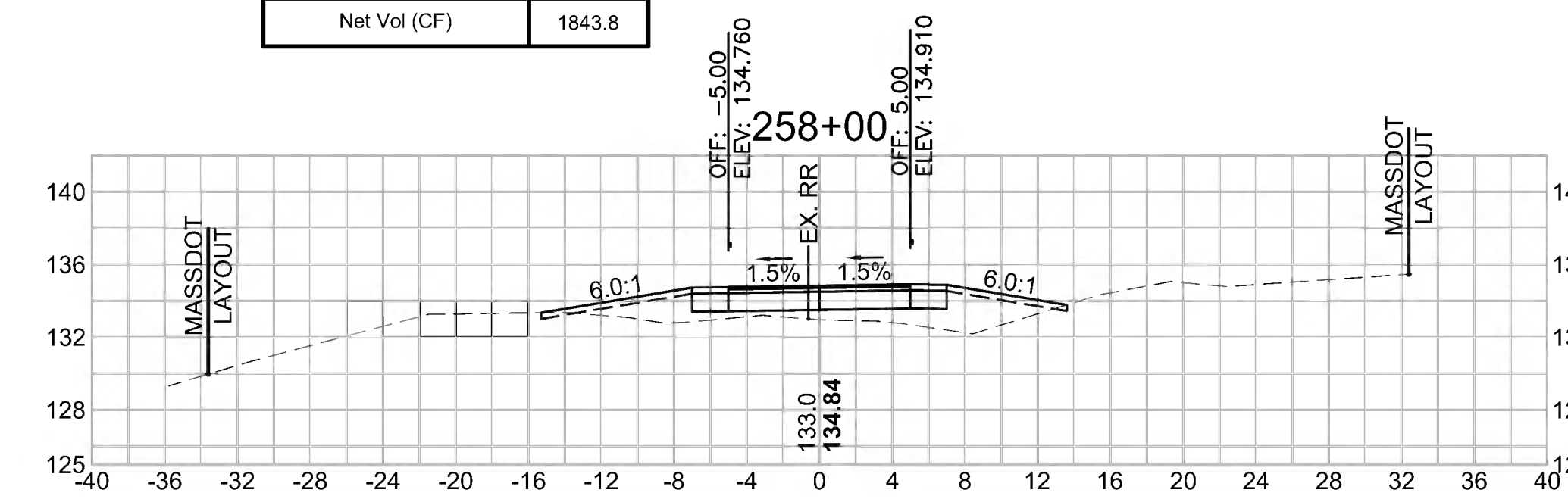
Total Volume at Station 255+00.00	
Cut Area (SF)	0.858
Fill Area (SF)	119.067
Cut Vol (CF)	1.0
Fill Vol (CF)	219.6
Cum Cut Vol (CF)	9735.9
Cum Fill Vol (CF)	7097.1
Net Vol (CF)	2638.9



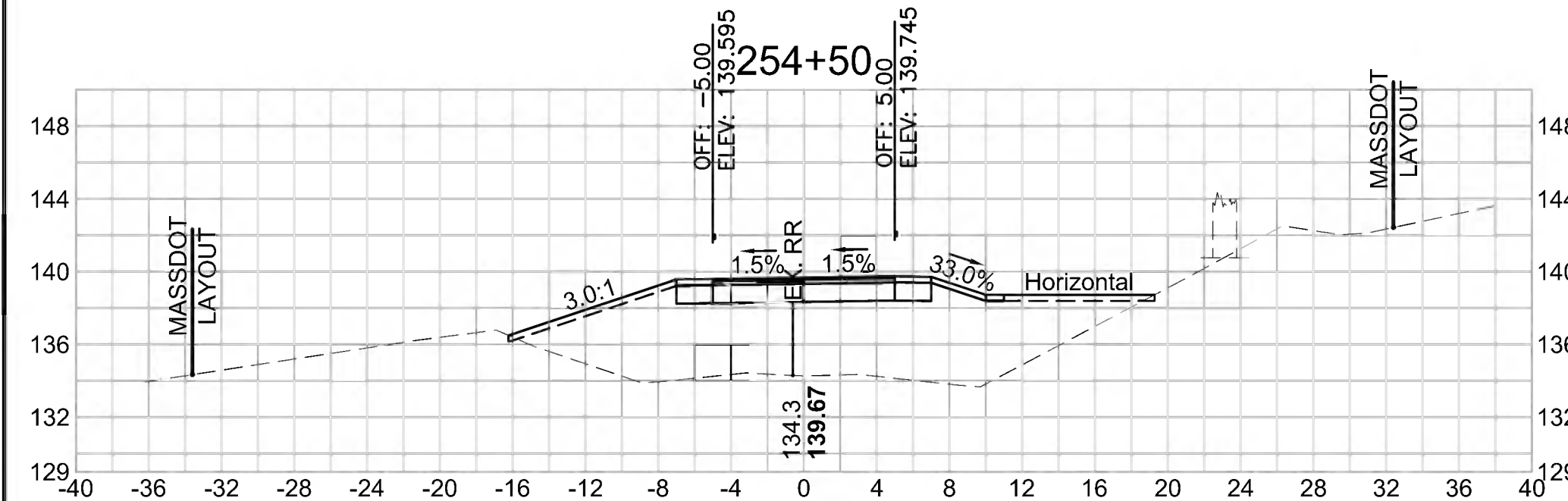
Total Volume at Station 256+50.00	
Cut Area (SF)	0.588
Fill Area (SF)	72.871
Cut Vol (CF)	1.2
Fill Vol (CF)	152.0
Cum Cut Vol (CF)	9740.5
Cum Fill Vol (CF)	7645.6
Net Vol (CF)	2094.8



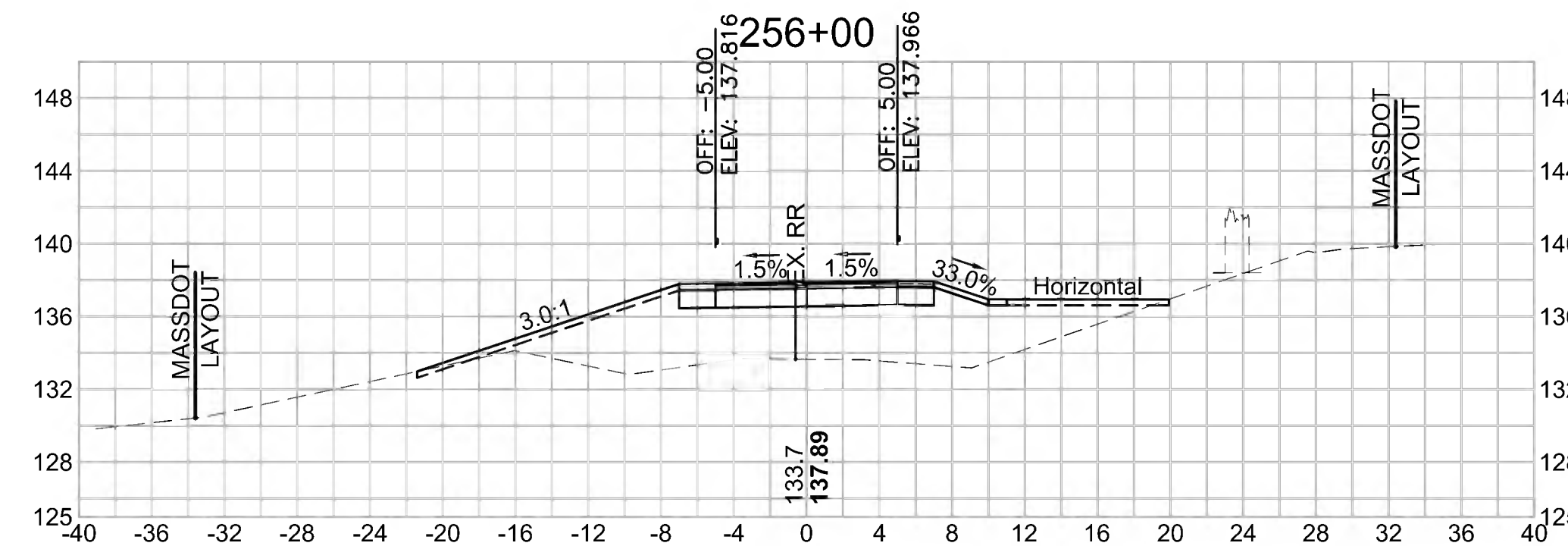
Total Volume at Station 258+00.00	
Cut Area (SF)	6.007
Fill Area (SF)	21.248
Cut Vol (CF)	11.3
Fill Vol (CF)	62.4
Cum Cut Vol (CF)	9758.5
Cum Fill Vol (CF)	7914.7
Net Vol (CF)	1843.8



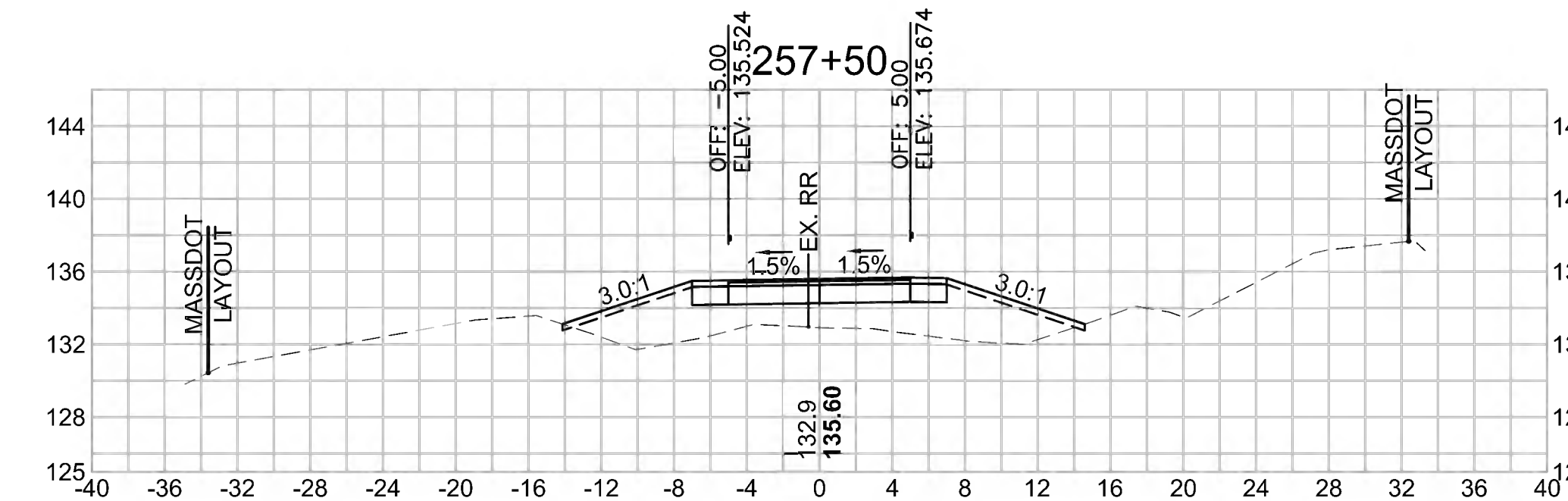
Total Volume at Station 254+50.00	
Cut Area (SF)	0.182
Fill Area (SF)	118.086
Cut Vol (CF)	0.4
Fill Vol (CF)	204.0
Cum Cut Vol (CF)	9735.0
Cum Fill Vol (CF)	6877.5
Net Vol (CF)	2857.5



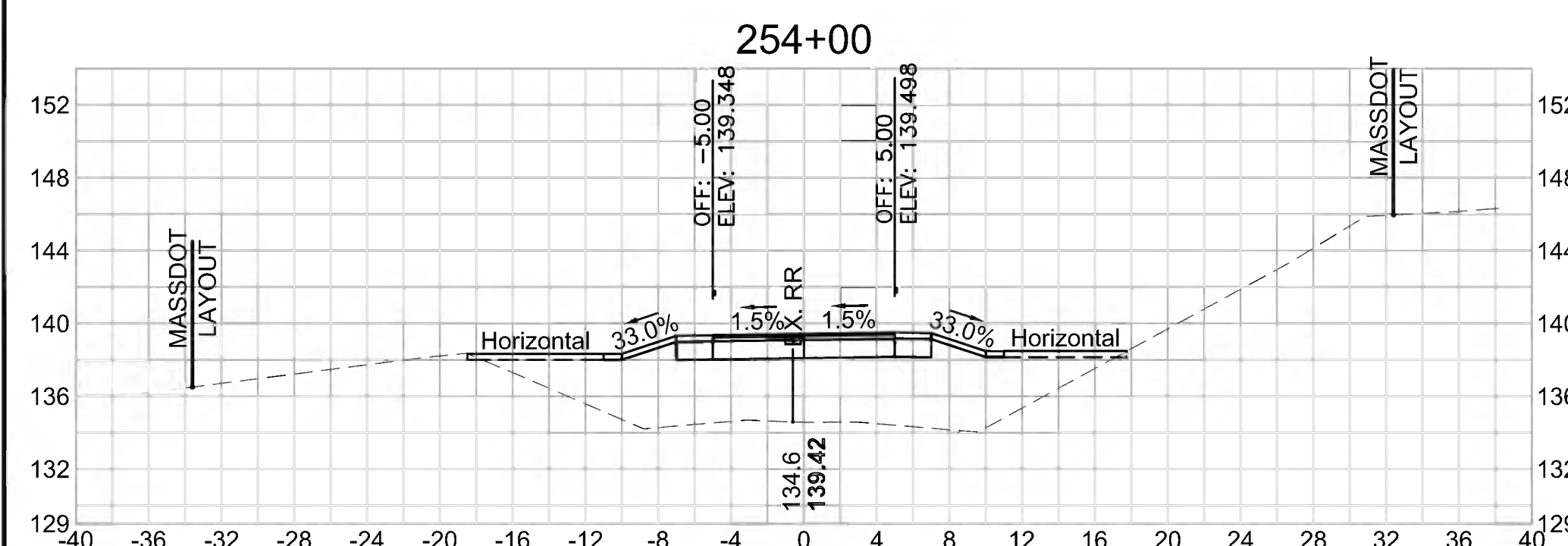
Total Volume at Station 256+00.00	
Cut Area (SF)	0.663
Fill Area (SF)	91.311
Cut Vol (CF)	1.6
Fill Vol (CF)	185.4
Cum Cut Vol (CF)	9739.3
Cum Fill Vol (CF)	7493.6
Net Vol (CF)	2245.7



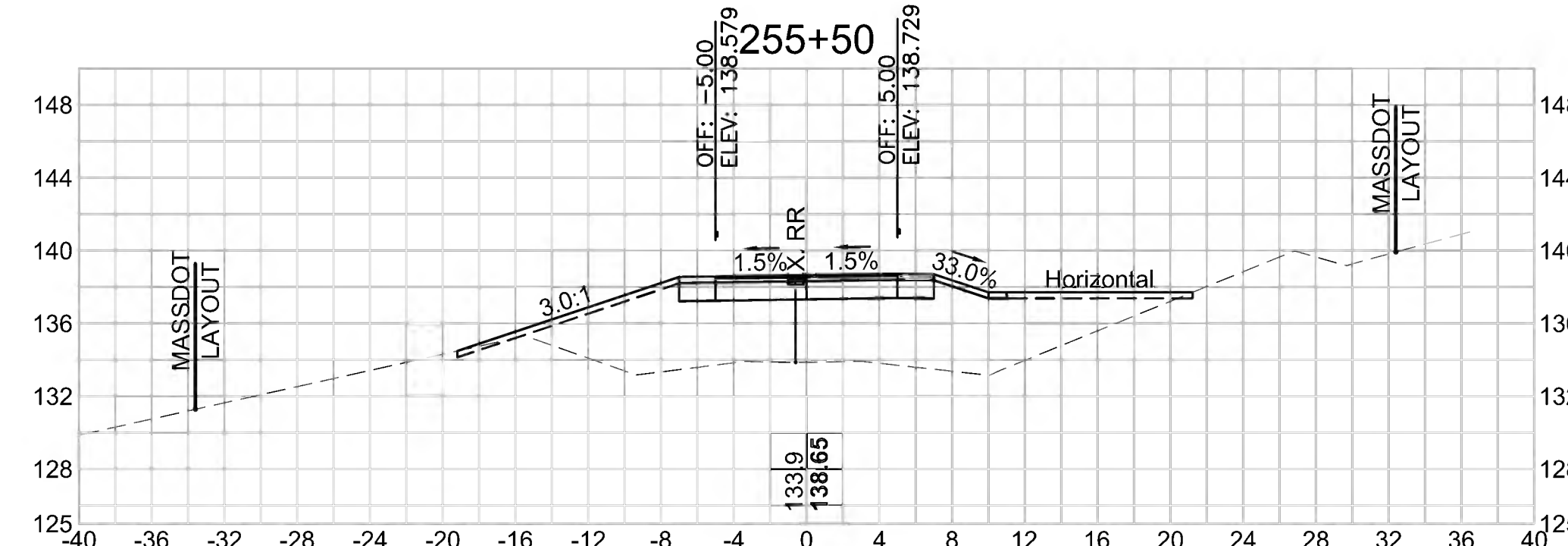
Total Volume at Station 257+50.00	
Cut Area (SF)	6.216
Fill Area (SF)	46.159
Cut Vol (CF)	6.0
Fill Vol (CF)	91.0
Cum Cut Vol (CF)	9747.2
Cum Fill Vol (CF)	7852.3
Net Vol (CF)	1894.9



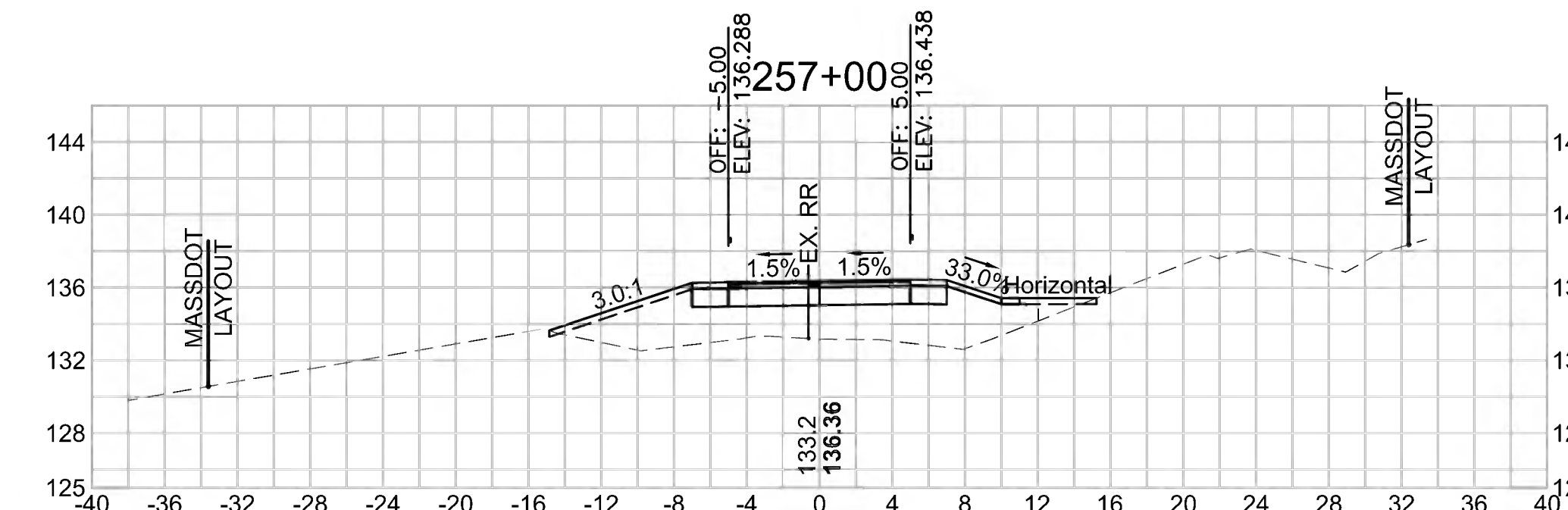
Total Volume at Station 254+00.00	
Cut Area (SF)	0.232
Fill Area (SF)	102.202
Cut Vol (CF)	0.4
Fill Vol (CF)	172.1
Cum Cut Vol (CF)	9734.6
Cum Fill Vol (CF)	6673.5
Net Vol (CF)	3061.1



Total Volume at Station 255+50.00	
Cut Area (SF)	1.054
Fill Area (SF)	108.950
Cut Vol (CF)	1.8
Fill Vol (CF)	211.1
Cum Cut Vol (CF)	9737.7
Cum Fill Vol (CF)	7308.2
Net Vol (CF)	2429.5



Total Volume at Station 257+00.00	
Cut Area (SF)	0.231
Fill Area (SF)	52.096
Cut Vol (CF)	0.8
Fill Vol (CF)	115.7
Cum Cut Vol (CF)	9741.2
Cum Fill Vol (CF)	7761.4
Net Vol (CF)	1979.9





SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	283	319

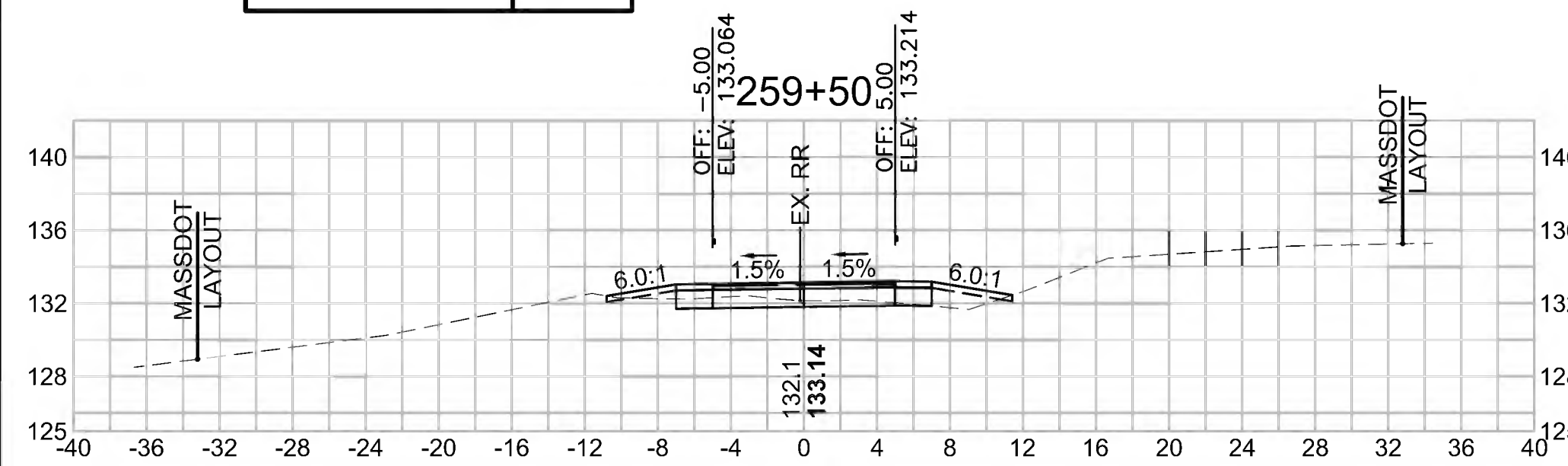
PROJECT FILE NO. 608164

CROSS SECTIONS

608164\_XSEC(CROSS SECTION LAYOUTS).DWG 27-Jun-2022

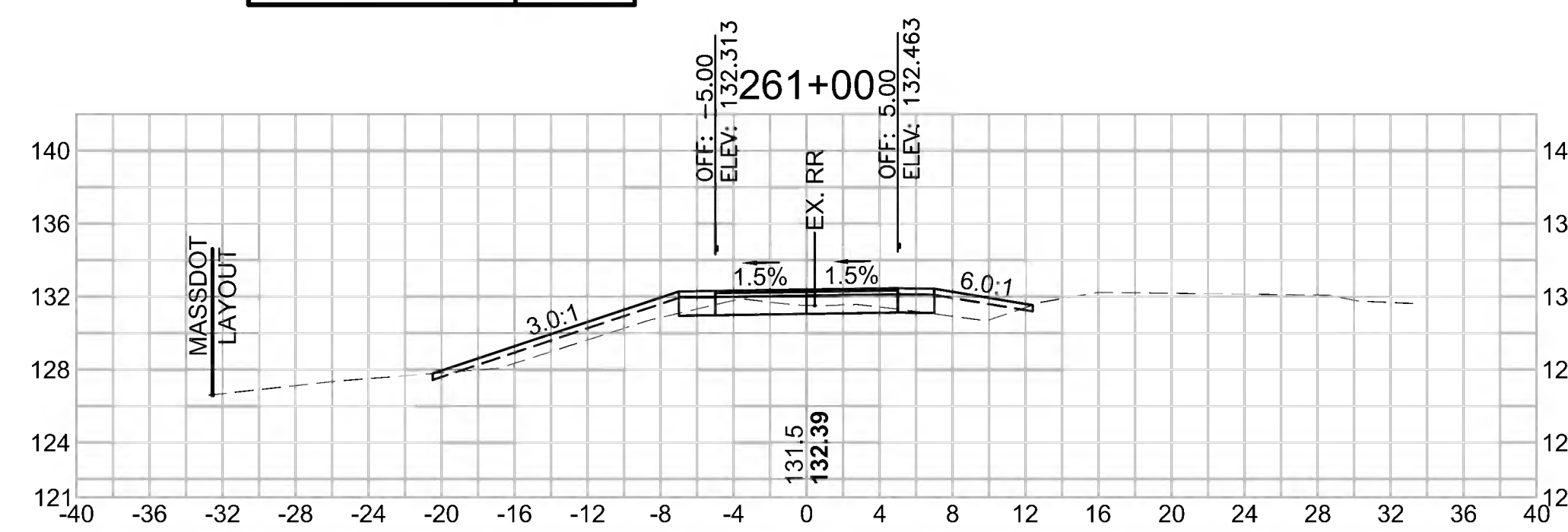
**Total Volume at Station 259+50.00**

Cut Area (SF)	5.628
Fill Area (SF)	3.161
Cut Vol (CF)	12.0
Fill Vol (CF)	7.4
Cum Cut Vol (CF)	9789.7
Cum Fill Vol (CF)	7955.5
Net Vol (CF)	1834.2



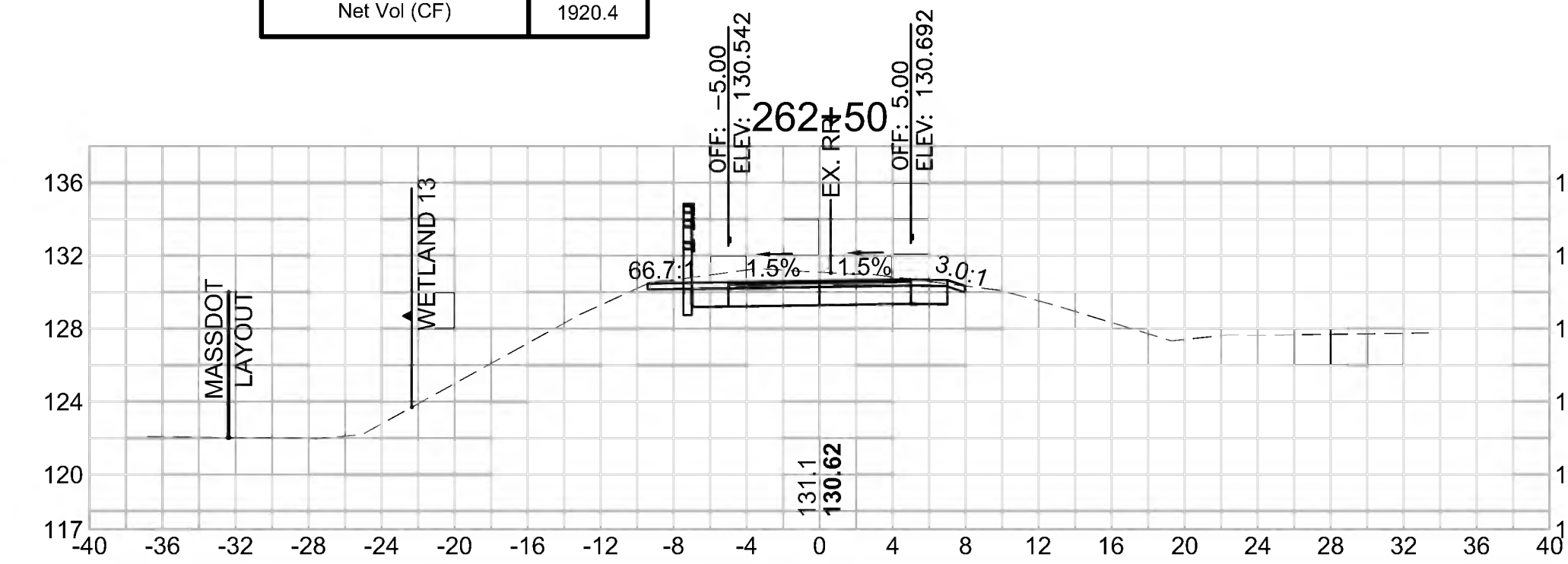
**Total Volume at Station 261+00.00**

Cut Area (SF)	6.614
Fill Area (SF)	10.801
Cut Vol (CF)	11.9
Fill Vol (CF)	16.6
Cum Cut Vol (CF)	9826.8
Cum Fill Vol (CF)	7987.6
Net Vol (CF)	1839.1



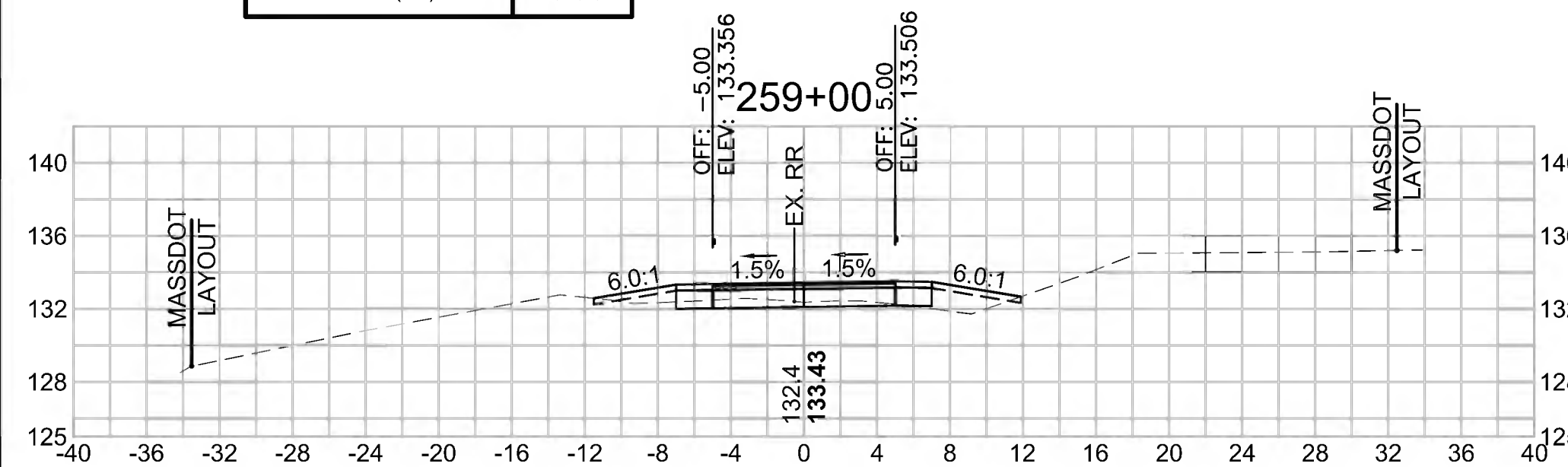
**Total Volume at Station 262+50.00**

Cut Area (SF)	34.753
Fill Area (SF)	0.000
Cut Vol (CF)	53.7
Fill Vol (CF)	0.9
Cum Cut Vol (CF)	9931.6
Cum Fill Vol (CF)	8011.2
Net Vol (CF)	1920.4



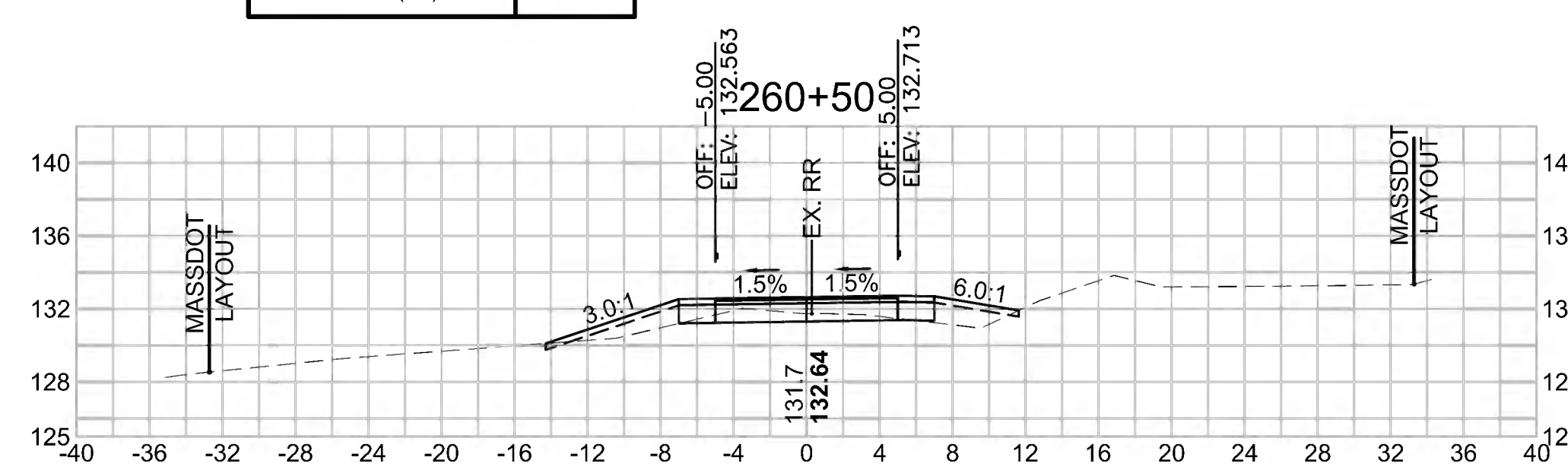
**Total Volume at Station 259+00.00**

Cut Area (SF)	7.382
Fill Area (SF)	4.819
Cut Vol (CF)	10.2
Fill Vol (CF)	9.1
Cum Cut Vol (CF)	9777.7
Cum Fill Vol (CF)	7948.1
Net Vol (CF)	1829.6



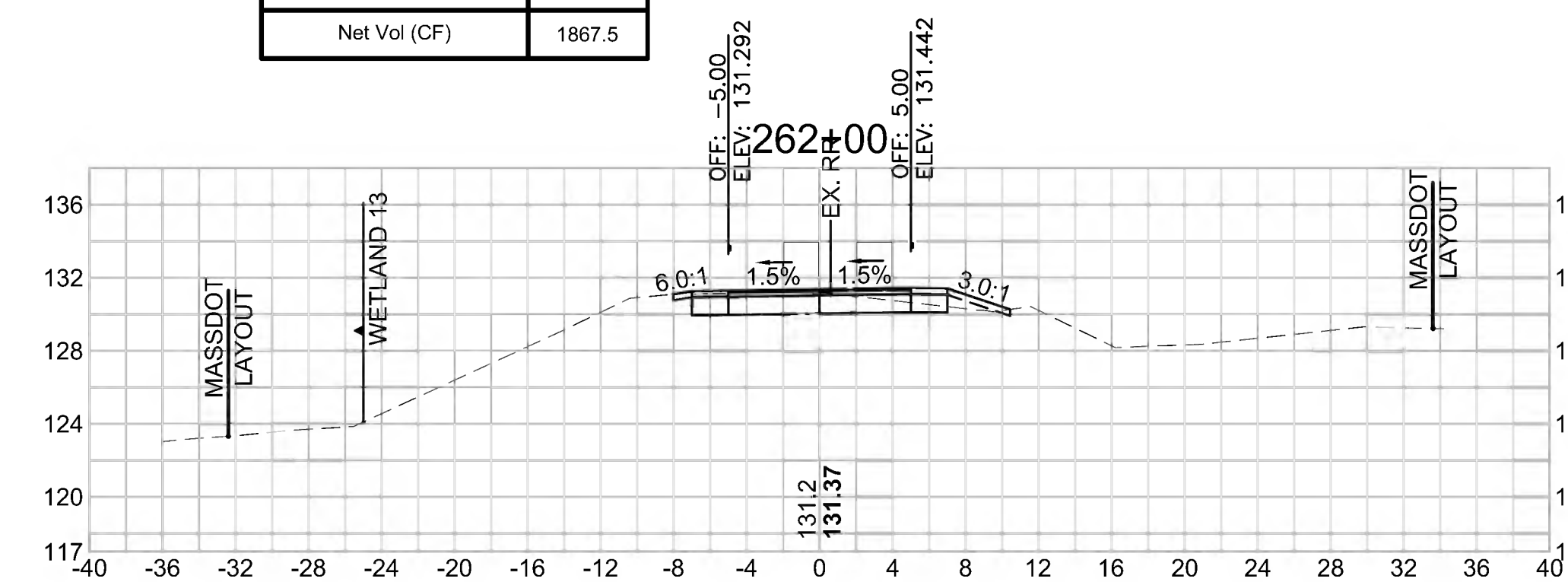
**Total Volume at Station 260+00.00**

Cut Area (SF)	6.241
Fill Area (SF)	7.127
Cut Vol (CF)	12.8
Fill Vol (CF)	9.6
Cum Cut Vol (CF)	9814.9
Cum Fill Vol (CF)	7971.0
Net Vol (CF)	1843.8



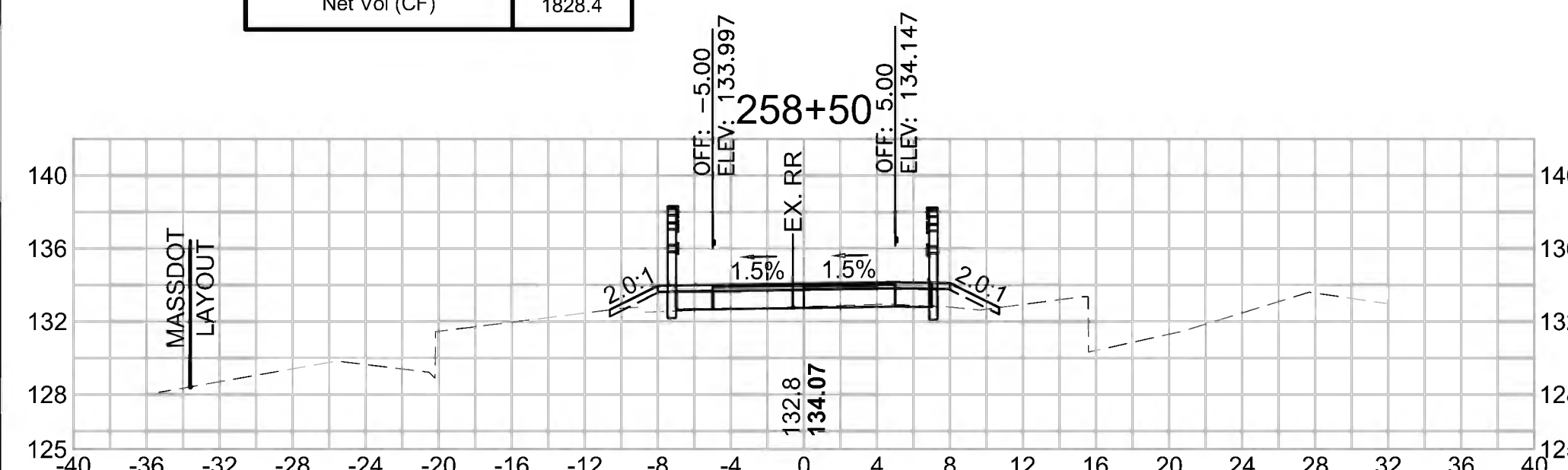
**Total Volume at Station 262+00.00**

Cut Area (SF)	23.243
Fill Area (SF)	0.932
Cut Vol (CF)	33.3
Fill Vol (CF)	6.8
Cum Cut Vol (CF)	9877.9
Cum Fill Vol (CF)	8010.3
Net Vol (CF)	1867.5



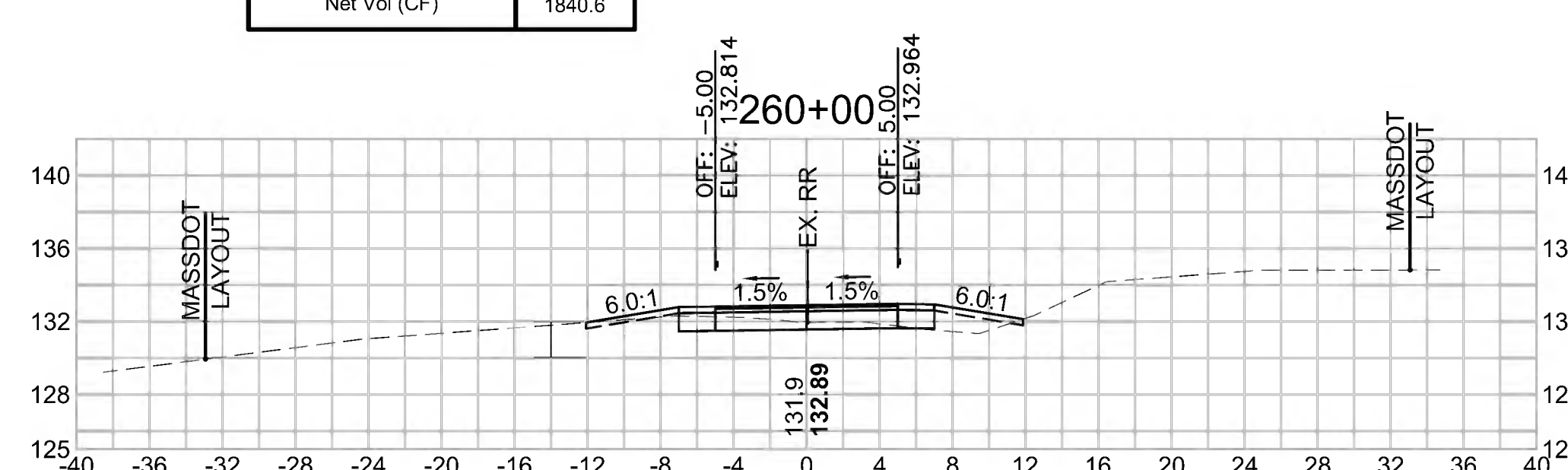
**Total Volume at Station 258+50.00**

Cut Area (SF)	3.667
Fill Area (SF)	4.995
Cut Vol (CF)	9.0
Fill Vol (CF)	24.3
Cum Cut Vol (CF)	9767.5
Cum Fill Vol (CF)	7939.0
Net Vol (CF)	1828.4



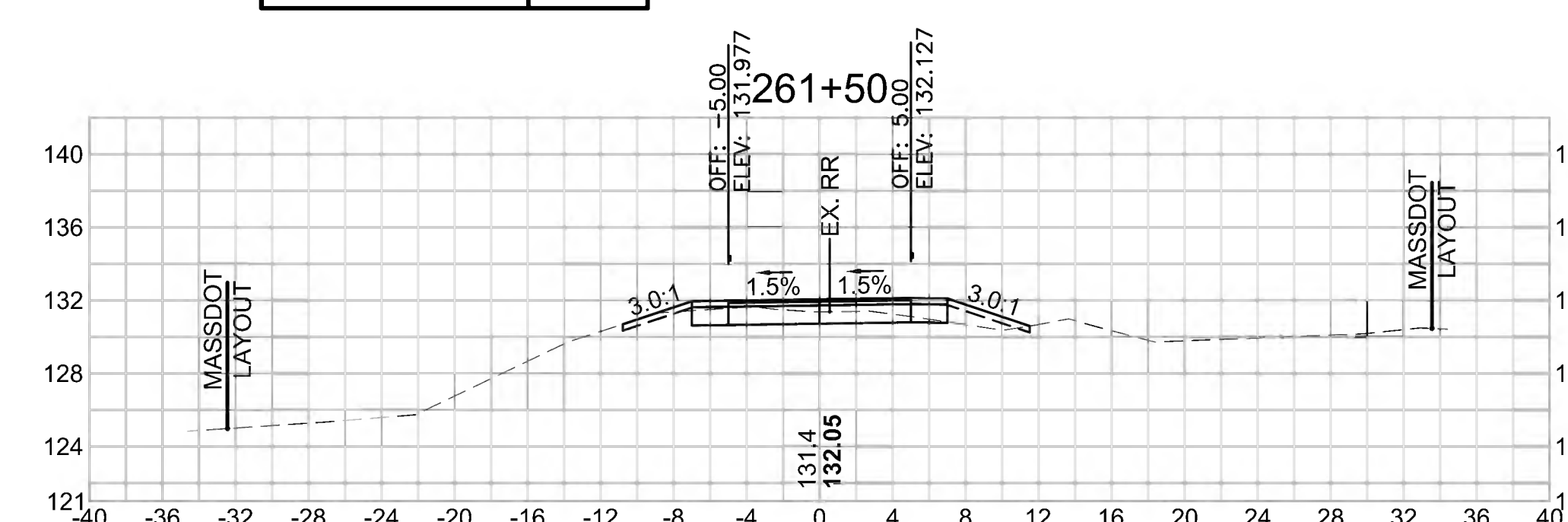
**Total Volume at Station 260+00.00**

Cut Area (SF)	7.630
Fill Area (SF)	3.238
Cut Vol (CF)	12.3
Fill Vol (CF)	5.9
Cum Cut Vol (CF)	9802.0
Cum Fill Vol (CF)	7961.4
Net Vol (CF)	1840.6



**Total Volume at Station 261+50.00**

Cut Area (SF)	12.670
Fill Area (SF)	6.395
Cut Vol (CF)	17.9
Fill Vol (CF)	15.9
Cum Cut Vol (CF)	9844.6
Cum Fill Vol (CF)	8003.6
Net Vol (CF)	1841.1



SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	284	319

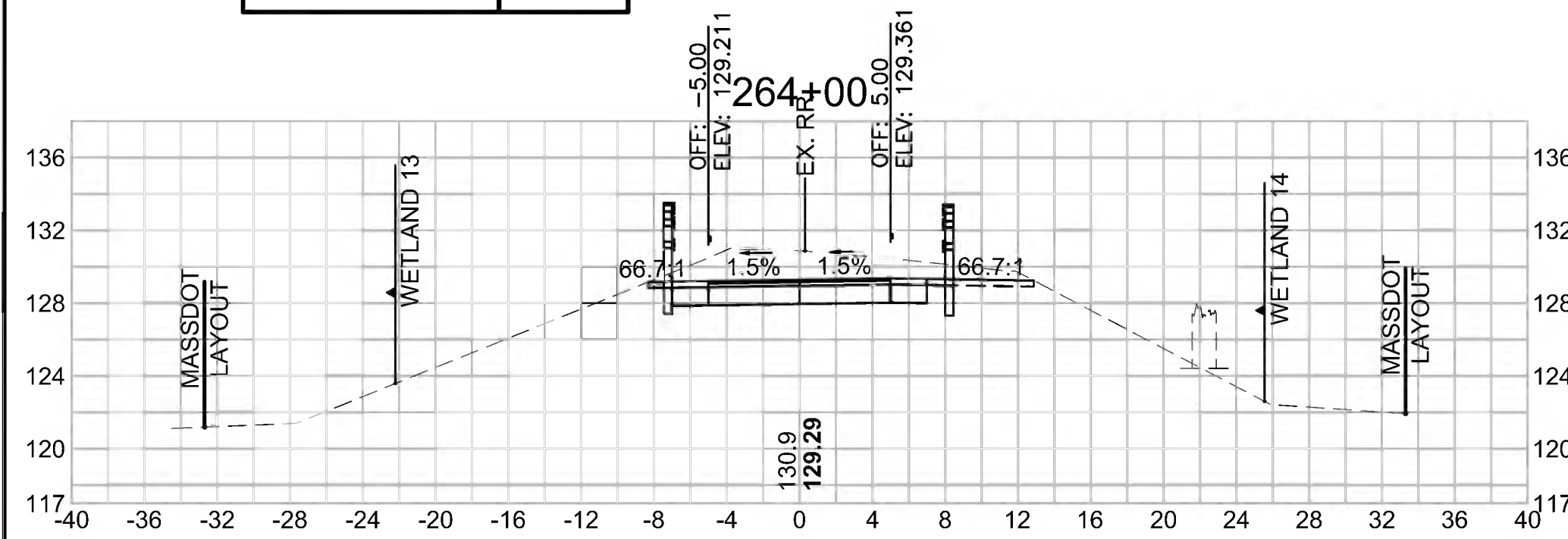
PROJECT FILE NO. 608164

CROSS SECTIONS

608164\_XSEC(CROSS SECTION LAYOUTS).DWG 27-Jun-2022

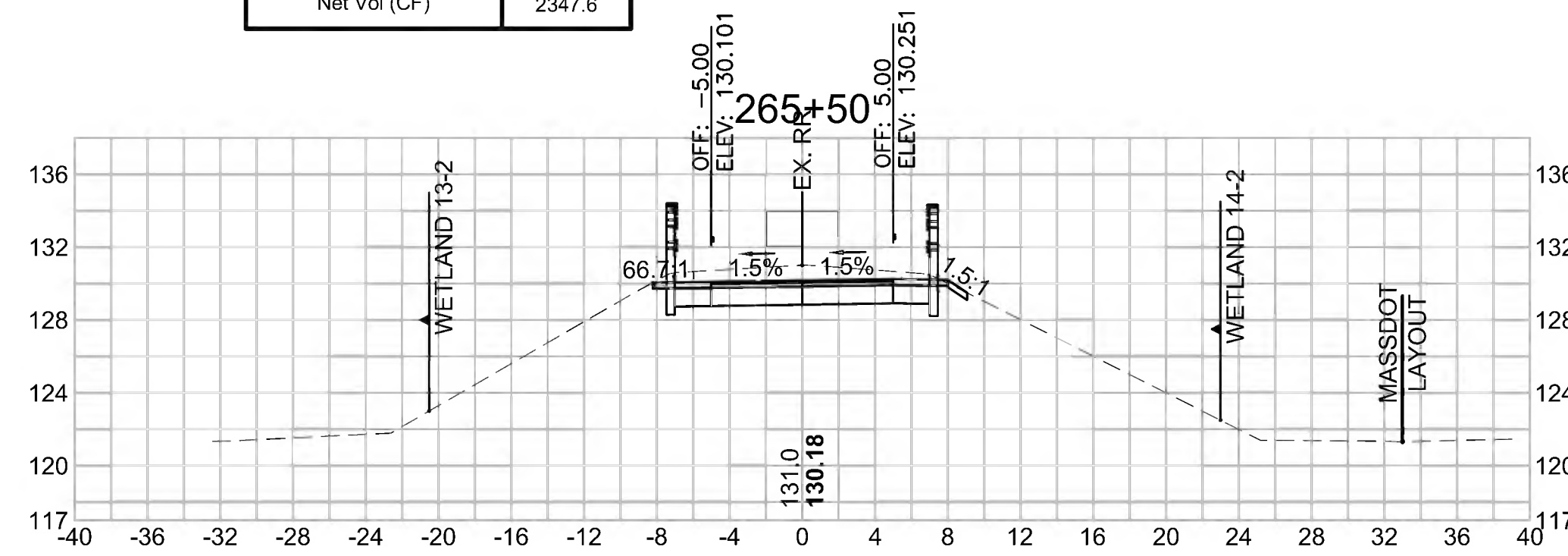
**Total Volume at Station 264+00.00**

Cut Area (SF)	44.515
Fill Area (SF)	2.235
Cut Vol (CF)	77.6
Fill Vol (CF)	2.1
Cum Cut Vol (CF)	10142.5
Cum Fill Vol (CF)	8013.4
Net Vol (CF)	2129.1



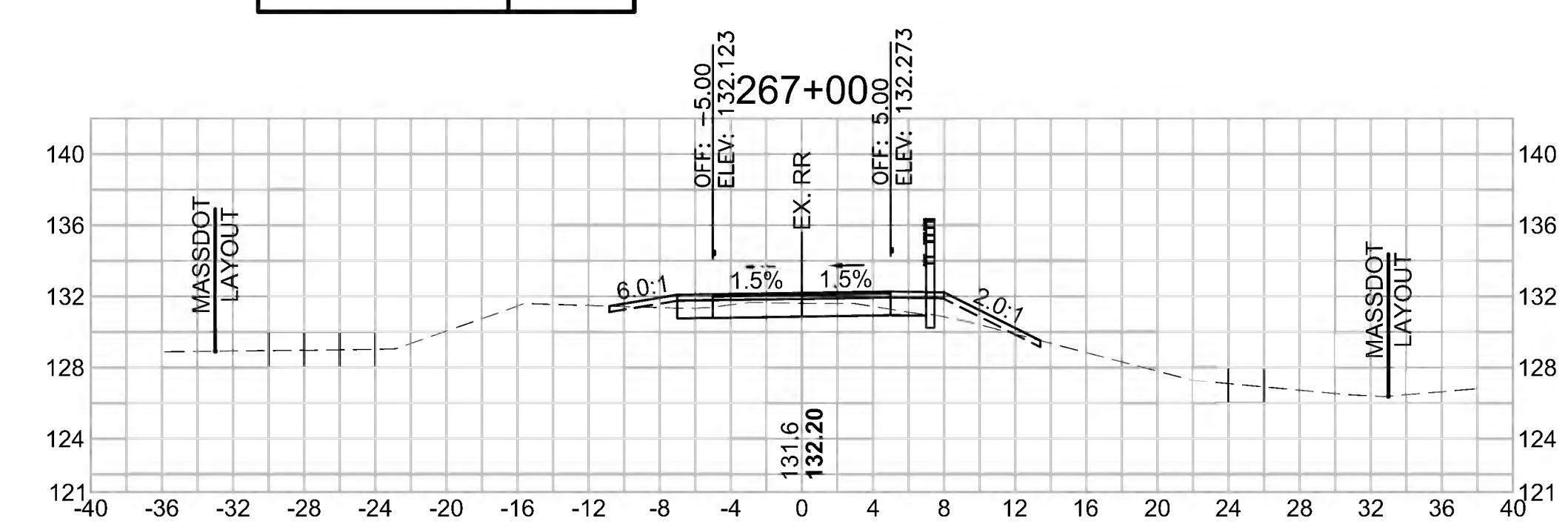
**Total Volume at Station 265+50.00**

Cut Area (SF)	28.952
Fill Area (SF)	0.000
Cut Vol (CF)	61.6
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	10364.4
Cum Fill Vol (CF)	8016.8
Net Vol (CF)	2347.6



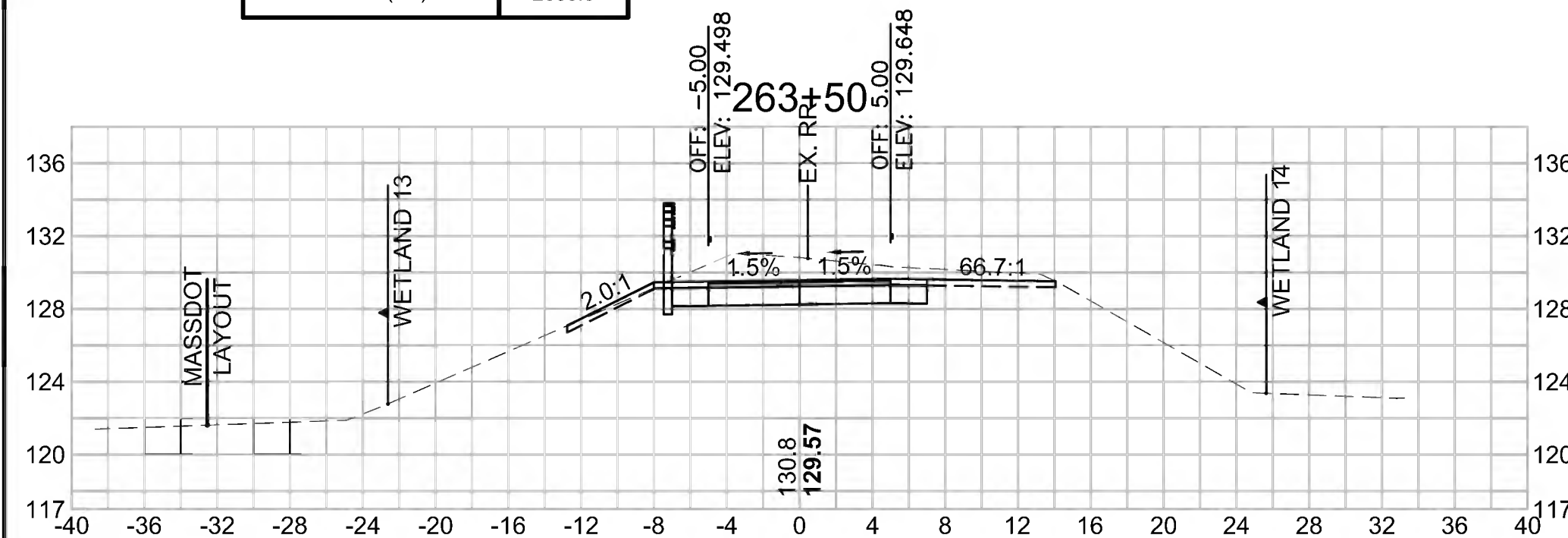
**Total Volume at Station 267+00.00**

Cut Area (SF)	9.594
Fill Area (SF)	3.254
Cut Vol (CF)	28.3
Fill Vol (CF)	4.9
Cum Cut Vol (CF)	10482.0
Cum Fill Vol (CF)	8023.7
Net Vol (CF)	2458.3



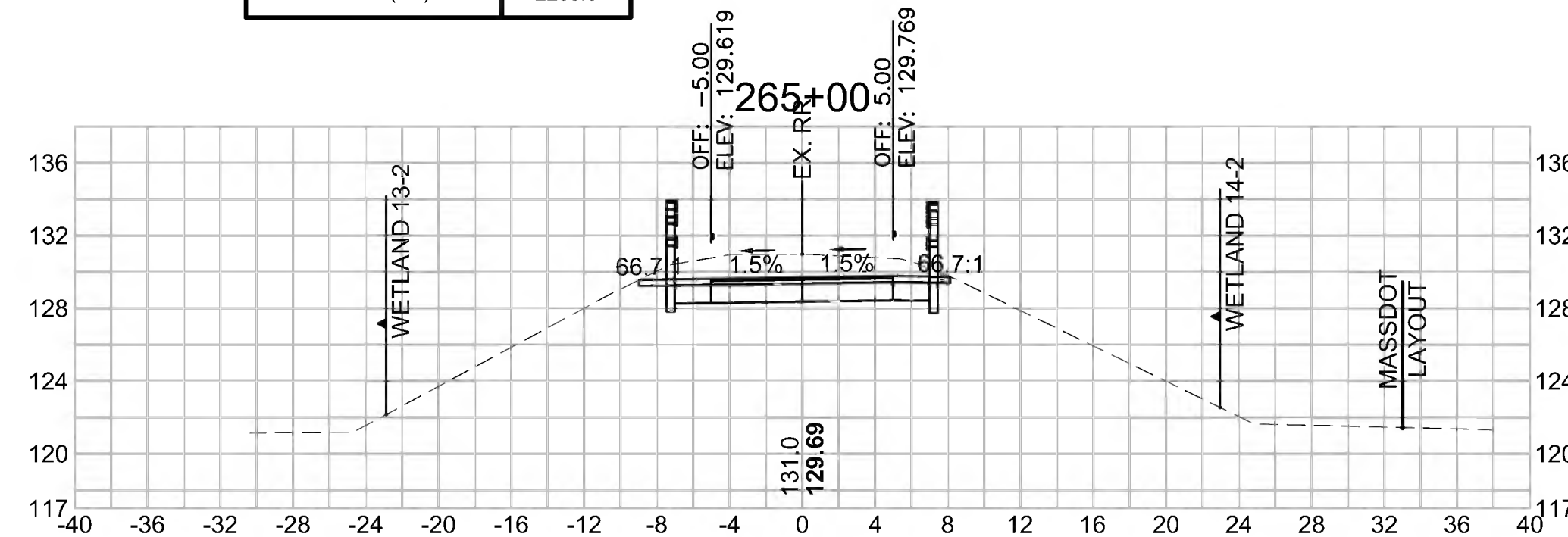
**Total Volume at Station 263+50.00**

Cut Area (SF)	39.330
Fill Area (SF)	0.000
Cut Vol (CF)	68.8
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	10064.9
Cum Fill Vol (CF)	8011.3
Net Vol (CF)	2053.6



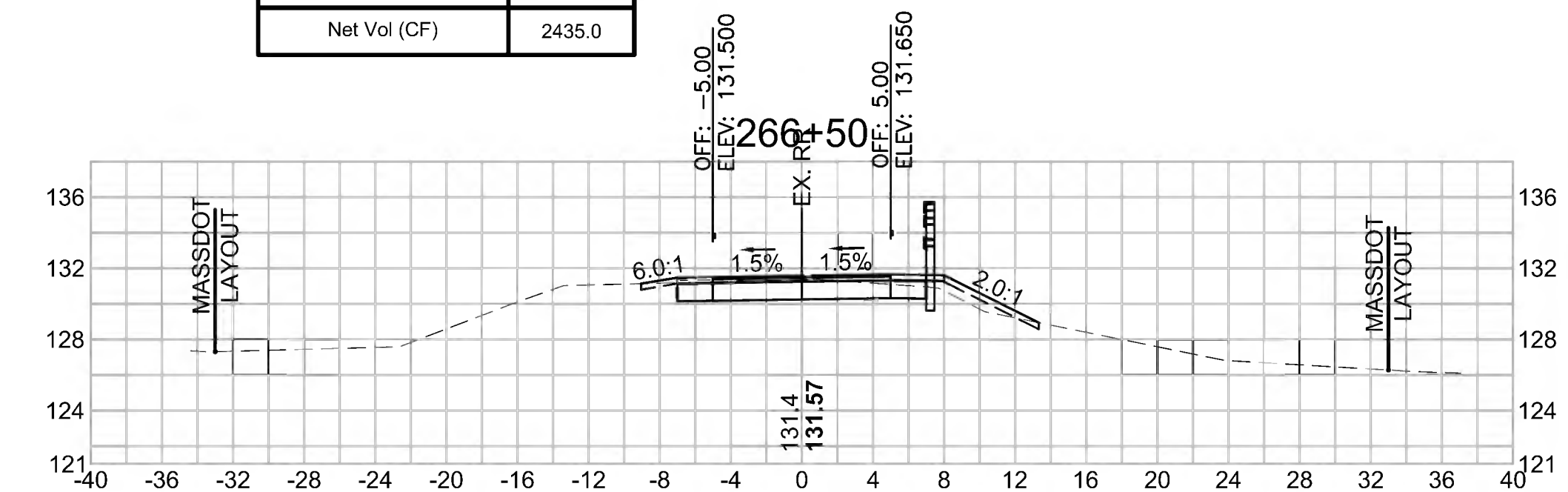
**Total Volume at Station 265+00.00**

Cut Area (SF)	37.581
Fill Area (SF)	0.000
Cut Vol (CF)	76.9
Fill Vol (CF)	0.7
Cum Cut Vol (CF)	10302.8
Cum Fill Vol (CF)	8016.8
Net Vol (CF)	2286.0



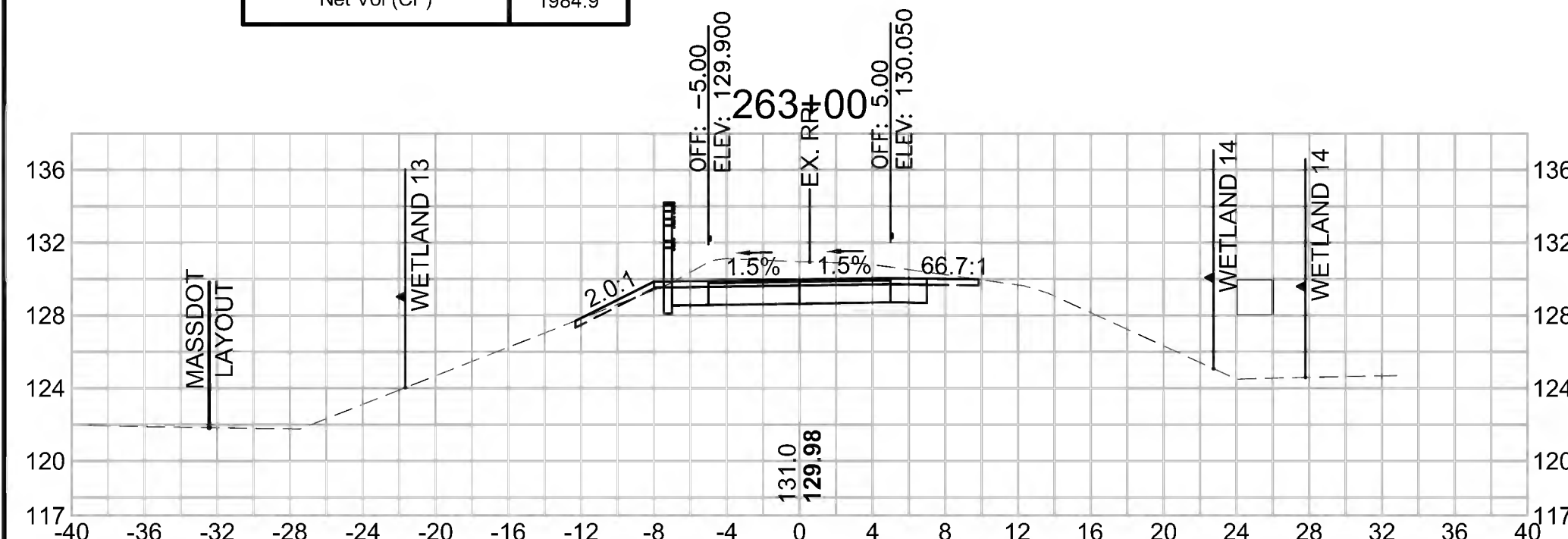
**Total Volume at Station 266+50.00**

Cut Area (SF)	20.963
Fill Area (SF)	2.079
Cut Vol (CF)	41.0
Fill Vol (CF)	1.9
Cum Cut Vol (CF)	10453.7
Cum Fill Vol (CF)	8018.8
Net Vol (CF)	2435.0



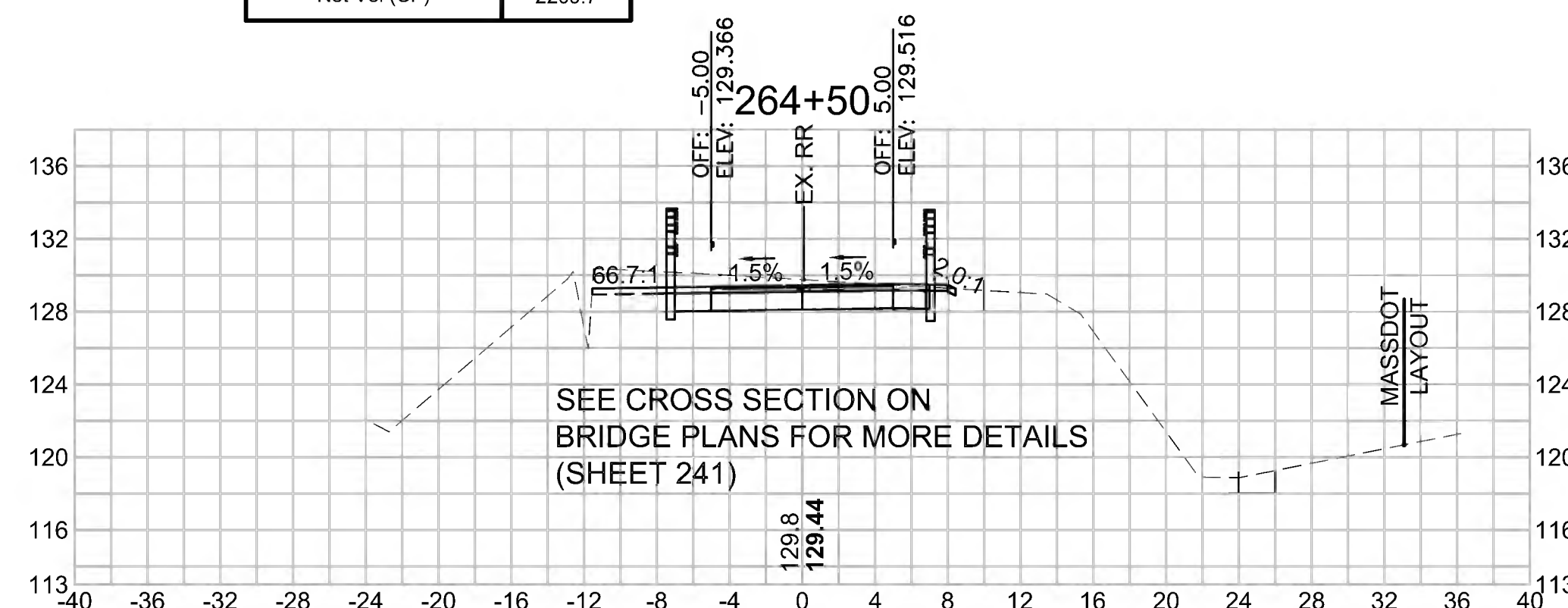
**Total Volume at Station 263+00.00**

Cut Area (SF)	34.961
Fill Area (SF)	0.066
Cut Vol (CF)	64.5
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	9996.1
Cum Fill Vol (CF)	8011.3
Net Vol (CF)	1984.9



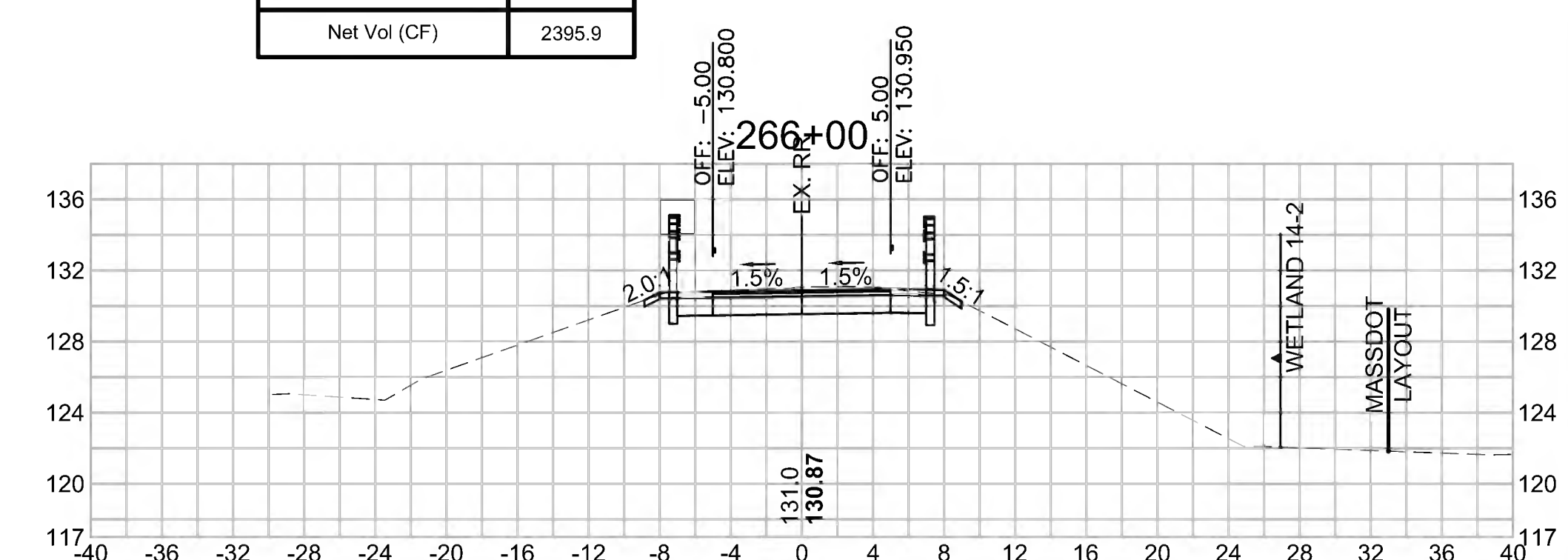
**Total Volume at Station 264+50.00**

Cut Area (SF)	45.493
Fill Area (SF)	0.745
Cut Vol (CF)	83.3
Fill Vol (CF)	2.8
Cum Cut Vol (CF)	10225.9
Cum Fill Vol (CF)	8016.2
Net Vol (CF)	2209.7



**Total Volume at Station 266+00.00**

Cut Area (SF)	23.271
Fill Area (SF)	0.000
Cut Vol (CF)	48.4
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	10412.8
Cum Fill Vol (CF)	8016.8
Net Vol (CF)	2395.9





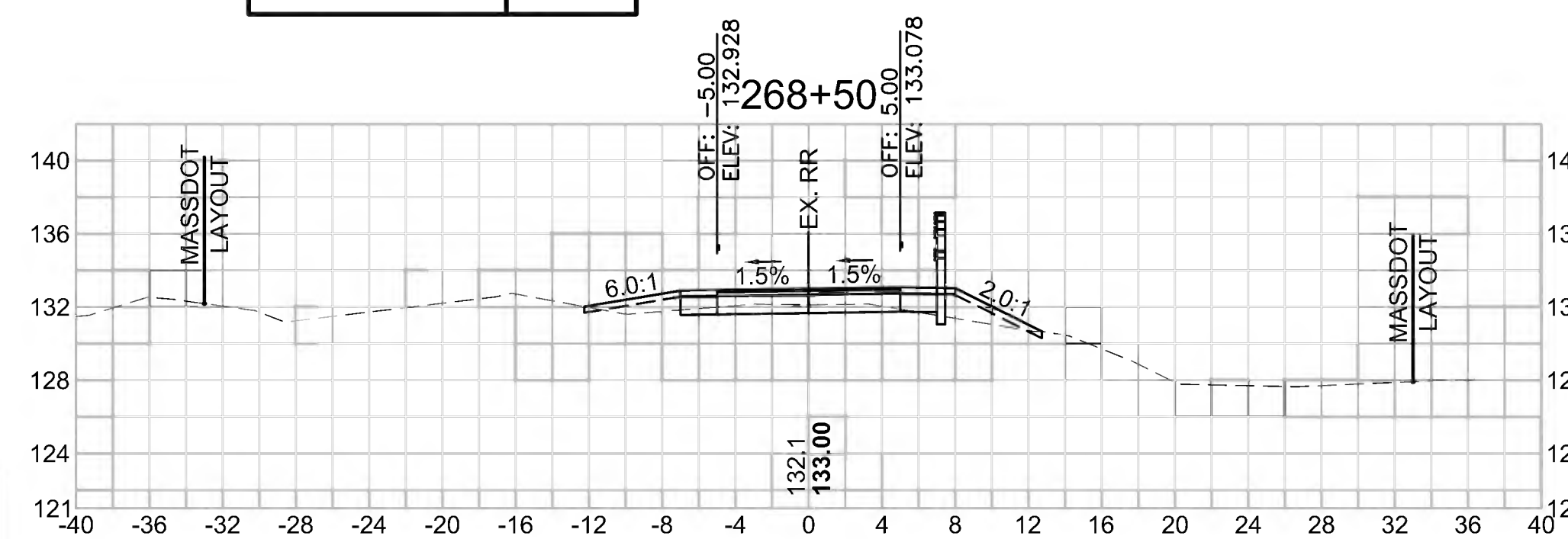
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	285	319

CROSS SECTIONS

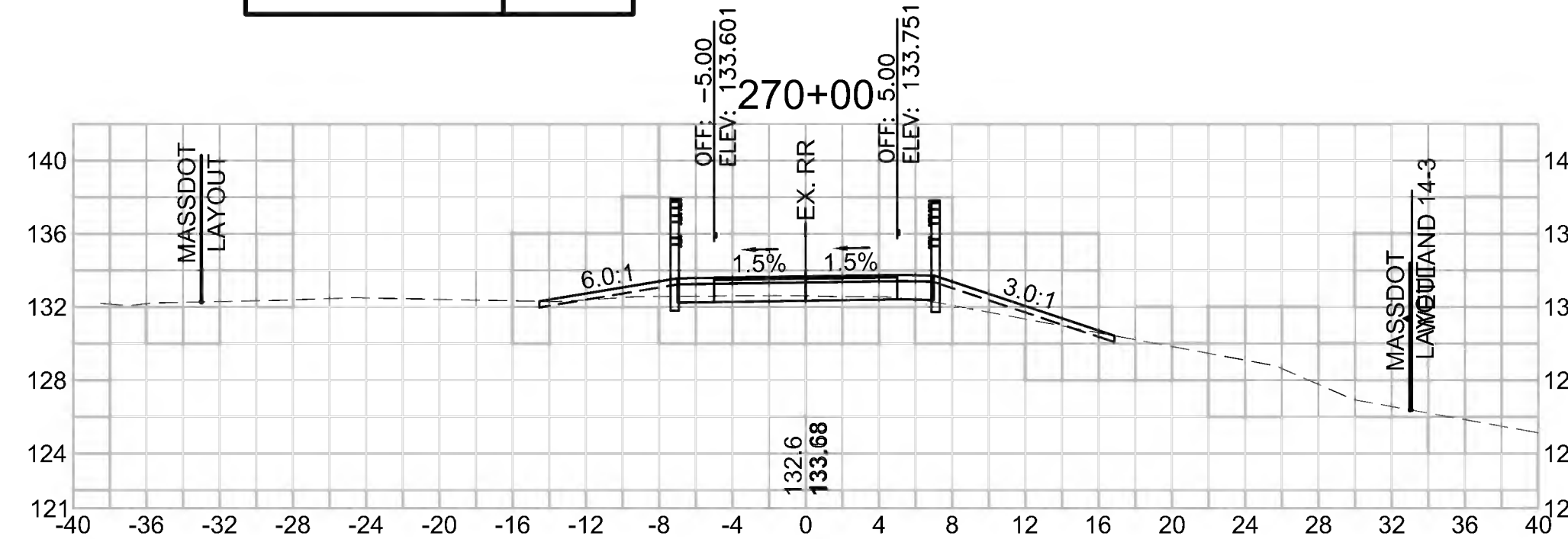
**Total Volume at Station 268+50.00**

Cut Area (SF)	6.922
Fill Area (SF)	5.881
Cut Vol (CF)	14.0
Fill Vol (CF)	8.7
Cum Cut Vol (CF)	10527.4
Cum Fill Vol (CF)	8046.2
Net Vol (CF)	2481.2



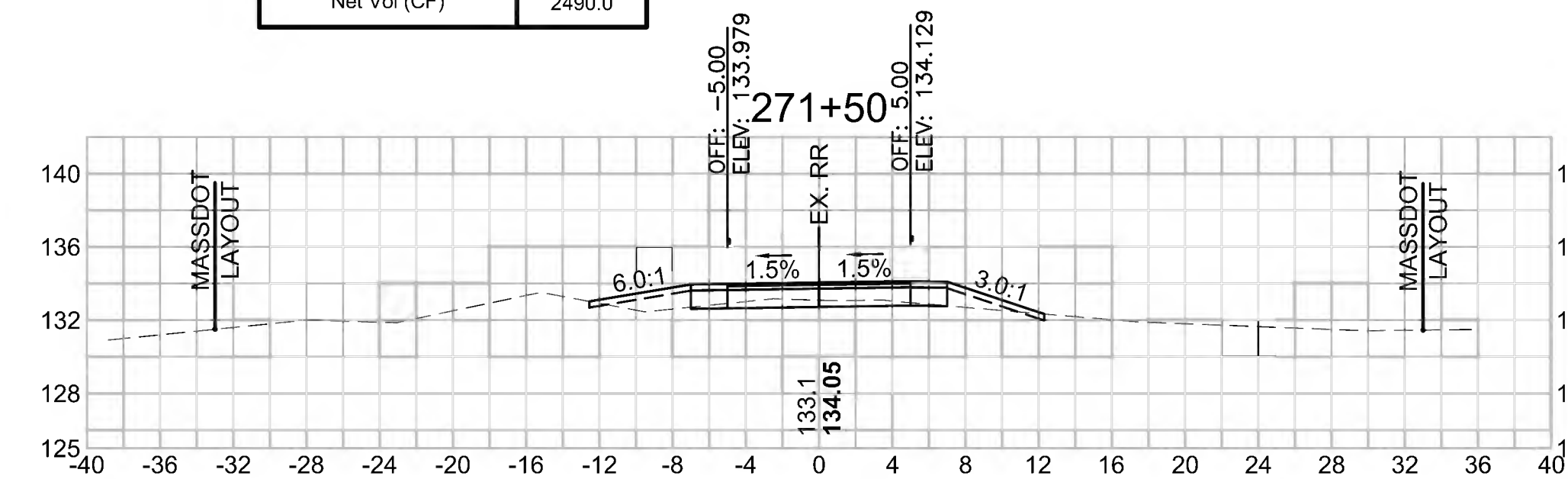
**Total Volume at Station 270+00.00**

Cut Area (SF)	16.138
Fill Area (SF)	5.597
Cut Vol (CF)	25.5
Fill Vol (CF)	14.8
Cum Cut Vol (CF)	10580.8
Cum Fill Vol (CF)	8096.8
Net Vol (CF)	2483.9



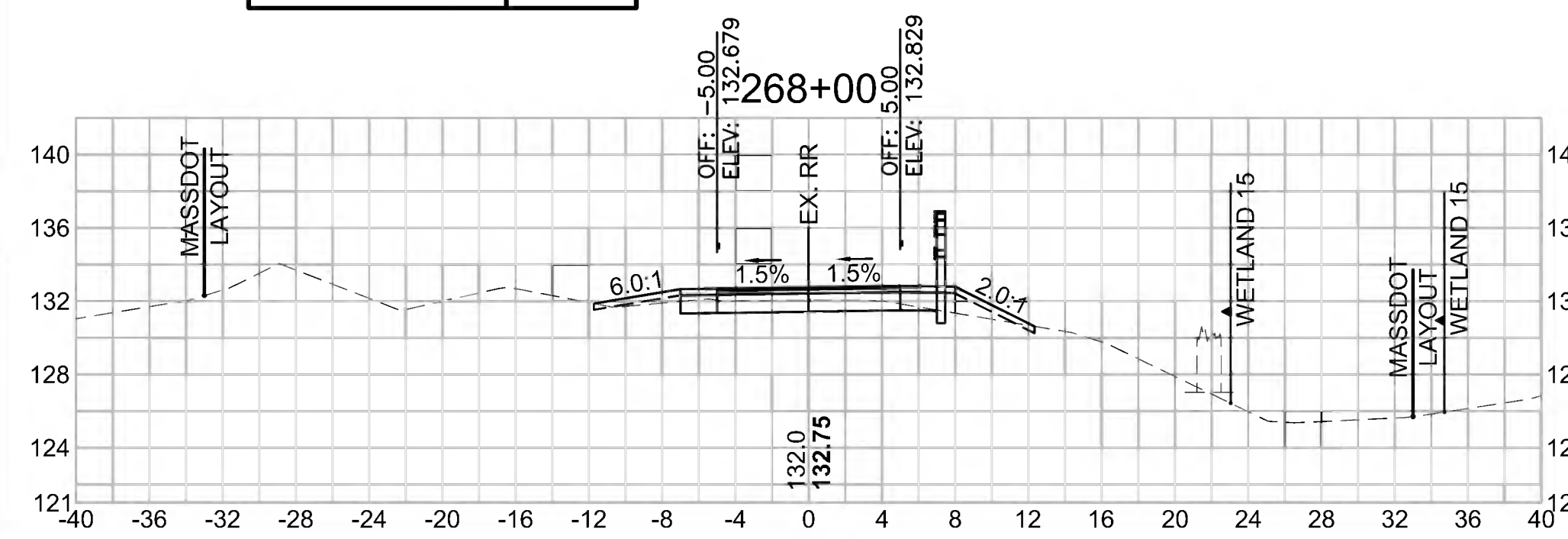
**Total Volume at Station 271+50.00**

Cut Area (SF)	12.582
Fill Area (SF)	4.728
Cut Vol (CF)	14.7
Fill Vol (CF)	13.5
Cum Cut Vol (CF)	10625.4
Cum Fill Vol (CF)	8135.4
Net Vol (CF)	2490.0



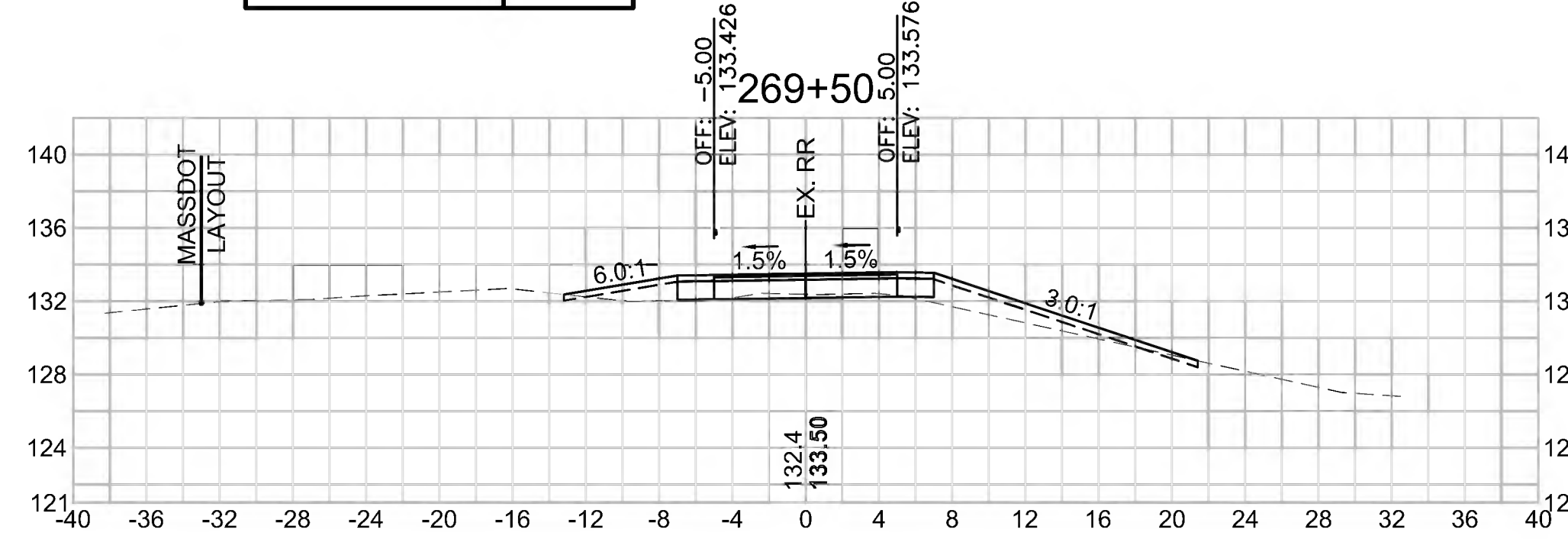
**Total Volume at Station 268+00.00**

Cut Area (SF)	8.250
Fill Area (SF)	3.461
Cut Vol (CF)	15.0
Fill Vol (CF)	7.0
Cum Cut Vol (CF)	10513.3
Cum Fill Vol (CF)	8037.5
Net Vol (CF)	2475.8



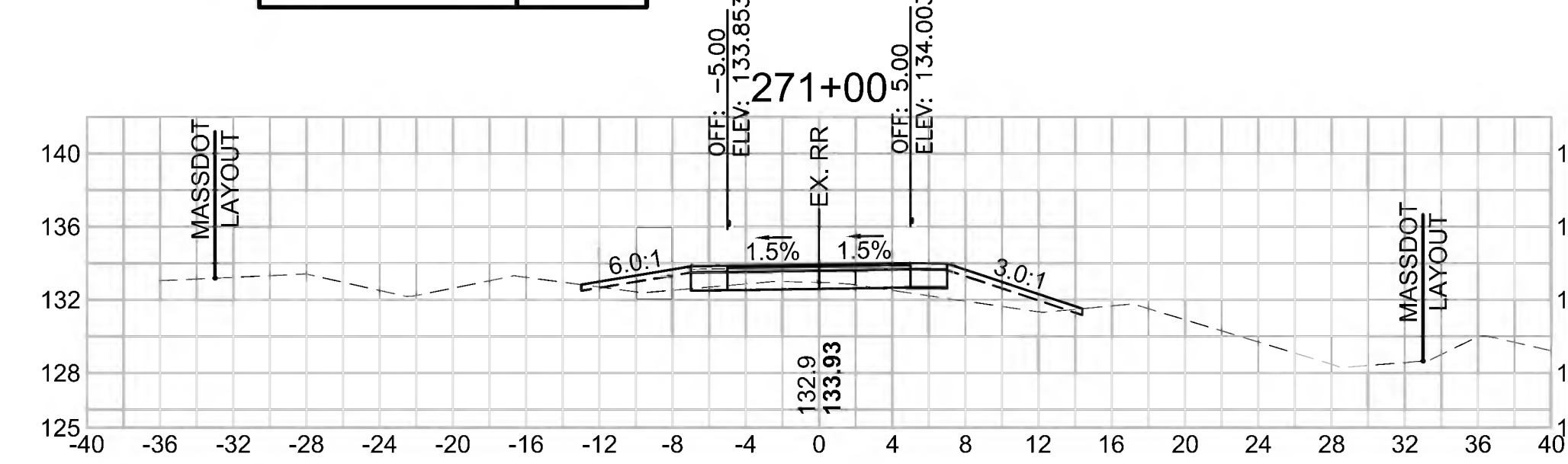
**Total Volume at Station 269+50.00**

Cut Area (SF)	11.450
Fill Area (SF)	10.431
Cut Vol (CF)	16.0
Fill Vol (CF)	20.0
Cum Cut Vol (CF)	10555.2
Cum Fill Vol (CF)	8082.0
Net Vol (CF)	2473.2



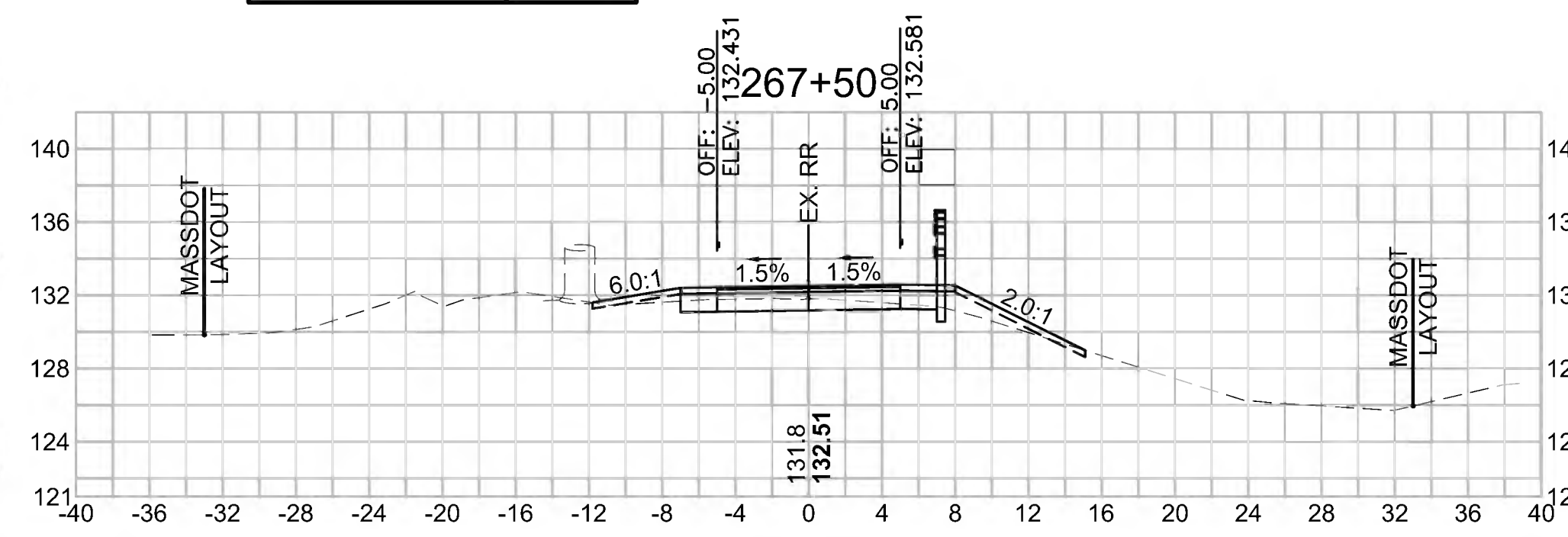
**Total Volume at Station 271+00.00**

Cut Area (SF)	3.288
Fill Area (SF)	9.901
Cut Vol (CF)	9.0
Fill Vol (CF)	14.5
Cum Cut Vol (CF)	10610.7
Cum Fill Vol (CF)	8121.9
Net Vol (CF)	2488.8



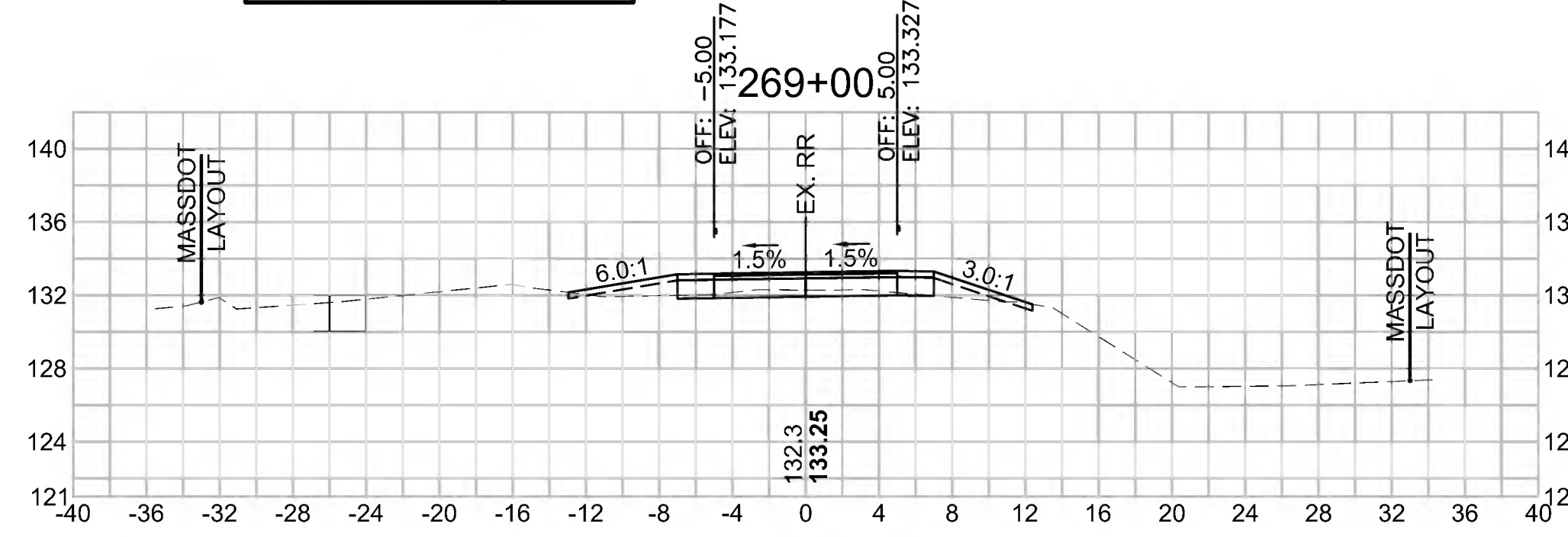
**Total Volume at Station 267+50.00**

Cut Area (SF)	7.984
Fill Area (SF)	4.106
Cut Vol (CF)	16.3
Fill Vol (CF)	6.8
Cum Cut Vol (CF)	10498.3
Cum Fill Vol (CF)	8030.5
Net Vol (CF)	2467.8



**Total Volume at Station 269+00.00**

Cut Area (SF)	5.848
Fill Area (SF)	11.181
Cut Vol (CF)	11.8
Fill Vol (CF)	15.8
Cum Cut Vol (CF)	10539.2
Cum Fill Vol (CF)	8062.0
Net Vol (CF)	2477.2



**Total Volume at Station 270+50.00**

Cut Area (SF)	6.449
Fill Area (SF)	5.776
Cut Vol (CF)	20.9
Fill Vol (CF)	10.5
Cum Cut Vol (CF)	10601.7
Cum Fill Vol (CF)	8107.4
Net Vol (CF)	2494.3



SUDBURY  
BRUCE FREEMAN RAIL TRAIL

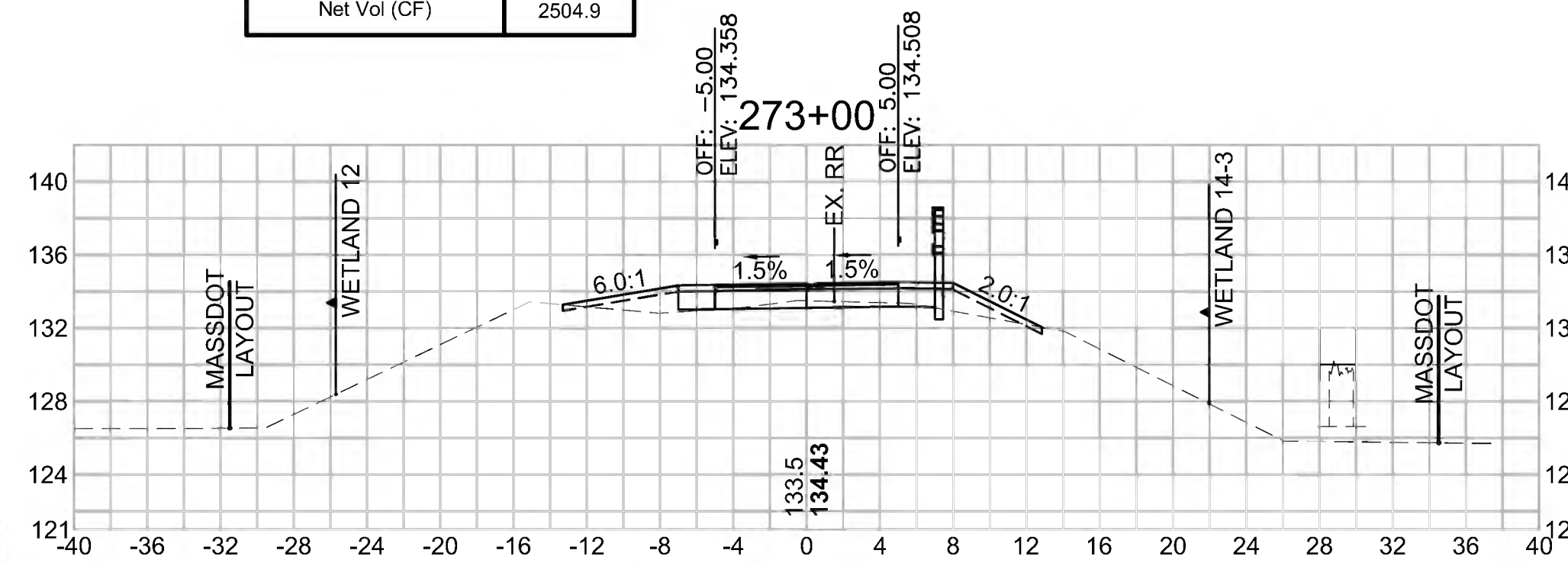
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	286	319

PROJECT FILE NO. 608164

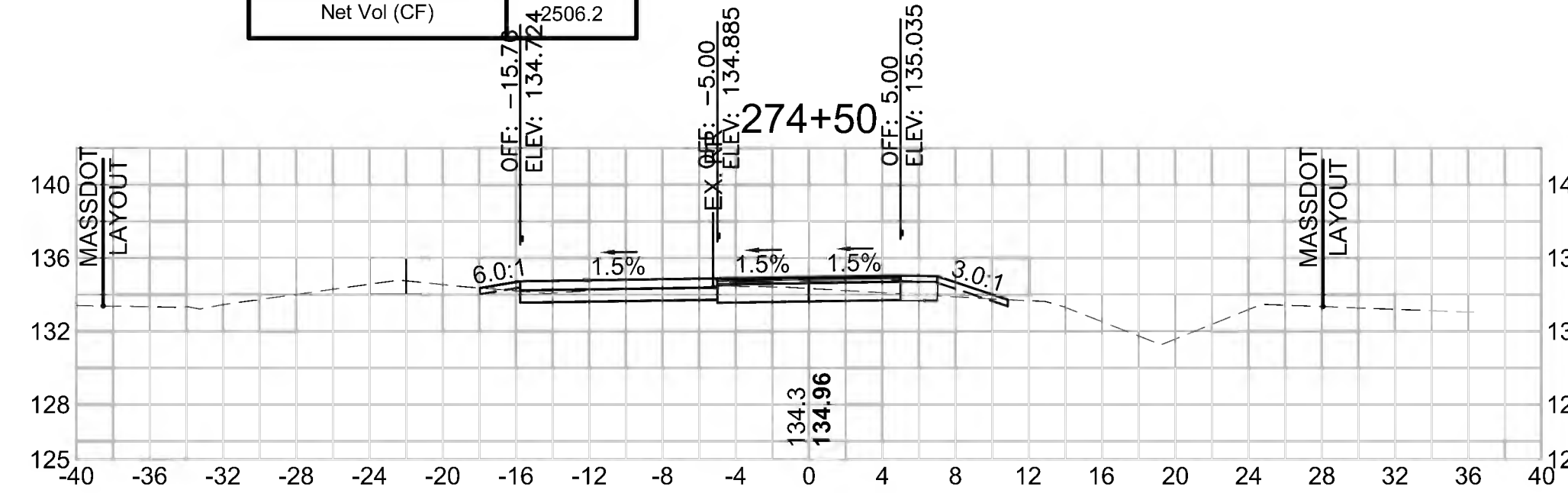
CROSS SECTIONS

608164\_XSEC(CROSS SECTION LAYOUTS).DWG 27-Jun-2022

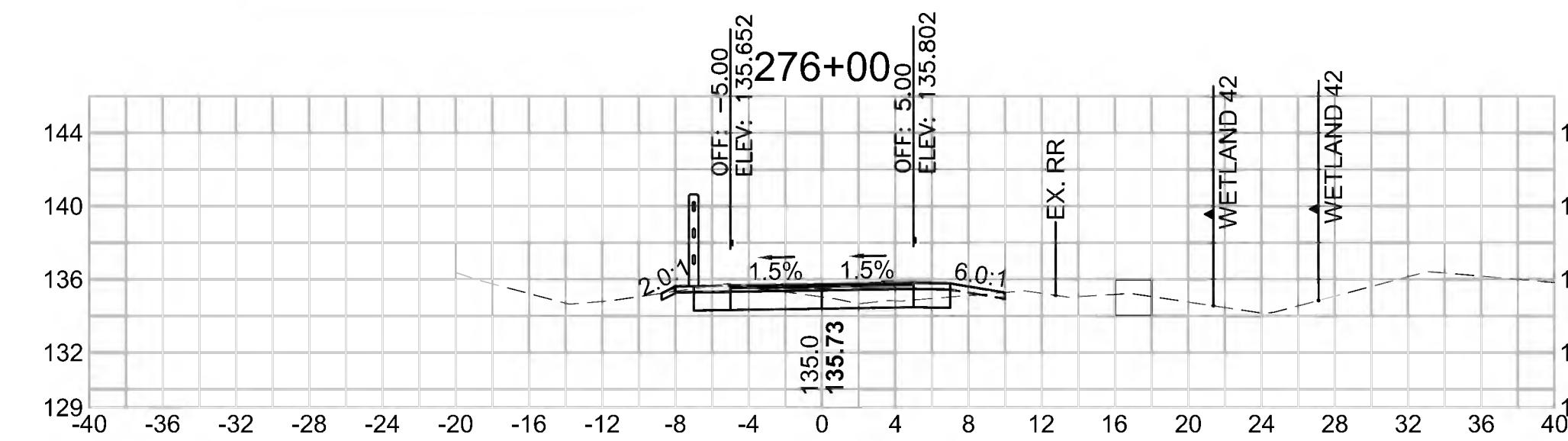
Total Volume at Station 273+00.00	
Cut Area (SF)	3.055
Fill Area (SF)	6.557
Cut Vol (CF)	7.7
Fill Vol (CF)	13.4
Cum Cut Vol (CF)	10677.4
Cum Fill Vol (CF)	8172.5
Net Vol (CF)	2504.9



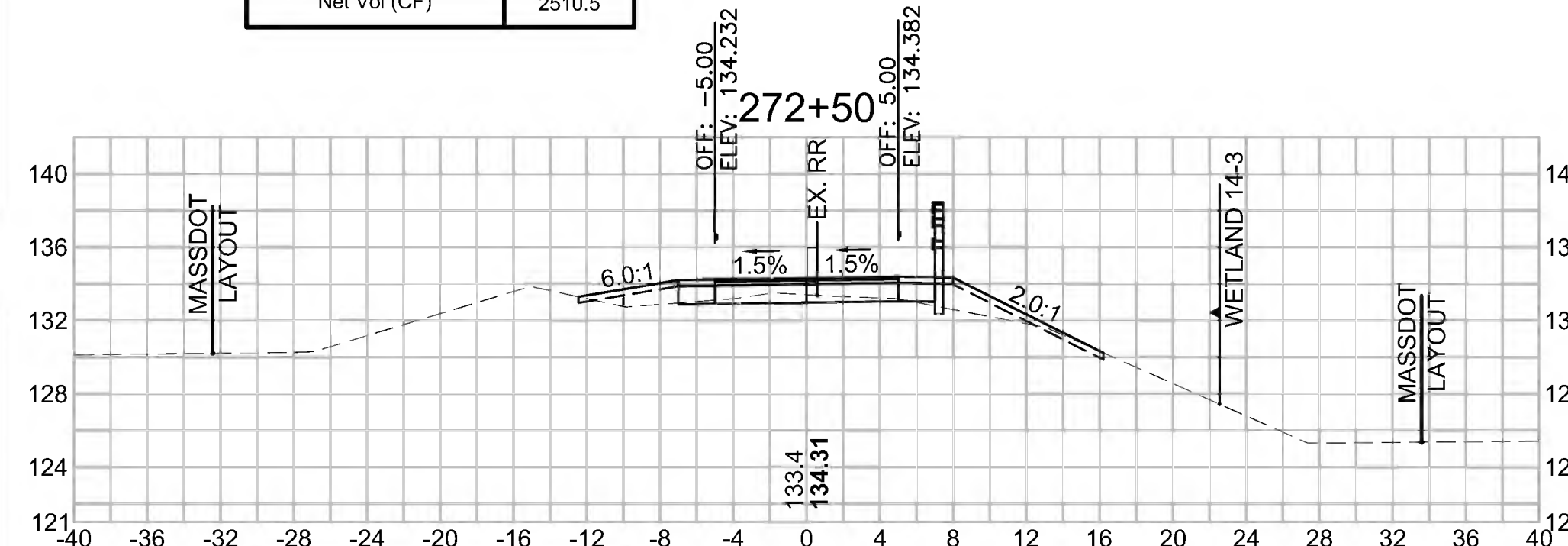
Total Volume at Station 274+50.00	
Cut Area (SF)	19.128
Fill Area (SF)	6.867
Cut Vol (CF)	28.8
Fill Vol (CF)	21.6
Cum Cut Vol (CF)	10731.9
Cum Fill Vol (CF)	8225.6
Net Vol (CF)	2506.2



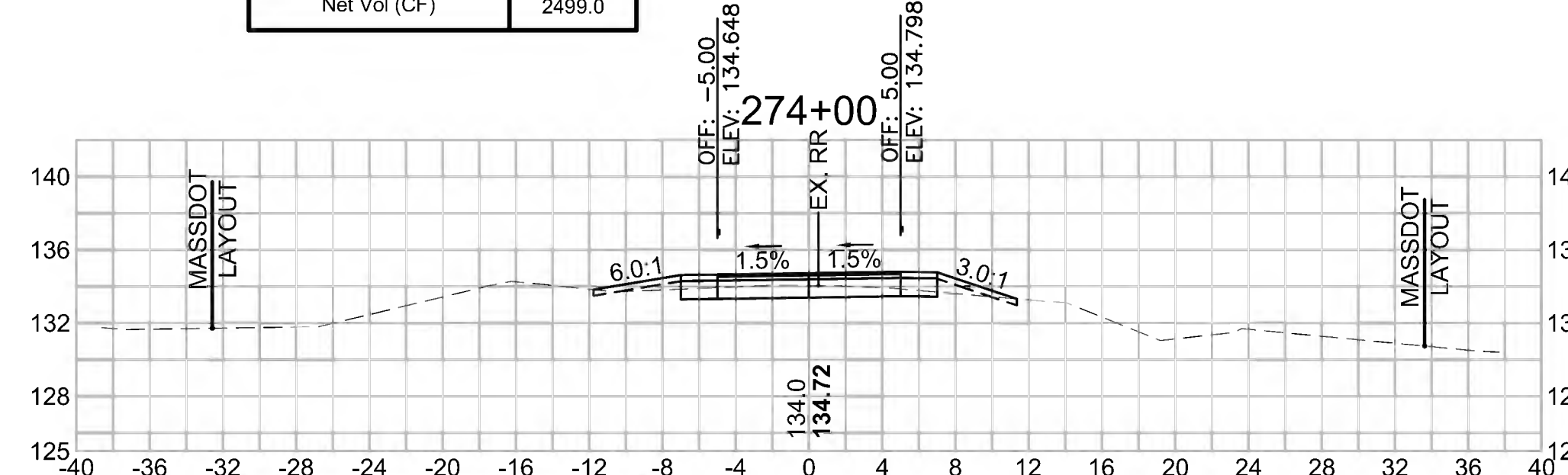
Total Volume at Station 276+00.00	
Cut Area (SF)	12.654
Fill Area (SF)	0.620
Cut Vol (CF)	27.7
Fill Vol (CF)	1.5
Cum Cut Vol (CF)	10874.9
Cum Fill Vol (CF)	8234.4
Net Vol (CF)	2640.5



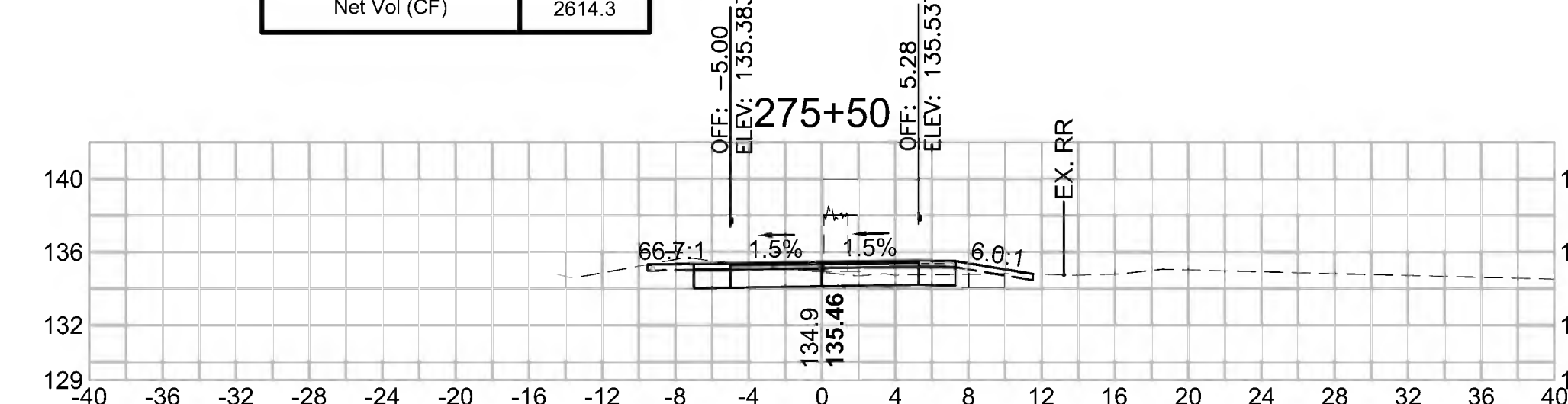
Total Volume at Station 272+50.00	
Cut Area (SF)	5.292
Fill Area (SF)	7.892
Cut Vol (CF)	18.7
Fill Vol (CF)	13.3
Cum Cut Vol (CF)	10669.6
Cum Fill Vol (CF)	8159.1
Net Vol (CF)	2510.5



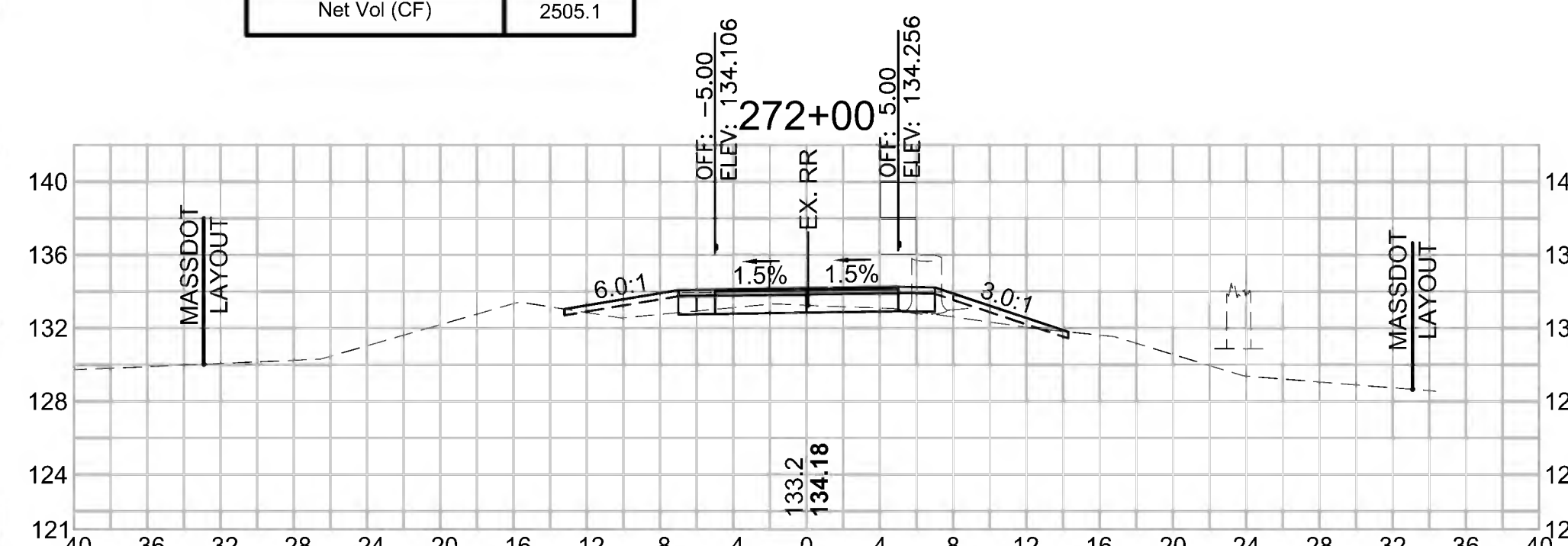
Total Volume at Station 274+00.00	
Cut Area (SF)	11.966
Fill Area (SF)	16.421
Cut Vol (CF)	17.0
Fill Vol (CF)	20.4
Cum Cut Vol (CF)	10703.1
Cum Fill Vol (CF)	8204.1
Net Vol (CF)	2499.0



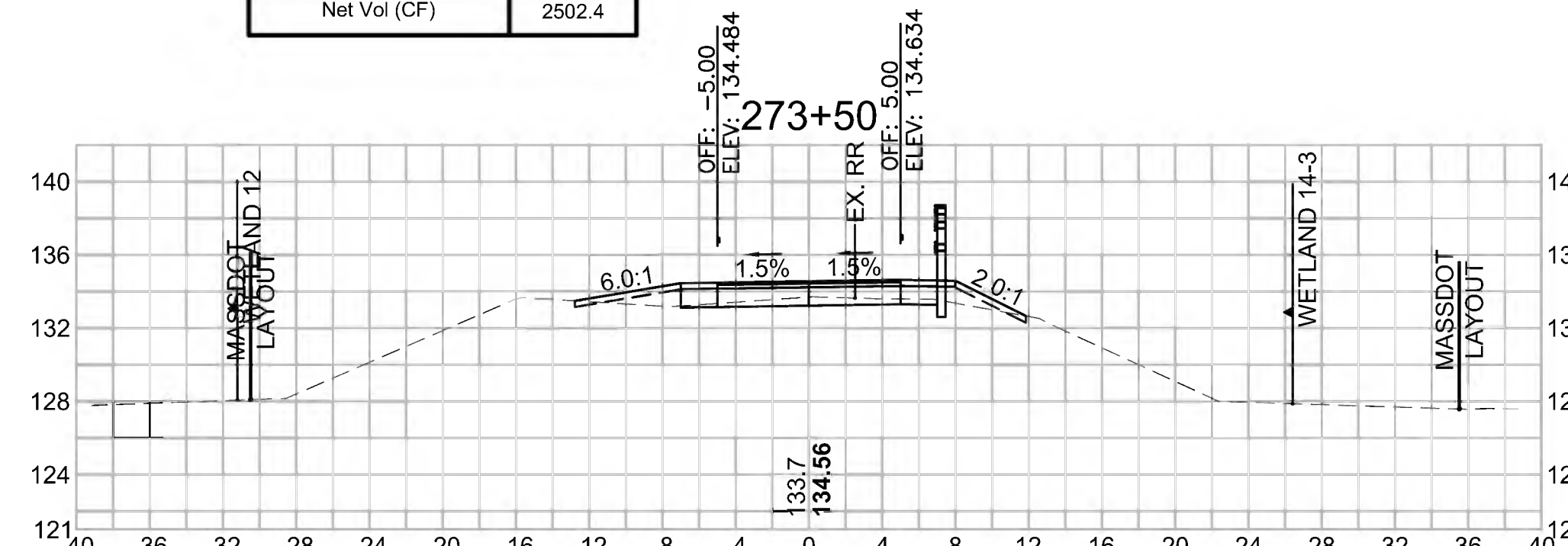
Total Volume at Station 275+50.00	
Cut Area (SF)	17.297
Fill Area (SF)	1.005
Cut Vol (CF)	56.8
Fill Vol (CF)	0.9
Cum Cut Vol (CF)	10847.2
Cum Fill Vol (CF)	8232.9
Net Vol (CF)	2614.3



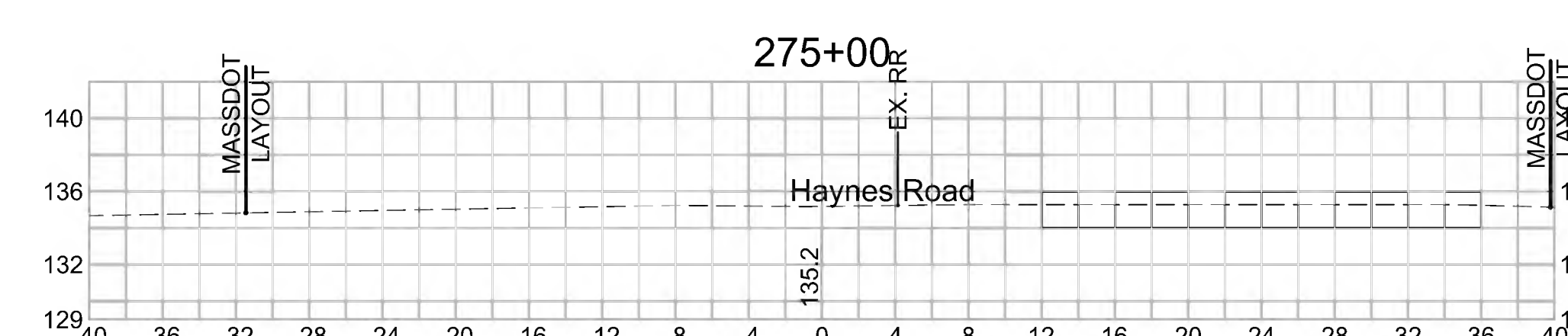
Total Volume at Station 272+00.00	
Cut Area (SF)	14.952
Fill Area (SF)	6.472
Cut Vol (CF)	25.5
Fill Vol (CF)	10.4
Cum Cut Vol (CF)	10650.9
Cum Fill Vol (CF)	8145.8
Net Vol (CF)	2505.1



Total Volume at Station 273+50.00	
Cut Area (SF)	6.373
Fill Area (SF)	5.575
Cut Vol (CF)	8.7
Fill Vol (CF)	11.2
Cum Cut Vol (CF)	10686.1
Cum Fill Vol (CF)	8183.7
Net Vol (CF)	2502.4



Total Volume at Station 275+00.00	
Cut Area (SF)	44.066
Fill Area (SF)	0.000
Cut Vol (CF)	58.5
Fill Vol (CF)	6.4
Cum Cut Vol (CF)	10790.4
Cum Fill Vol (CF)	8232.0
Net Vol (CF)	2558.4





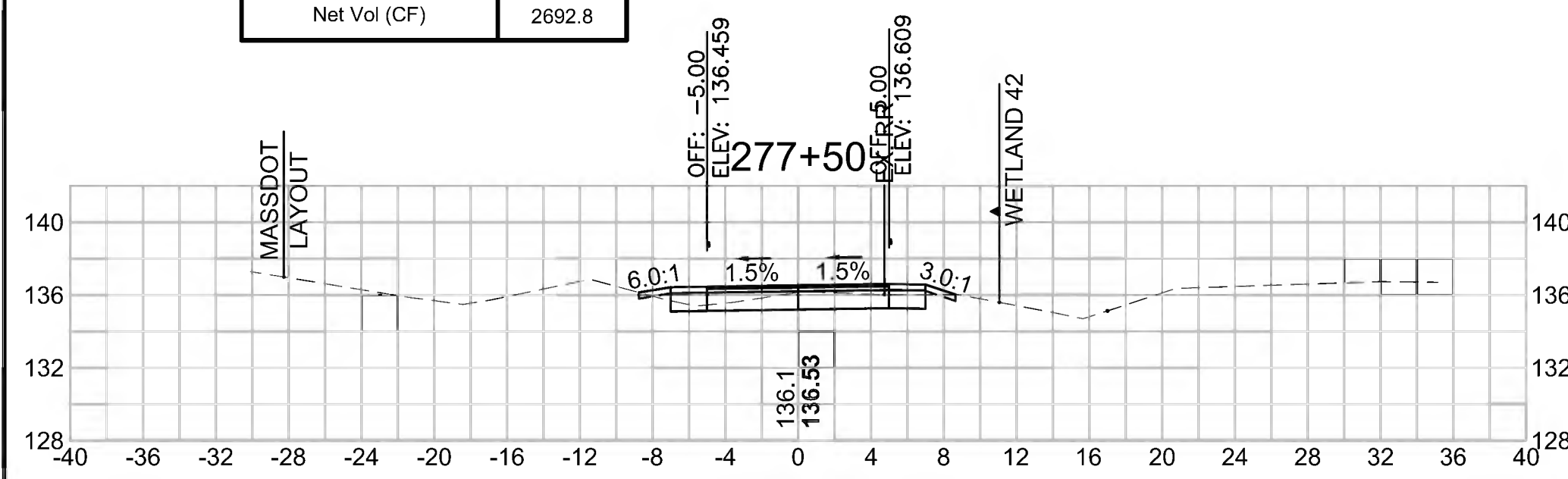
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	287	319

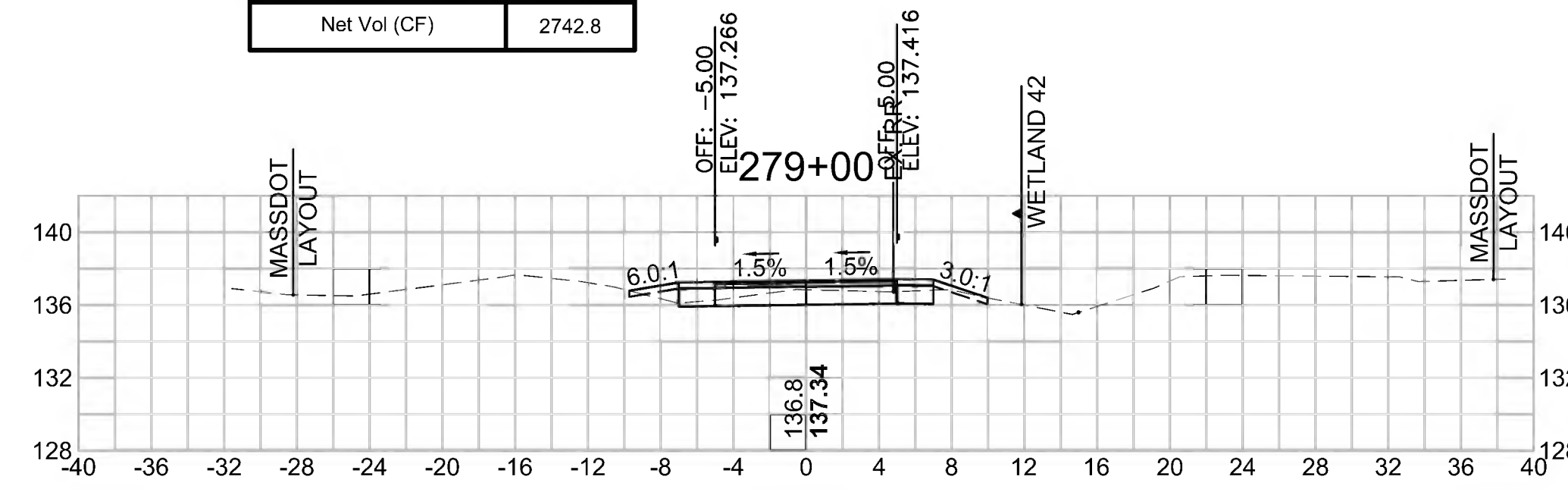
PROJECT FILE NO. 608164

CROSS SECTIONS

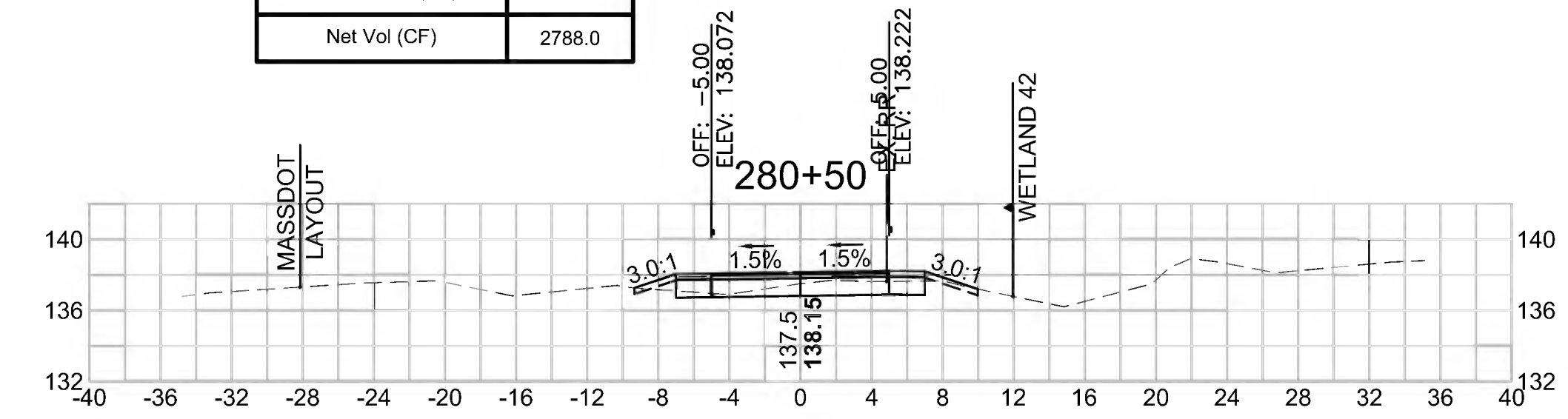
Total Volume at Station 277+50.00	
Cut Area (SF)	9.978
Fill Area (SF)	0.269
Cut Vol (CF)	15.8
Fill Vol (CF)	0.3
Cum Cut Vol (CF)	10928.2
Cum Fill Vol (CF)	8235.5
Net Vol (CF)	2692.8



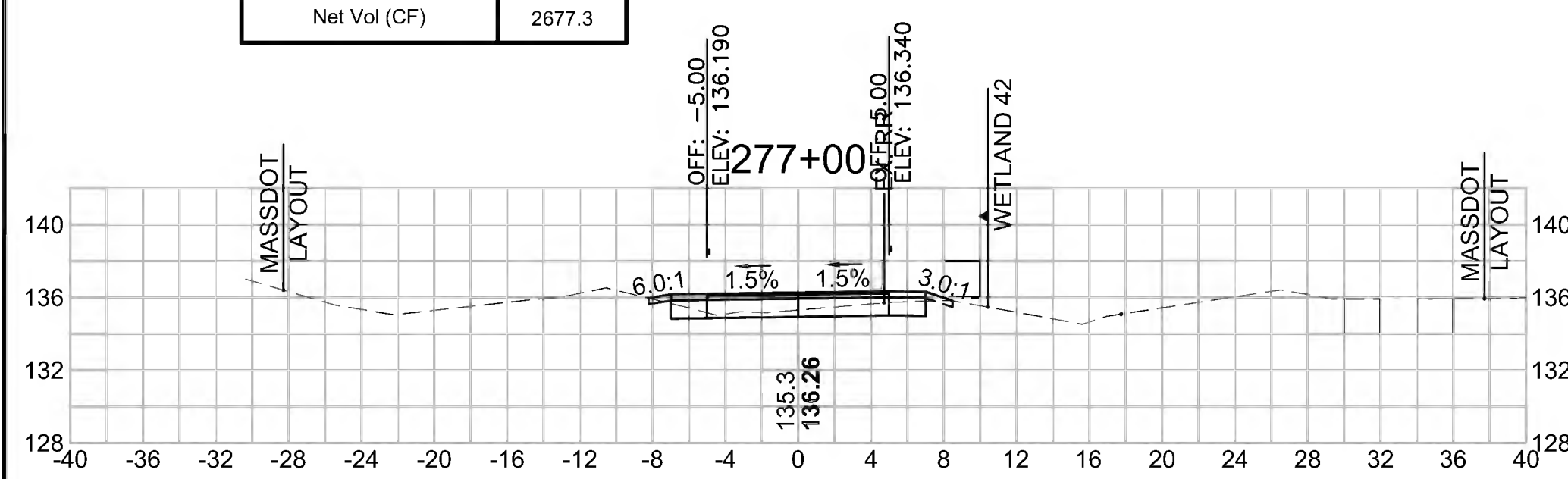
Total Volume at Station 279+00.00	
Cut Area (SF)	9.292
Fill Area (SF)	0.846
Cut Vol (CF)	17.6
Fill Vol (CF)	1.2
Cum Cut Vol (CF)	10981.4
Cum Fill Vol (CF)	8238.6
Net Vol (CF)	2742.8



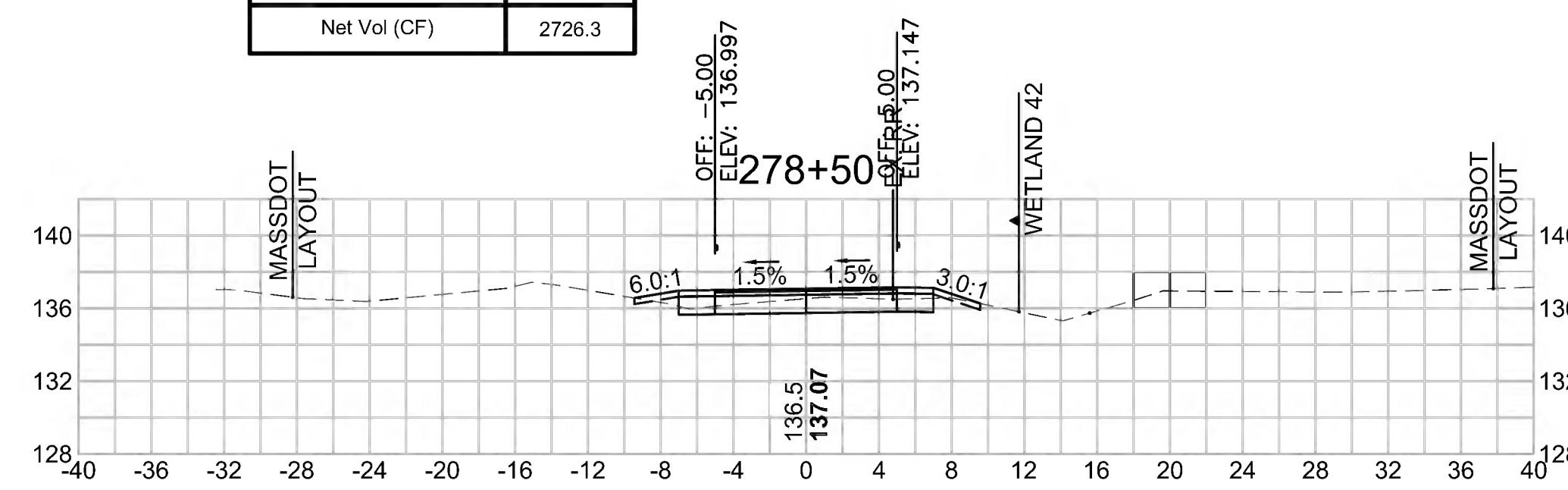
Total Volume at Station 280+50.00	
Cut Area (SF)	8.526
Fill Area (SF)	0.500
Cut Vol (CF)	15.8
Fill Vol (CF)	1.5
Cum Cut Vol (CF)	11031.2
Cum Fill Vol (CF)	8243.1
Net Vol (CF)	2788.0



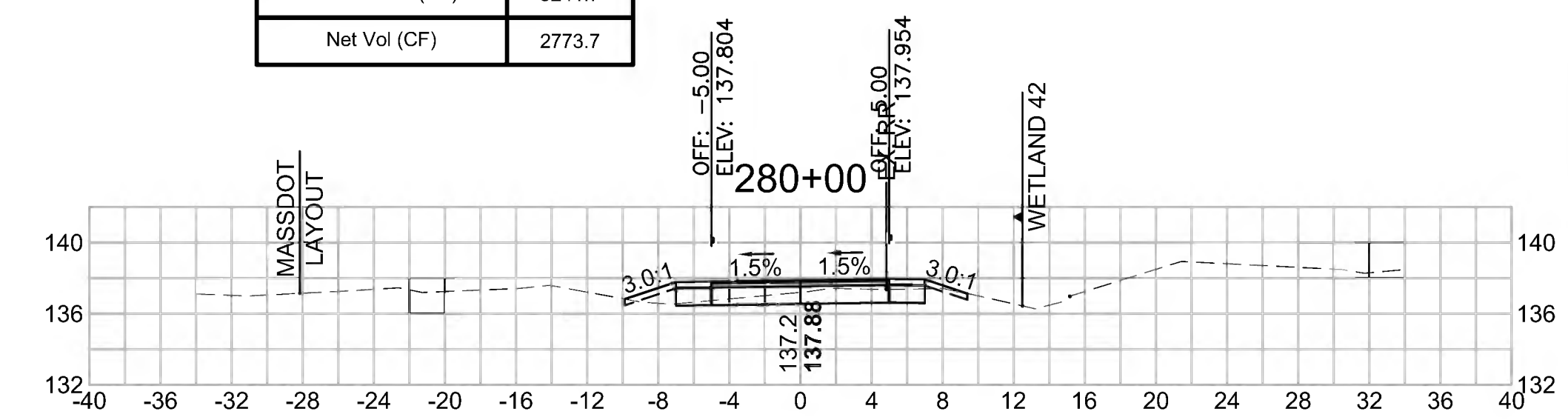
Total Volume at Station 277+00.00	
Cut Area (SF)	7.093
Fill Area (SF)	0.066
Cut Vol (CF)	16.2
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	10912.4
Cum Fill Vol (CF)	8235.1
Net Vol (CF)	2677.3



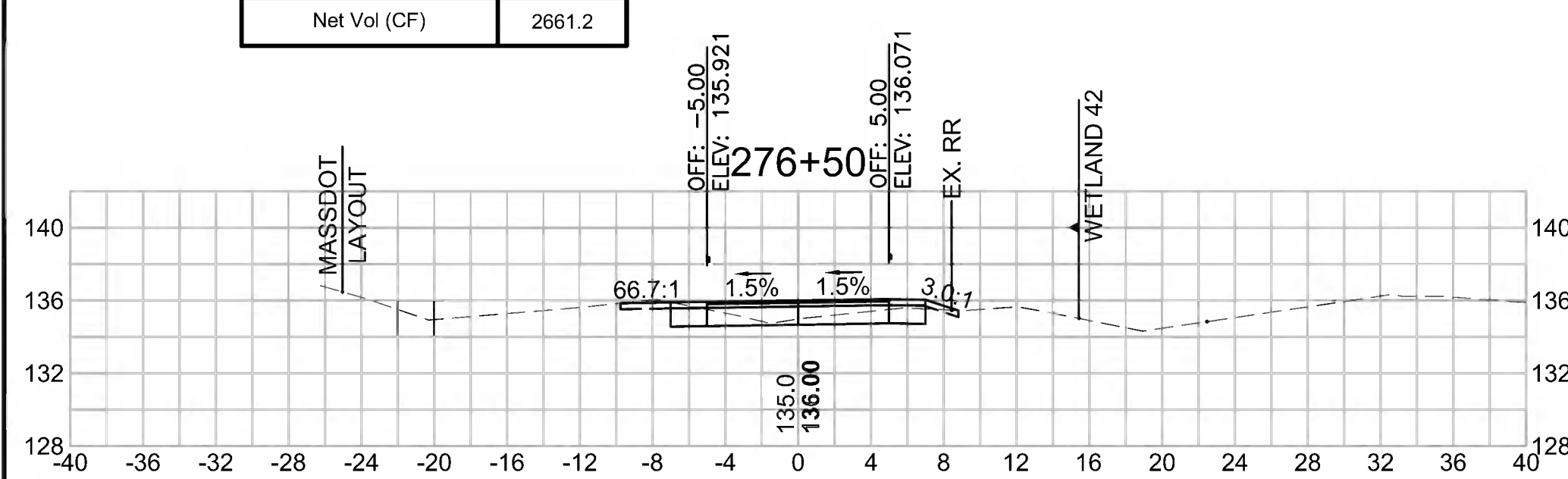
Total Volume at Station 278+50.00	
Cut Area (SF)	9.760
Fill Area (SF)	0.426
Cut Vol (CF)	17.7
Fill Vol (CF)	1.0
Cum Cut Vol (CF)	10963.7
Cum Fill Vol (CF)	8237.4
Net Vol (CF)	2726.3



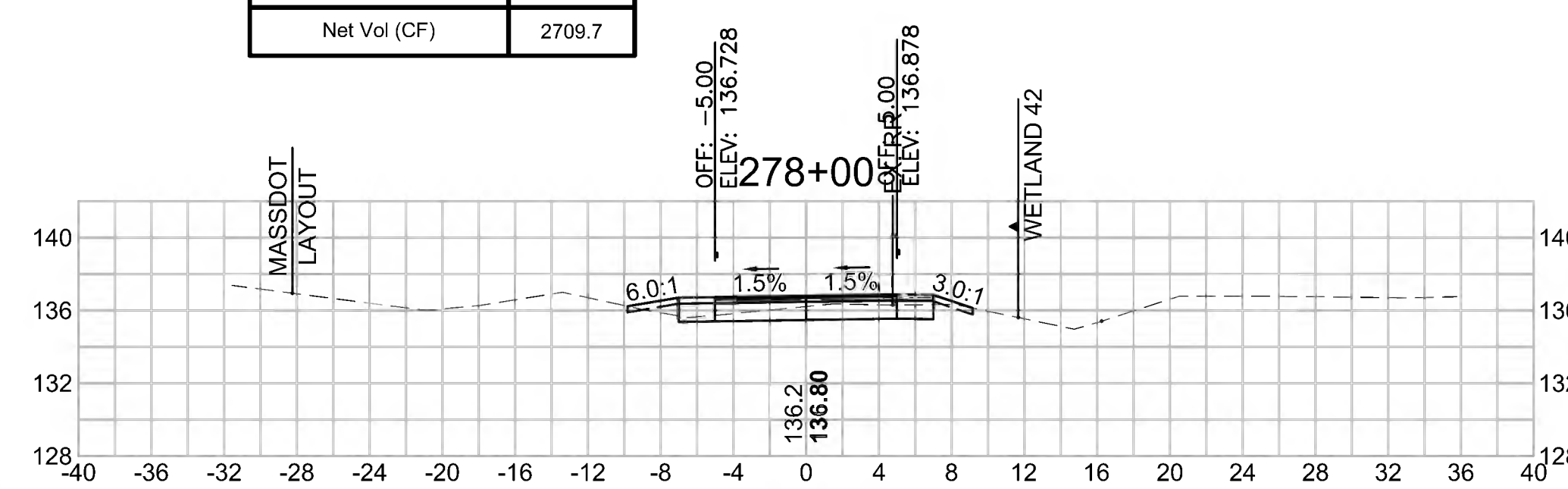
Total Volume at Station 280+00.00	
Cut Area (SF)	8.550
Fill Area (SF)	1.082
Cut Vol (CF)	16.6
Fill Vol (CF)	1.7
Cum Cut Vol (CF)	11015.4
Cum Fill Vol (CF)	8241.7
Net Vol (CF)	2773.7



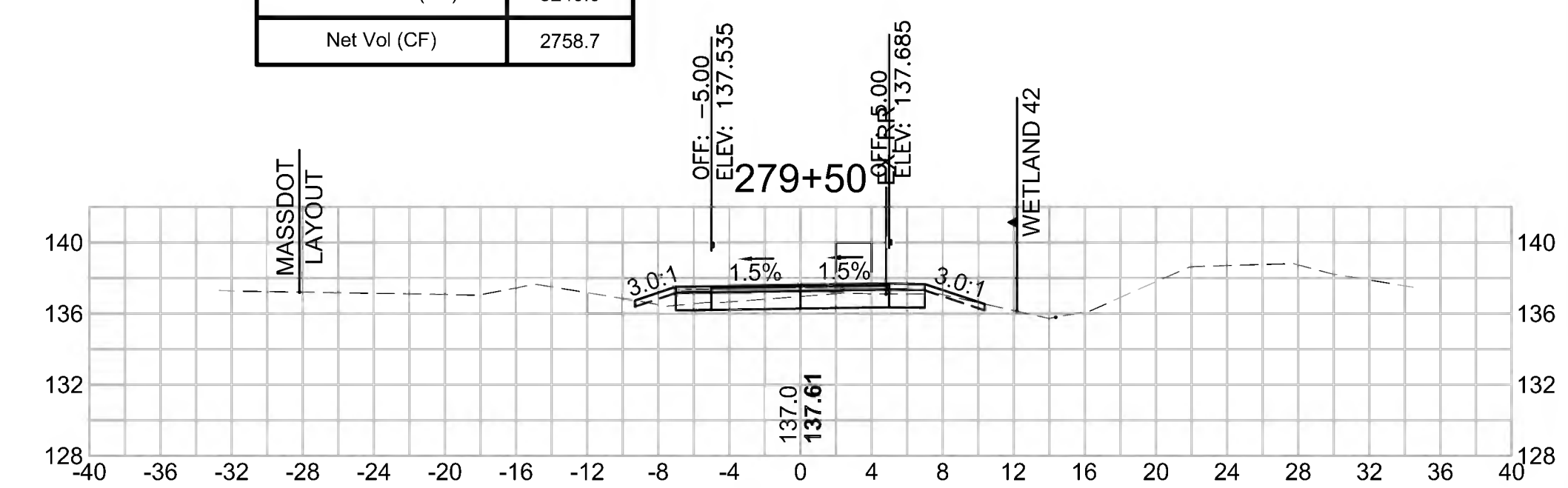
Total Volume at Station 276+50.00	
Cut Area (SF)	10.381
Fill Area (SF)	0.043
Cut Vol (CF)	21.3
Fill Vol (CF)	0.6
Cum Cut Vol (CF)	10896.2
Cum Fill Vol (CF)	8235.0
Net Vol (CF)	2661.2



Total Volume at Station 278+00.00	
Cut Area (SF)	9.312
Fill Area (SF)	0.703
Cut Vol (CF)	17.9
Fill Vol (CF)	0.9
Cum Cut Vol (CF)	10946.1
Cum Fill Vol (CF)	8236.4
Net Vol (CF)	2709.7



Total Volume at Station 279+50.00	
Cut Area (SF)	9.420
Fill Area (SF)	0.707
Cut Vol (CF)	17.3
Fill Vol (CF)	1.4
Cum Cut Vol (CF)	10998.7
Cum Fill Vol (CF)	8240.0
Net Vol (CF)	2758.7



SUDBURY  
BRUCE FREEMAN RAIL TRAIL

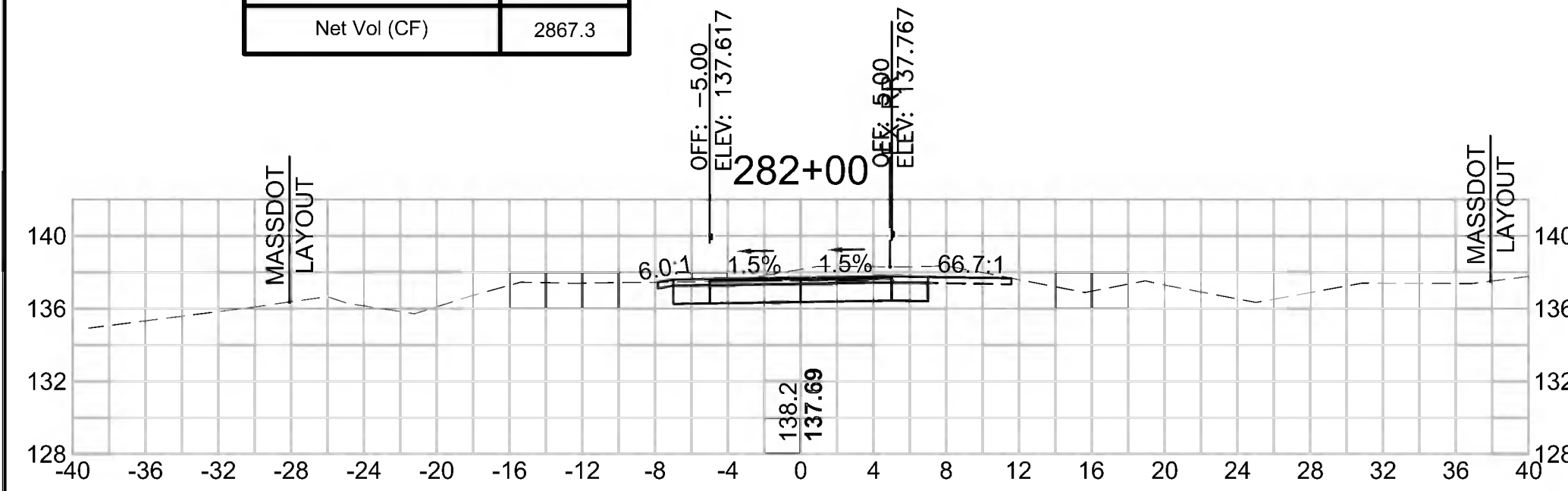
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	288	319
PROJECT FILE NO. 608164			

CROSS SECTIONS

608164.X\$SEC(CROSS SECTION LAYOUTS).DWG 27-Jun-2022

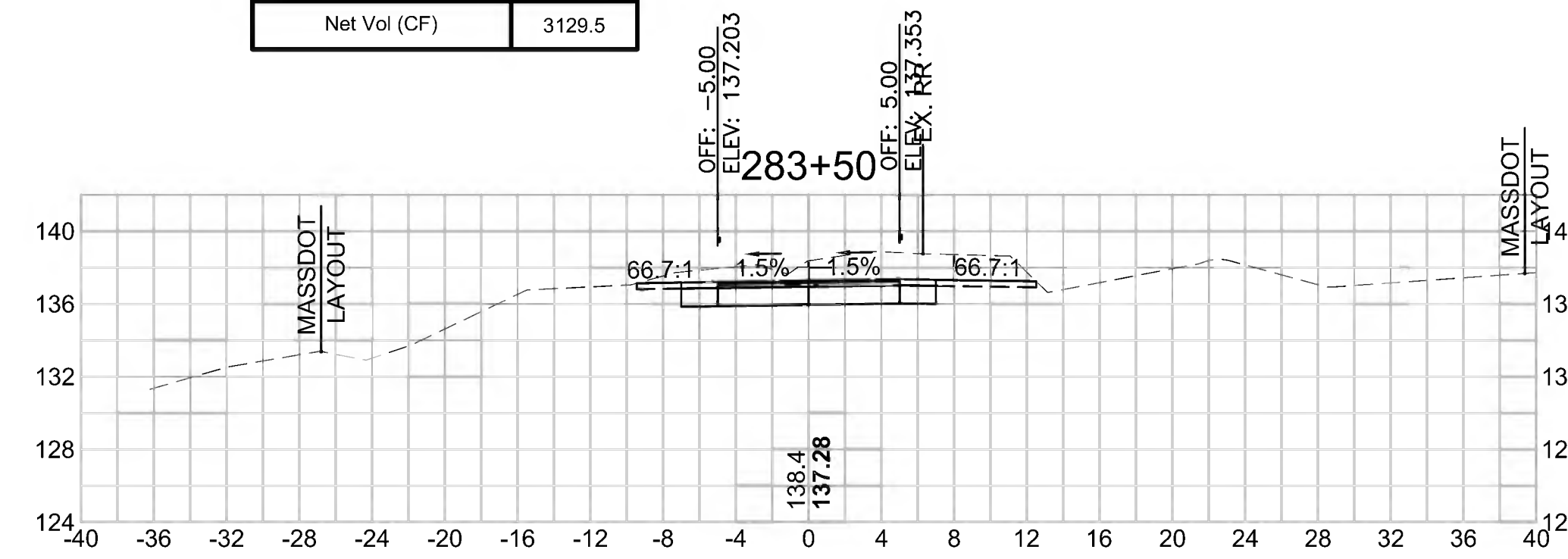
**Total Volume at Station 282+00.00**

Cut Area (SF)	28.258
Fill Area (SF)	0.000
Cut Vol (CF)	40.9
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	11111.7
Cum Fill Vol (CF)	8244.4
Net Vol (CF)	2867.3



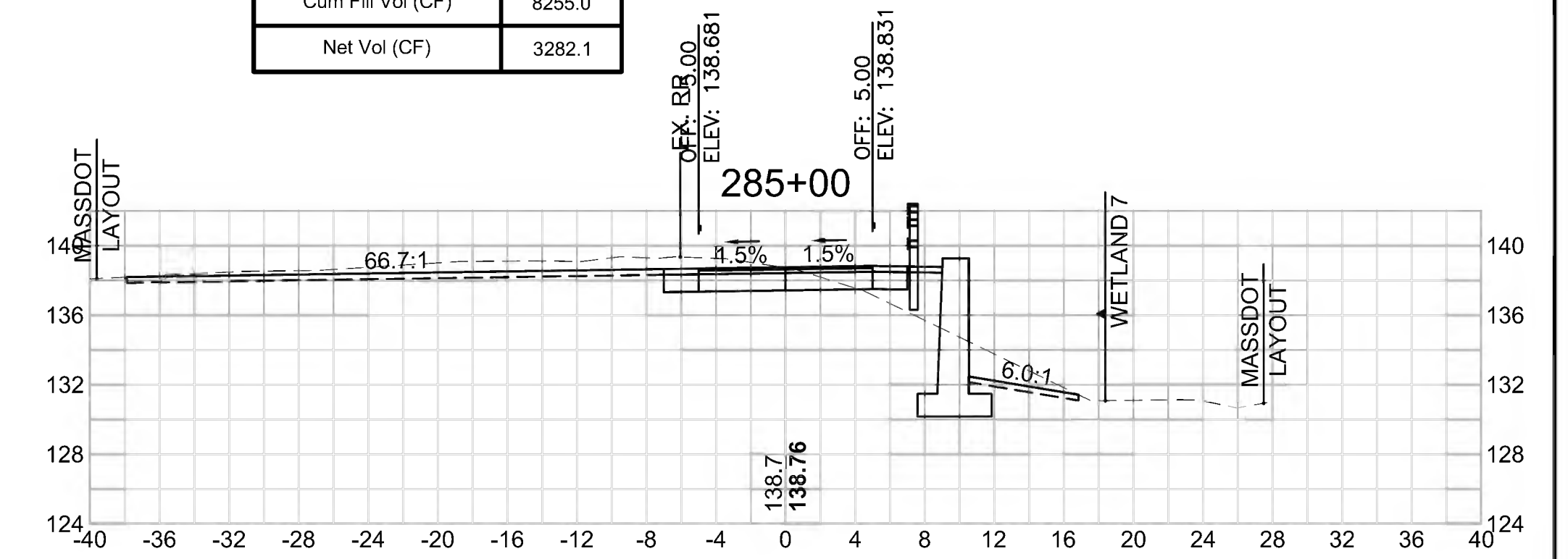
**Total Volume at Station 283+50.00**

Cut Area (SF)	59.185
Fill Area (SF)	0.222
Cut Vol (CF)	105.4
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	11374.1
Cum Fill Vol (CF)	8244.7
Net Vol (CF)	3129.5



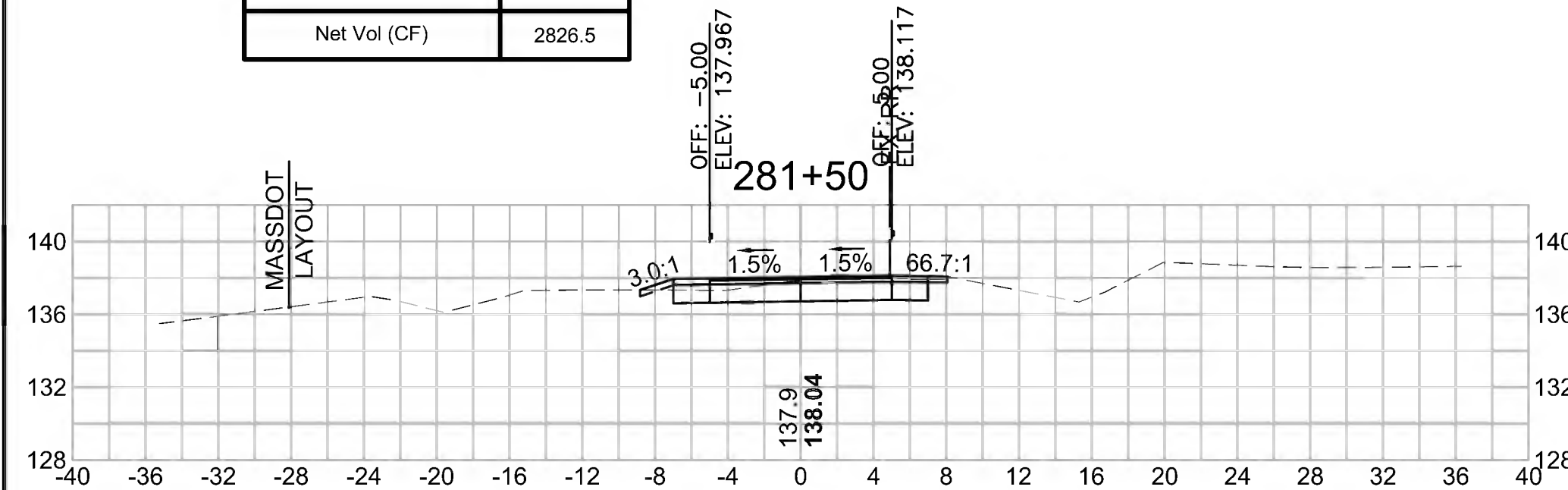
**Total Volume at Station 285+00.00**

Cut Area (SF)	51.764
Fill Area (SF)	6.023
Cut Vol (CF)	47.9
Fill Vol (CF)	5.6
Cum Cut Vol (CF)	11537.1
Cum Fill Vol (CF)	8255.0
Net Vol (CF)	3282.1



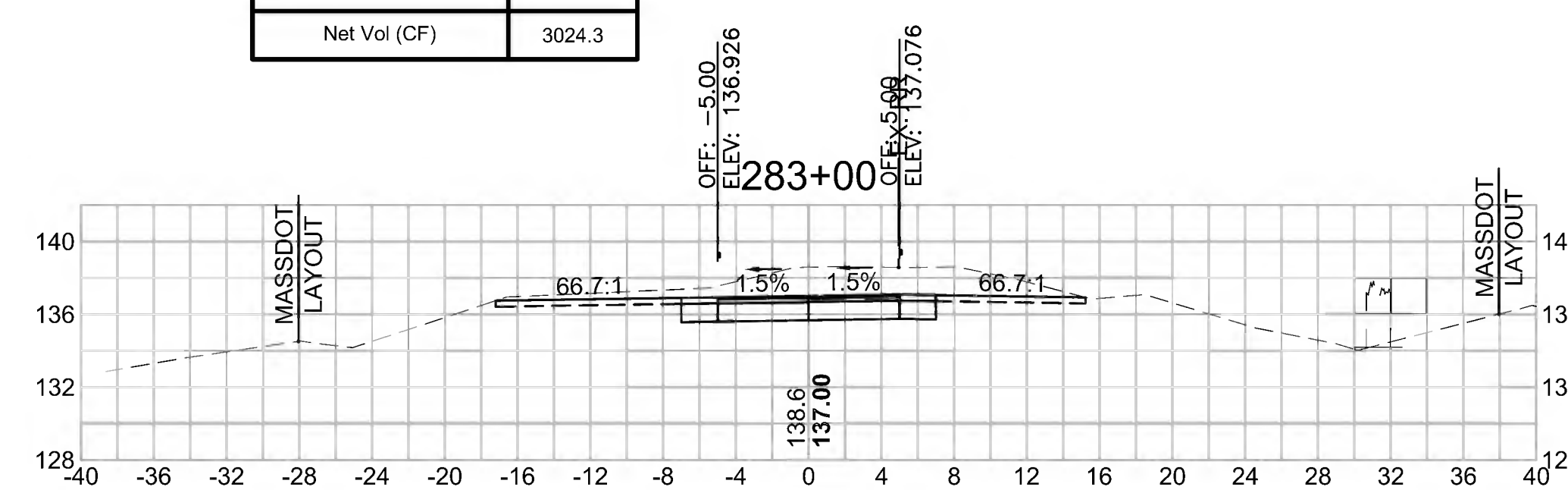
**Total Volume at Station 281+50.00**

Cut Area (SF)	15.927
Fill Area (SF)	0.106
Cut Vol (CF)	23.2
Fill Vol (CF)	0.4
Cum Cut Vol (CF)	11070.8
Cum Fill Vol (CF)	8244.4
Net Vol (CF)	2826.5



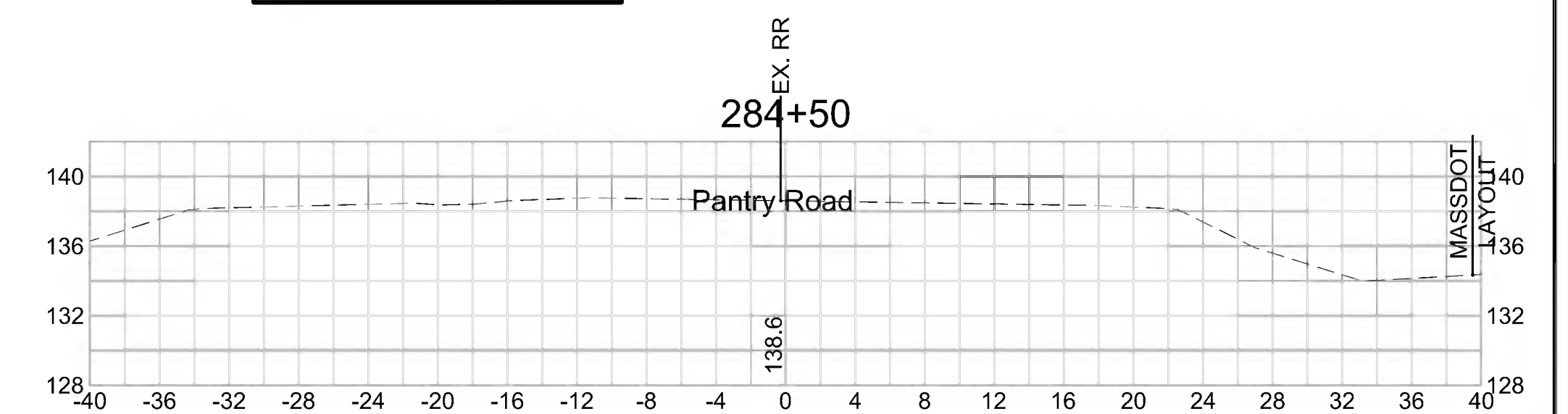
**Total Volume at Station 283+00.00**

Cut Area (SF)	54.652
Fill Area (SF)	0.000
Cut Vol (CF)	90.7
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	11268.7
Cum Fill Vol (CF)	8244.4
Net Vol (CF)	3024.3



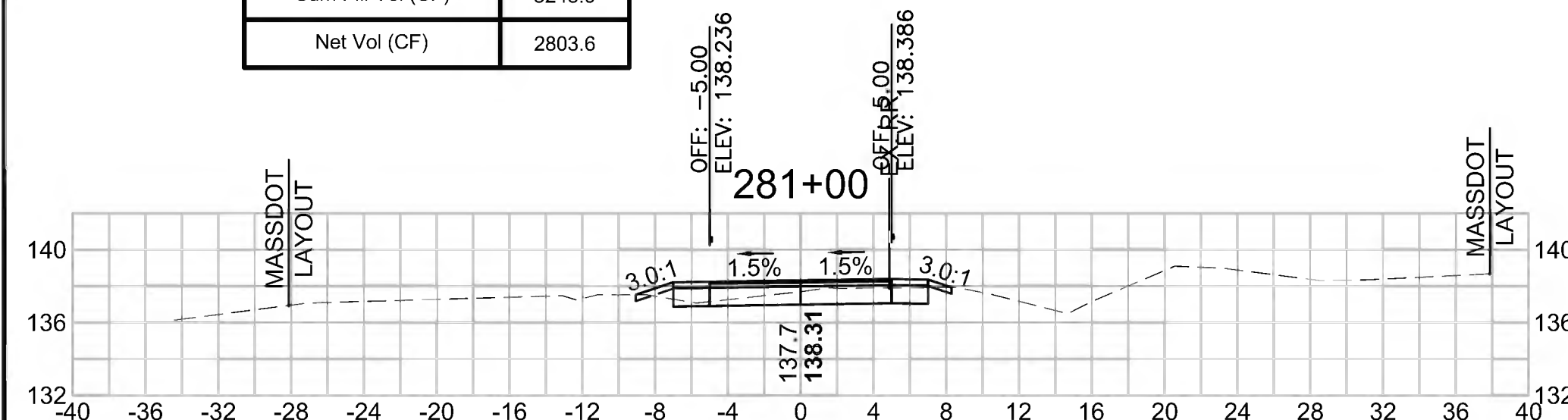
**Total Volume at Station 284+50.00**

Cut Area (SF)	0.000
Fill Area (SF)	0.000
Cut Vol (CF)	30.1
Fill Vol (CF)	2.3
Cum Cut Vol (CF)	11489.2
Cum Fill Vol (CF)	8249.4
Net Vol (CF)	3239.8



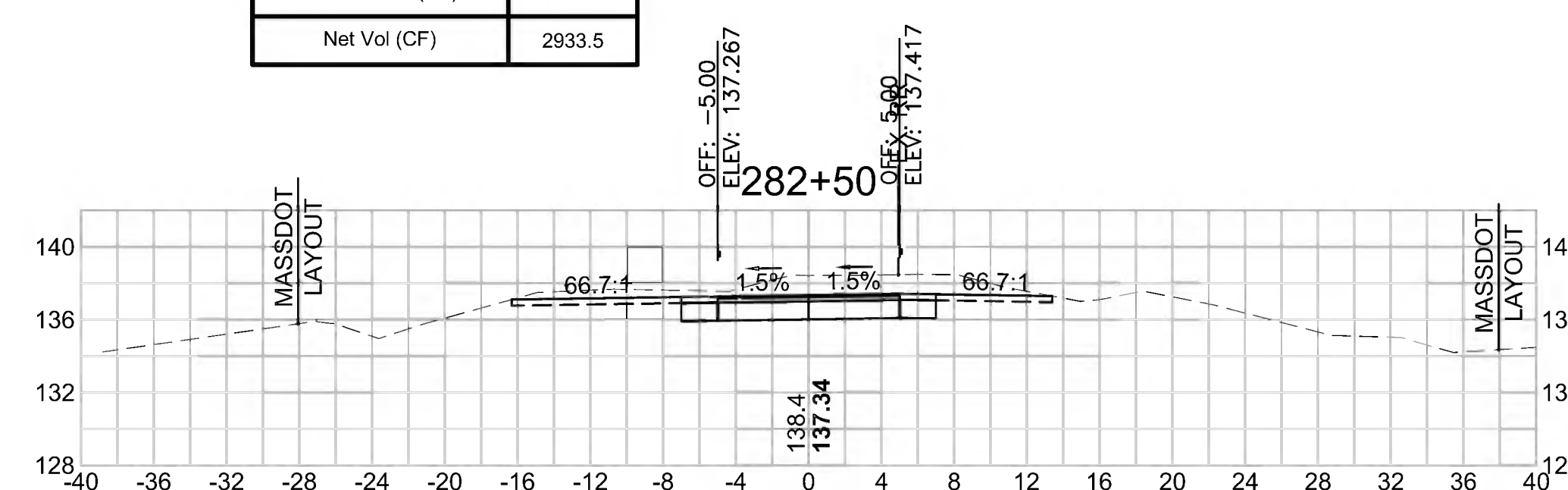
**Total Volume at Station 281+00.00**

Cut Area (SF)	9.182
Fill Area (SF)	0.352
Cut Vol (CF)	16.4
Fill Vol (CF)	0.8
Cum Cut Vol (CF)	11047.6
Cum Fill Vol (CF)	8243.9
Net Vol (CF)	2803.6



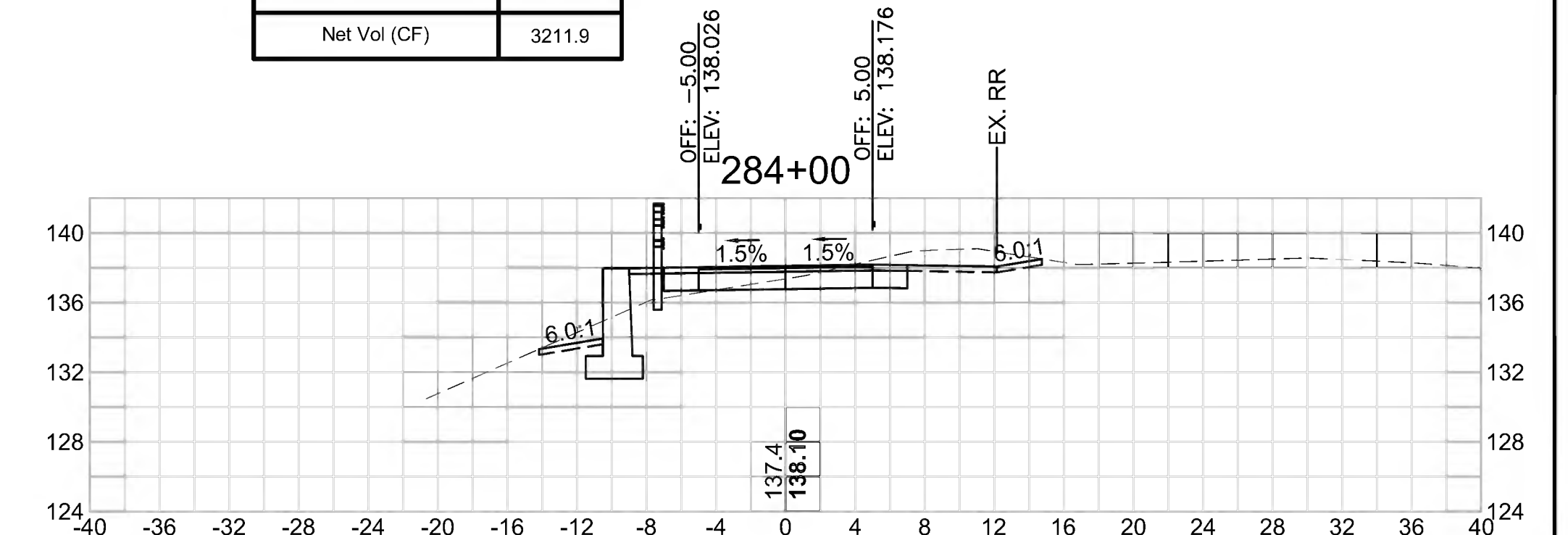
**Total Volume at Station 282+50.00**

Cut Area (SF)	43.320
Fill Area (SF)	0.000
Cut Vol (CF)	66.3
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	11178.0
Cum Fill Vol (CF)	8244.4
Net Vol (CF)	2933.5



**Total Volume at Station 284+00.00**

Cut Area (SF)	32.535
Fill Area (SF)	2.450
Cut Vol (CF)	84.9
Fill Vol (CF)	2.5
Cum Cut Vol (CF)	11459.0
Cum Fill Vol (CF)	8247.1
Net Vol (CF)	3211.9





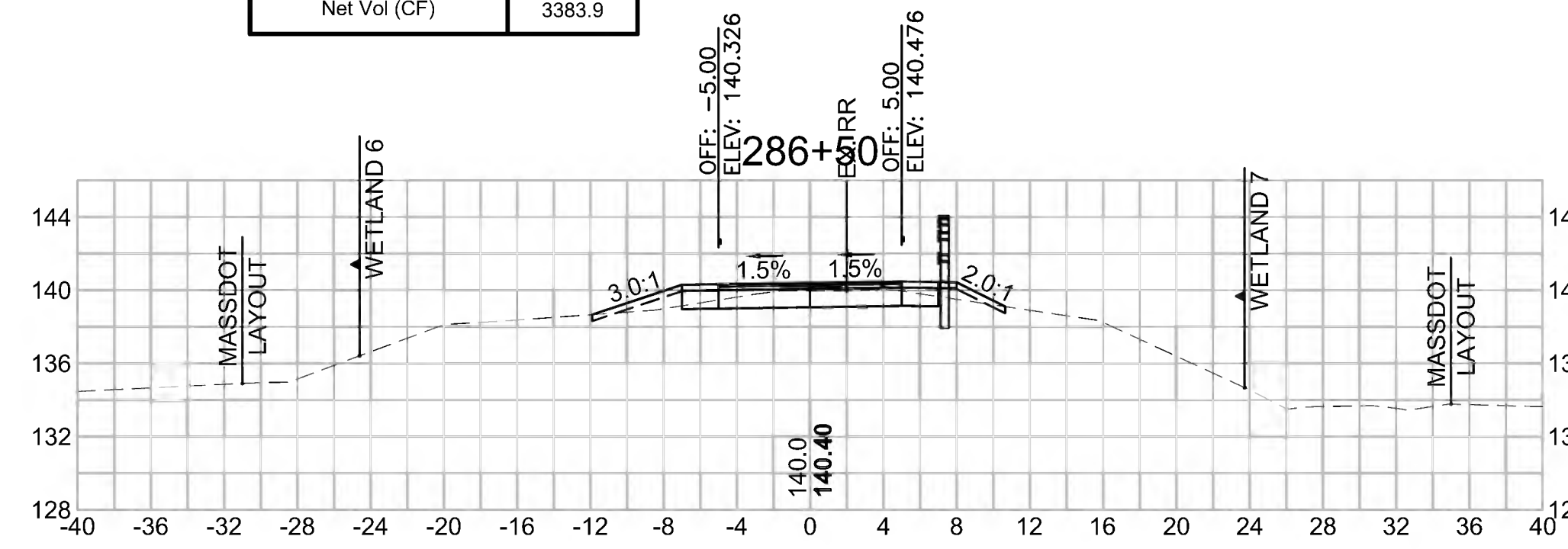
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	289	319
PROJECT FILE NO. 608164			

CROSS SECTIONS

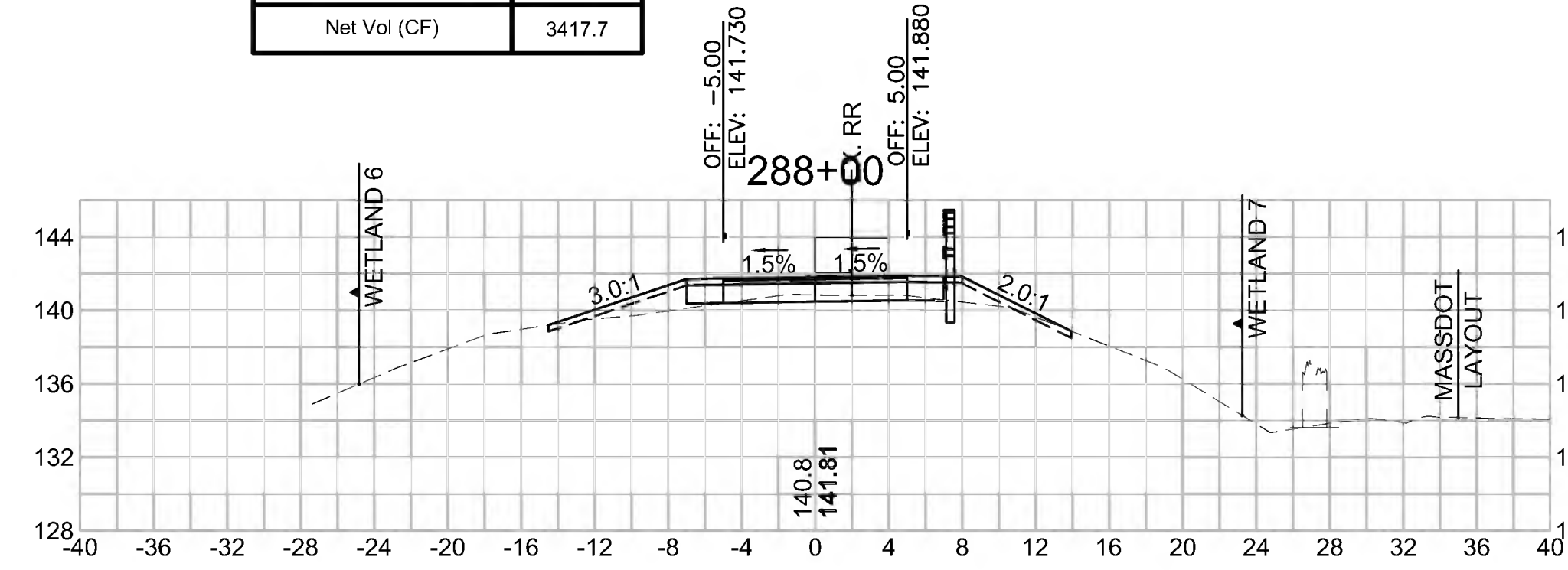
**Total Volume at Station 286+50.00**

Cut Area (SF)	10.652
Fill Area (SF)	2.537
Cut Vol (CF)	22.5
Fill Vol (CF)	3.7
Cum Cut Vol (CF)	11655.5
Cum Fill Vol (CF)	8271.6
Net Vol (CF)	3383.9



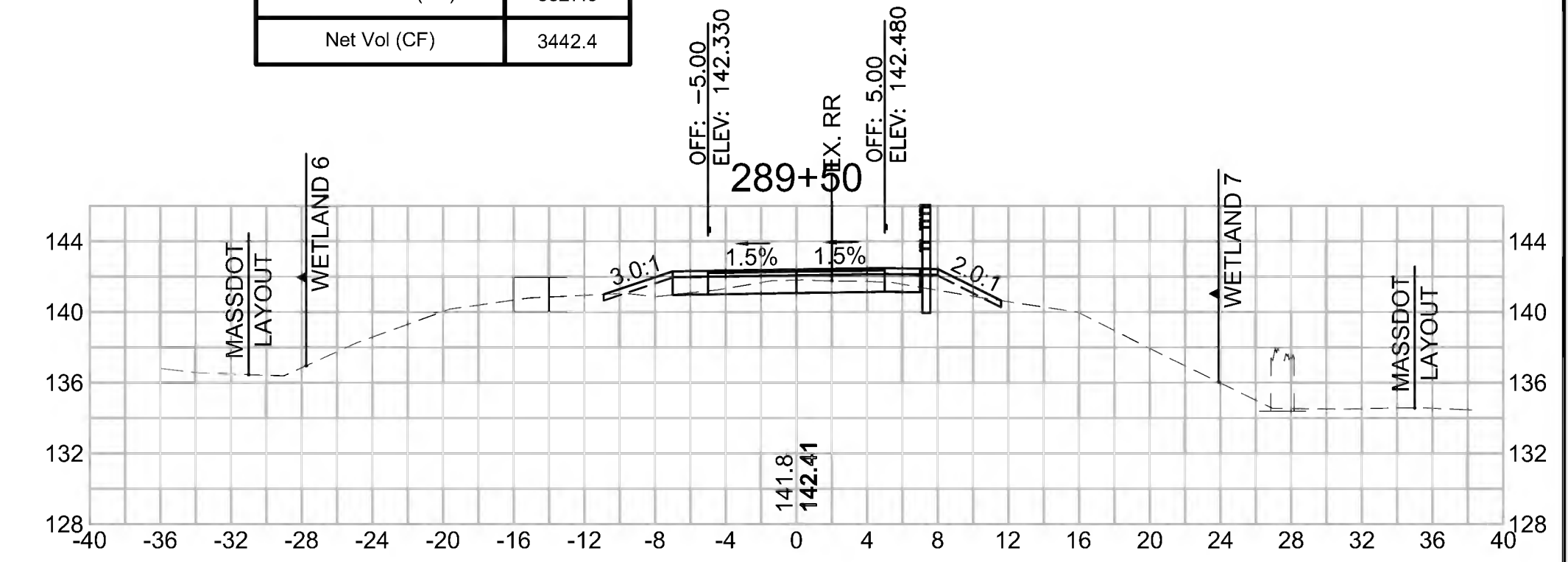
**Total Volume at Station 288+00.00**

Cut Area (SF)	10.395
Fill Area (SF)	6.320
Cut Vol (CF)	22.4
Fill Vol (CF)	11.9
Cum Cut Vol (CF)	11715.7
Cum Fill Vol (CF)	8298.0
Net Vol (CF)	3417.7



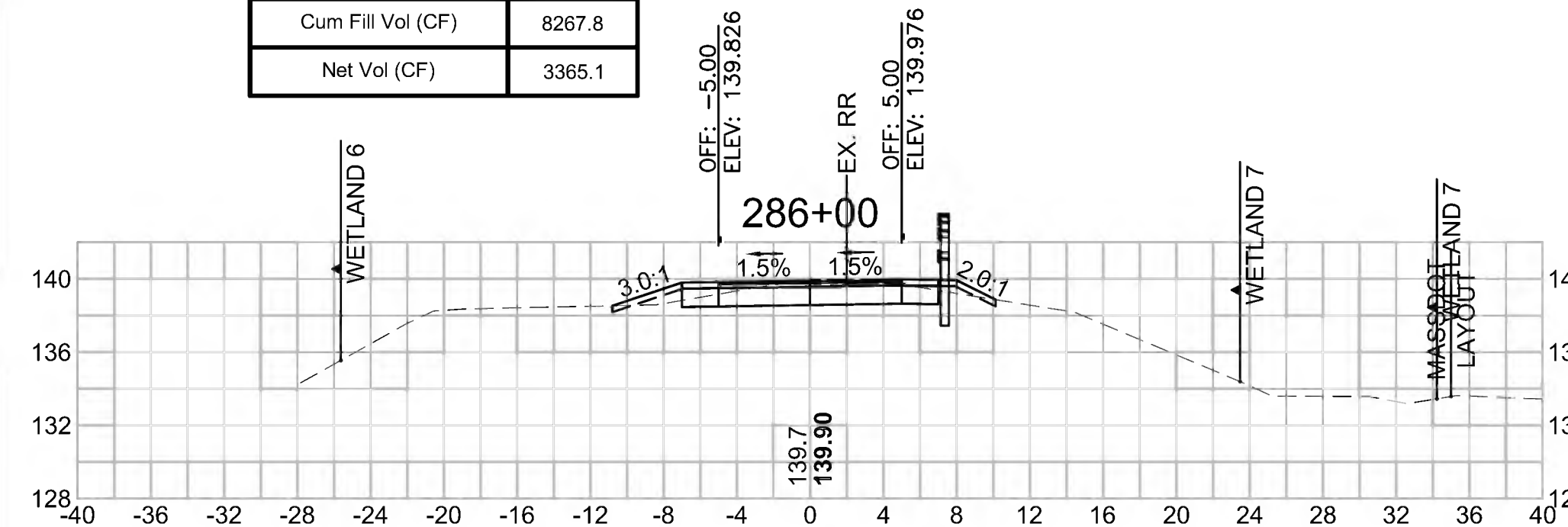
**Total Volume at Station 289+50.00**

Cut Area (SF)	7.485
Fill Area (SF)	3.349
Cut Vol (CF)	12.2
Fill Vol (CF)	7.5
Cum Cut Vol (CF)	11770.0
Cum Fill Vol (CF)	8327.6
Net Vol (CF)	3442.4



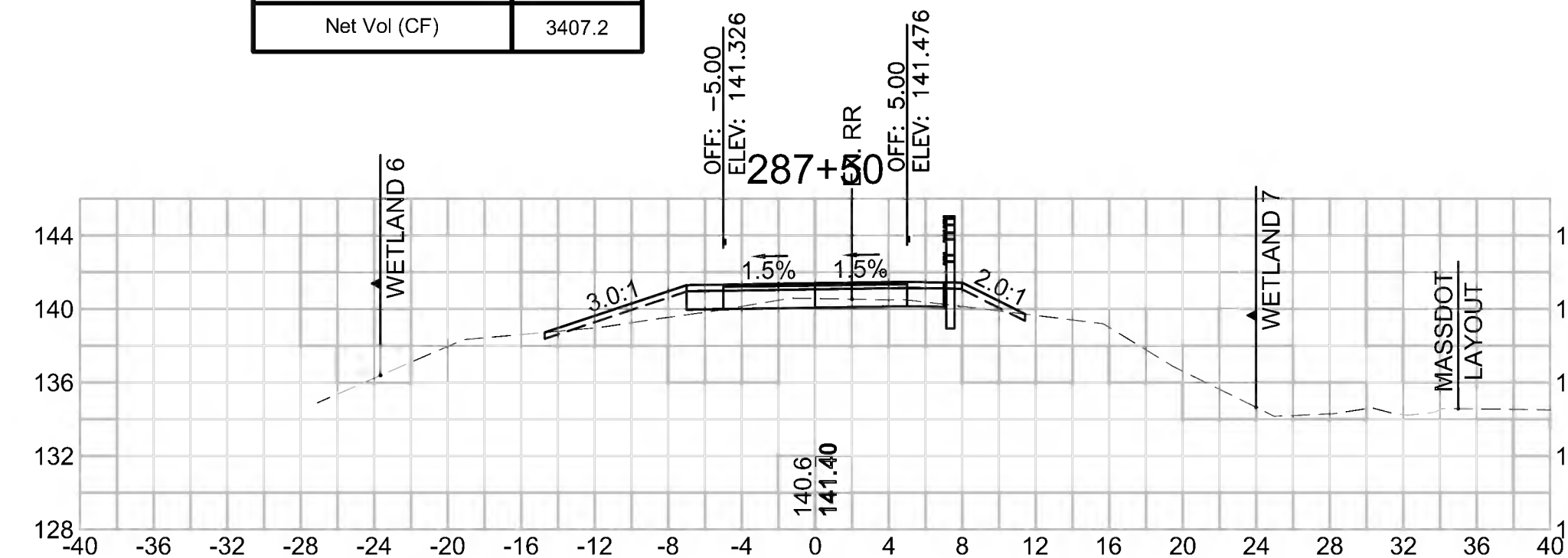
**Total Volume at Station 286+00.00**

Cut Area (SF)	13.658
Fill Area (SF)	1.480
Cut Vol (CF)	30.3
Fill Vol (CF)	4.3
Cum Cut Vol (CF)	11633.0
Cum Fill Vol (CF)	8267.8
Net Vol (CF)	3365.1



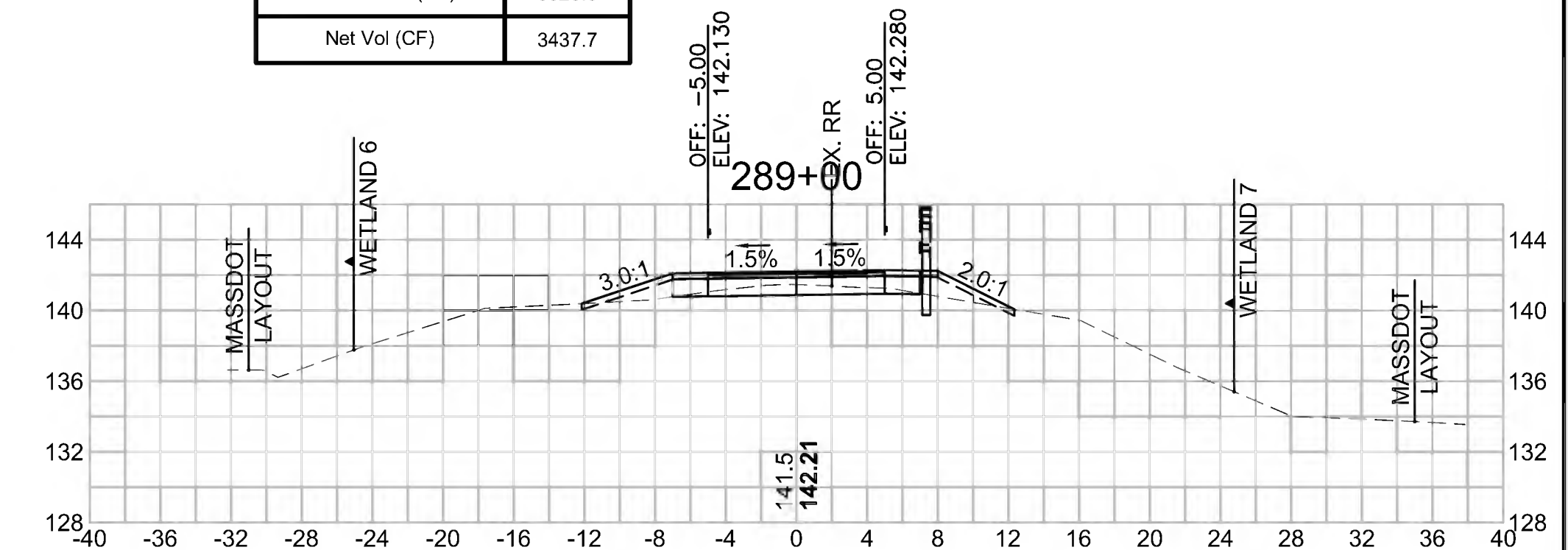
**Total Volume at Station 287+50.00**

Cut Area (SF)	13.780
Fill Area (SF)	6.505
Cut Vol (CF)	20.4
Fill Vol (CF)	9.1
Cum Cut Vol (CF)	11693.3
Cum Fill Vol (CF)	8286.1
Net Vol (CF)	3407.2



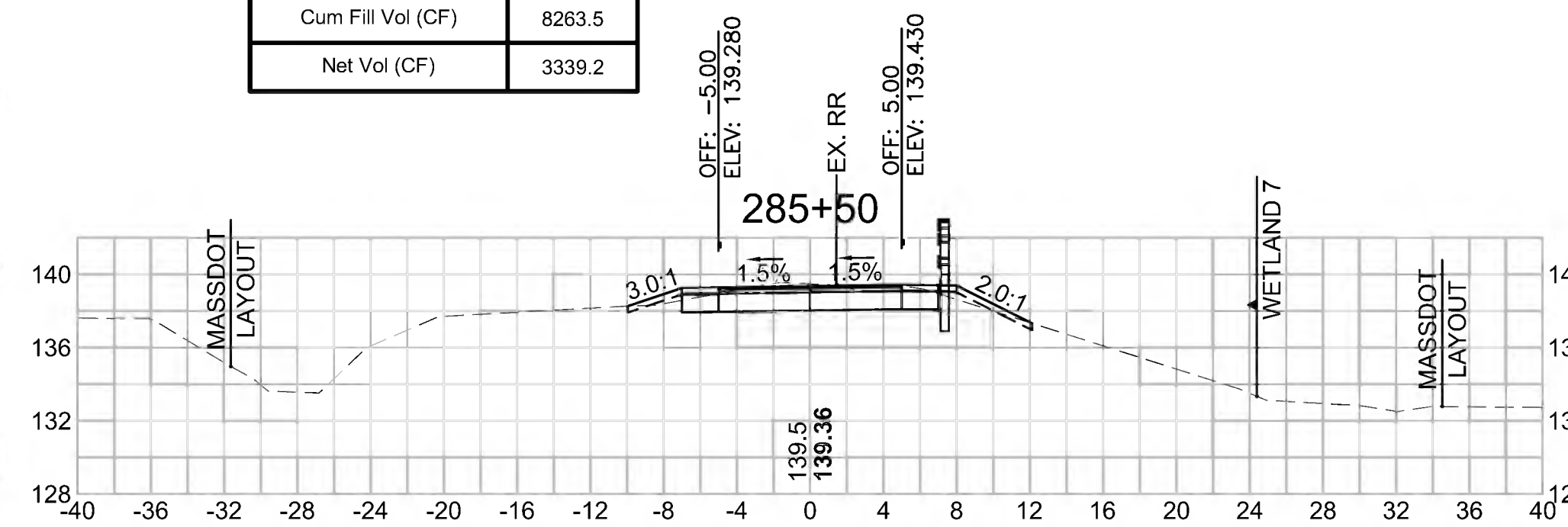
**Total Volume at Station 289+00.00**

Cut Area (SF)	5.738
Fill Area (SF)	4.803
Cut Vol (CF)	18.9
Fill Vol (CF)	10.3
Cum Cut Vol (CF)	11757.8
Cum Fill Vol (CF)	8320.0
Net Vol (CF)	3437.7



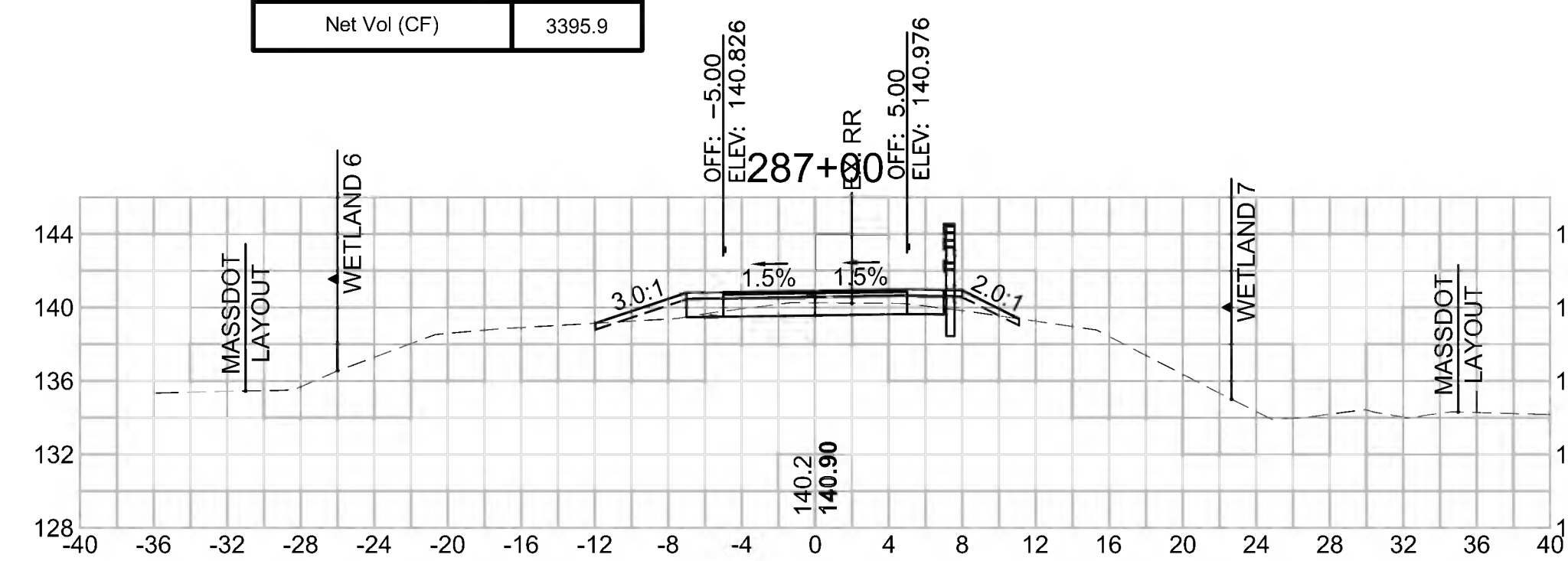
**Total Volume at Station 285+50.00**

Cut Area (SF)	19.066
Fill Area (SF)	3.194
Cut Vol (CF)	65.6
Fill Vol (CF)	8.5
Cum Cut Vol (CF)	11602.7
Cum Fill Vol (CF)	8263.5
Net Vol (CF)	3339.2



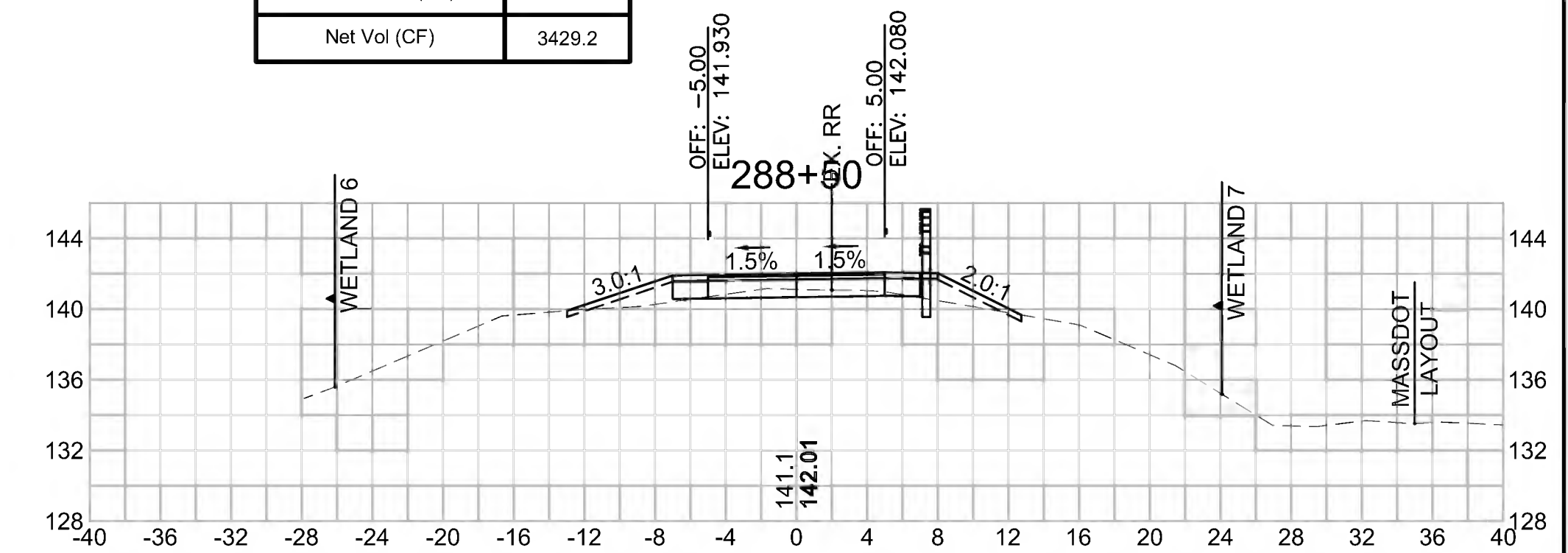
**Total Volume at Station 287+00.00**

Cut Area (SF)	8.206
Fill Area (SF)	3.343
Cut Vol (CF)	17.5
Fill Vol (CF)	5.4
Cum Cut Vol (CF)	11672.9
Cum Fill Vol (CF)	8277.0
Net Vol (CF)	3395.9



**Total Volume at Station 288+50.00**

Cut Area (SF)	14.651
Fill Area (SF)	6.327
Cut Vol (CF)	23.2
Fill Vol (CF)	11.7
Cum Cut Vol (CF)	11738.9
Cum Fill Vol (CF)	8309.7
Net Vol (CF)	3429.2



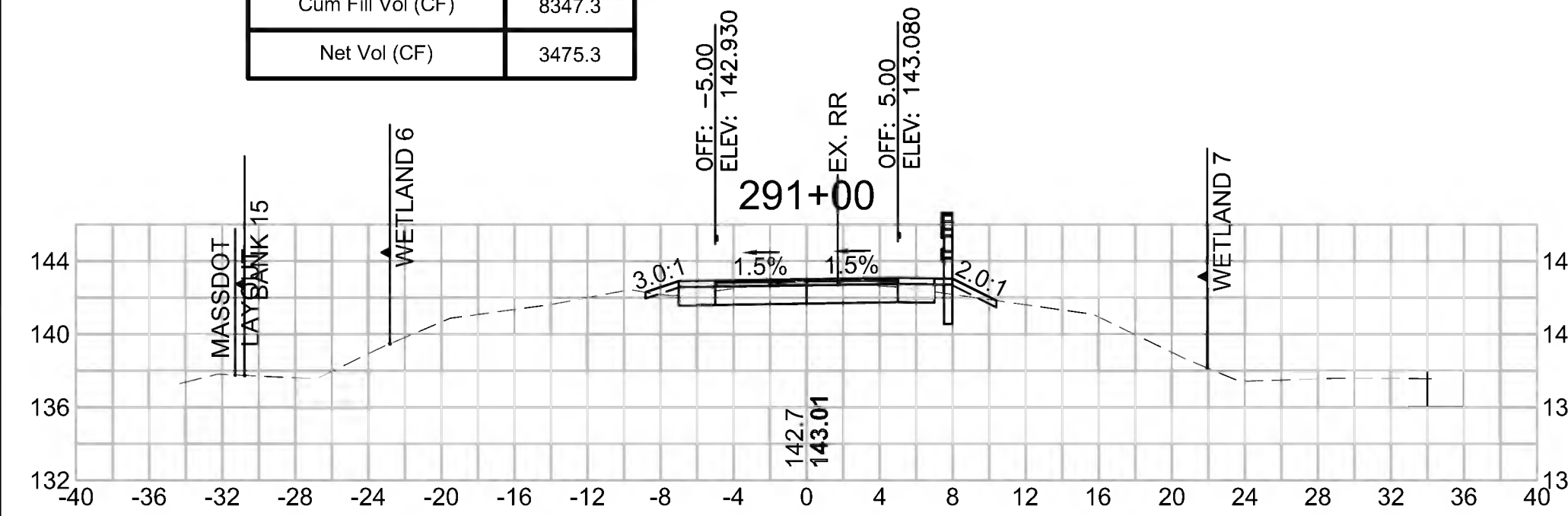
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	290	319
PROJECT FILE NO. 608164			

CROSS SECTIONS

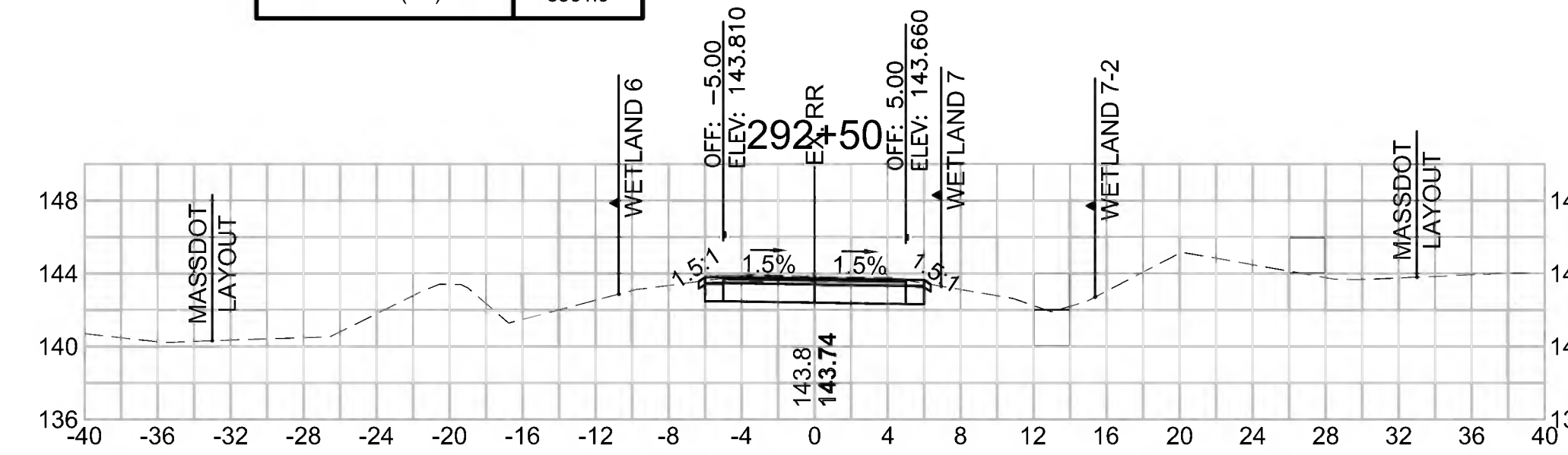
**Total Volume at Station 291+00.00**

Cut Area (SF)	13.191
Fill Area (SF)	1.057
Cut Vol (CF)	21.9
Fill Vol (CF)	2.3
Cum Cut Vol (CF)	11822.7
Cum Fill Vol (CF)	8347.3
Net Vol (CF)	3475.3



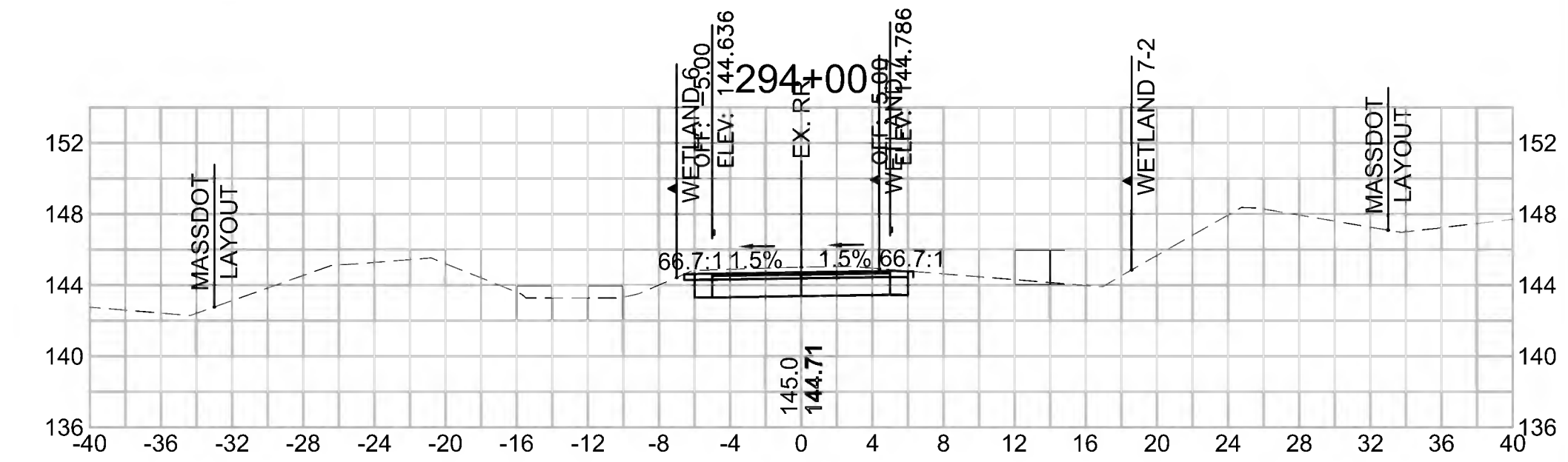
**Total Volume at Station 292+50.00**

Cut Area (SF)	16.886
Fill Area (SF)	0.000
Cut Vol (CF)	30.7
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	11910.2
Cum Fill Vol (CF)	8348.4
Net Vol (CF)	3561.9



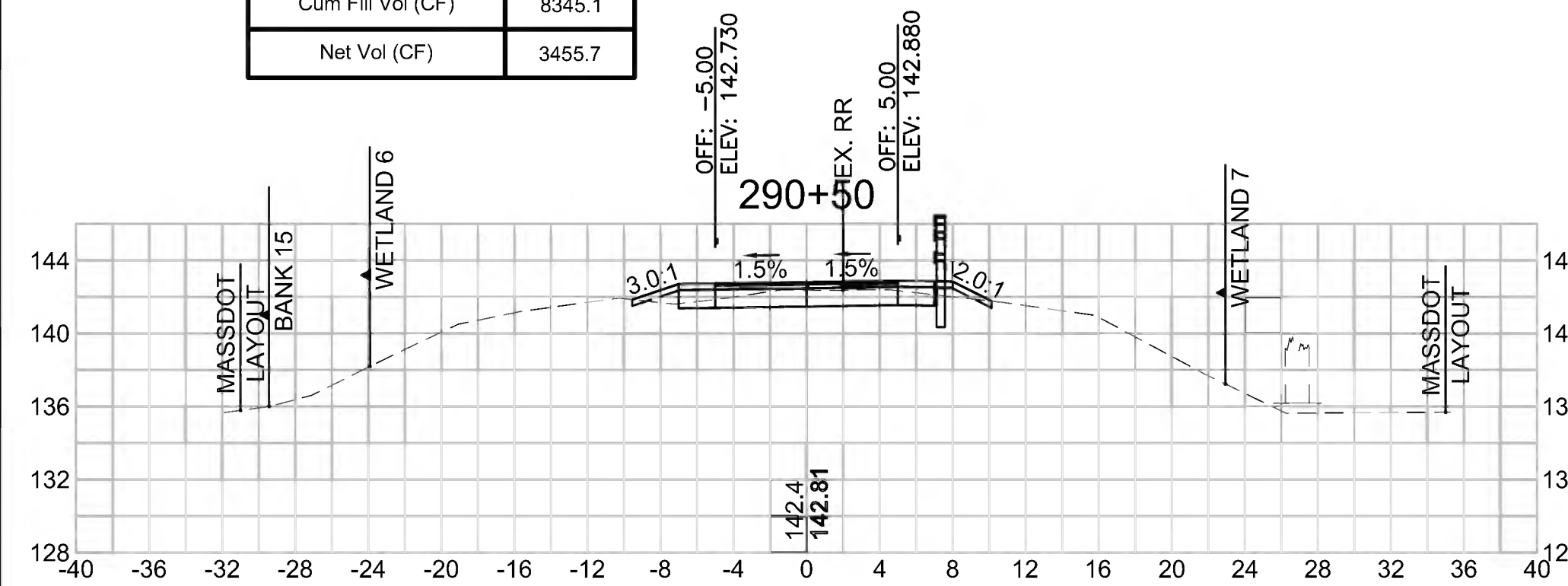
**Total Volume at Station 294+00.00**

Cut Area (SF)	19.091
Fill Area (SF)	0.000
Cut Vol (CF)	35.8
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	12013.0
Cum Fill Vol (CF)	8348.4
Net Vol (CF)	3664.6



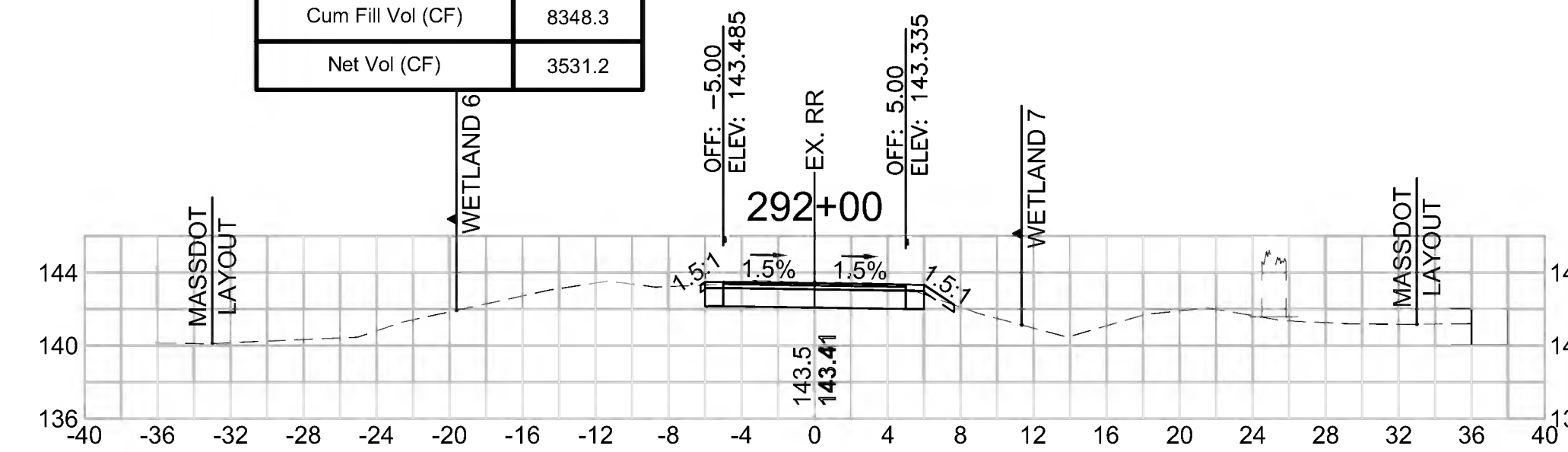
**Total Volume at Station 290+50.00**

Cut Area (SF)	10.501
Fill Area (SF)	1.398
Cut Vol (CF)	16.8
Fill Vol (CF)	7.9
Cum Cut Vol (CF)	11800.7
Cum Fill Vol (CF)	8345.1
Net Vol (CF)	3455.7



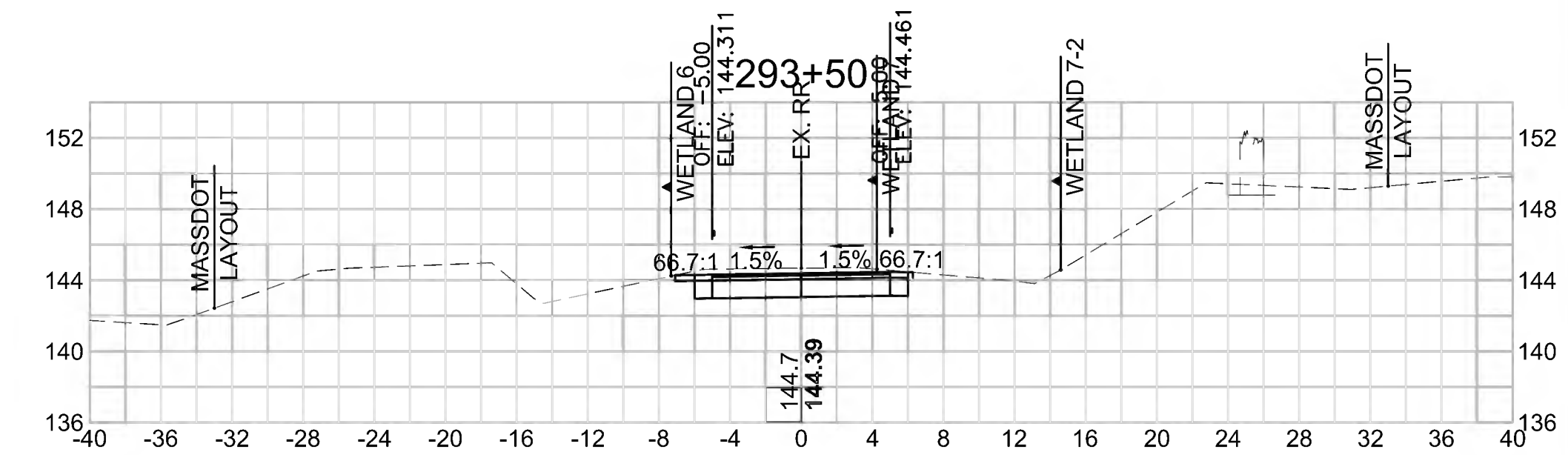
**Total Volume at Station 292+00.00**

Cut Area (SF)	16.290
Fill Area (SF)	0.024
Cut Vol (CF)	29.9
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	11879.5
Cum Fill Vol (CF)	8348.3
Net Vol (CF)	3531.2



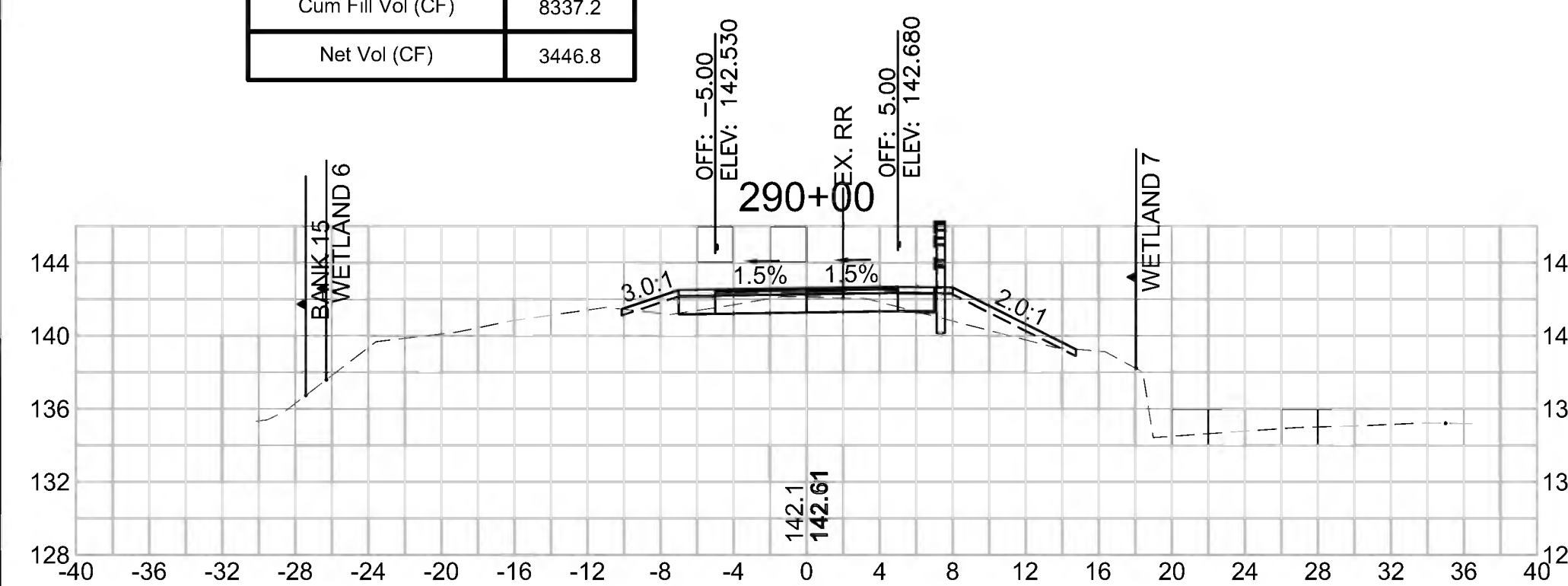
**Total Volume at Station 293+50.00**

Cut Area (SF)	19.542
Fill Area (SF)	0.000
Cut Vol (CF)	34.7
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	11977.2
Cum Fill Vol (CF)	8348.4
Net Vol (CF)	3628.9



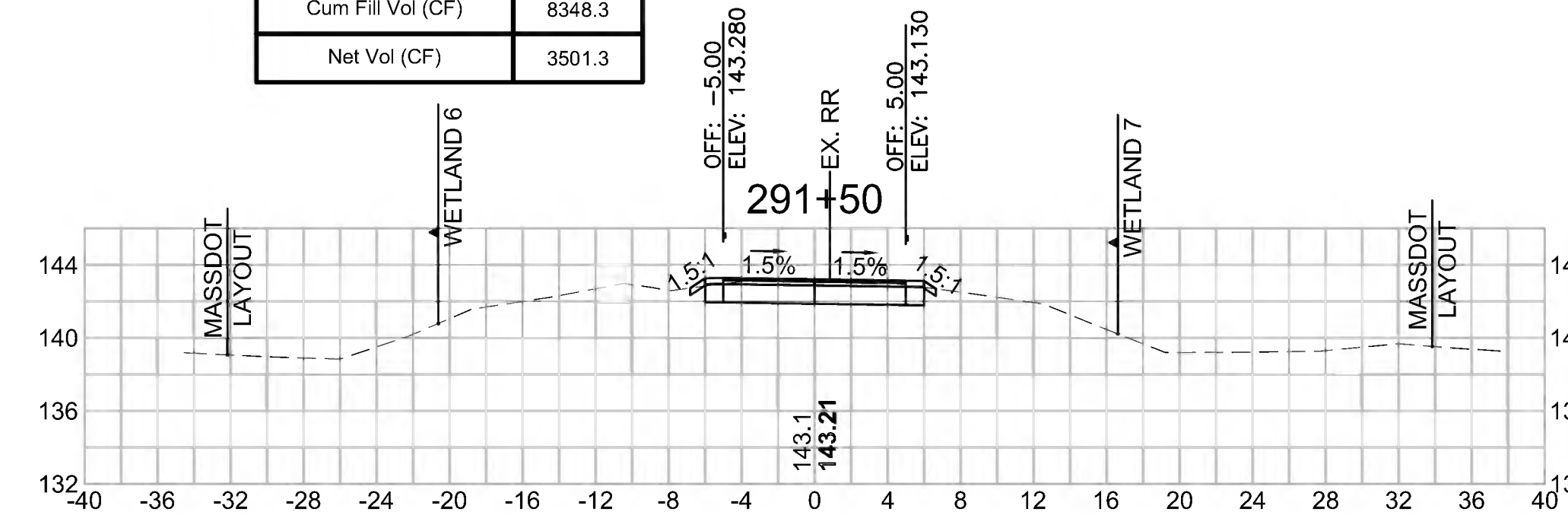
**Total Volume at Station 290+00.00**

Cut Area (SF)	7.605
Fill Area (SF)	7.084
Cut Vol (CF)	14.0
Fill Vol (CF)	9.7
Cum Cut Vol (CF)	11784.0
Cum Fill Vol (CF)	8337.2
Net Vol (CF)	3446.8



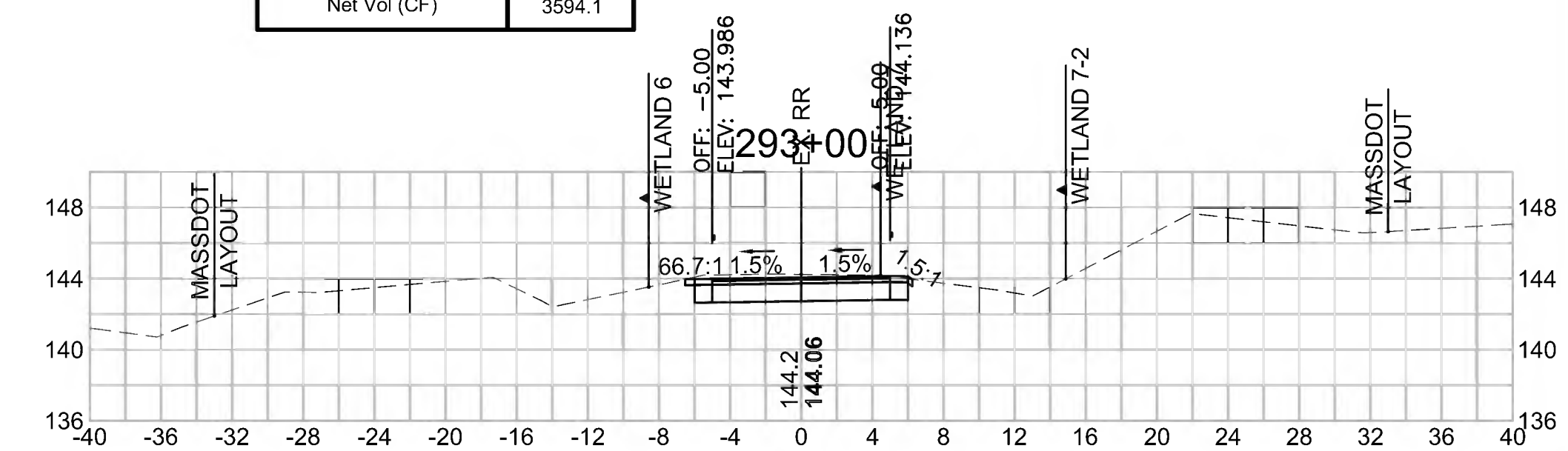
**Total Volume at Station 291+50.00**

Cut Area (SF)	15.952
Fill Area (SF)	0.001
Cut Vol (CF)	27.0
Fill Vol (CF)	1.0
Cum Cut Vol (CF)	11849.7
Cum Fill Vol (CF)	8348.3
Net Vol (CF)	3501.3



**Total Volume at Station 293+00.00**

Cut Area (SF)	17.971
Fill Area (SF)	0.000
Cut Vol (CF)	32.3
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	11942.5
Cum Fill Vol (CF)	8348.4
Net Vol (CF)	3594.1



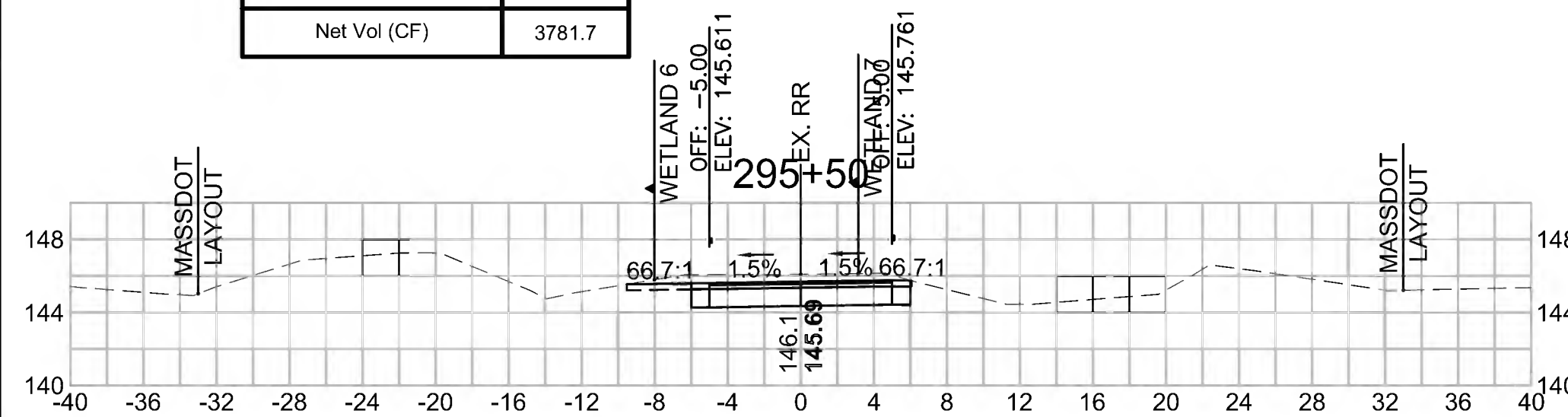


SUDBURY  
BRUCE FREEMAN RAIL TRAIL

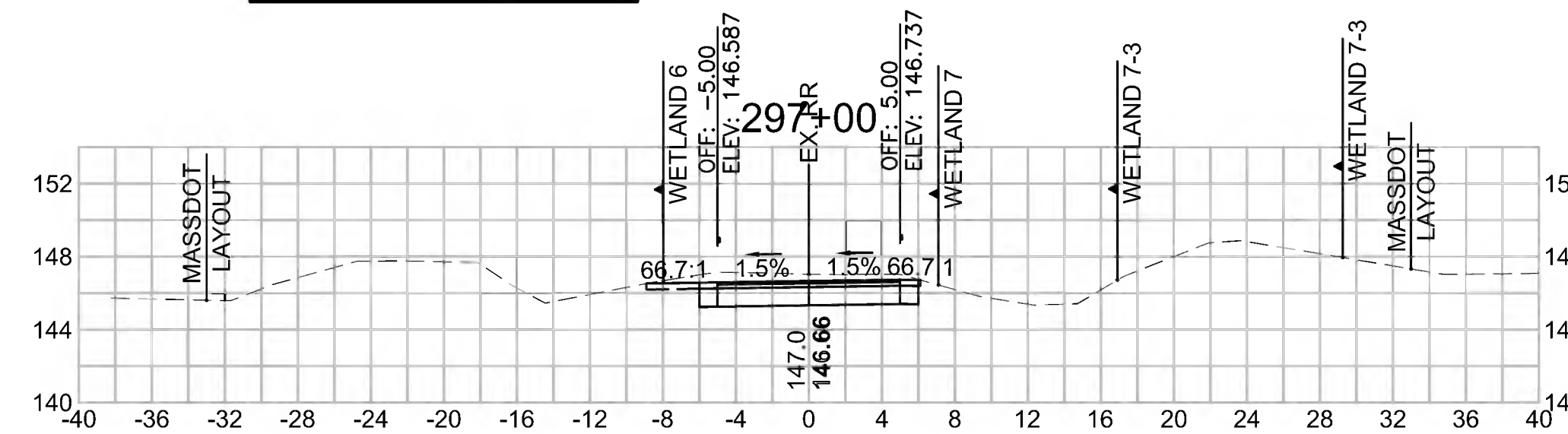
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	291	319
PROJECT FILE NO. 608164			

CROSS SECTIONS

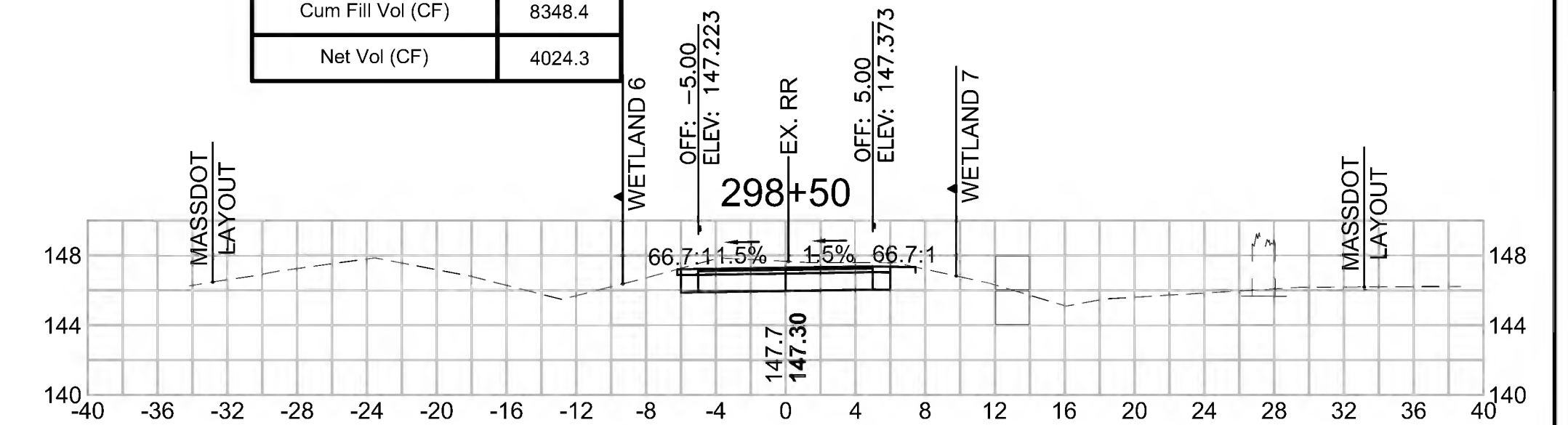
Total Volume at Station 295+50.00	
Cut Area (SF)	22.788
Fill Area (SF)	0.000
Cut Vol (CF)	41.1
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	12130.1
Cum Fill Vol (CF)	8348.4
Net Vol (CF)	3781.7



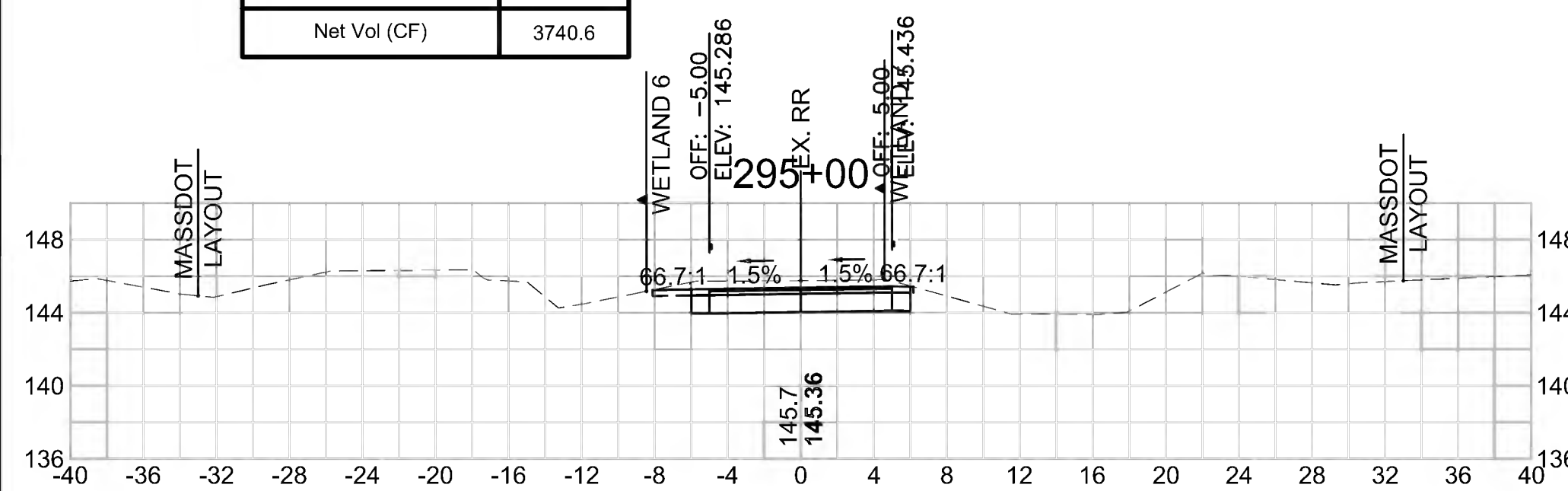
Total Volume at Station 297+00.00	
Cut Area (SF)	22.246
Fill Area (SF)	0.000
Cut Vol (CF)	41.3
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	12254.8
Cum Fill Vol (CF)	8348.4
Net Vol (CF)	3906.5



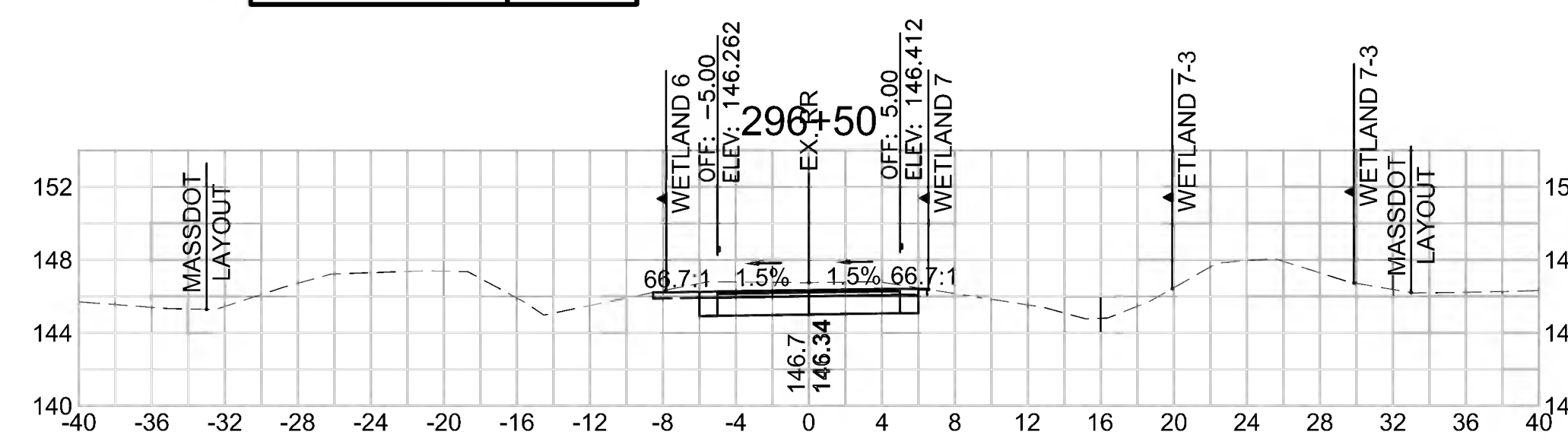
Total Volume at Station 298+50.00	
Cut Area (SF)	20.555
Fill Area (SF)	0.000
Cut Vol (CF)	39.5
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	12372.7
Cum Fill Vol (CF)	8348.4
Net Vol (CF)	4024.3



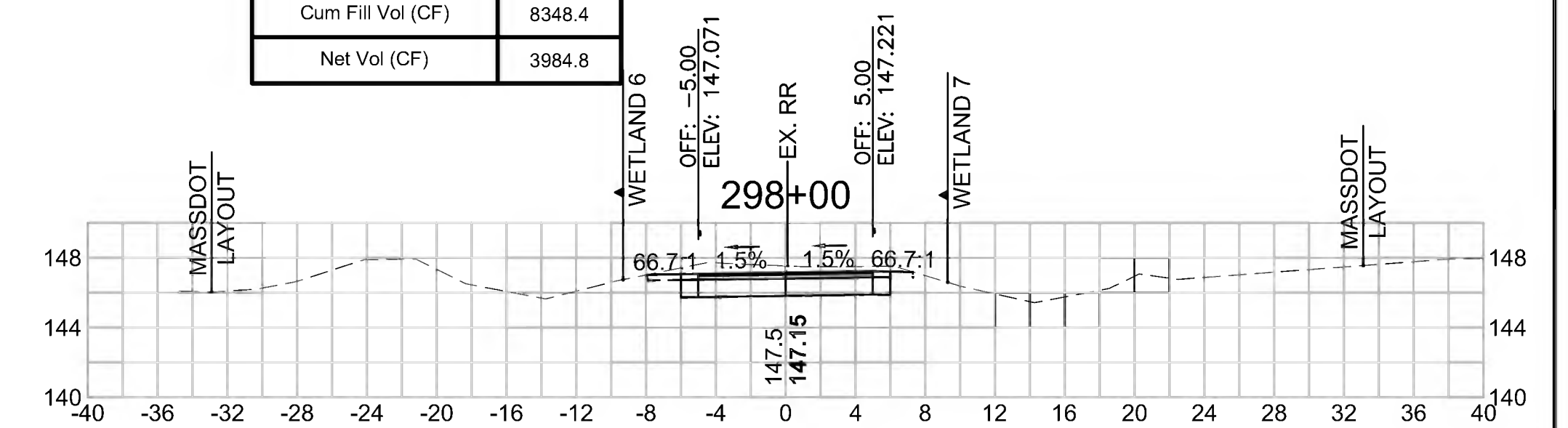
Total Volume at Station 295+00.00	
Cut Area (SF)	21.649
Fill Area (SF)	0.000
Cut Vol (CF)	39.1
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	12089.9
Cum Fill Vol (CF)	8348.4
Net Vol (CF)	3740.6



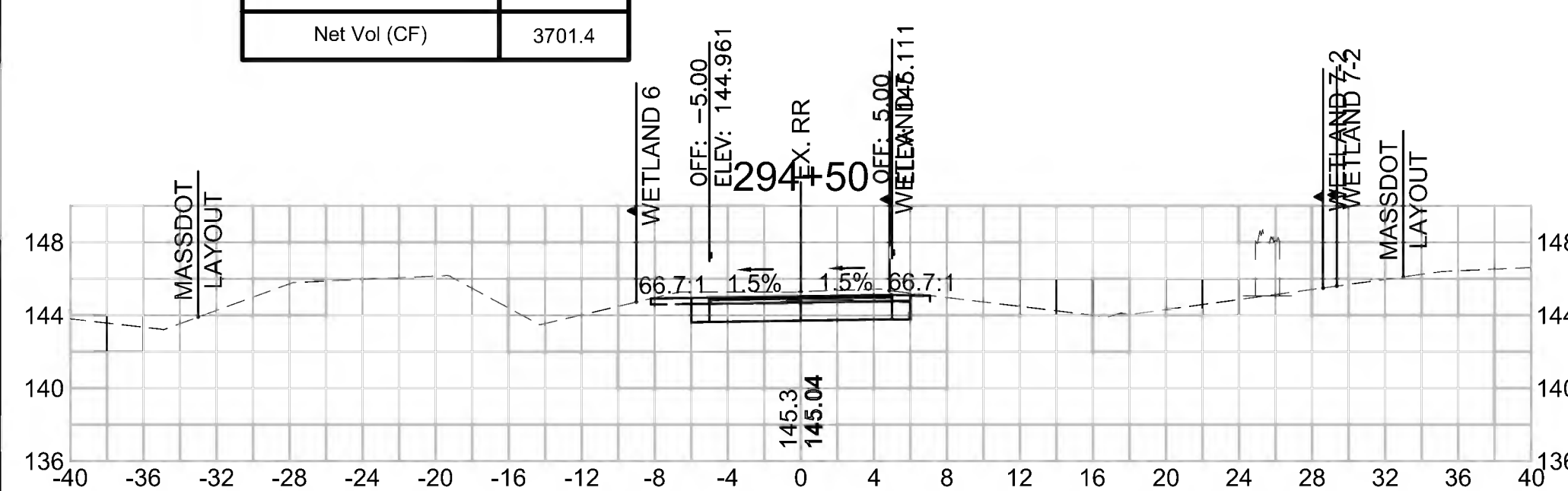
Total Volume at Station 296+50.00	
Cut Area (SF)	22.352
Fill Area (SF)	0.000
Cut Vol (CF)	41.5
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	12213.5
Cum Fill Vol (CF)	8348.4
Net Vol (CF)	3865.2



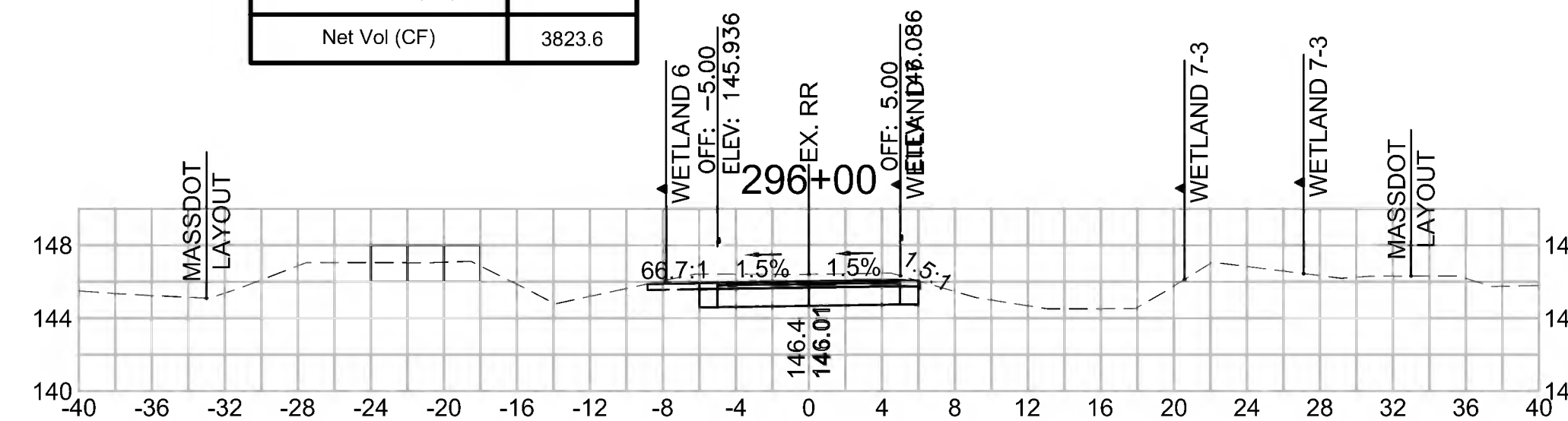
Total Volume at Station 298+00.00	
Cut Area (SF)	22.100
Fill Area (SF)	0.000
Cut Vol (CF)	39.1
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	12333.2
Cum Fill Vol (CF)	8348.4
Net Vol (CF)	3984.8



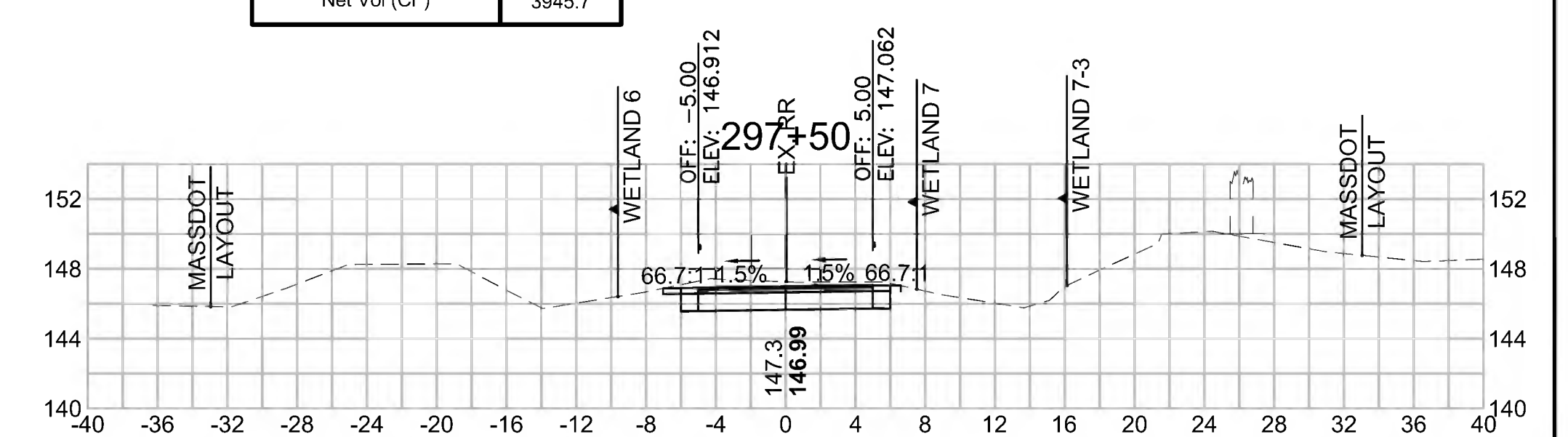
Total Volume at Station 294+50.00	
Cut Area (SF)	20.627
Fill Area (SF)	0.000
Cut Vol (CF)	36.8
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	12049.8
Cum Fill Vol (CF)	8348.4
Net Vol (CF)	3701.4



Total Volume at Station 296+00.00	
Cut Area (SF)	22.498
Fill Area (SF)	0.000
Cut Vol (CF)	41.9
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	12172.0
Cum Fill Vol (CF)	8348.4
Net Vol (CF)	3823.6



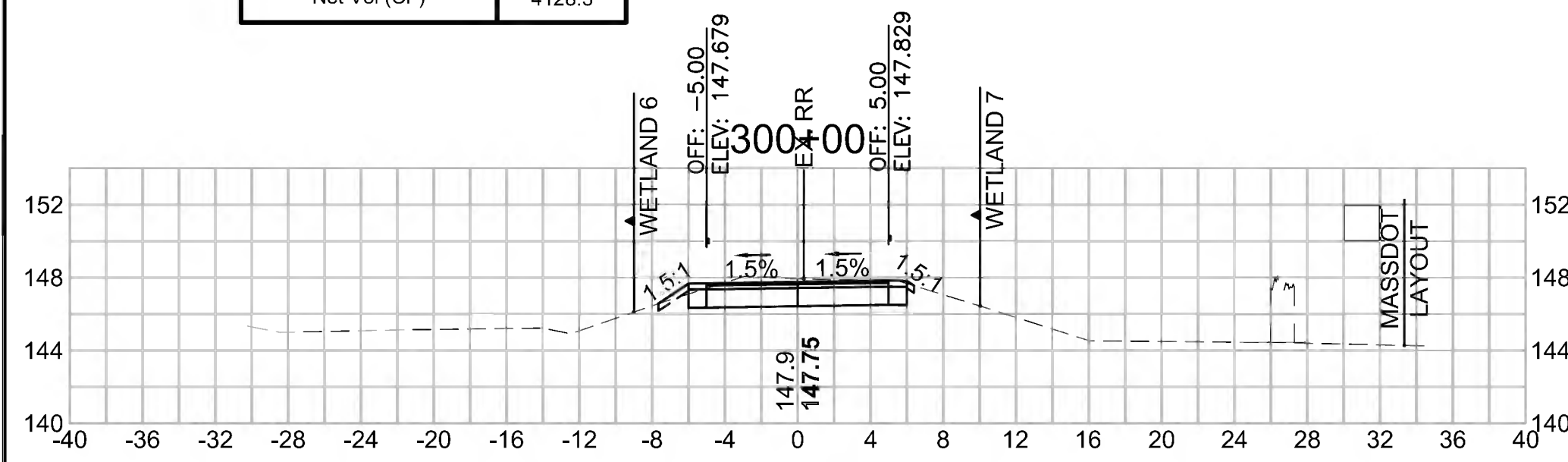
Total Volume at Station 297+50.00	
Cut Area (SF)	20.129
Fill Area (SF)	0.000
Cut Vol (CF)	39.2
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	12294.1
Cum Fill Vol (CF)	8348.4
Net Vol (CF)	3945.7



**CROSS SECTIONS**

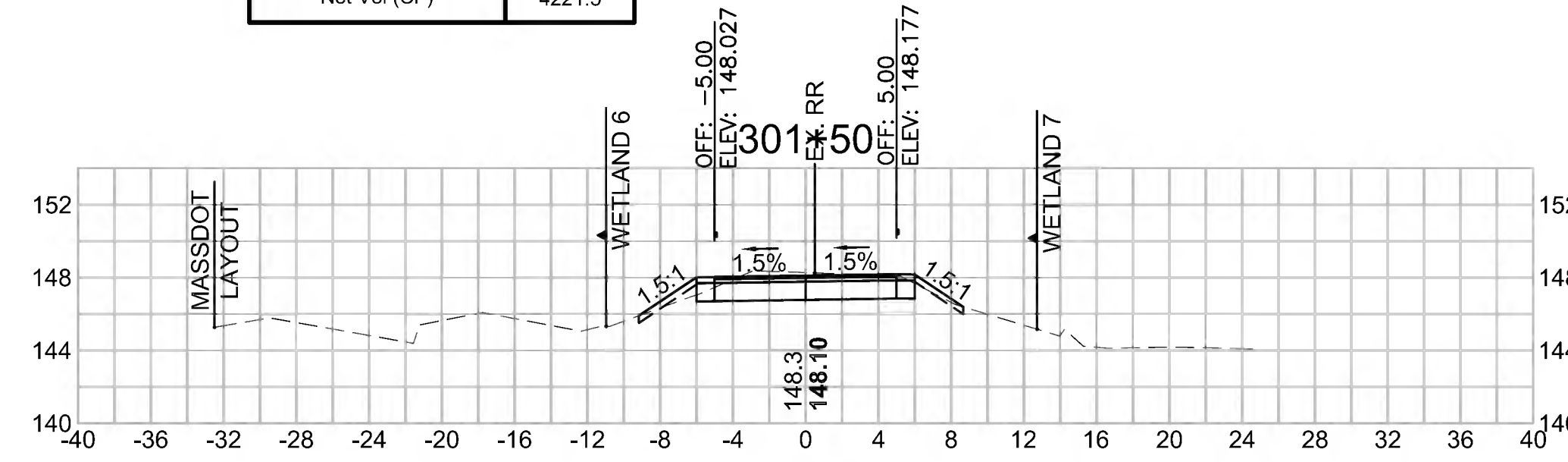
**Total Volume at Station 300+00.00**

Cut Area (SF)	17.154
Fill Area (SF)	0.043
Cut Vol (CF)	32.7
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	12476.7
Cum Fill Vol (CF)	8348.4
Net Vol (CF)	4128.3



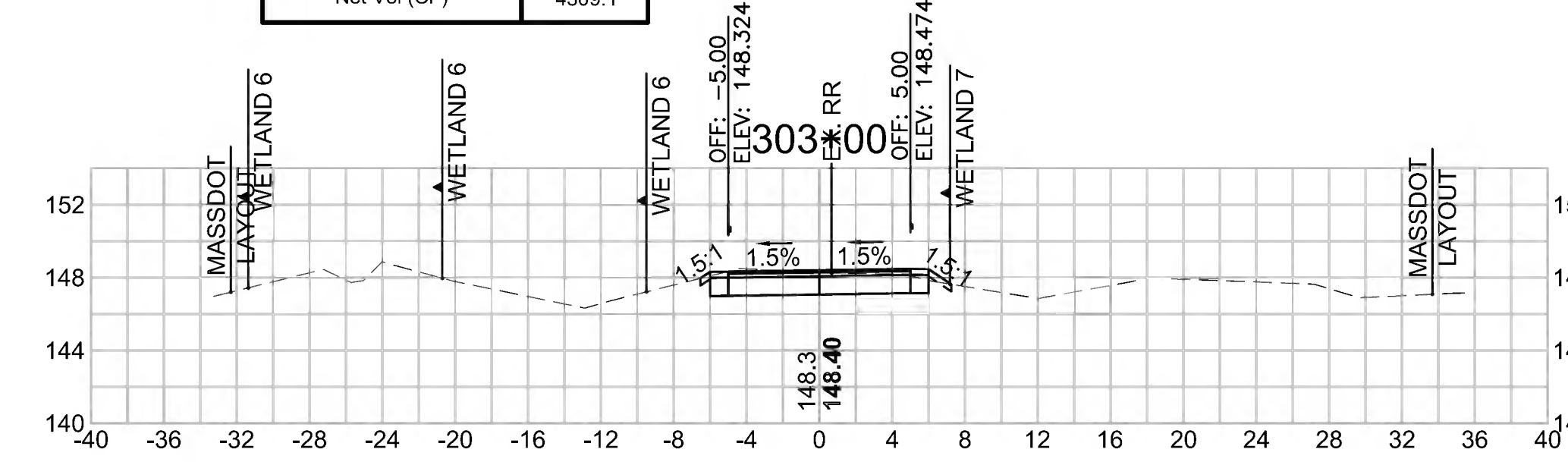
**Total Volume at Station 301+50.00**

Cut Area (SF)	16.144
Fill Area (SF)	0.556
Cut Vol (CF)	30.8
Fill Vol (CF)	0.6
Cum Cut Vol (CF)	12570.7
Cum Fill Vol (CF)	8349.2
Net Vol (CF)	4221.5



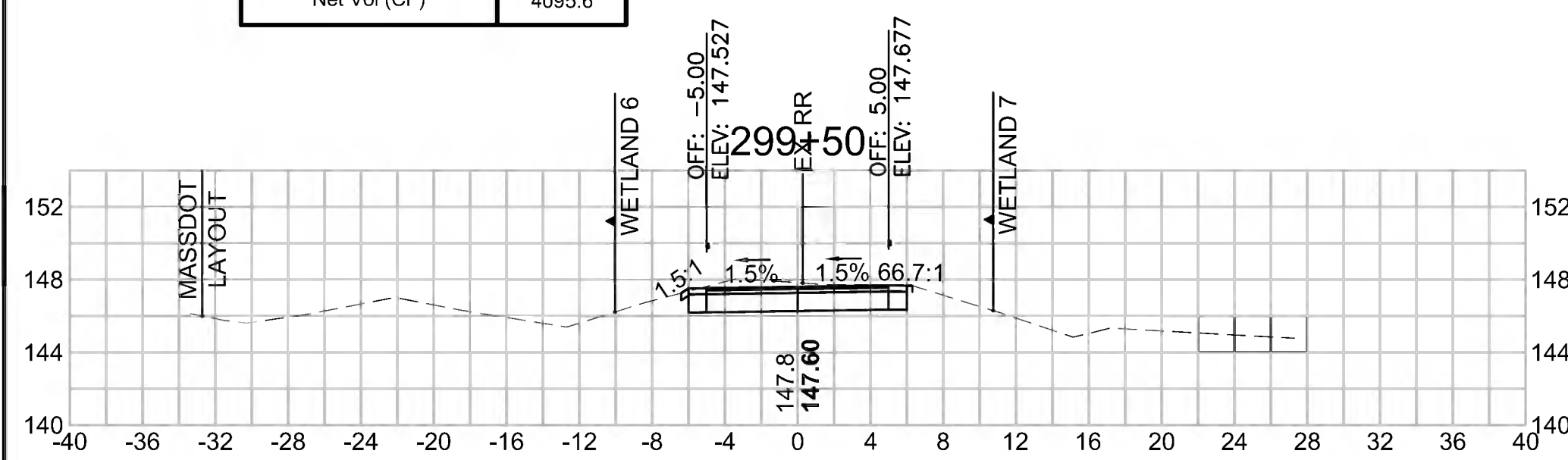
**Total Volume at Station 303+00.00**

Cut Area (SF)	14.693
Fill Area (SF)	0.053
Cut Vol (CF)	28.2
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	12659.1
Cum Fill Vol (CF)	8350.0
Net Vol (CF)	4309.1



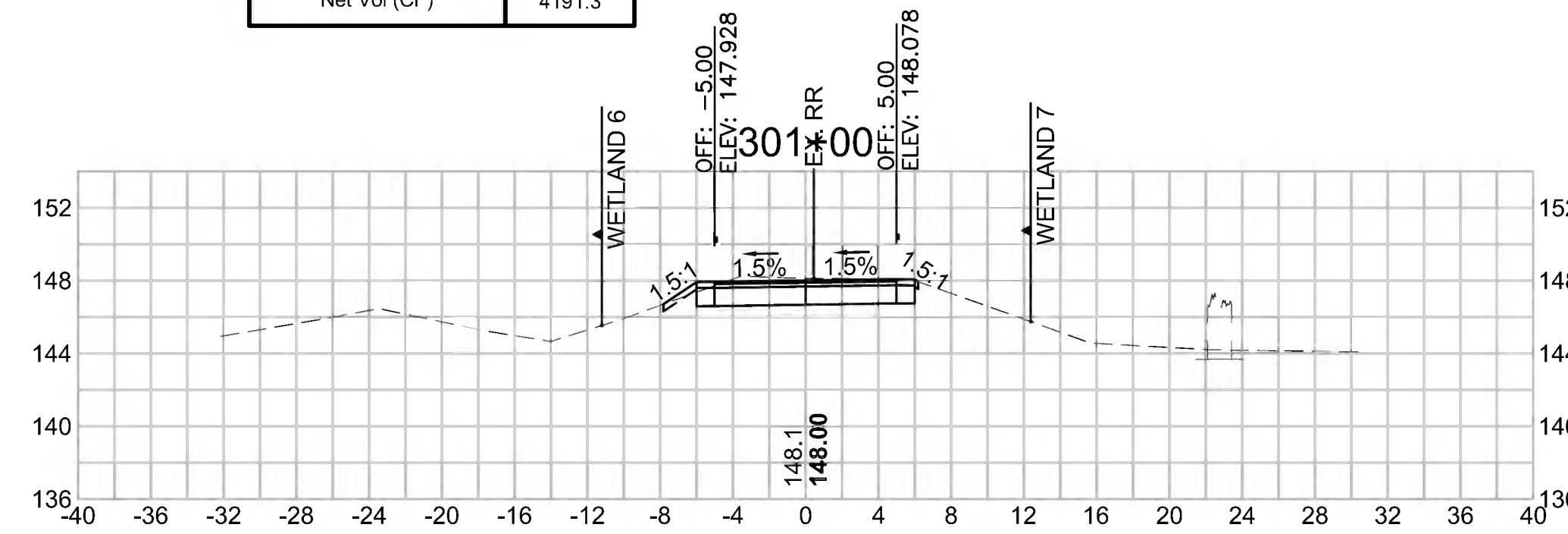
**Total Volume at Station 299+50.00**

Cut Area (SF)	18.190
Fill Area (SF)	0.000
Cut Vol (CF)	34.6
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	12444.0
Cum Fill Vol (CF)	8348.4
Net Vol (CF)	4095.6



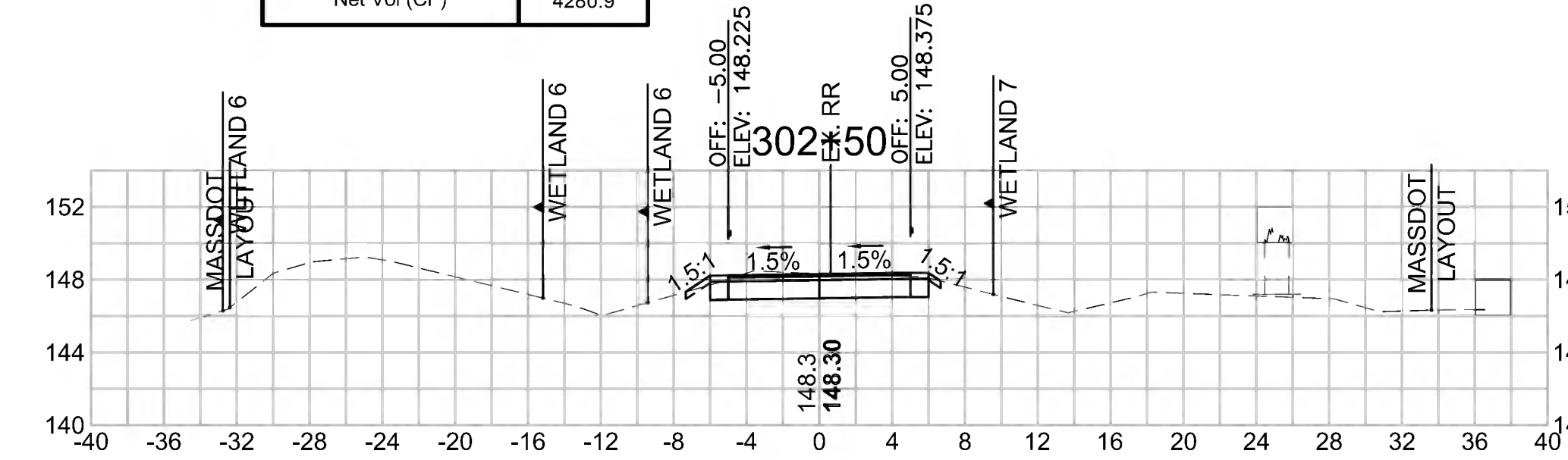
**Total Volume at Station 301+00.00**

Cut Area (SF)	17.105
Fill Area (SF)	0.042
Cut Vol (CF)	31.6
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	12540.0
Cum Fill Vol (CF)	8348.7
Net Vol (CF)	4191.3



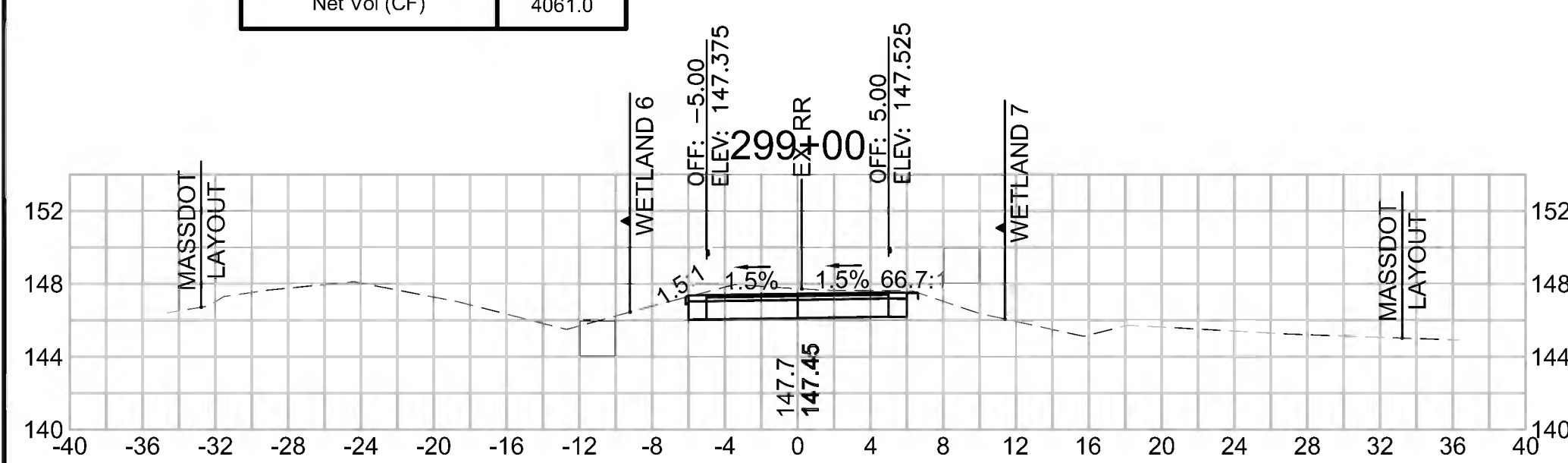
**Total Volume at Station 302+50.00**

Cut Area (SF)	15.798
Fill Area (SF)	0.017
Cut Vol (CF)	29.9
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	12630.9
Cum Fill Vol (CF)	8349.9
Net Vol (CF)	4280.9



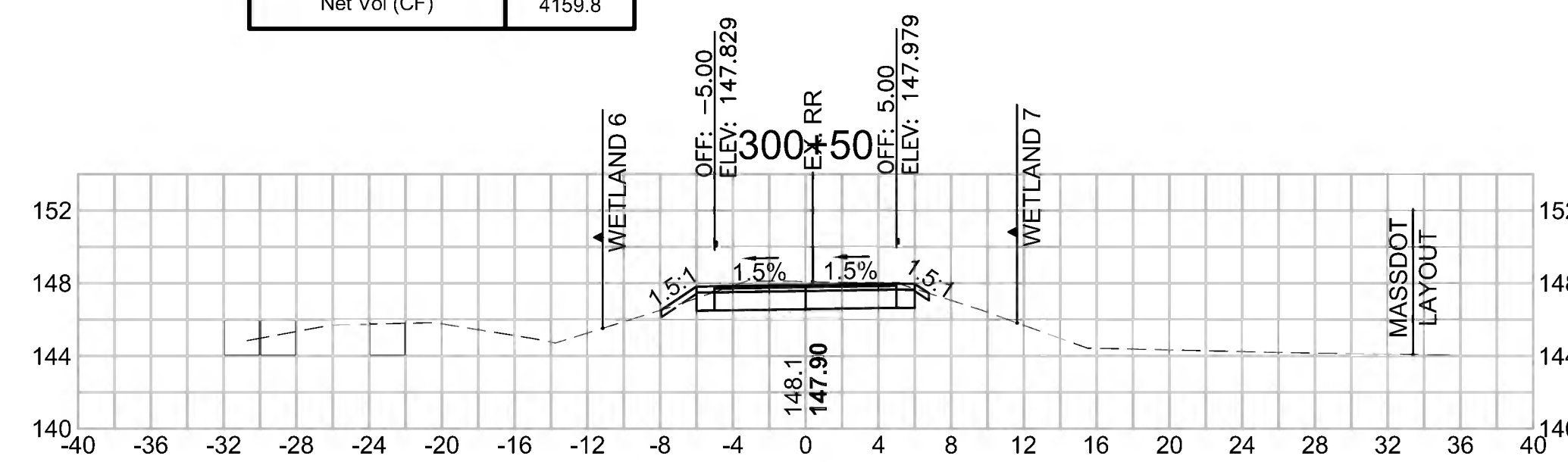
**Total Volume at Station 299+00.00**

Cut Area (SF)	19.134
Fill Area (SF)	0.000
Cut Vol (CF)	36.7
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	12409.4
Cum Fill Vol (CF)	8348.4
Net Vol (CF)	4061.0



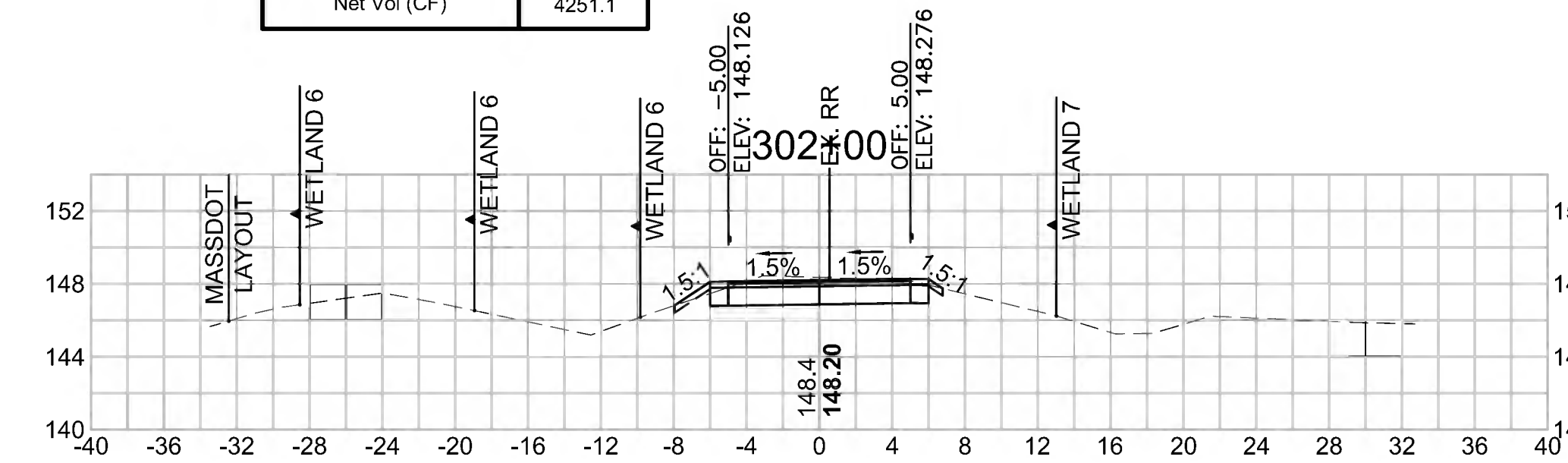
**Total Volume at Station 300+50.00**

Cut Area (SF)	17.029
Fill Area (SF)	0.093
Cut Vol (CF)	31.7
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	12508.3
Cum Fill Vol (CF)	8348.5
Net Vol (CF)	4159.8



**Total Volume at Station 302+00.00**

Cut Area (SF)	16.496
Fill Area (SF)	0.094
Cut Vol (CF)	30.2
Fill Vol (CF)	0.6
Cum Cut Vol (CF)	12601.0
Cum Fill Vol (CF)	8349.8
Net Vol (CF)	4251.1





SUDBURY  
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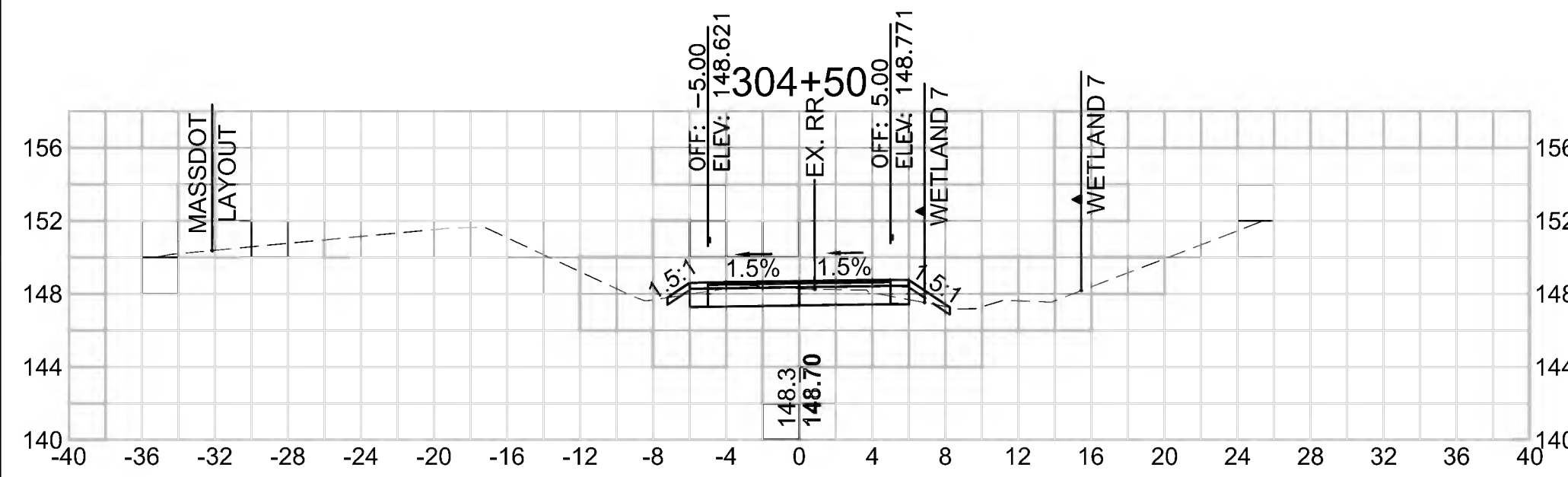
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	293	319
PROJECT FILE NO. 608164			

CROSS SECTIONS

608164\_XSEC(CROSS SECTION LAYOUTS).DWG 27-Jun-2022

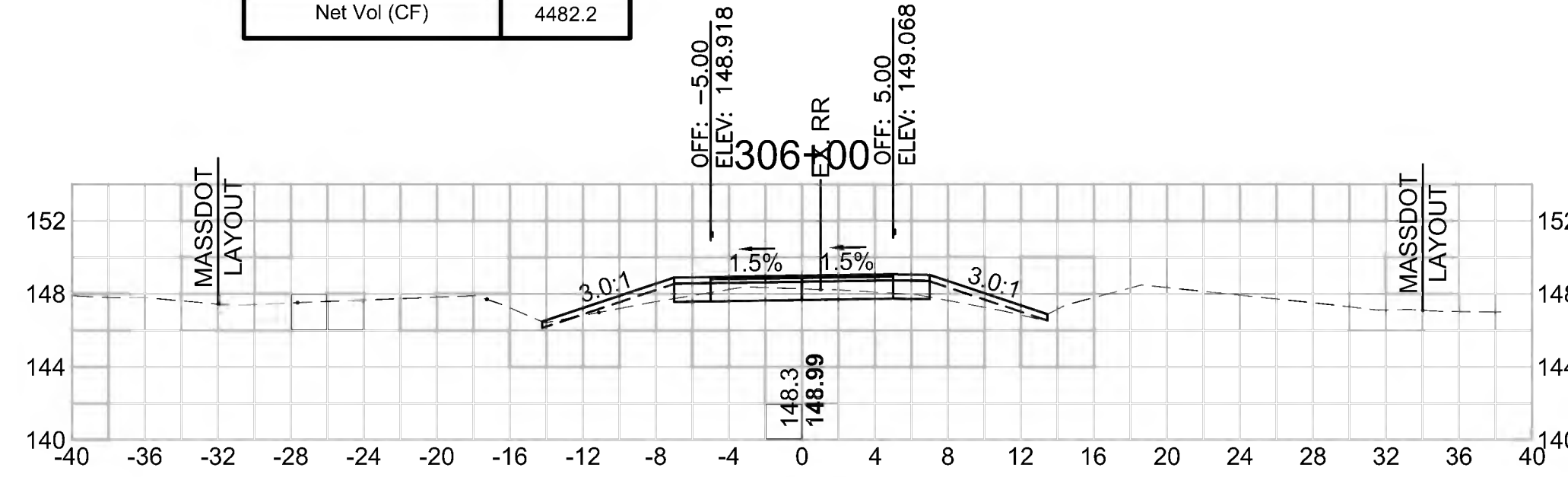
**Total Volume at Station 304+50.00**

Cut Area (SF)	12.695
Fill Area (SF)	0.527
Cut Vol (CF)	22.7
Fill Vol (CF)	0.5
Cum Cut Vol (CF)	12730.6
Cum Fill Vol (CF)	8350.7
Net Vol (CF)	4380.0



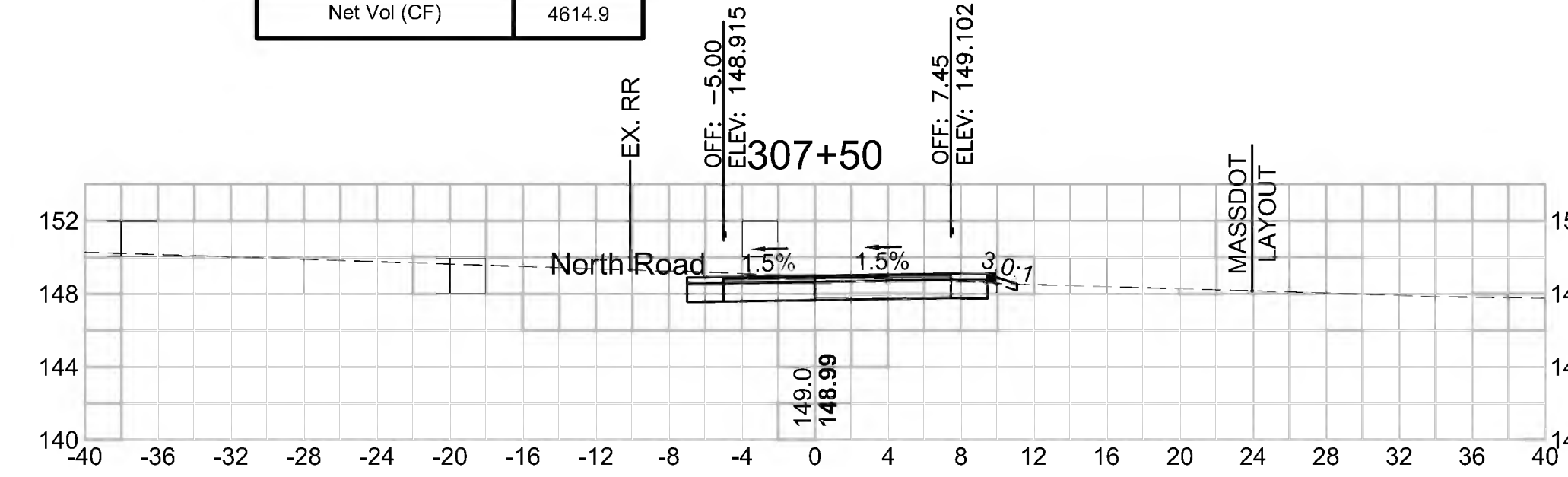
**Total Volume at Station 306+00.00**

Cut Area (SF)	18.518
Fill Area (SF)	4.761
Cut Vol (CF)	41.9
Fill Vol (CF)	8.9
Cum Cut Vol (CF)	12847.2
Cum Fill Vol (CF)	8365.0
Net Vol (CF)	4482.2



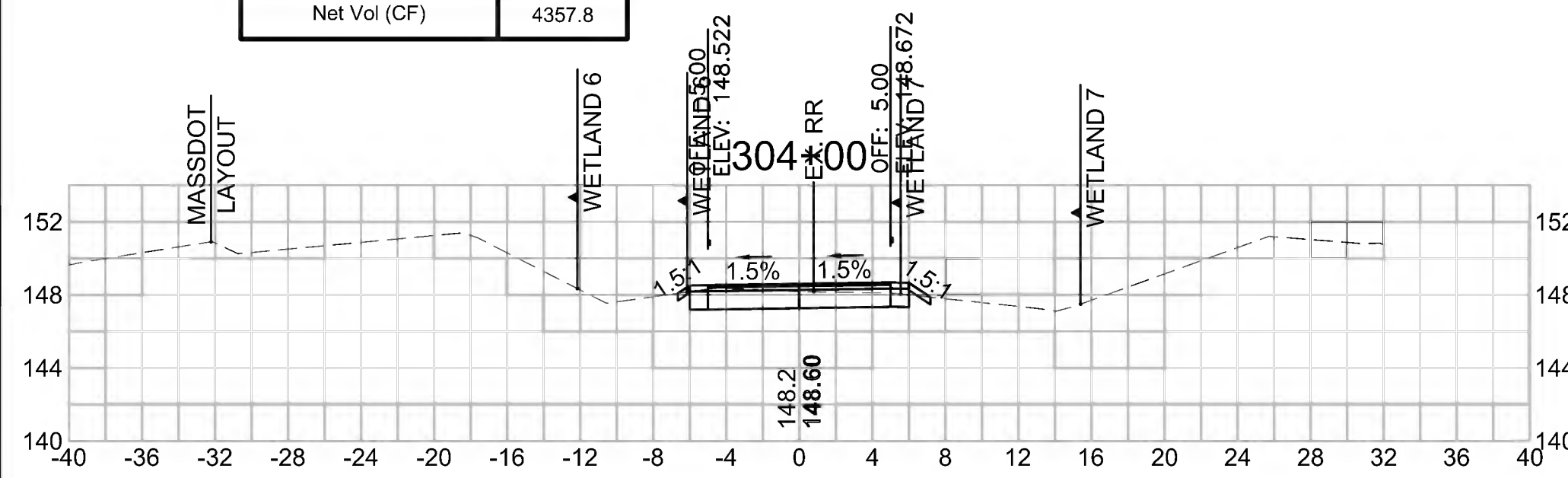
**Total Volume at Station 307+50.00**

Cut Area (SF)	79.732
Fill Area (SF)	0.024
Cut Vol (CF)	101.4
Fill Vol (CF)	12.3
Cum Cut Vol (CF)	13018.6
Cum Fill Vol (CF)	8403.6
Net Vol (CF)	4614.9



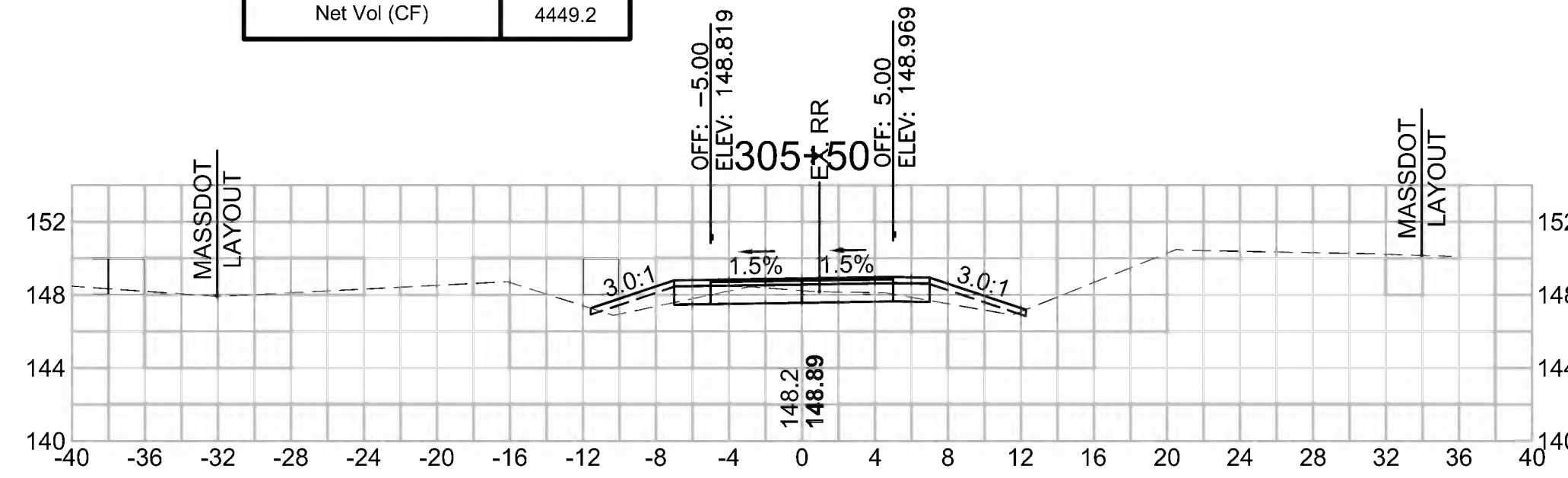
**Total Volume at Station 304+00.00**

Cut Area (SF)	11.791
Fill Area (SF)	0.064
Cut Vol (CF)	23.1
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	12708.0
Cum Fill Vol (CF)	8350.1
Net Vol (CF)	4357.8



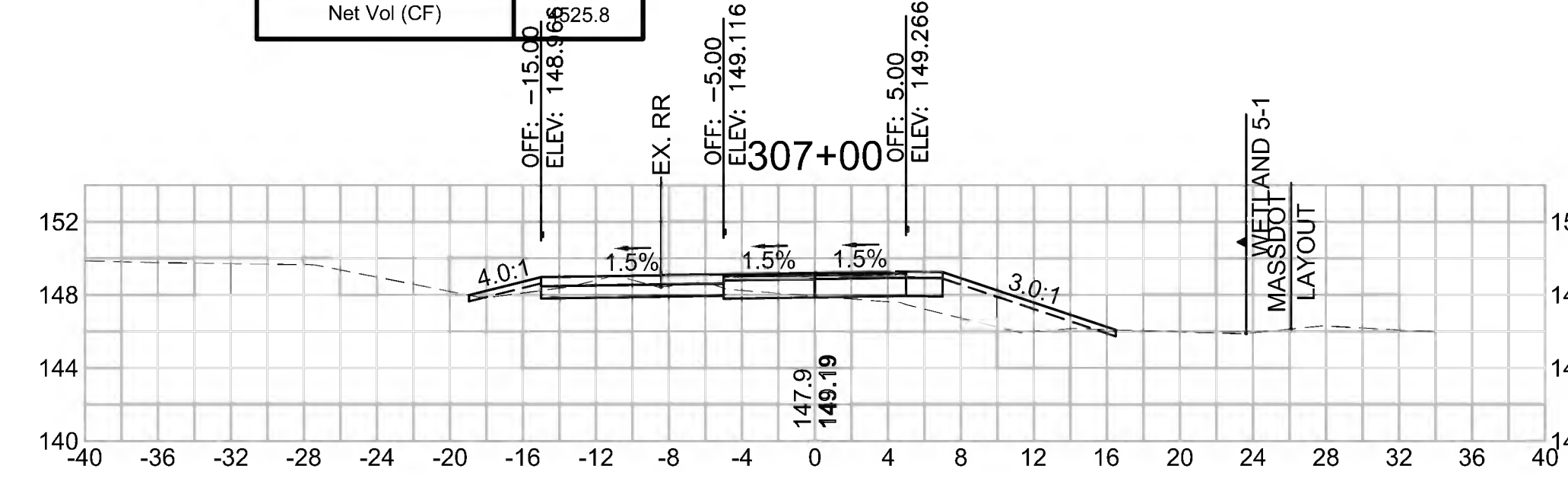
**Total Volume at Station 305+50.00**

Cut Area (SF)	26.728
Fill Area (SF)	4.848
Cut Vol (CF)	43.8
Fill Vol (CF)	4.7
Cum Cut Vol (CF)	12805.3
Cum Fill Vol (CF)	8356.1
Net Vol (CF)	4449.2



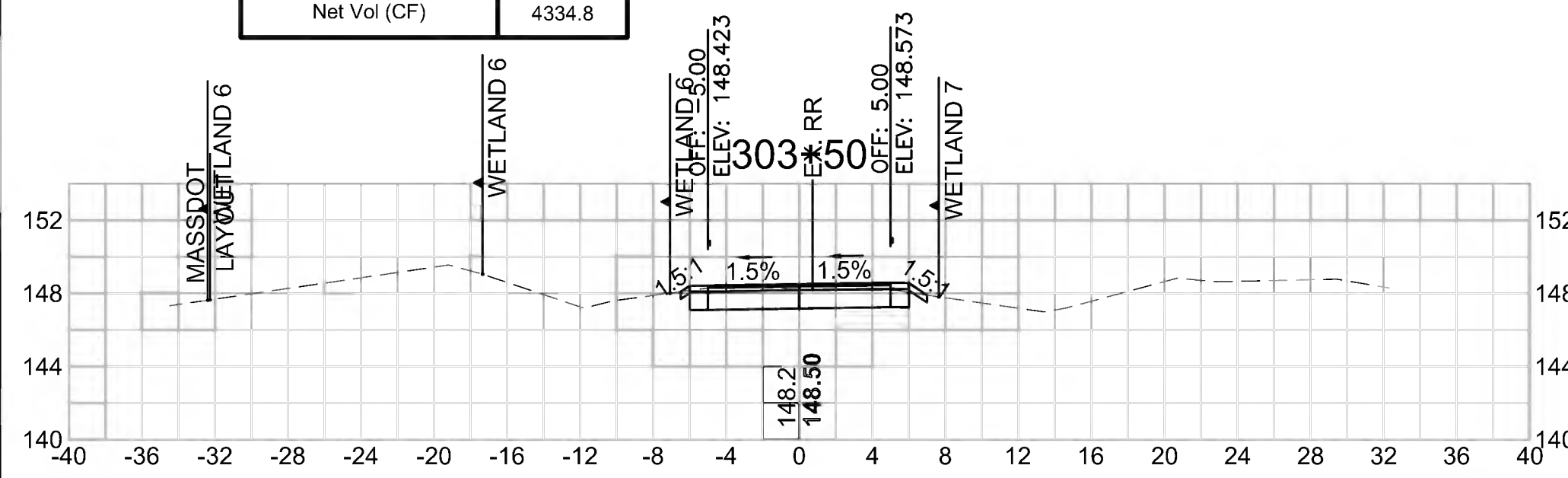
**Total Volume at Station 307+00.00**

Cut Area (SF)	29.756
Fill Area (SF)	13.211
Cut Vol (CF)	40.2
Fill Vol (CF)	17.1
Cum Cut Vol (CF)	12917.2
Cum Fill Vol (CF)	8391.4
Net Vol (CF)	4525.8



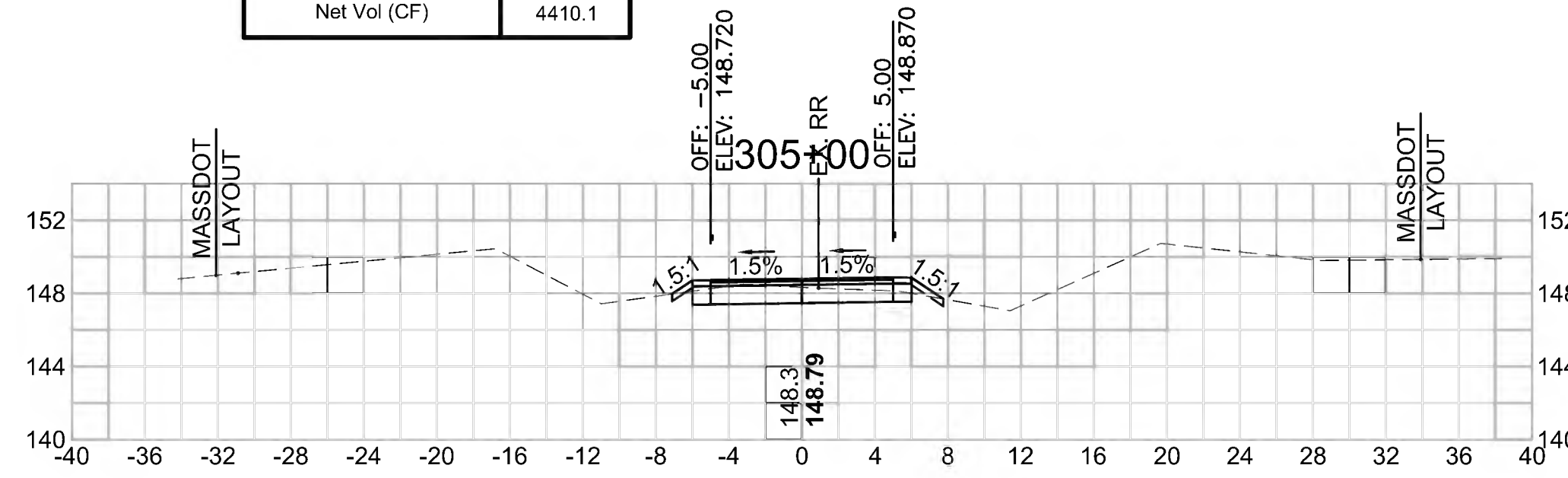
**Total Volume at Station 303+50.00**

Cut Area (SF)	13.145
Fill Area (SF)	0.011
Cut Vol (CF)	25.8
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	12684.9
Cum Fill Vol (CF)	8350.0
Net Vol (CF)	4334.8



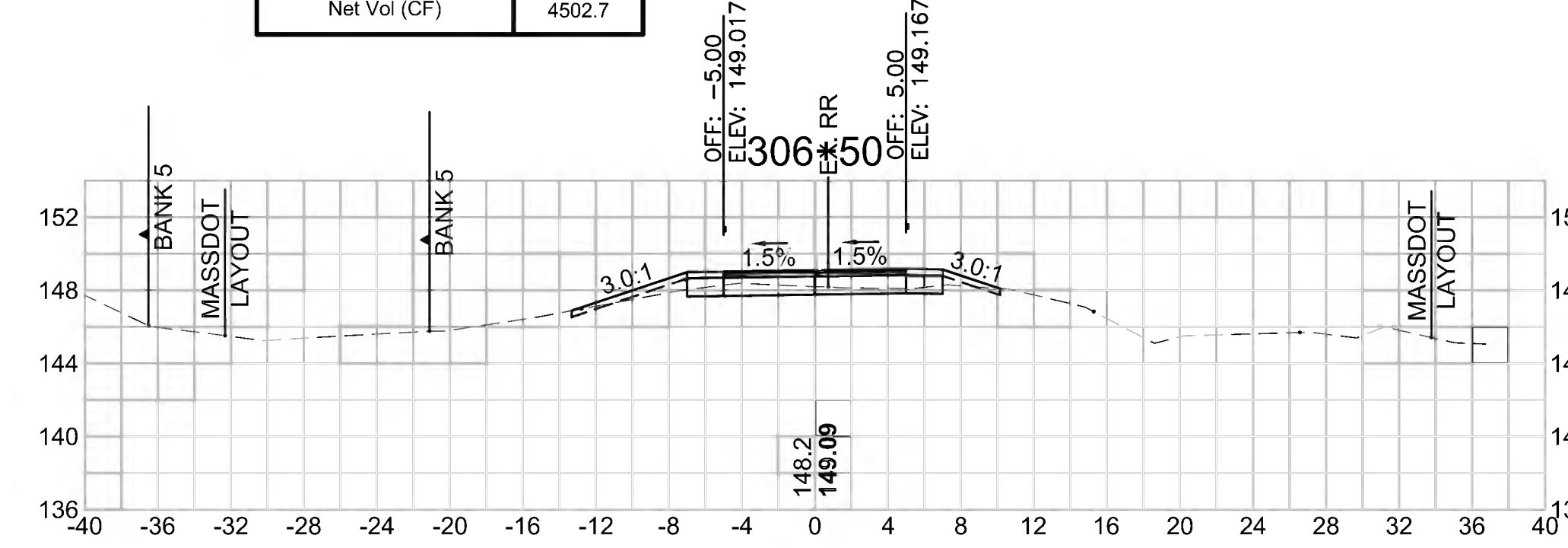
**Total Volume at Station 305+00.00**

Cut Area (SF)	20.597
Fill Area (SF)	0.254
Cut Vol (CF)	30.8
Fill Vol (CF)	0.7
Cum Cut Vol (CF)	12761.5
Cum Fill Vol (CF)	8351.4
Net Vol (CF)	4410.1



**Total Volume at Station 306+50.00**

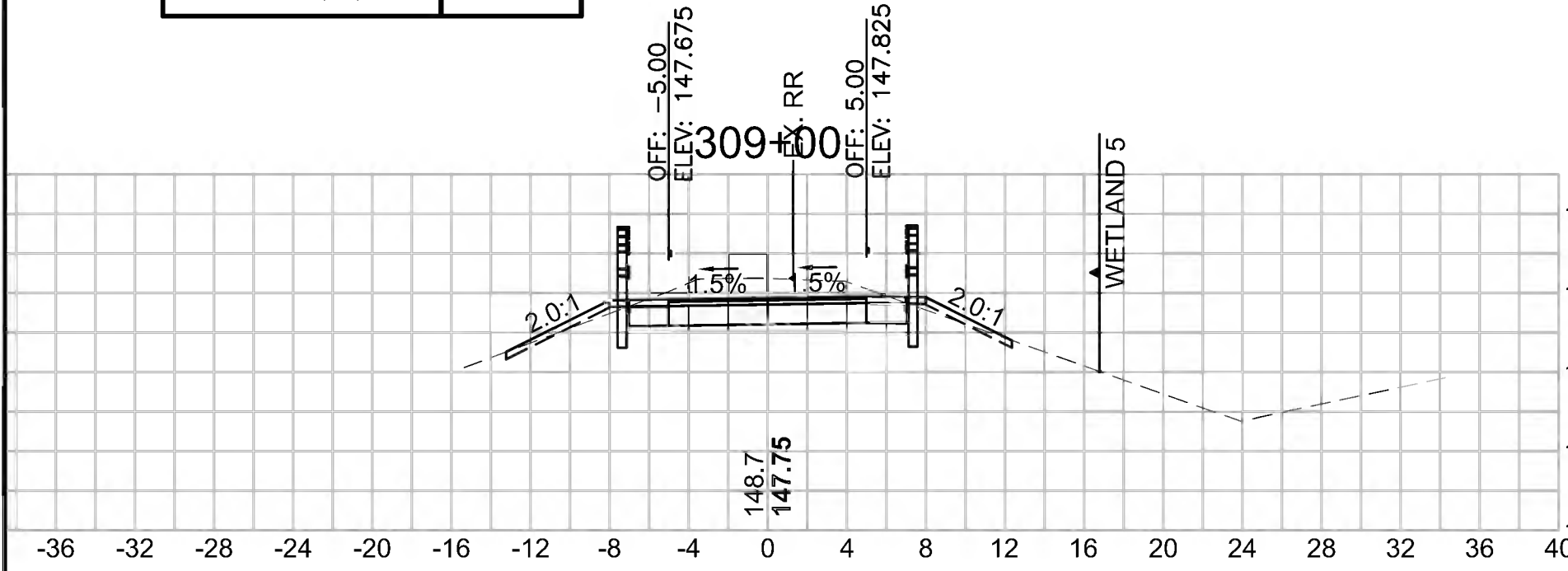
Cut Area (SF)	13.675
Fill Area (SF)	5.256
Cut Vol (CF)	29.8
Fill Vol (CF)	9.3
Cum Cut Vol (CF)	12877.0
Cum Fill Vol (CF)	8374.3
Net Vol (CF)	4502.7



**CROSS SECTIONS**

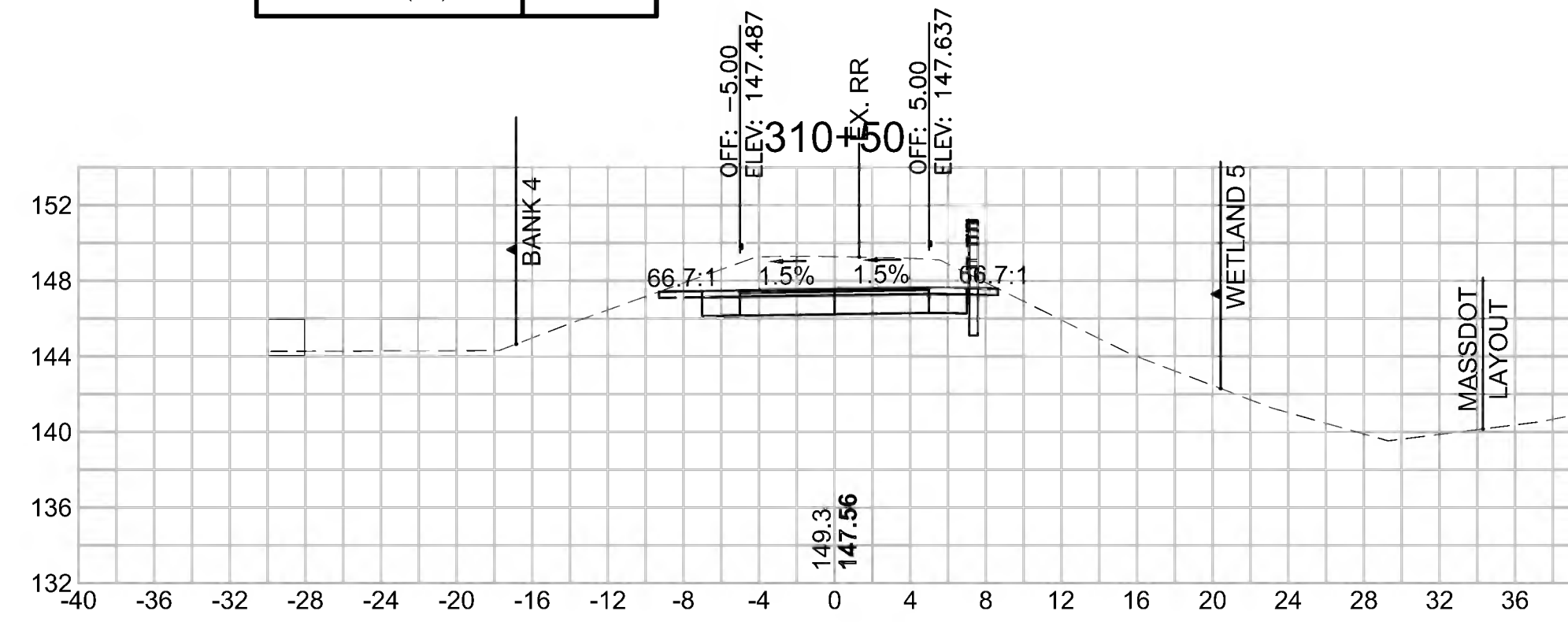
**Total Volume at Station 309+00.00**

Cut Area (SF)	28.856
Fill Area (SF)	1.518
Cut Vol (CF)	50.9
Fill Vol (CF)	1.5
Cum Cut Vol (CF)	13201.3
Cum Fill Vol (CF)	8435.0
Net Vol (CF)	4766.3



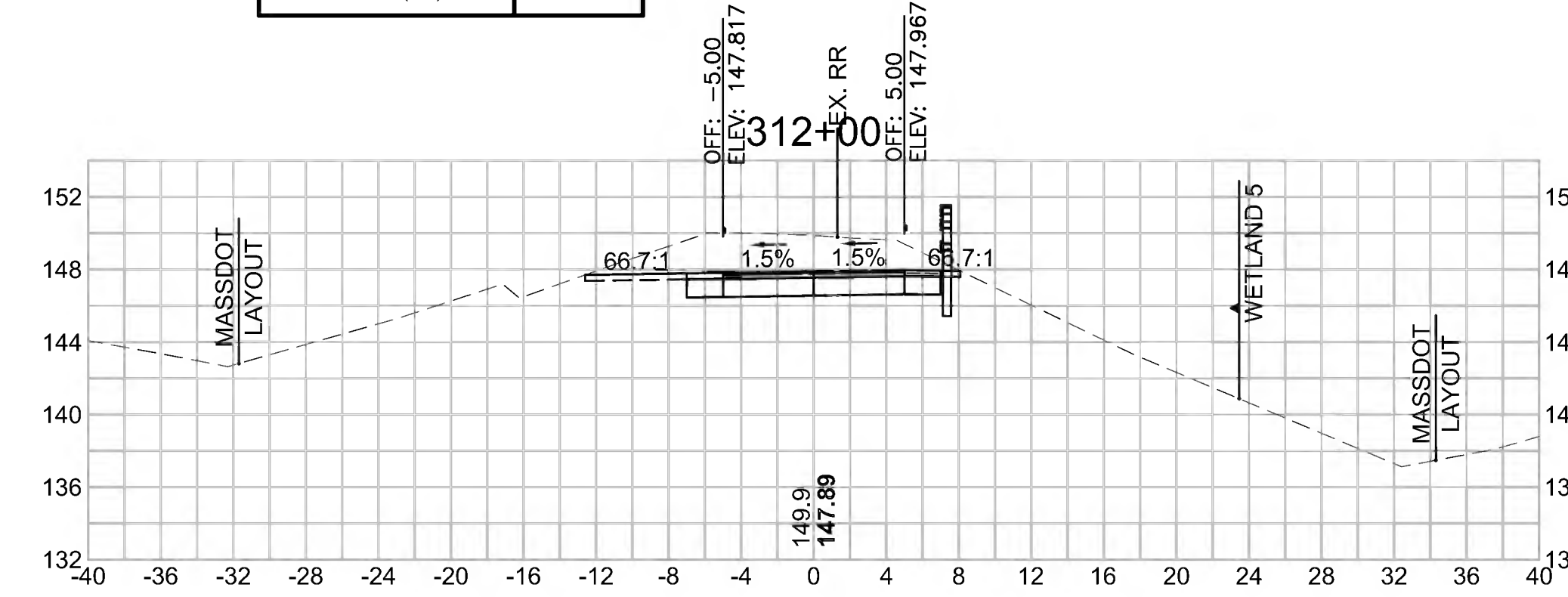
**Total Volume at Station 310+50.00**

Cut Area (SF)	47.202
Fill Area (SF)	0.000
Cut Vol (CF)	87.8
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	13436.3
Cum Fill Vol (CF)	8446.9
Net Vol (CF)	4989.4



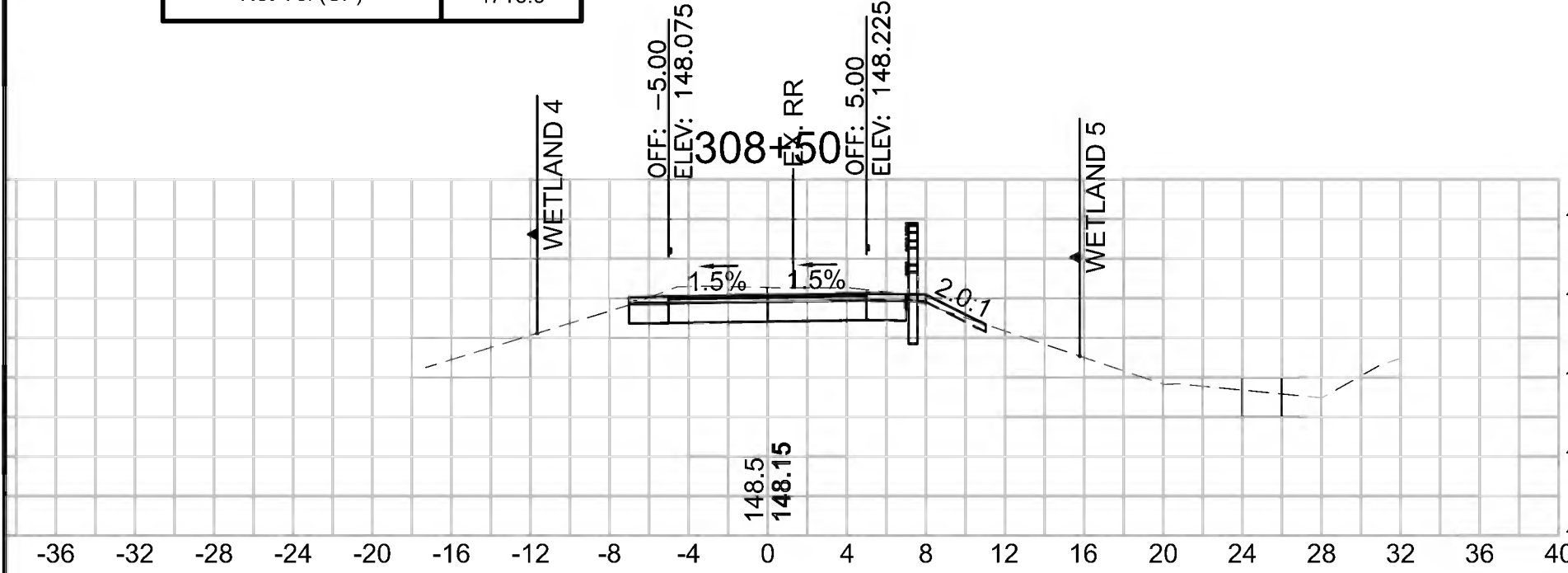
**Total Volume at Station 312+00.00**

Cut Area (SF)	59.214
Fill Area (SF)	0.123
Cut Vol (CF)	118.2
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	13775.9
Cum Fill Vol (CF)	8447.3
Net Vol (CF)	5328.6



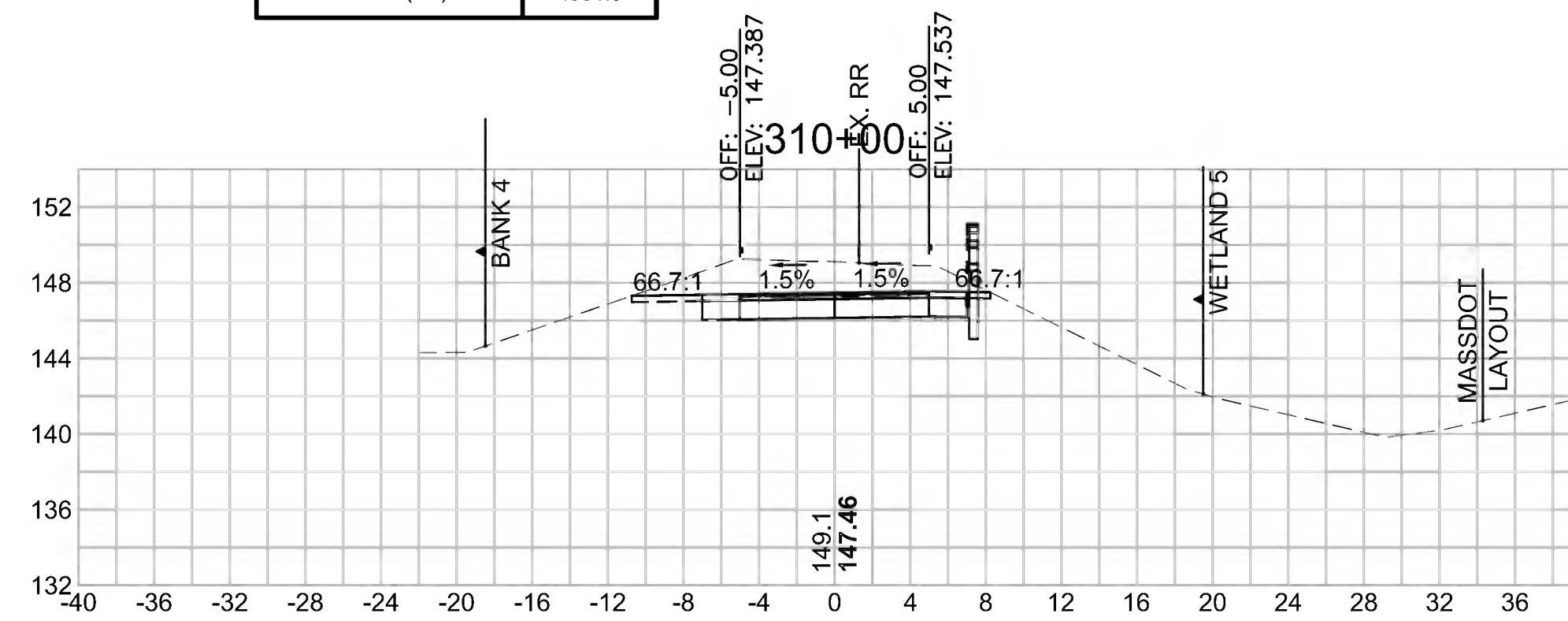
**Total Volume at Station 308+50.00**

Cut Area (SF)	26.103
Fill Area (SF)	0.096
Cut Vol (CF)	41.1
Fill Vol (CF)	15.0
Cum Cut Vol (CF)	13150.4
Cum Fill Vol (CF)	8433.5
Net Vol (CF)	4716.9



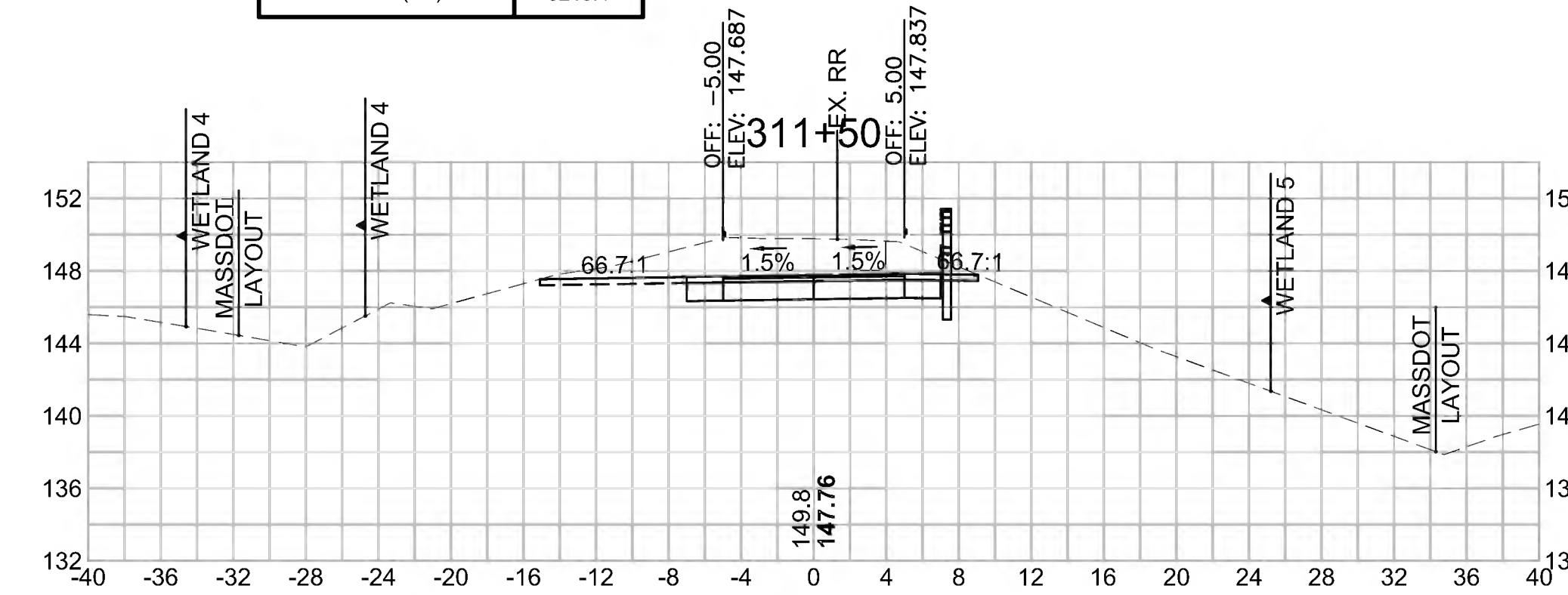
**Total Volume at Station 310+00.00**

Cut Area (SF)	47.665
Fill Area (SF)	0.000
Cut Vol (CF)	82.3
Fill Vol (CF)	5.2
Cum Cut Vol (CF)	13348.4
Cum Fill Vol (CF)	8446.9
Net Vol (CF)	4901.5



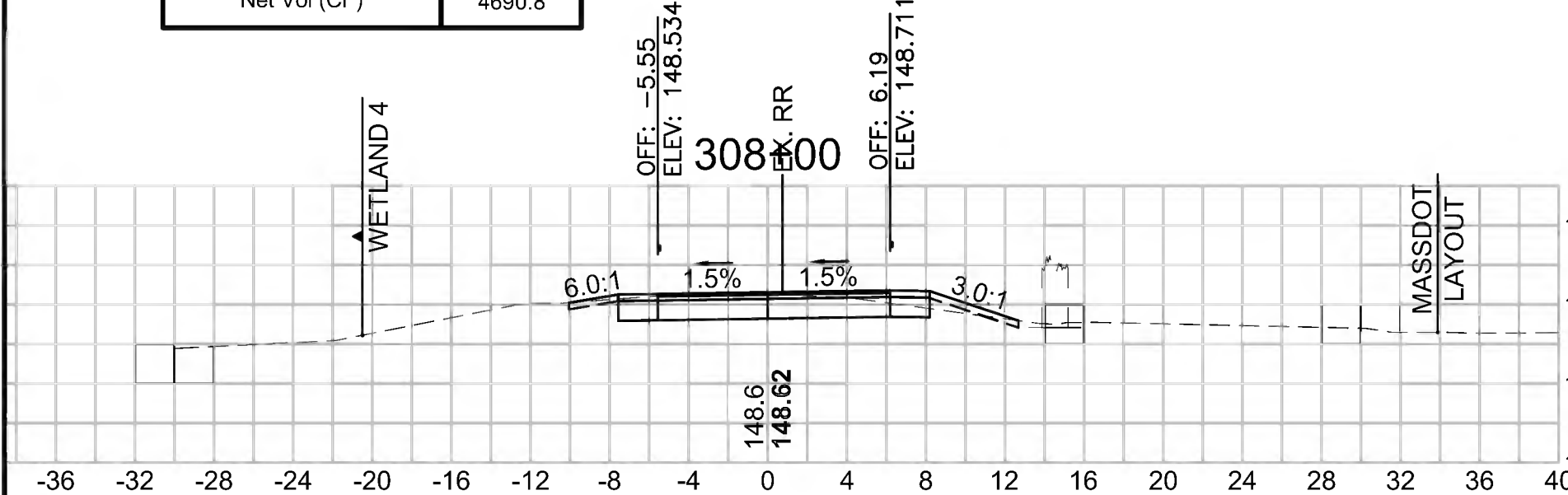
**Total Volume at Station 311+50.00**

Cut Area (SF)	68.474
Fill Area (SF)	0.000
Cut Vol (CF)	120.6
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	13657.7
Cum Fill Vol (CF)	8447.2
Net Vol (CF)	5210.4



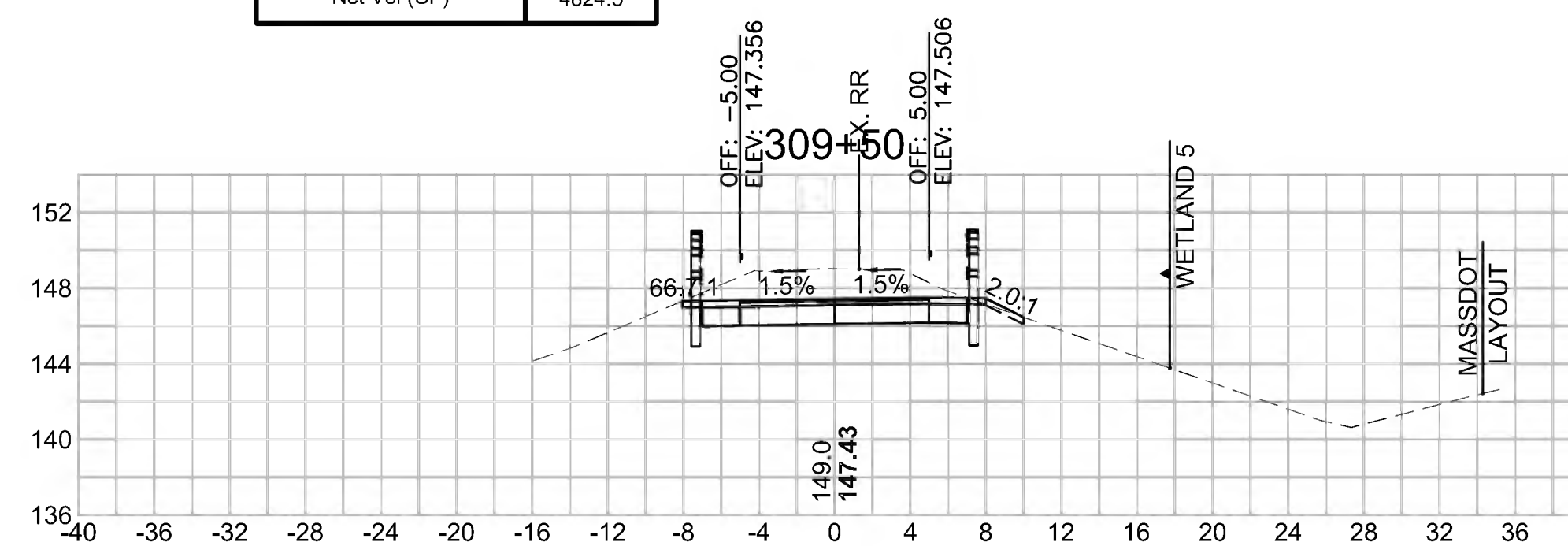
**Total Volume at Station 308+00.00**

Cut Area (SF)	18.272
Fill Area (SF)	16.066
Cut Vol (CF)	90.7
Fill Vol (CF)	14.9
Cum Cut Vol (CF)	13109.3
Cum Fill Vol (CF)	8418.5
Net Vol (CF)	4690.8



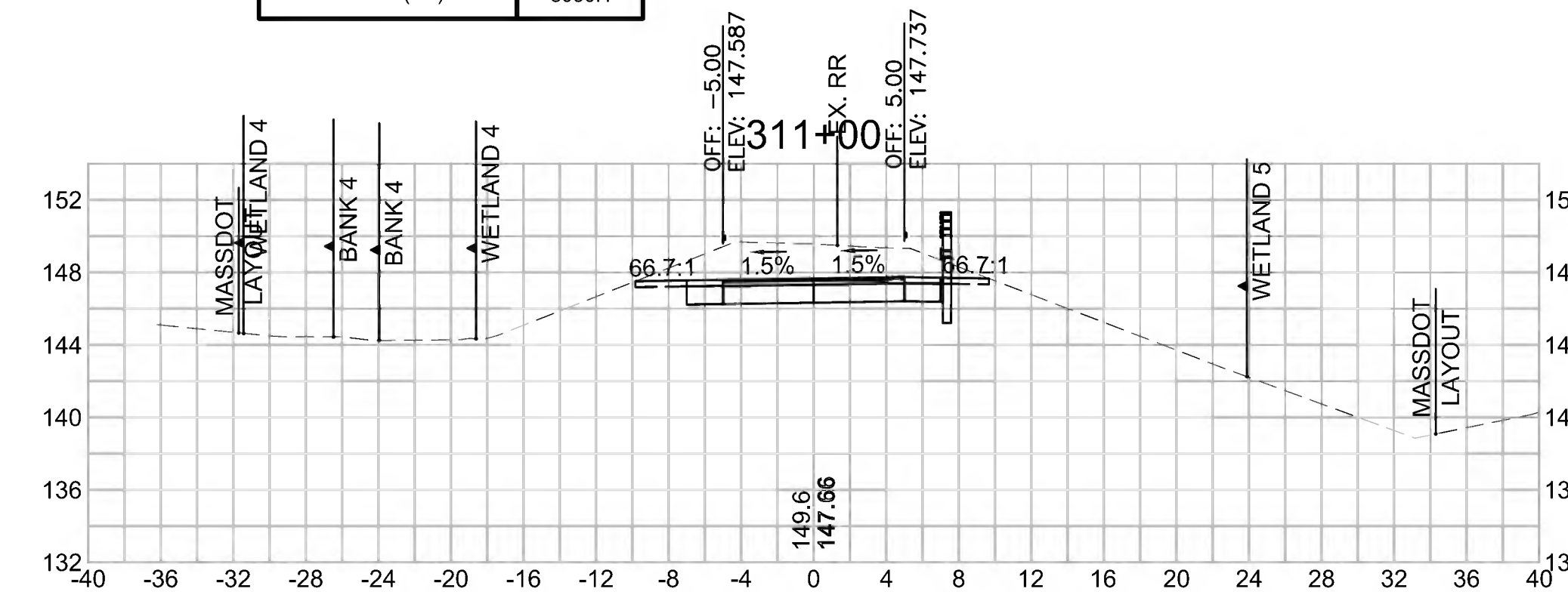
**Total Volume at Station 309+50.00**

Cut Area (SF)	41.186
Fill Area (SF)	5.665
Cut Vol (CF)	64.9
Fill Vol (CF)	6.7
Cum Cut Vol (CF)	13266.1
Cum Fill Vol (CF)	8441.6
Net Vol (CF)	4824.5



**Total Volume at Station 311+00.00**

Cut Area (SF)	61.726
Fill Area (SF)	0.185
Cut Vol (CF)	100.9
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	13537.1
Cum Fill Vol (CF)	8447.1
Net Vol (CF)	5090.1





SUDBURY  
BRUCE FREEMAN RAIL TRAIL

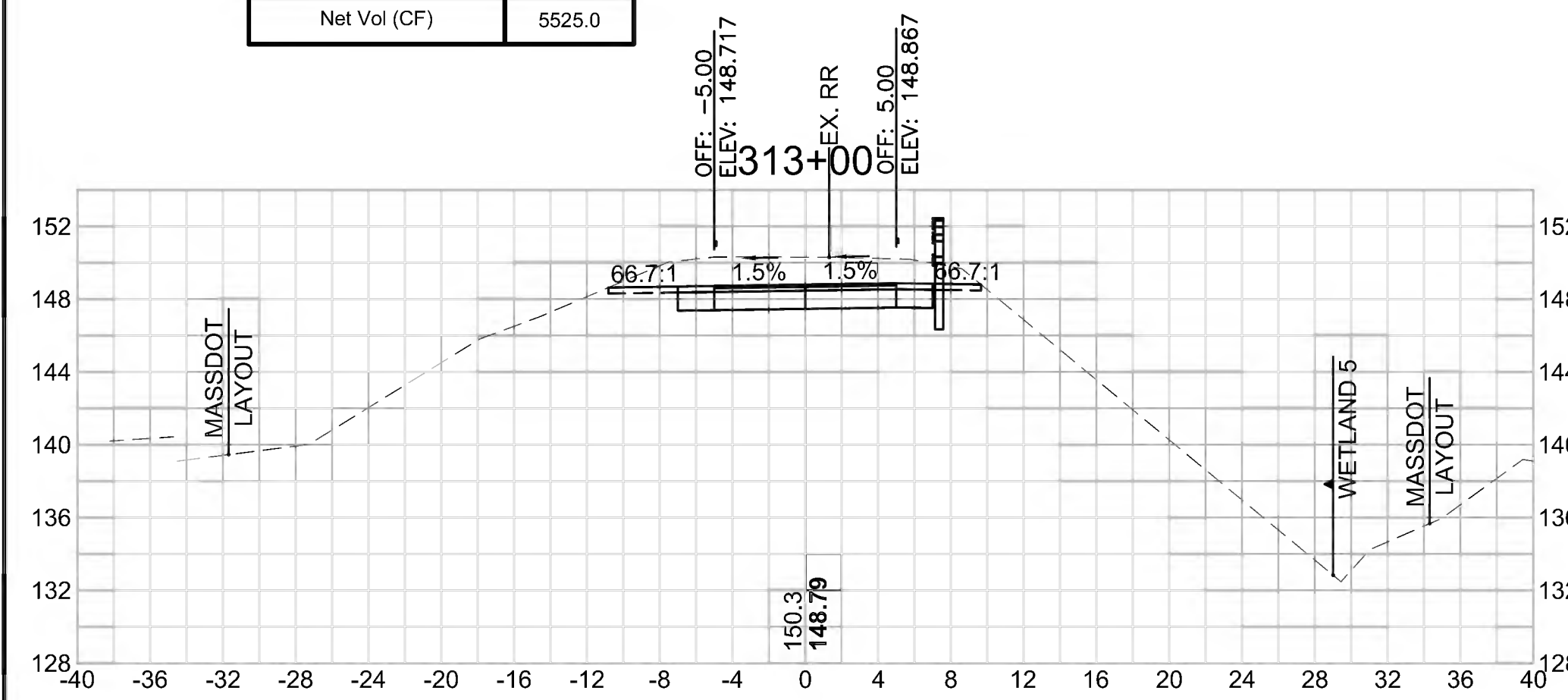
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	295	319
PROJECT FILE NO. 608164			

CROSS SECTIONS

608164.XSEC(CROSS SECTION LAYOUTS).DWG 27-Jun-2022

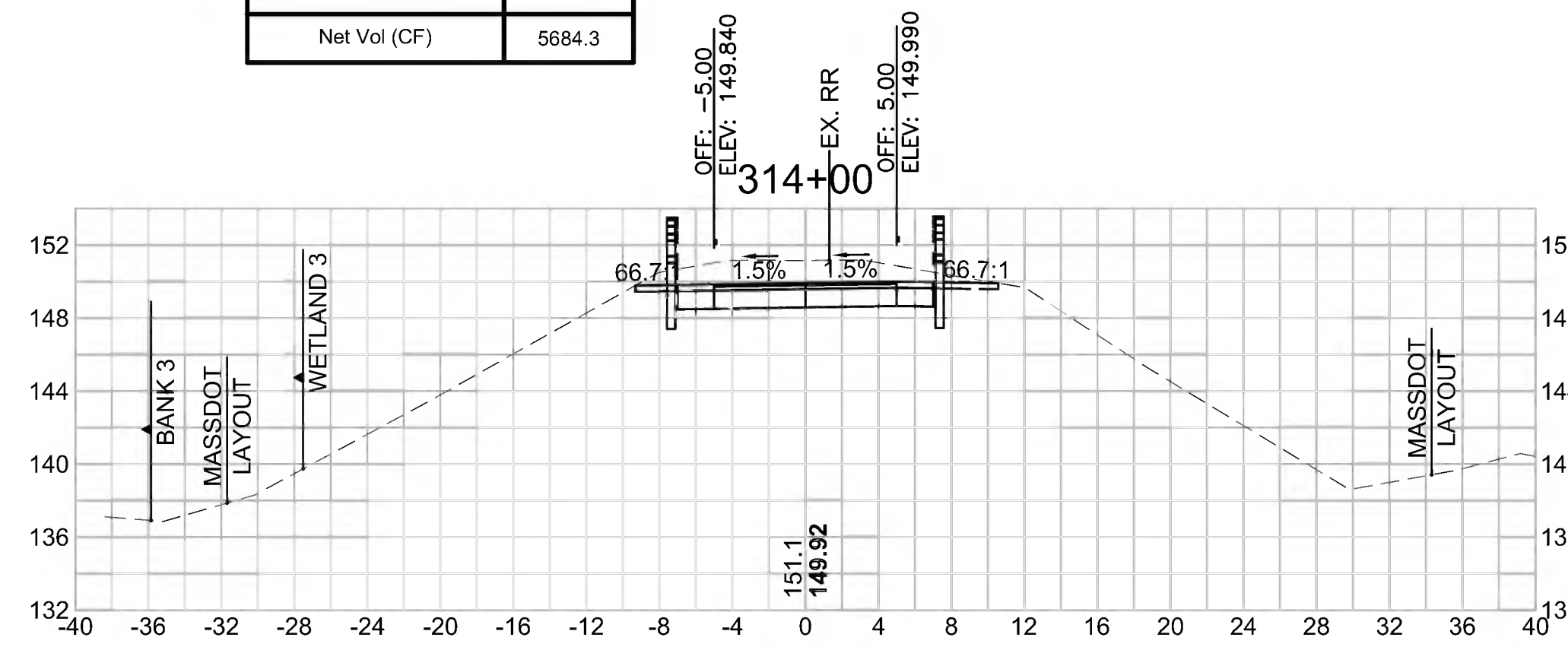
**Total Volume at Station 313+00.00**

Cut Area (SF)	46.228
Fill Area (SF)	0.000
Cut Vol (CF)	92.3
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	13972.5
Cum Fill Vol (CF)	8447.5
Net Vol (CF)	5525.0



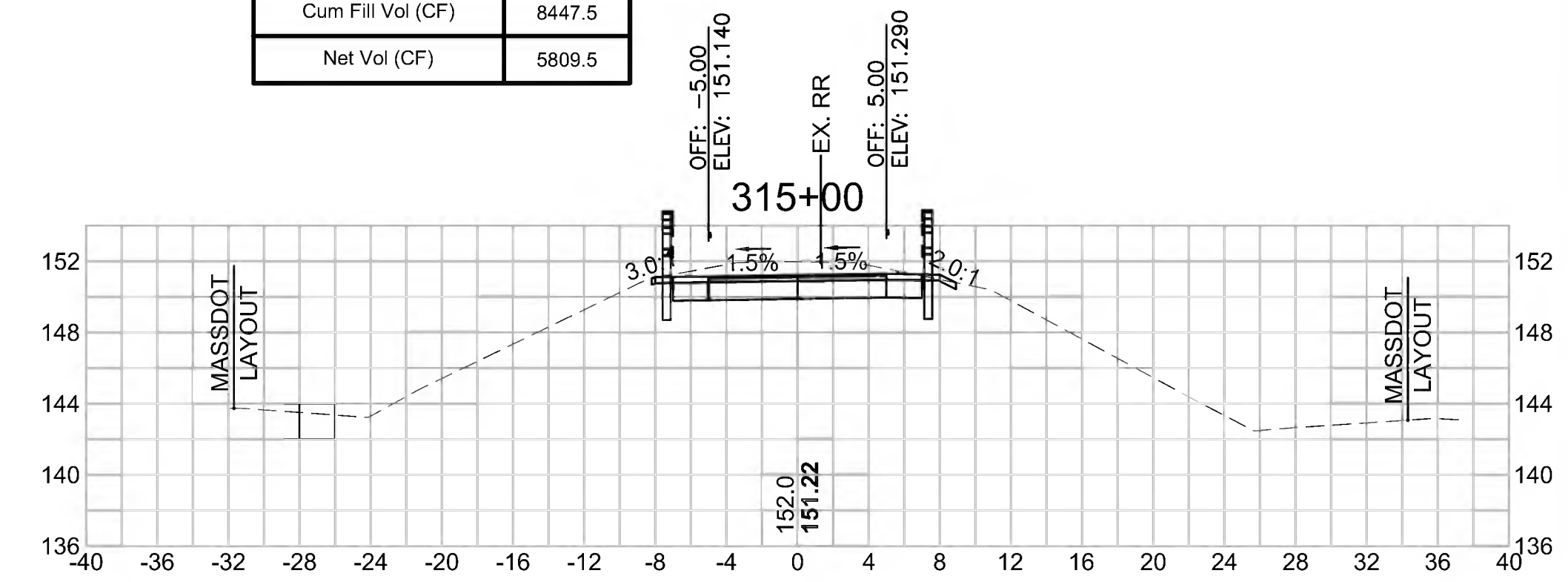
**Total Volume at Station 314+00.00**

Cut Area (SF)	38.540
Fill Area (SF)	0.000
Cut Vol (CF)	76.1
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	14131.8
Cum Fill Vol (CF)	8447.5
Net Vol (CF)	5684.3



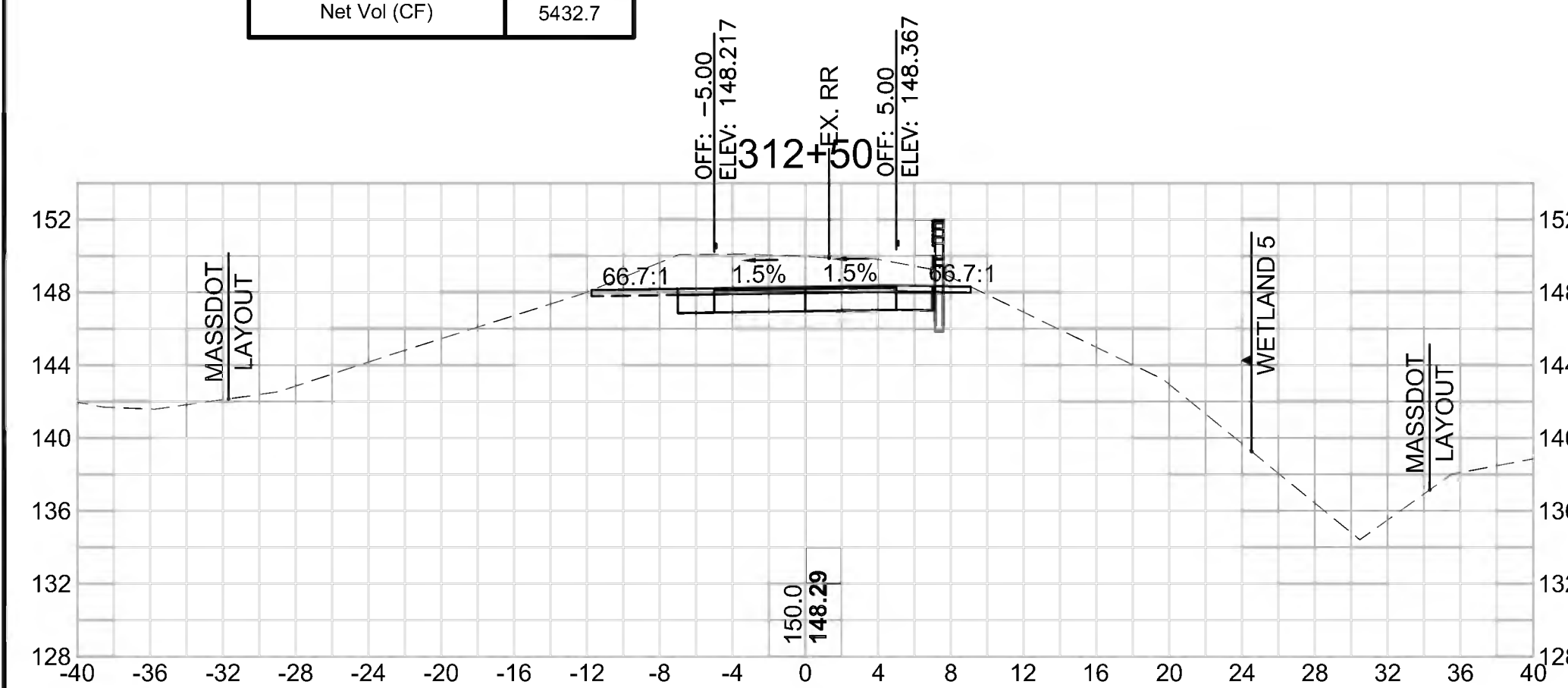
**Total Volume at Station 315+00.00**

Cut Area (SF)	29.539
Fill Area (SF)	0.000
Cut Vol (CF)	58.4
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	14257.0
Cum Fill Vol (CF)	8447.5
Net Vol (CF)	5809.5



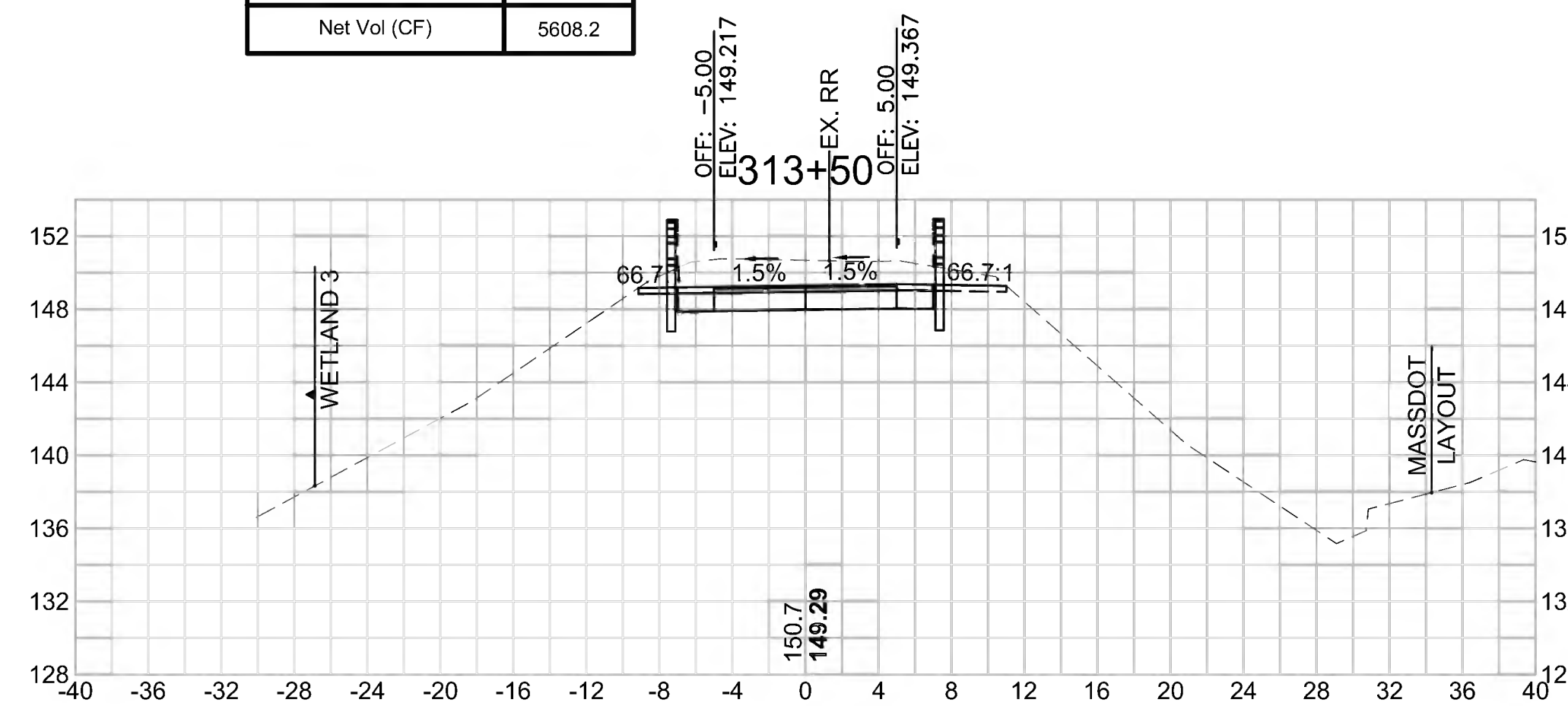
**Total Volume at Station 312+50.00**

Cut Area (SF)	53.434
Fill Area (SF)	0.000
Cut Vol (CF)	104.3
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	13880.2
Cum Fill Vol (CF)	8447.5
Net Vol (CF)	5432.7



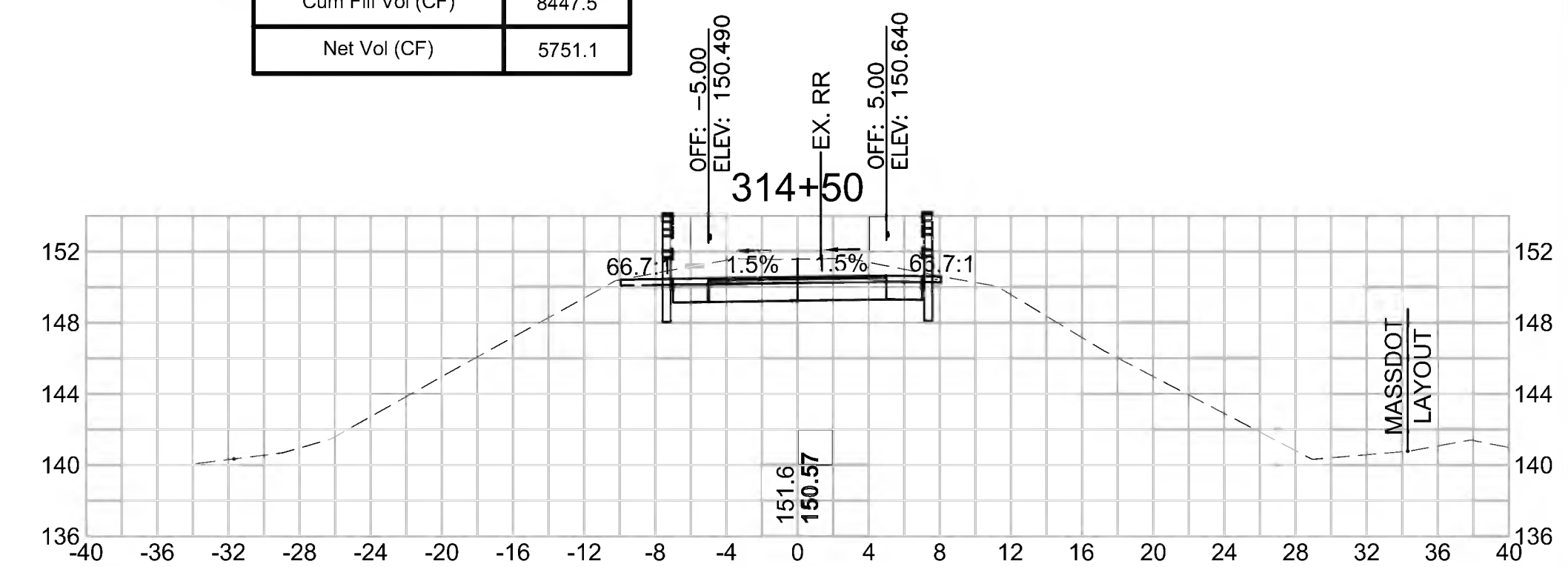
**Total Volume at Station 313+50.00**

Cut Area (SF)	43.650
Fill Area (SF)	0.018
Cut Vol (CF)	83.2
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	14055.7
Cum Fill Vol (CF)	8447.5
Net Vol (CF)	5608.2



**Total Volume at Station 314+50.00**

Cut Area (SF)	33.549
Fill Area (SF)	0.000
Cut Vol (CF)	66.7
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	14198.6
Cum Fill Vol (CF)	8447.5
Net Vol (CF)	5751.1



SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	296	319

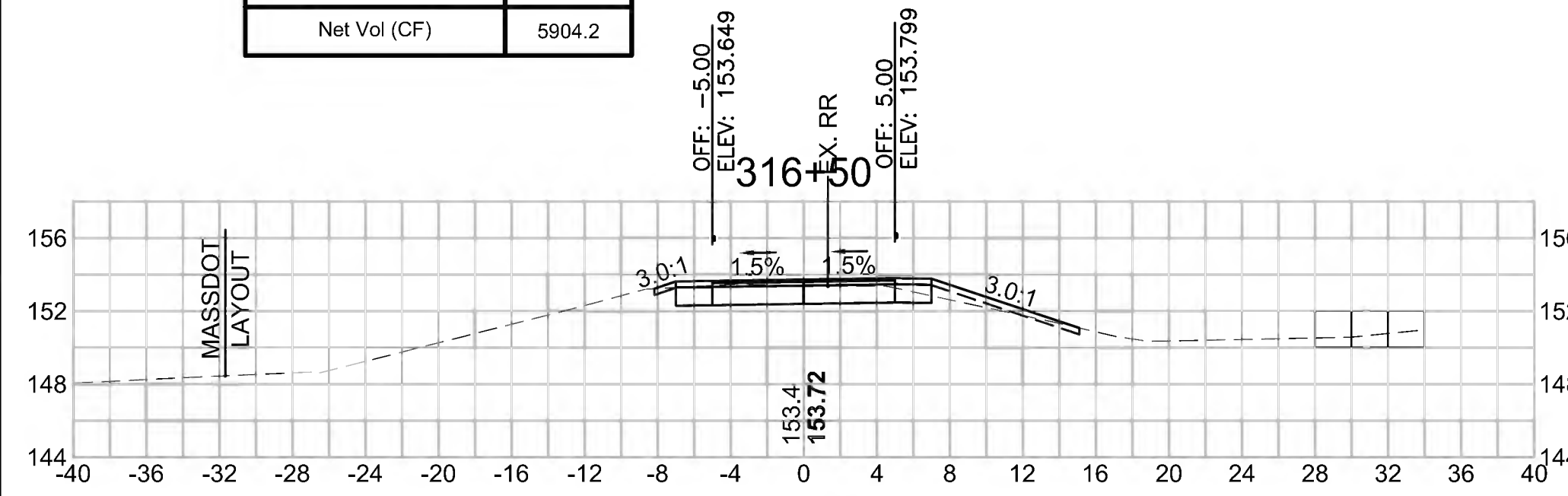
PROJECT FILE NO. 608164

CROSS SECTIONS

608164\_XSEC(CROSS SECTION LAYOUTS).DWG 27-Jun-2022

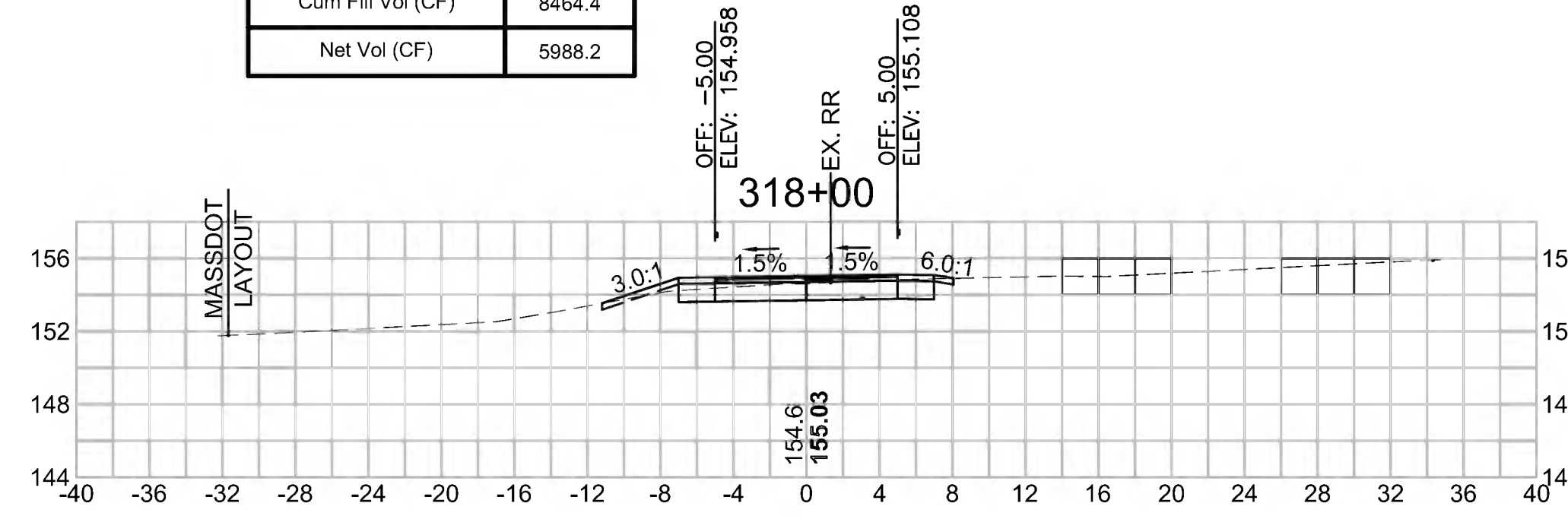
**Total Volume at Station 316+50.00**

Cut Area (SF)	18.222
Fill Area (SF)	1.292
Cut Vol (CF)	30.0
Fill Vol (CF)	5.5
Cum Cut Vol (CF)	14366.1
Cum Fill Vol (CF)	8461.9
Net Vol (CF)	5904.2



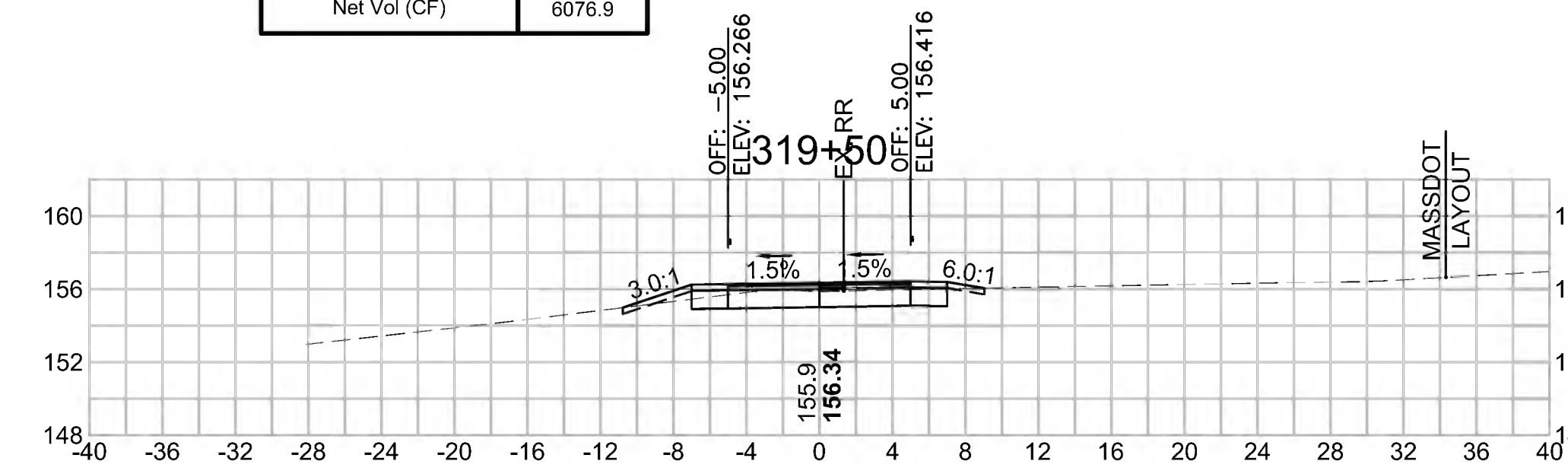
**Total Volume at Station 318+00.00**

Cut Area (SF)	15.594
Fill Area (SF)	0.080
Cut Vol (CF)	28.5
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	14452.6
Cum Fill Vol (CF)	8464.4
Net Vol (CF)	5988.2



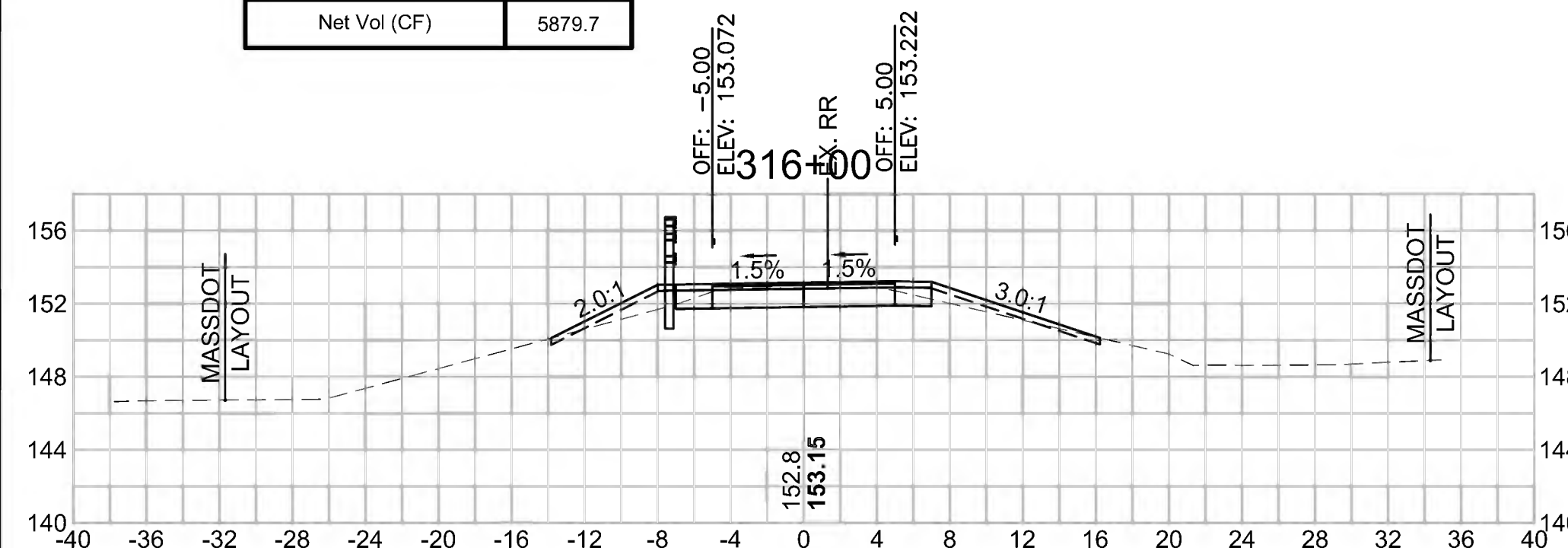
**Total Volume at Station 319+50.00**

Cut Area (SF)	24.589
Fill Area (SF)	0.078
Cut Vol (CF)	36.6
Fill Vol (CF)	1.8
Cum Cut Vol (CF)	14546.6
Cum Fill Vol (CF)	8469.7
Net Vol (CF)	6076.9



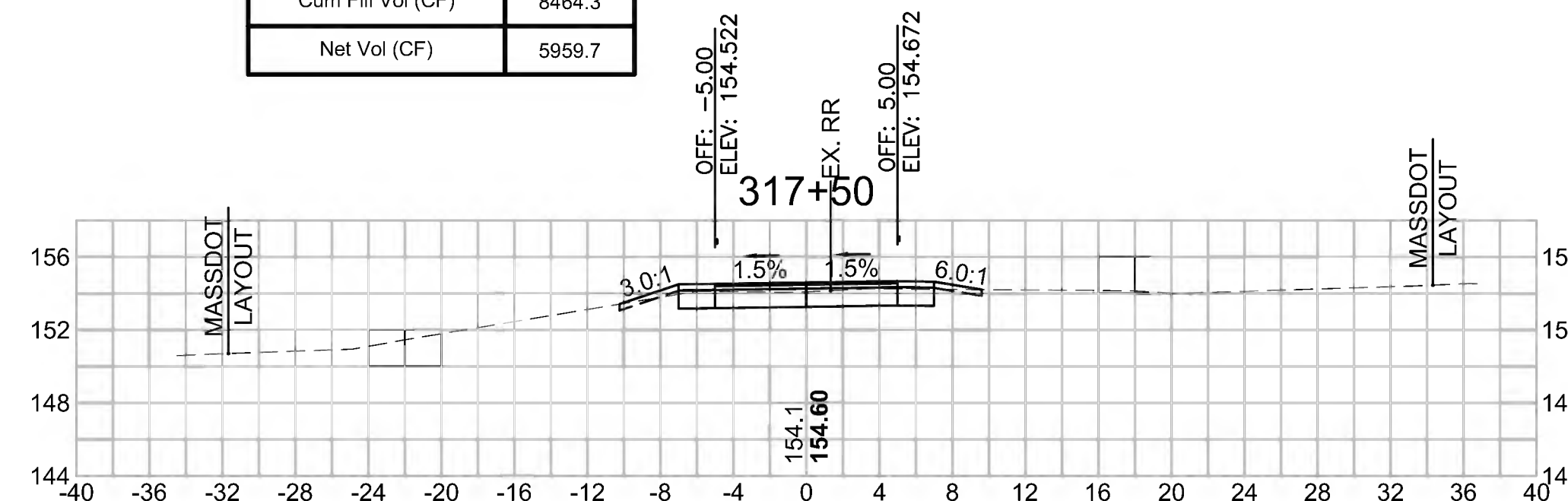
**Total Volume at Station 316+00.00**

Cut Area (SF)	14.228
Fill Area (SF)	4.661
Cut Vol (CF)	32.5
Fill Vol (CF)	6.6
Cum Cut Vol (CF)	14336.1
Cum Fill Vol (CF)	8456.4
Net Vol (CF)	5879.7



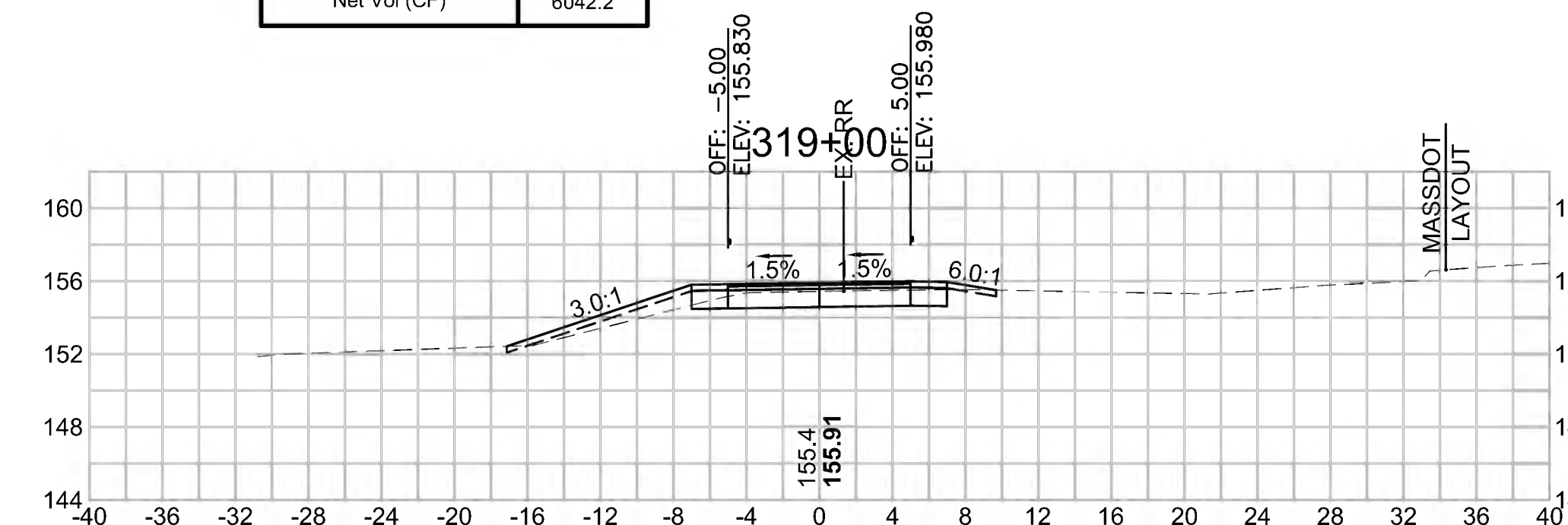
**Total Volume at Station 317+50.00**

Cut Area (SF)	15.227
Fill Area (SF)	0.021
Cut Vol (CF)	27.6
Fill Vol (CF)	0.6
Cum Cut Vol (CF)	14424.0
Cum Fill Vol (CF)	8464.3
Net Vol (CF)	5959.7



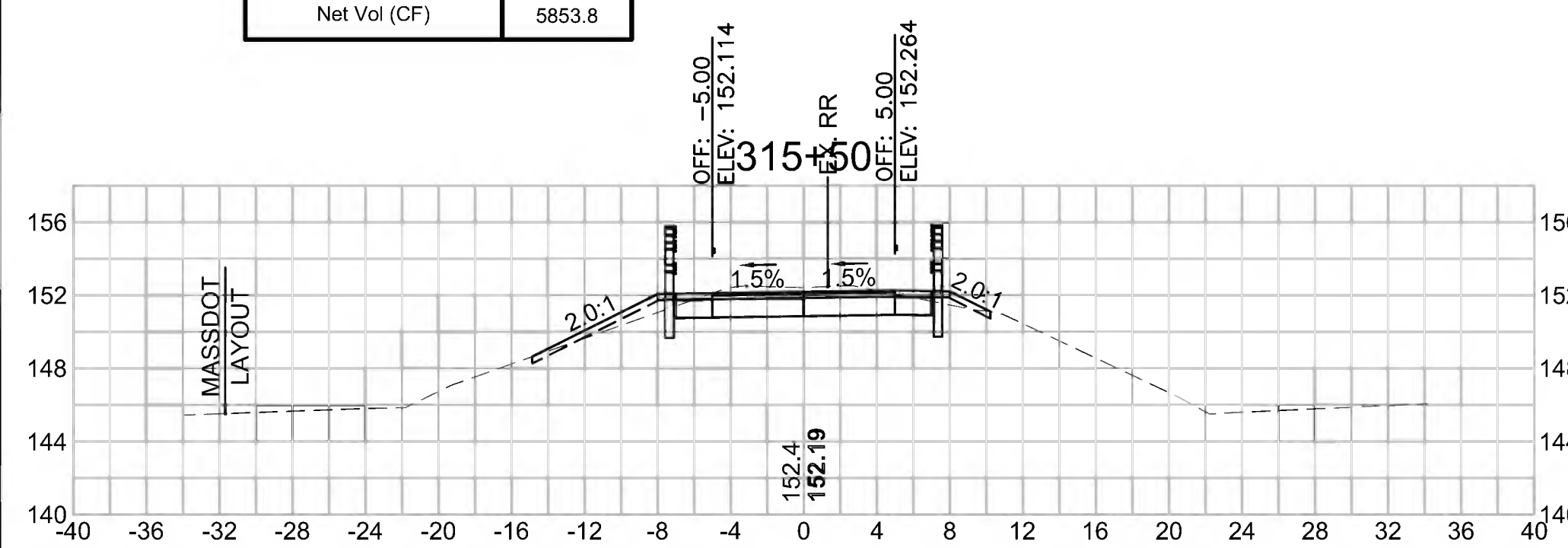
**Total Volume at Station 319+00.00**

Cut Area (SF)	14.916
Fill Area (SF)	1.909
Cut Vol (CF)	28.4
Fill Vol (CF)	2.6
Cum Cut Vol (CF)	14510.0
Cum Fill Vol (CF)	8467.9
Net Vol (CF)	6042.2



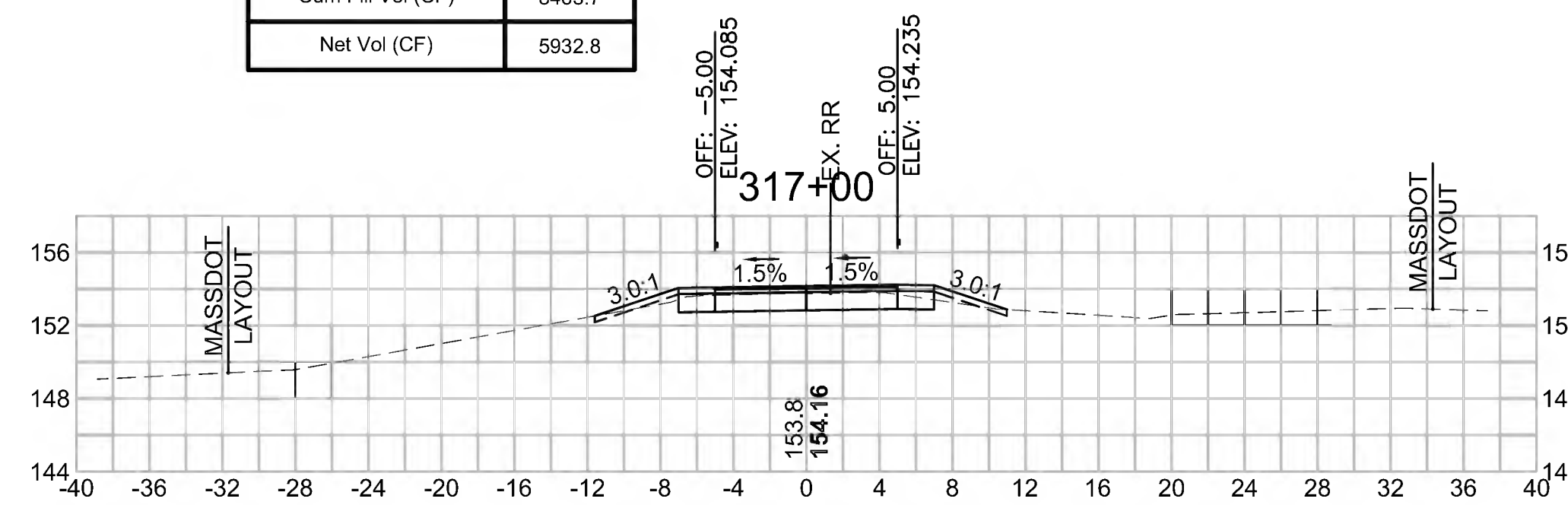
**Total Volume at Station 315+50.00**

Cut Area (SF)	20.826
Fill Area (SF)	2.479
Cut Vol (CF)	46.6
Fill Vol (CF)	2.3
Cum Cut Vol (CF)	14303.6
Cum Fill Vol (CF)	8449.8
Net Vol (CF)	5853.8



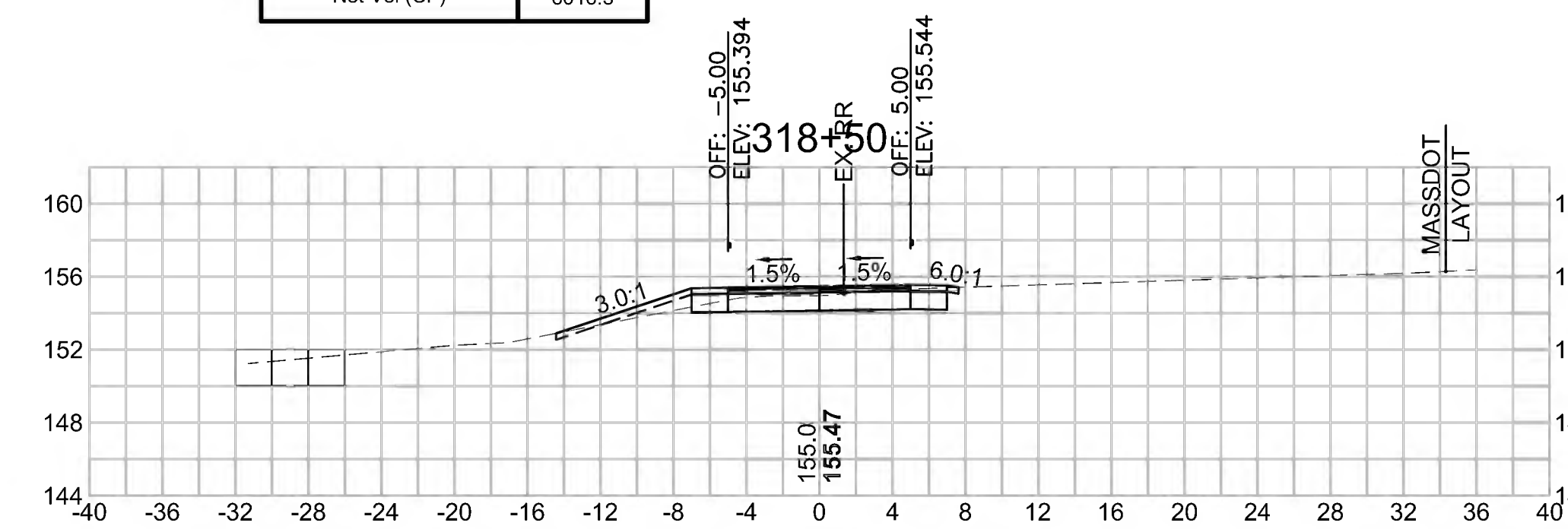
**Total Volume at Station 317+00.00**

Cut Area (SF)	14.546
Fill Area (SF)	0.634
Cut Vol (CF)	30.3
Fill Vol (CF)	1.8
Cum Cut Vol (CF)	14396.5
Cum Fill Vol (CF)	8463.7
Net Vol (CF)	5932.8



**Total Volume at Station 318+50.00**

Cut Area (SF)	15.772
Fill Area (SF)	0.874
Cut Vol (CF)	29.0
Fill Vol (CF)	0.9
Cum Cut Vol (CF)	14481.6
Cum Fill Vol (CF)	8465.3
Net Vol (CF)	6016.3





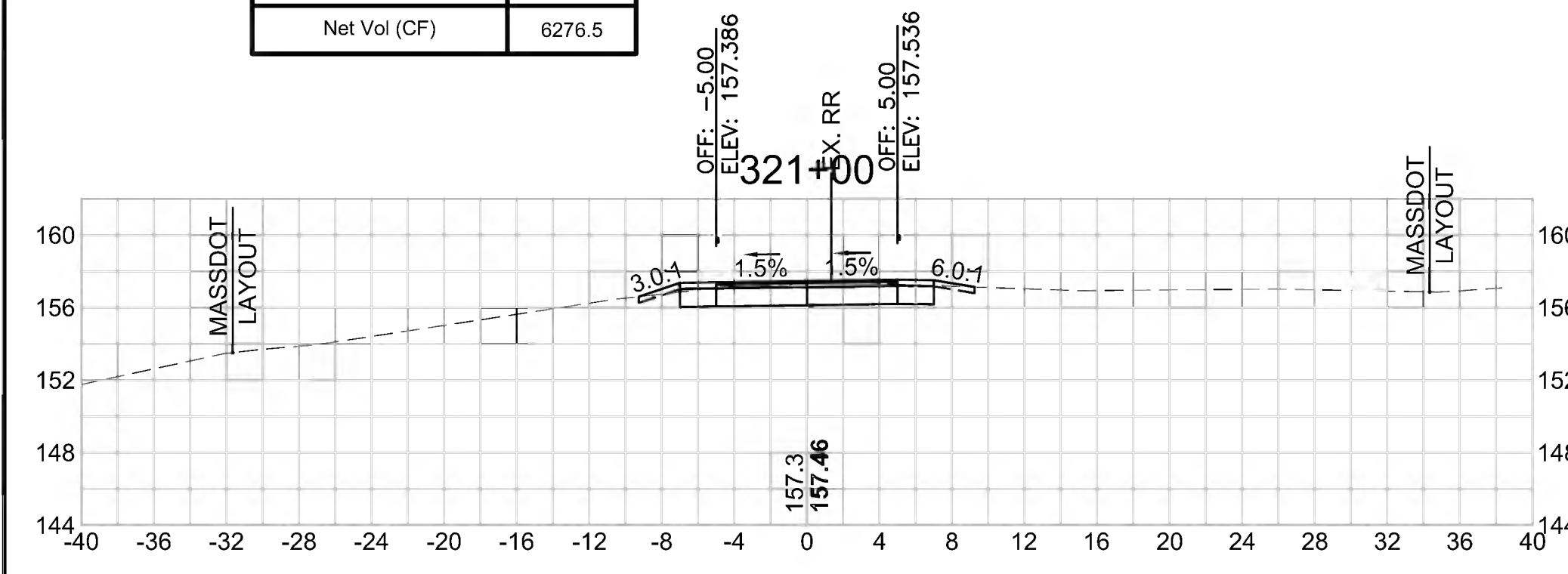
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	297	319

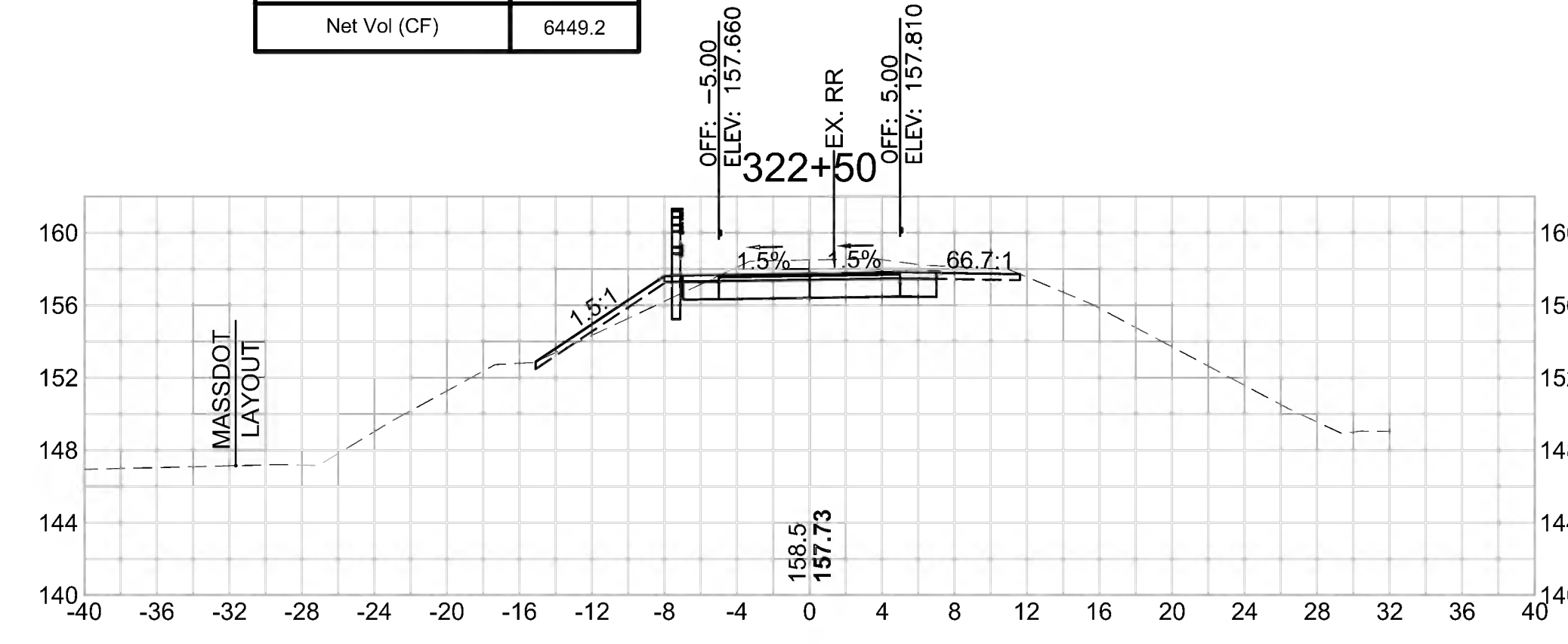
PROJECT FILE NO. 608164

CROSS SECTIONS

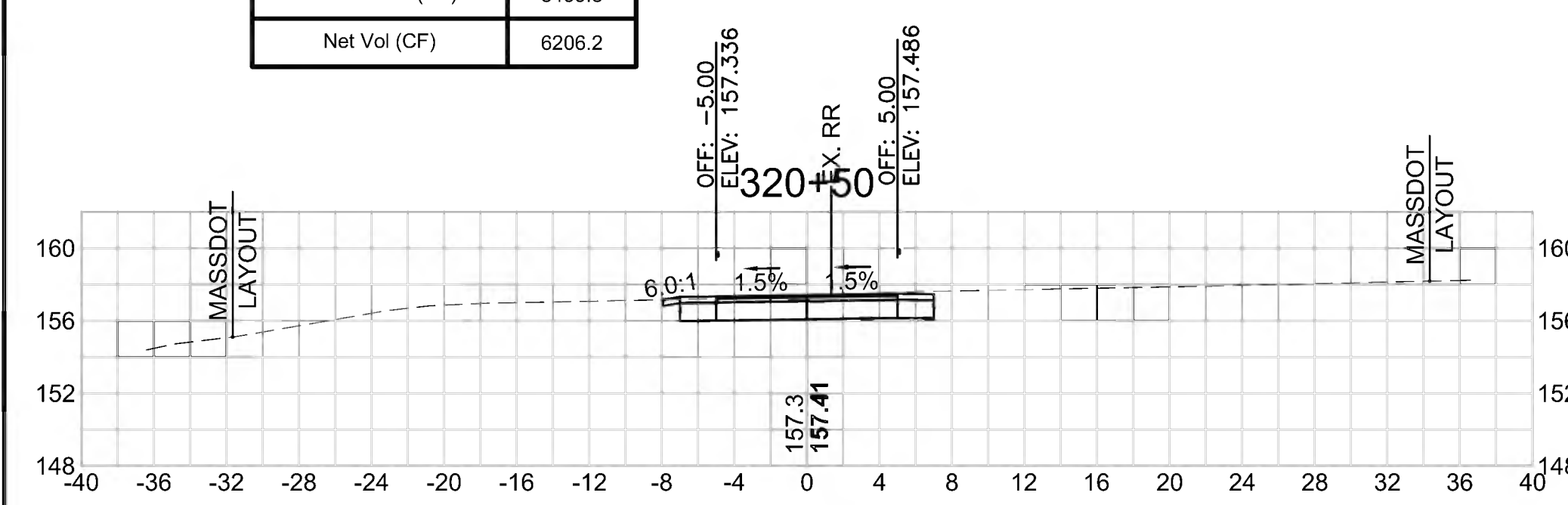
Total Volume at Station 321+00.00	
Cut Area (SF)	26.648
Fill Area (SF)	0.057
Cut Vol (CF)	70.3
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	14746.3
Cum Fill Vol (CF)	8469.8
Net Vol (CF)	6276.5



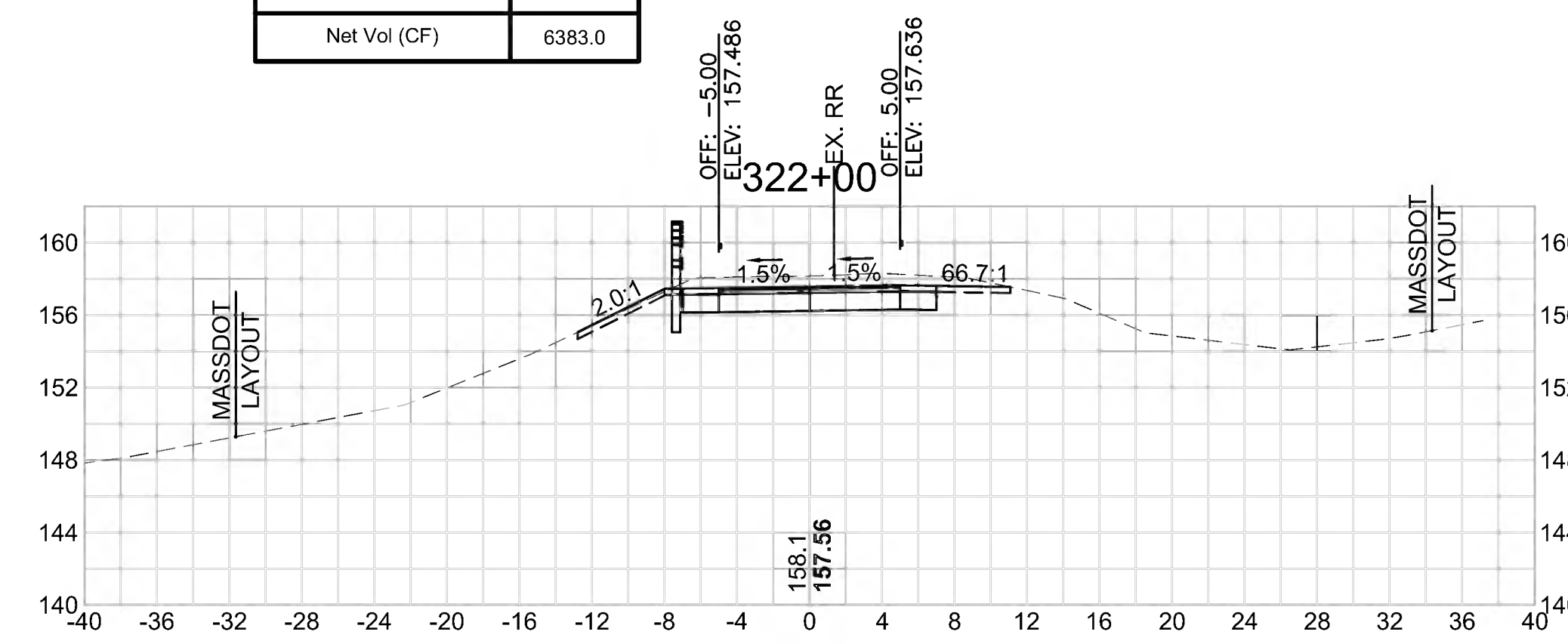
Total Volume at Station 322+50.00	
Cut Area (SF)	37.507
Fill Area (SF)	3.438
Cut Vol (CF)	71.9
Fill Vol (CF)	5.7
Cum Cut Vol (CF)	14930.5
Cum Fill Vol (CF)	8481.4
Net Vol (CF)	6449.2



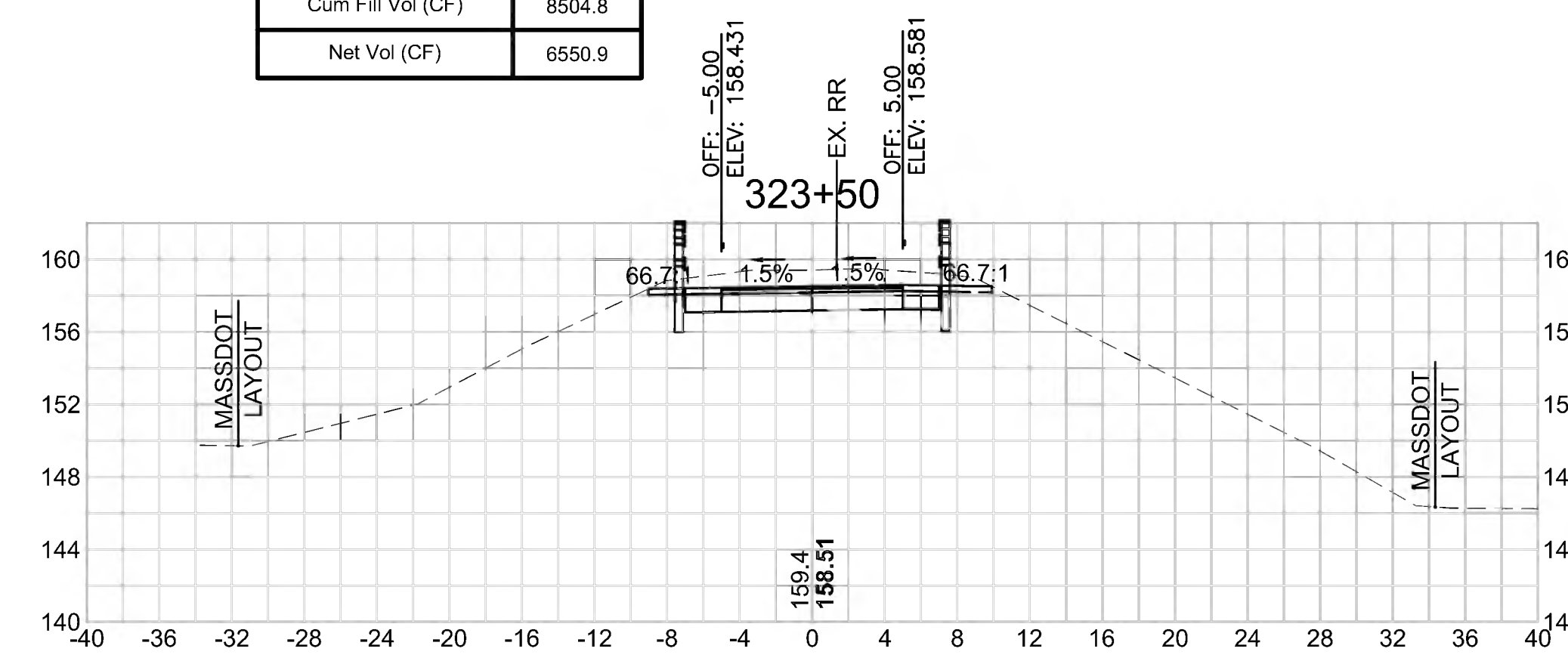
Total Volume at Station 320+50.00	
Cut Area (SF)	49.256
Fill Area (SF)	0.000
Cut Vol (CF)	76.1
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	14676.0
Cum Fill Vol (CF)	8469.8
Net Vol (CF)	6206.2



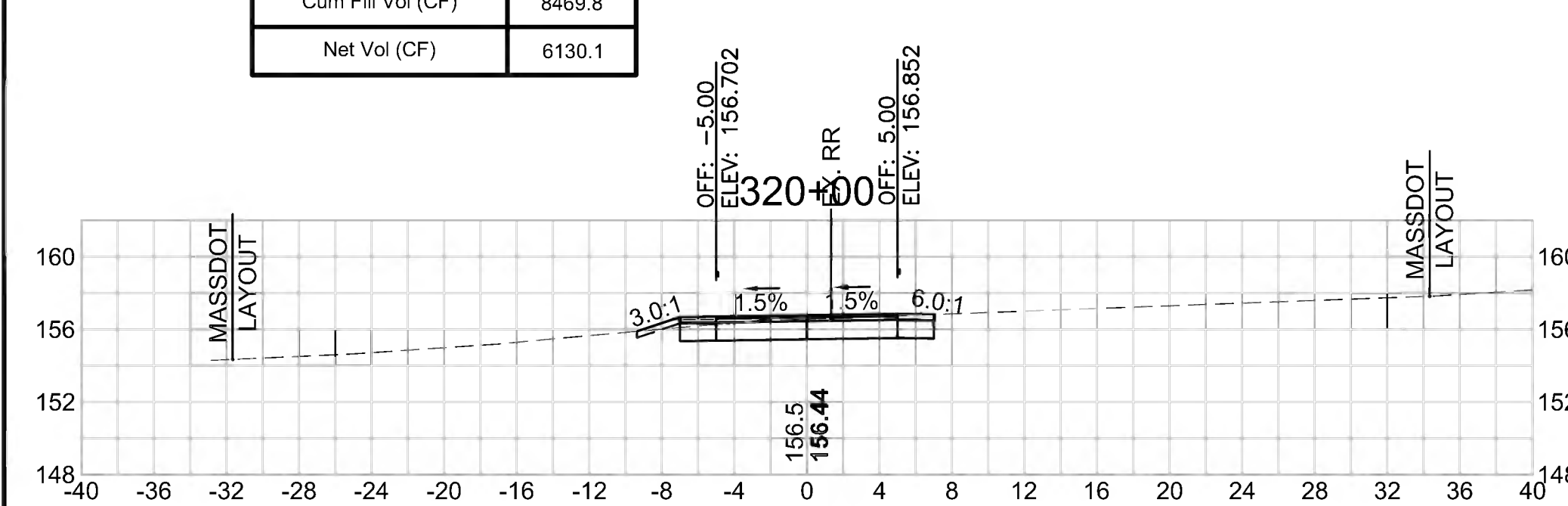
Total Volume at Station 322+00.00	
Cut Area (SF)	40.113
Fill Area (SF)	2.705
Cut Vol (CF)	62.4
Fill Vol (CF)	4.2
Cum Cut Vol (CF)	14858.6
Cum Fill Vol (CF)	8475.7
Net Vol (CF)	6383.0



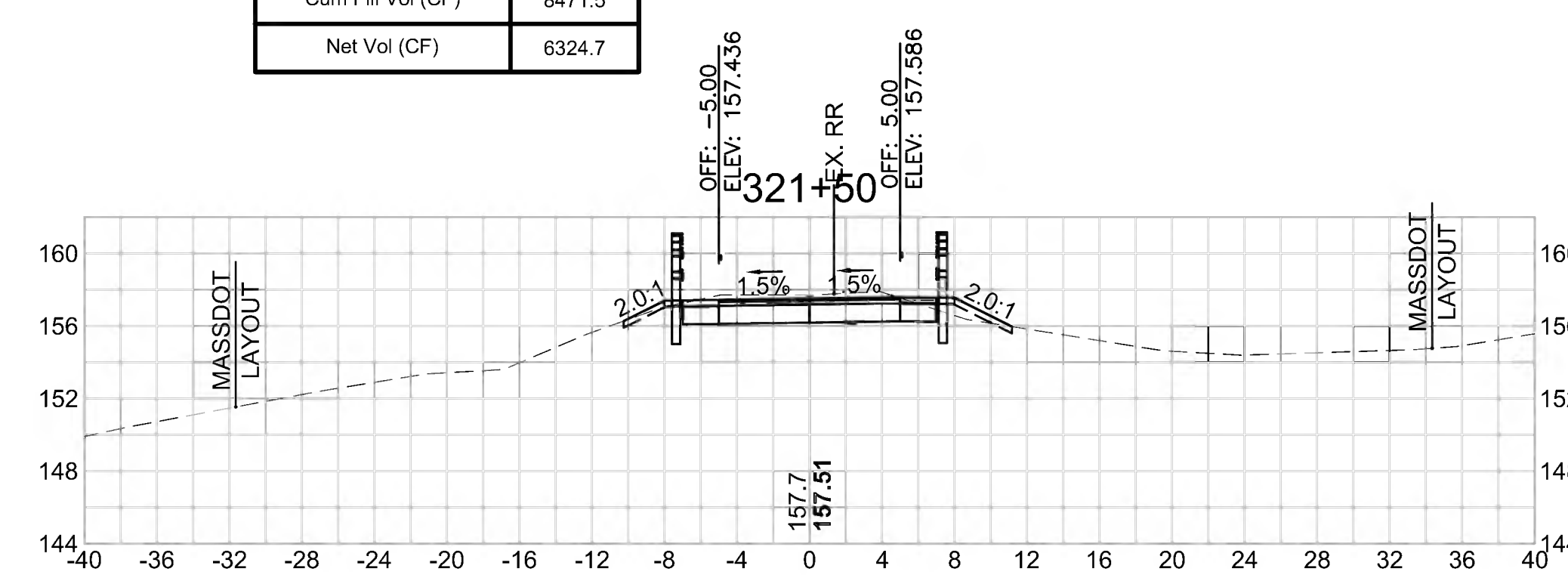
Total Volume at Station 323+50.00	
Cut Area (SF)	45.108
Fill Area (SF)	0.000
Cut Vol (CF)	66.2
Fill Vol (CF)	10.1
Cum Cut Vol (CF)	15055.8
Cum Fill Vol (CF)	8504.8
Net Vol (CF)	6550.9



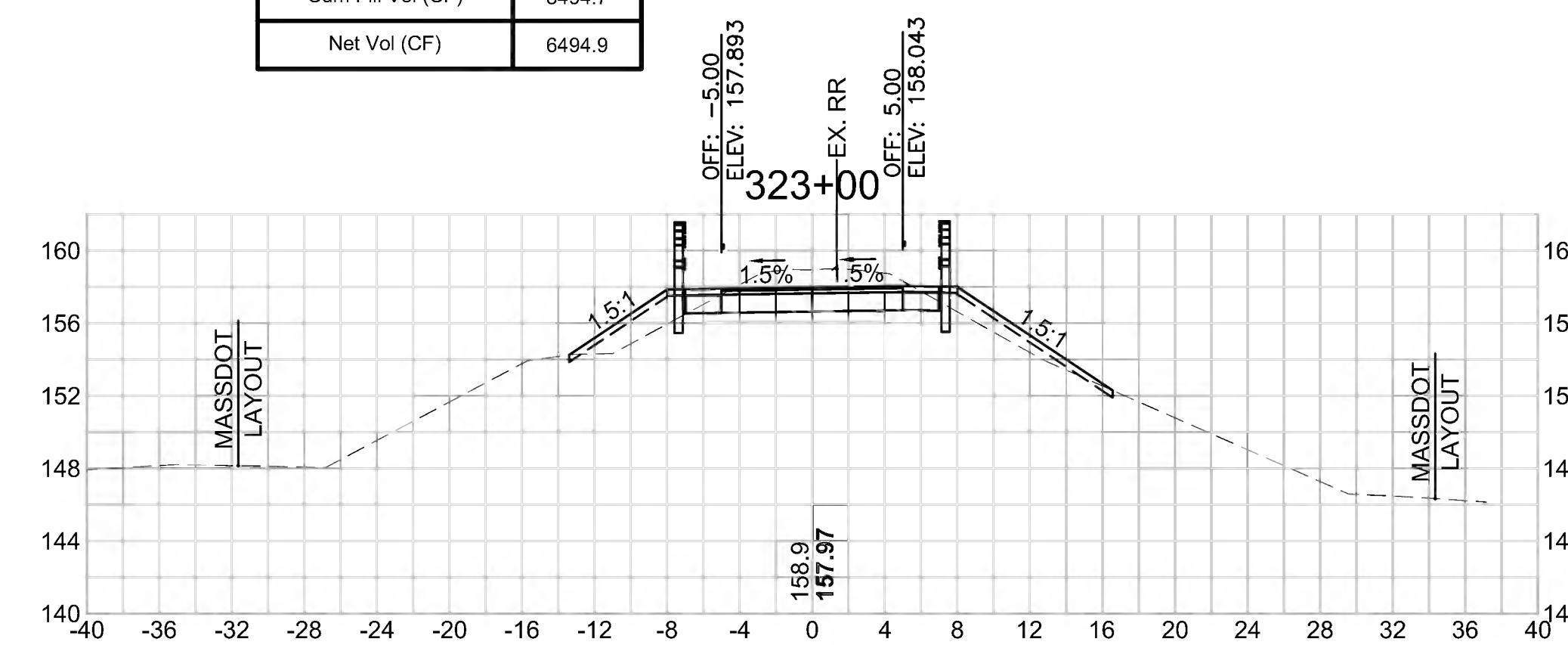
Total Volume at Station 320+00.00	
Cut Area (SF)	32.967
Fill Area (SF)	0.000
Cut Vol (CF)	53.3
Fill Vol (CF)	0.1
Cum Cut Vol (CF)	14599.9
Cum Fill Vol (CF)	8469.8
Net Vol (CF)	6130.1



Total Volume at Station 321+50.00	
Cut Area (SF)	27.287
Fill Area (SF)	1.779
Cut Vol (CF)	49.9
Fill Vol (CF)	1.7
Cum Cut Vol (CF)	14796.2
Cum Fill Vol (CF)	8471.5
Net Vol (CF)	6324.7



Total Volume at Station 323+00.00	
Cut Area (SF)	26.338
Fill Area (SF)	10.961
Cut Vol (CF)	59.1
Fill Vol (CF)	13.3
Cum Cut Vol (CF)	14989.6
Cum Fill Vol (CF)	8494.7
Net Vol (CF)	6494.9



SUDBURY  
BRUCE FREEMAN RAIL TRAIL

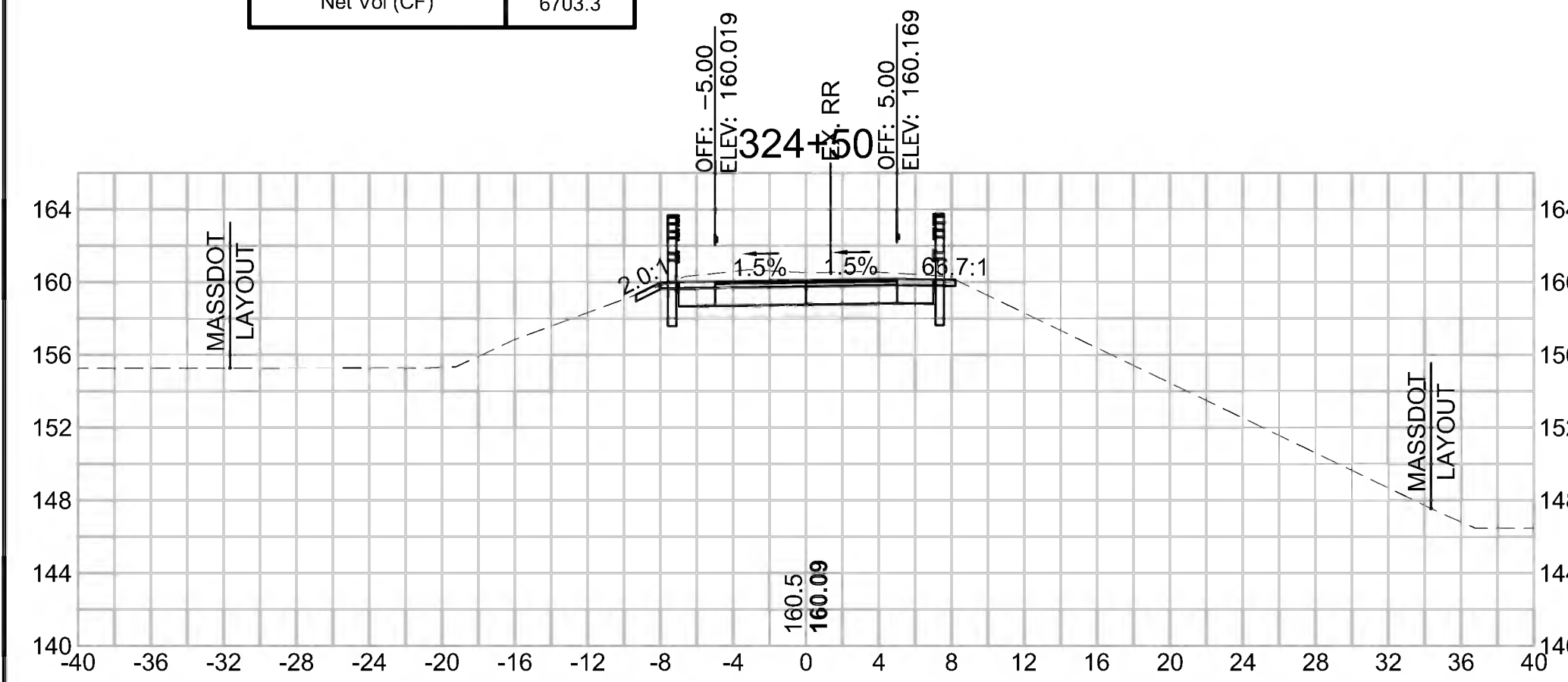
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	298	319
PROJECT FILE NO. 608164			

CROSS SECTIONS

608164.XSEC(CROSS SECTION LAYOUTS).DWG 27-Jun-2022

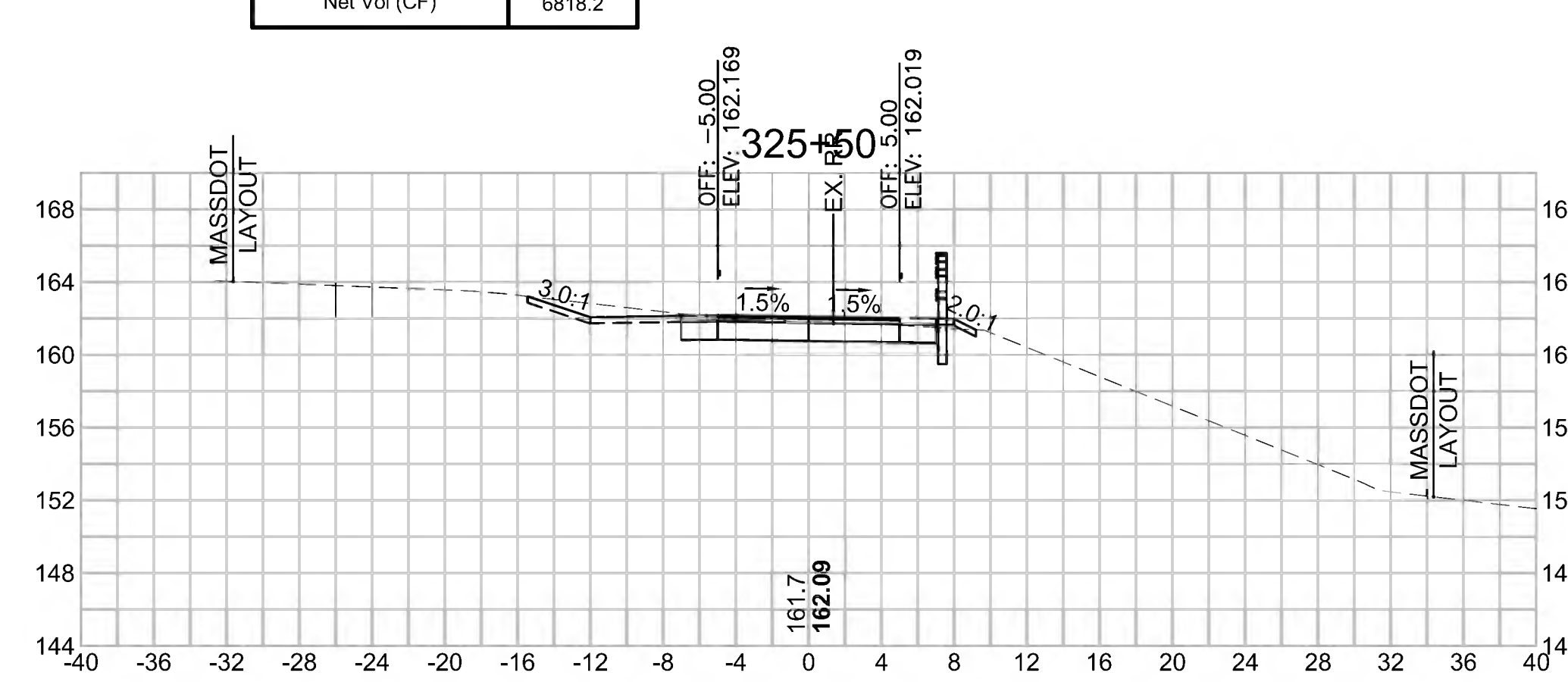
**Total Volume at Station 324+50.00**

Cut Area (SF)	35.553
Fill Area (SF)	0.000
Cut Vol (CF)	71.8
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	15208.2
Cum Fill Vol (CF)	8504.8
Net Vol (CF)	6703.3



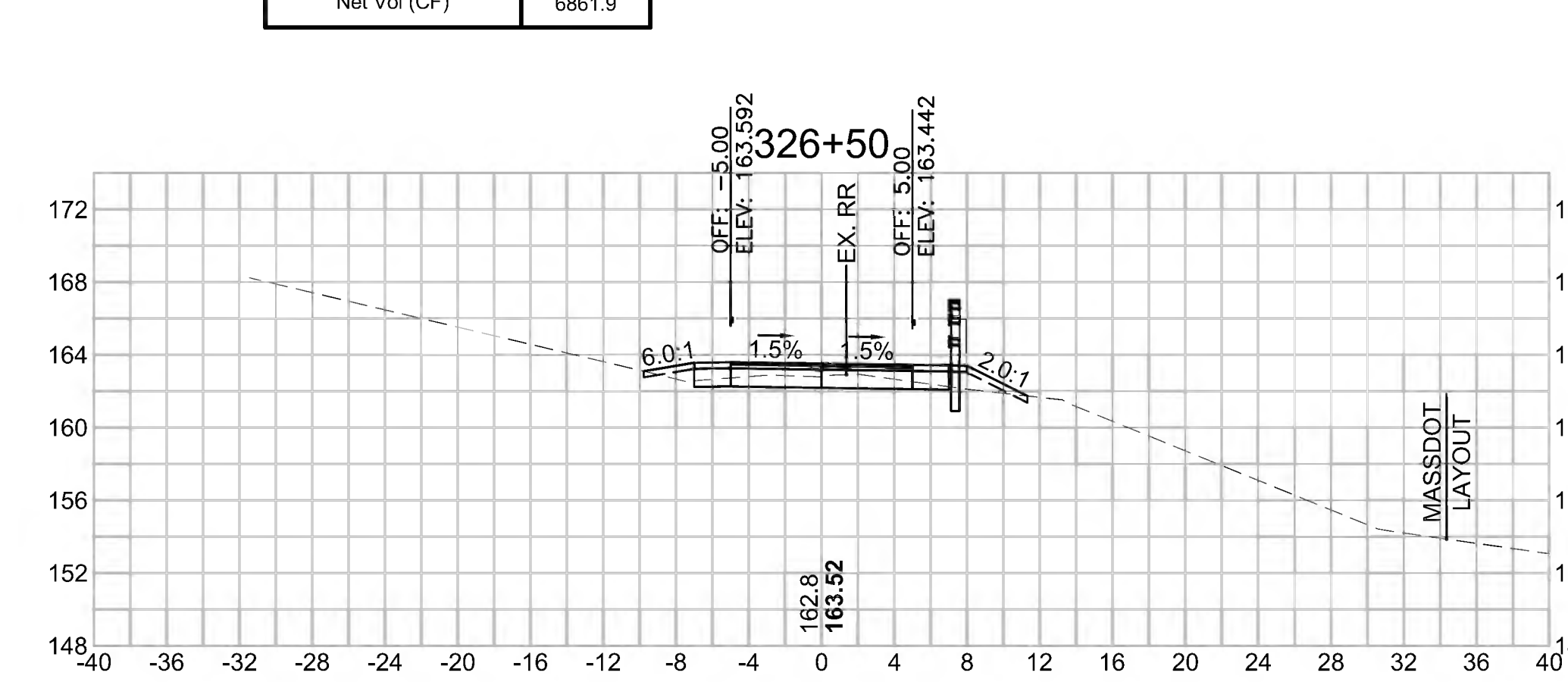
**Total Volume at Station 325+50.00**

Cut Area (SF)	21.576
Fill Area (SF)	0.211
Cut Vol (CF)	51.3
Fill Vol (CF)	0.5
Cum Cut Vol (CF)	15323.7
Cum Fill Vol (CF)	8505.6
Net Vol (CF)	6818.2



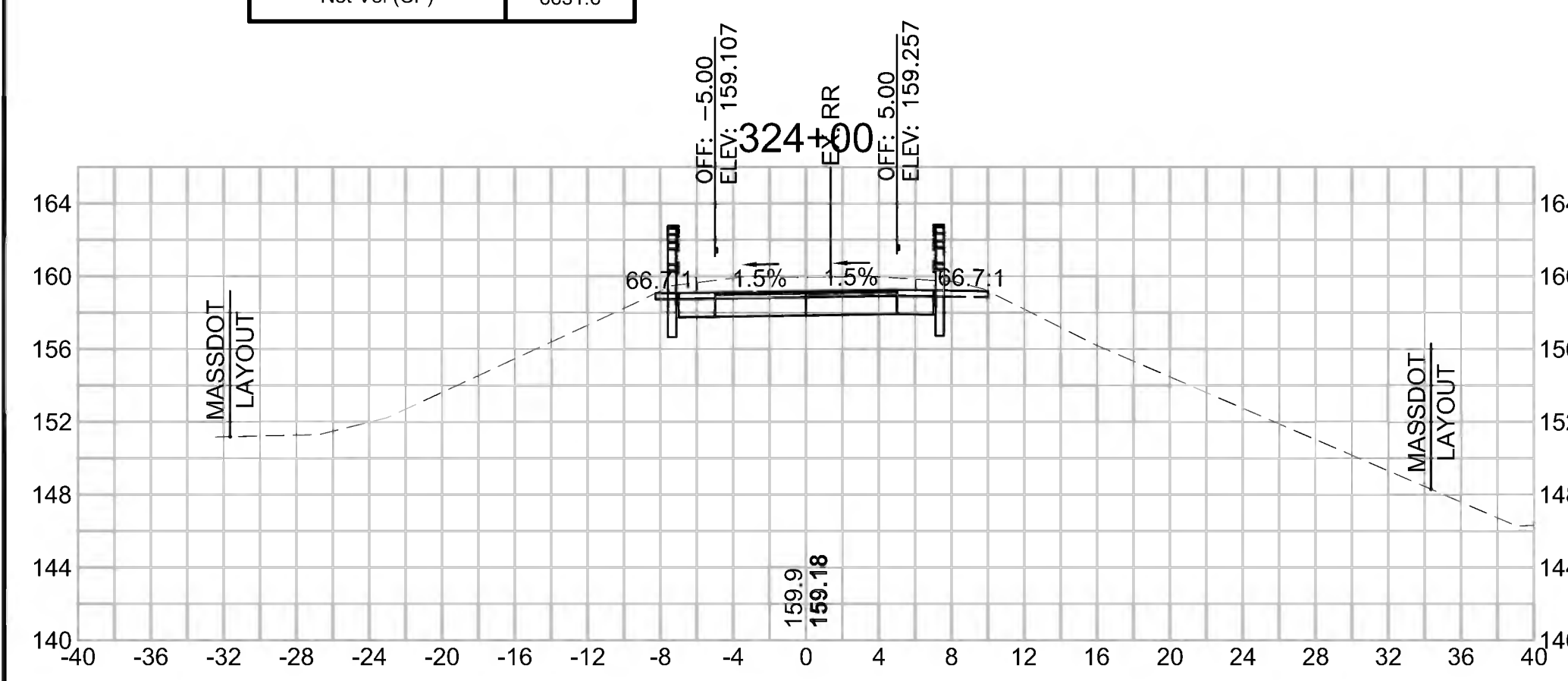
**Total Volume at Station 326+50.00**

Cut Area (SF)	10.360
Fill Area (SF)	2.731
Cut Vol (CF)	18.9
Fill Vol (CF)	3.4
Cum Cut Vol (CF)	15371.9
Cum Fill Vol (CF)	8510.0
Net Vol (CF)	6861.9



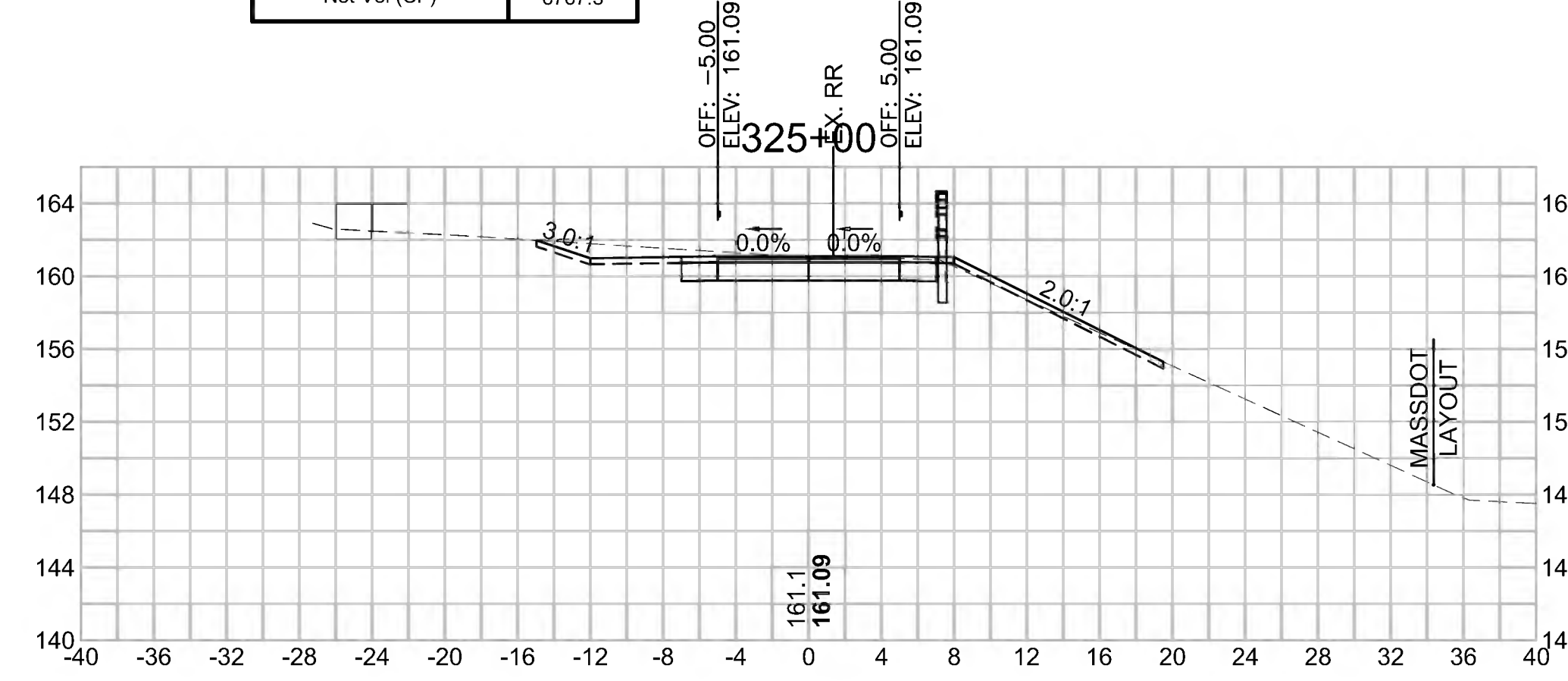
**Total Volume at Station 324+00.00**

Cut Area (SF)	41.953
Fill Area (SF)	0.000
Cut Vol (CF)	80.6
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	15136.4
Cum Fill Vol (CF)	8504.8
Net Vol (CF)	6631.6



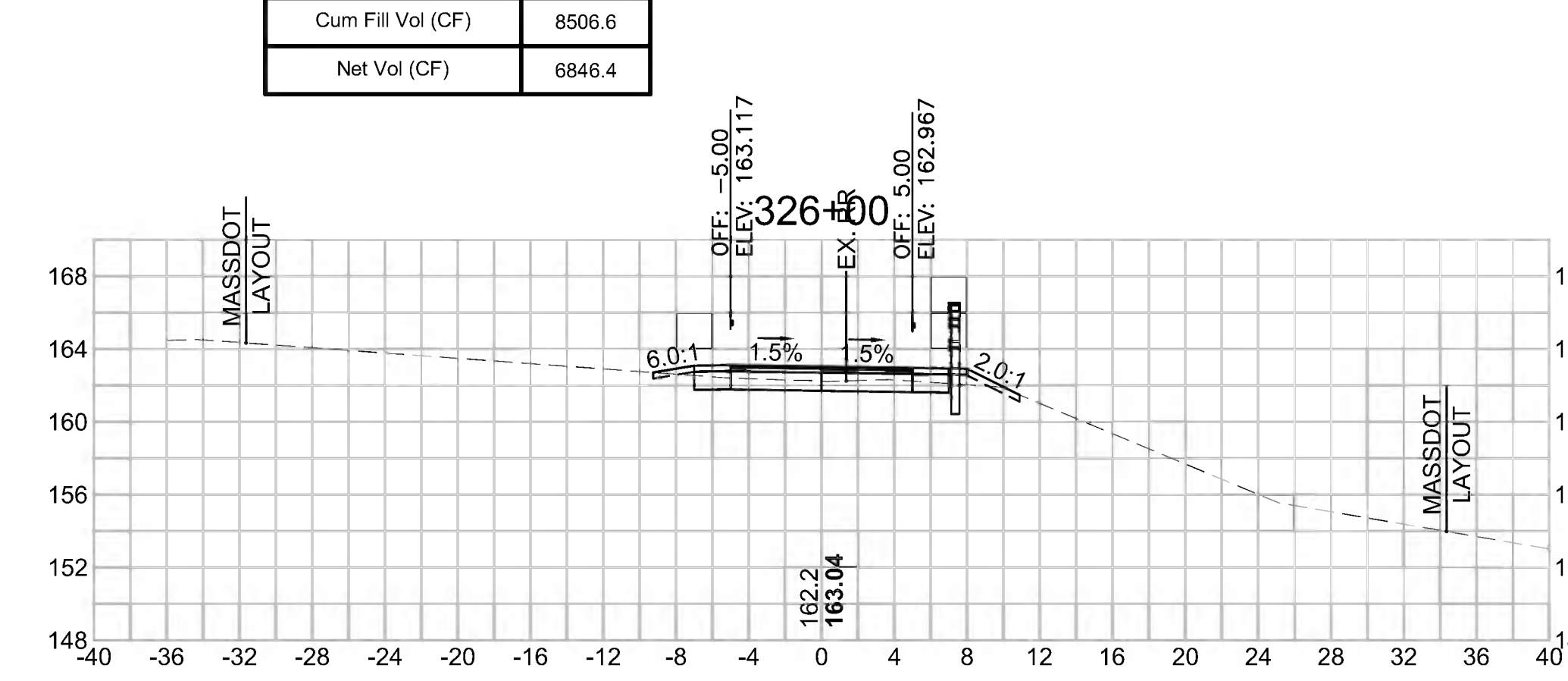
**Total Volume at Station 325+00.00**

Cut Area (SF)	33.840
Fill Area (SF)	0.281
Cut Vol (CF)	64.3
Fill Vol (CF)	0.3
Cum Cut Vol (CF)	15272.4
Cum Fill Vol (CF)	8505.1
Net Vol (CF)	6767.3



**Total Volume at Station 326+00.00**

Cut Area (SF)	10.046
Fill Area (SF)	0.925
Cut Vol (CF)	29.3
Fill Vol (CF)	1.1
Cum Cut Vol (CF)	15353.0
Cum Fill Vol (CF)	8506.6
Net Vol (CF)	6846.4





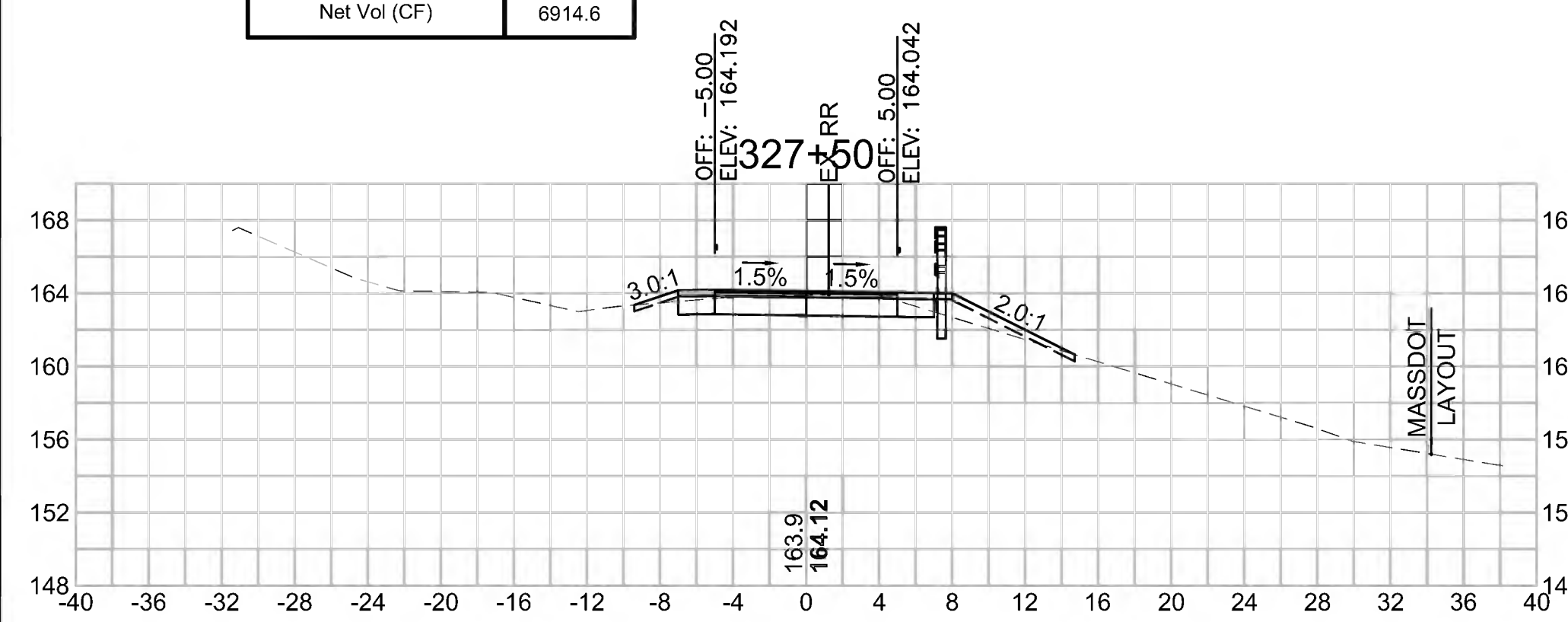
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	299	319
PROJECT FILE NO. 608164			

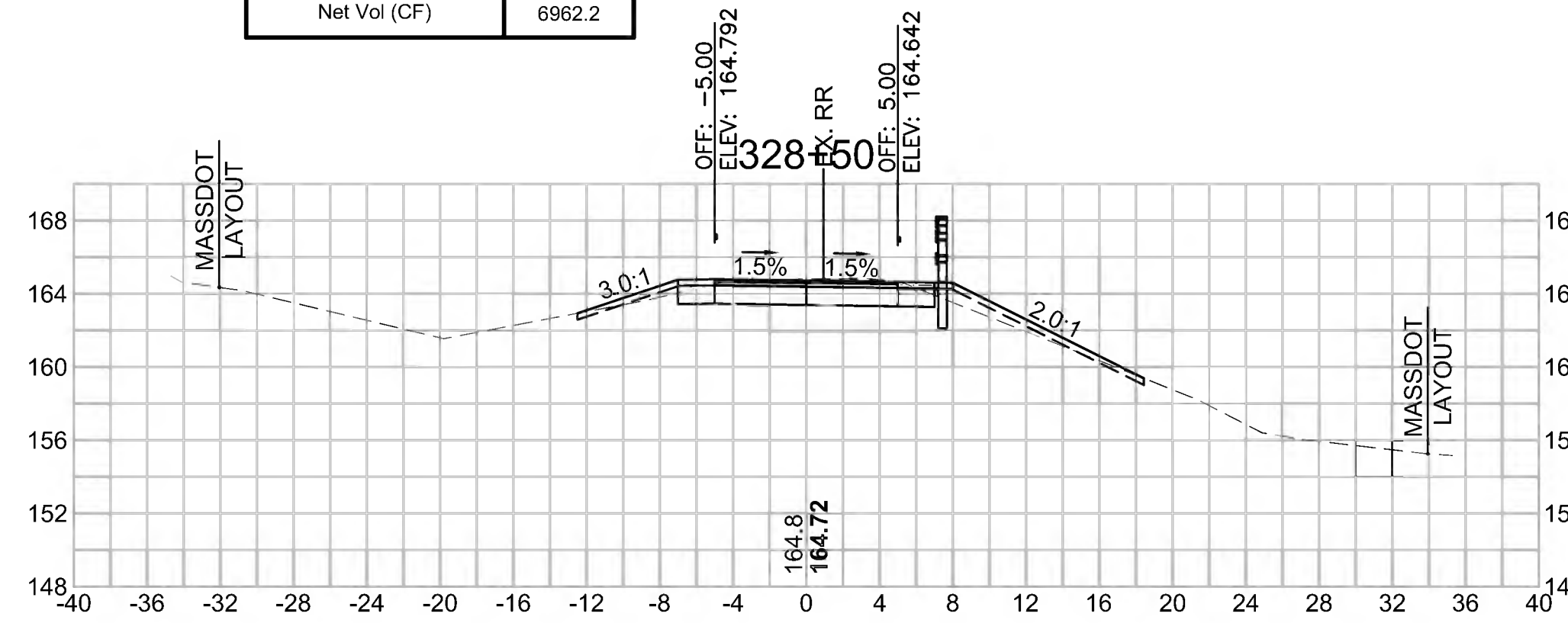
CROSS SECTIONS

608164\_XSEC(CROSS SECTION LAYOUTS).DWG 27-Jun-2022

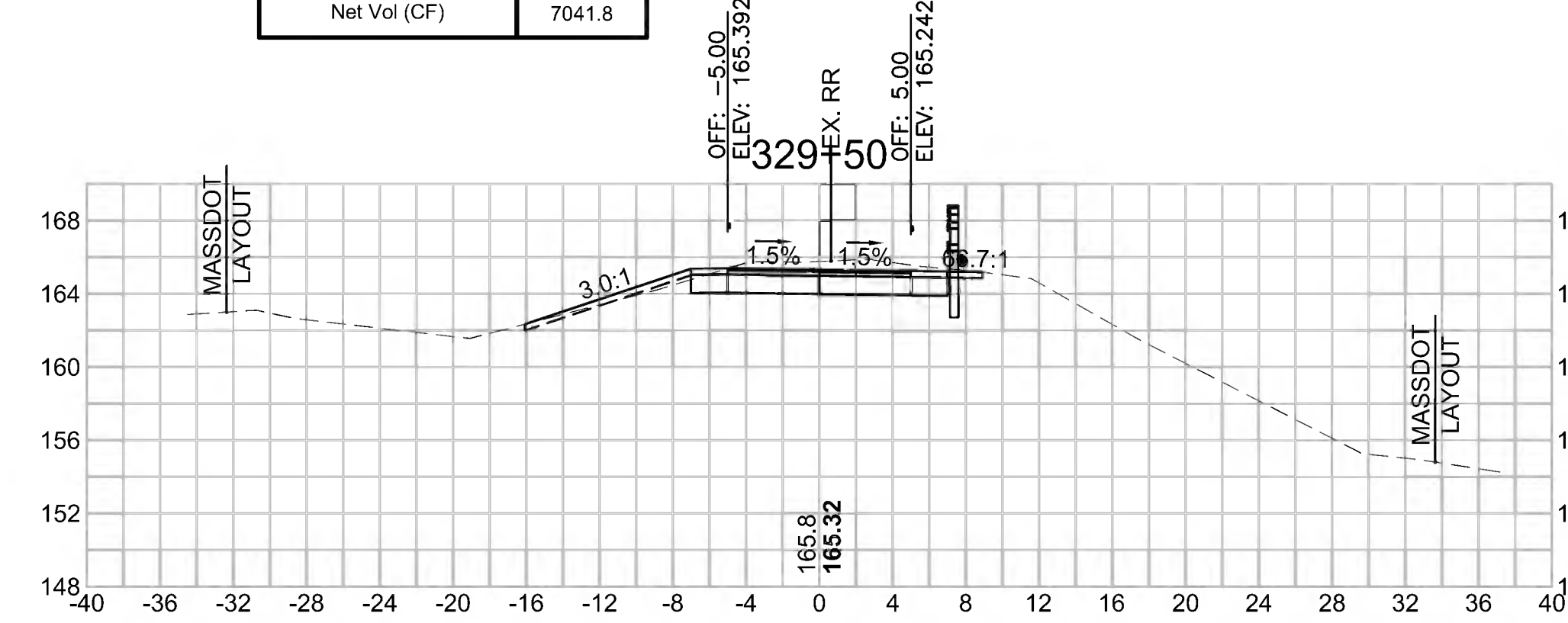
Total Volume at Station 327+50.00	
Cut Area (SF)	18.077
Fill Area (SF)	3.265
Cut Vol (CF)	33.9
Fill Vol (CF)	4.2
Cum Cut Vol (CF)	15432.5
Cum Fill Vol (CF)	8517.9
Net Vol (CF)	6914.6



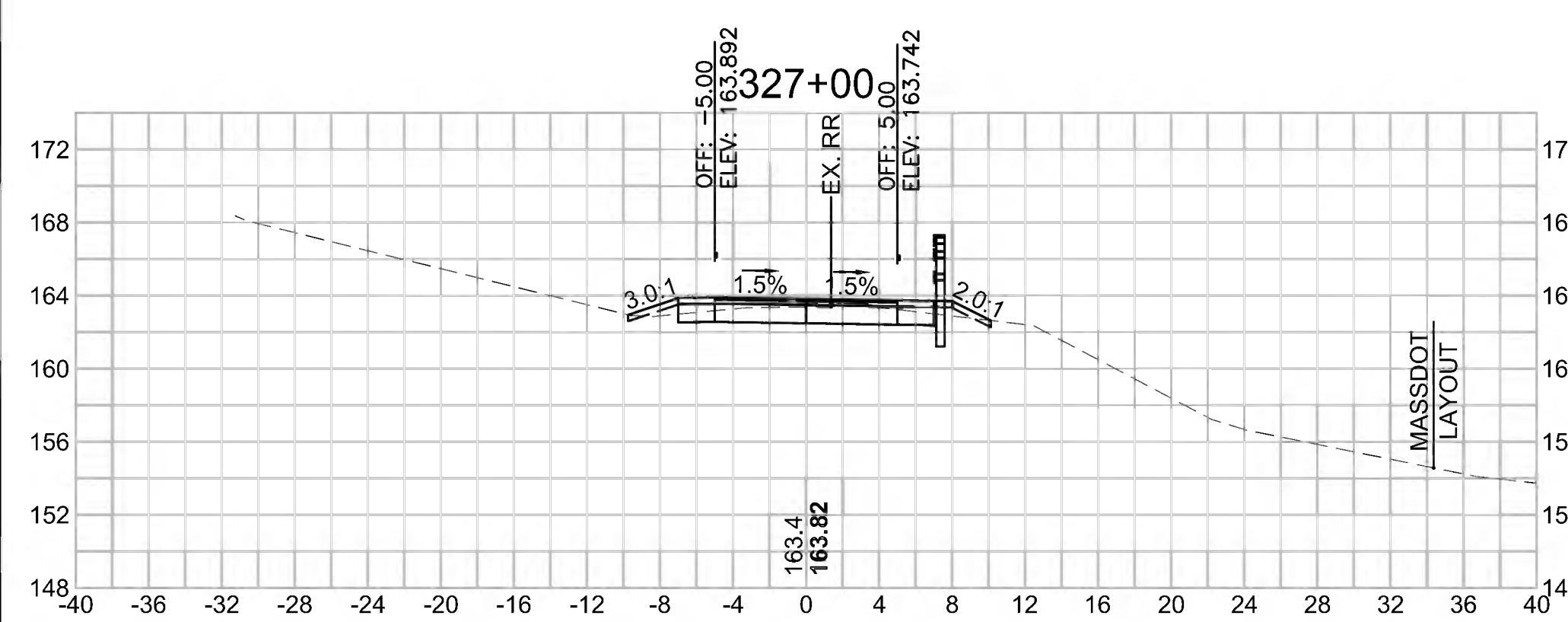
Total Volume at Station 328+50.00	
Cut Area (SF)	18.666
Fill Area (SF)	3.588
Cut Vol (CF)	33.0
Fill Vol (CF)	9.1
Cum Cut Vol (CF)	15498.0
Cum Fill Vol (CF)	8535.8
Net Vol (CF)	6962.2



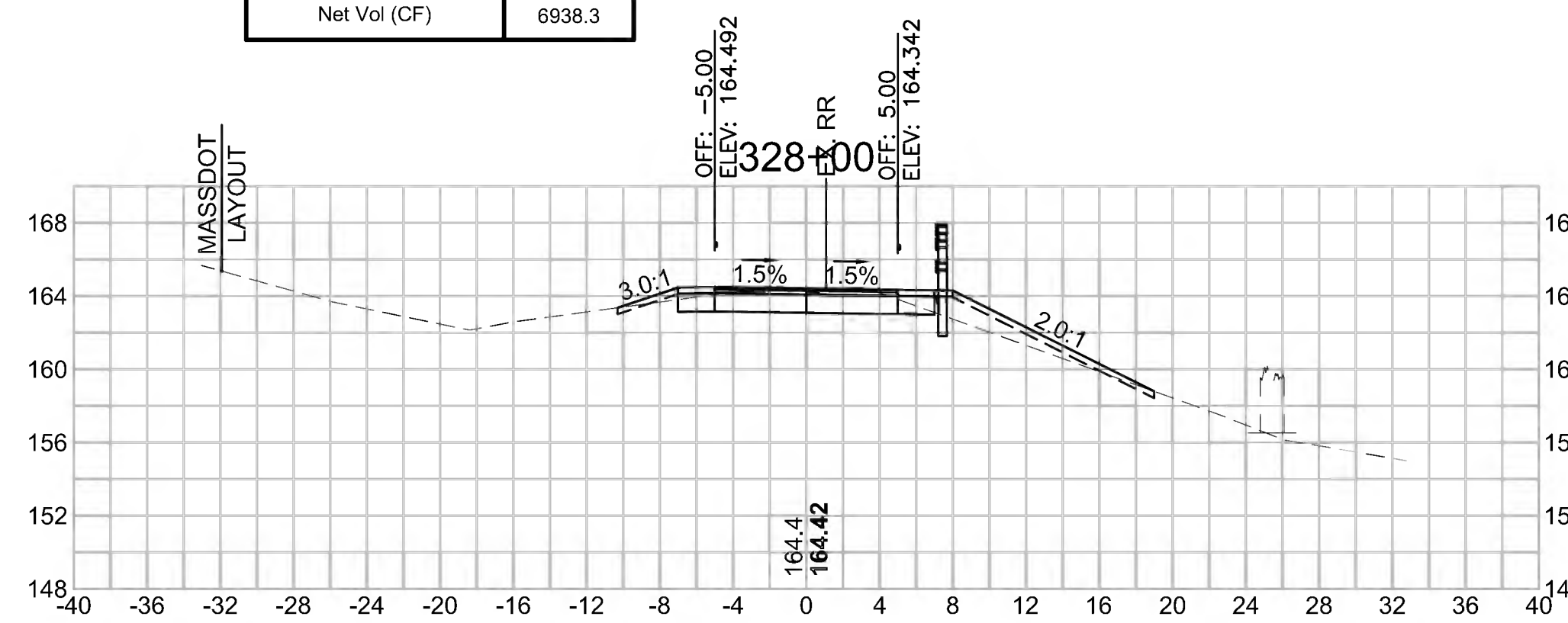
Total Volume at Station 329+50.00	
Cut Area (SF)	24.875
Fill Area (SF)	0.622
Cut Vol (CF)	44.8
Fill Vol (CF)	0.7
Cum Cut Vol (CF)	15581.8
Cum Fill Vol (CF)	8540.0
Net Vol (CF)	7041.8



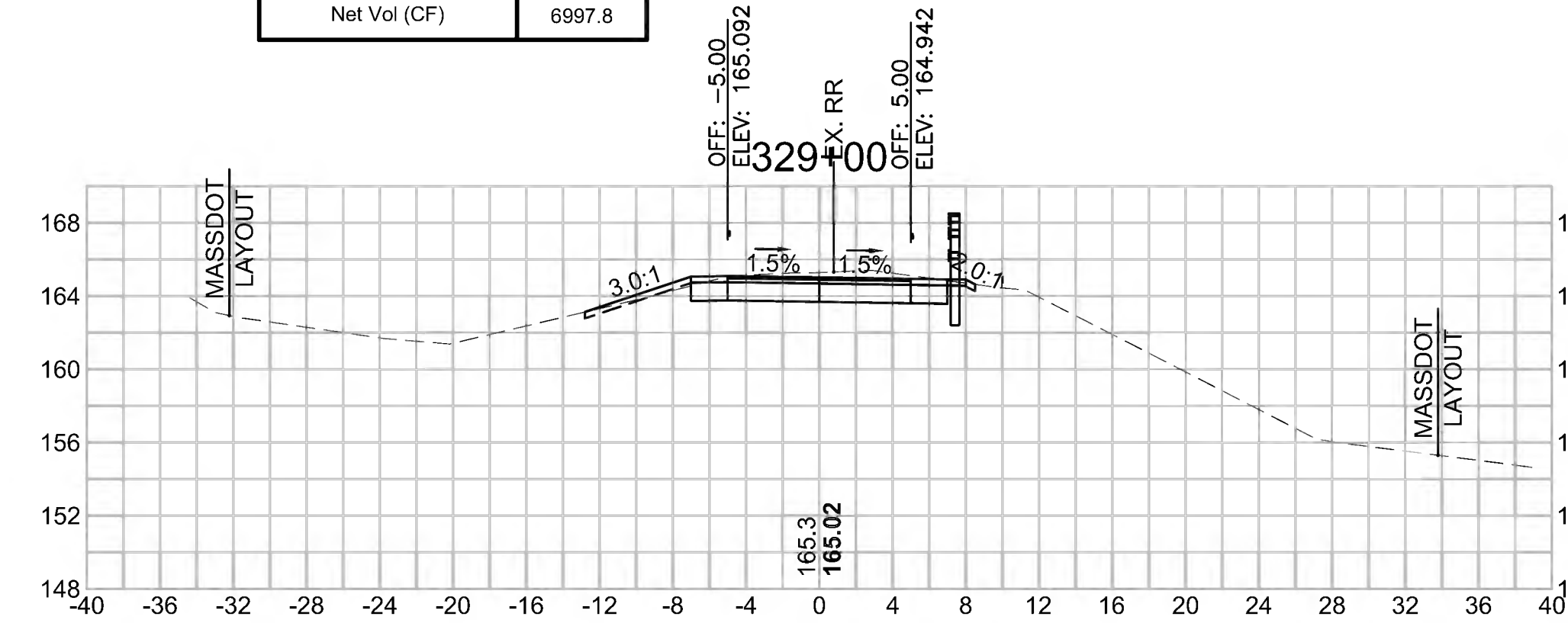
Total Volume at Station 327+00.00	
Cut Area (SF)	18.500
Fill Area (SF)	1.258
Cut Vol (CF)	26.7
Fill Vol (CF)	3.7
Cum Cut Vol (CF)	15398.6
Cum Fill Vol (CF)	8513.7
Net Vol (CF)	6884.9



Total Volume at Station 328+00.00	
Cut Area (SF)	16.999
Fill Area (SF)	6.252
Cut Vol (CF)	32.5
Fill Vol (CF)	8.8
Cum Cut Vol (CF)	15465.0
Cum Fill Vol (CF)	8526.7
Net Vol (CF)	6938.3



Total Volume at Station 329+00.00	
Cut Area (SF)	23.511
Fill Area (SF)	0.168
Cut Vol (CF)	39.1
Fill Vol (CF)	3.5
Cum Cut Vol (CF)	15537.0
Cum Fill Vol (CF)	8539.3
Net Vol (CF)	6997.8



SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	300	319

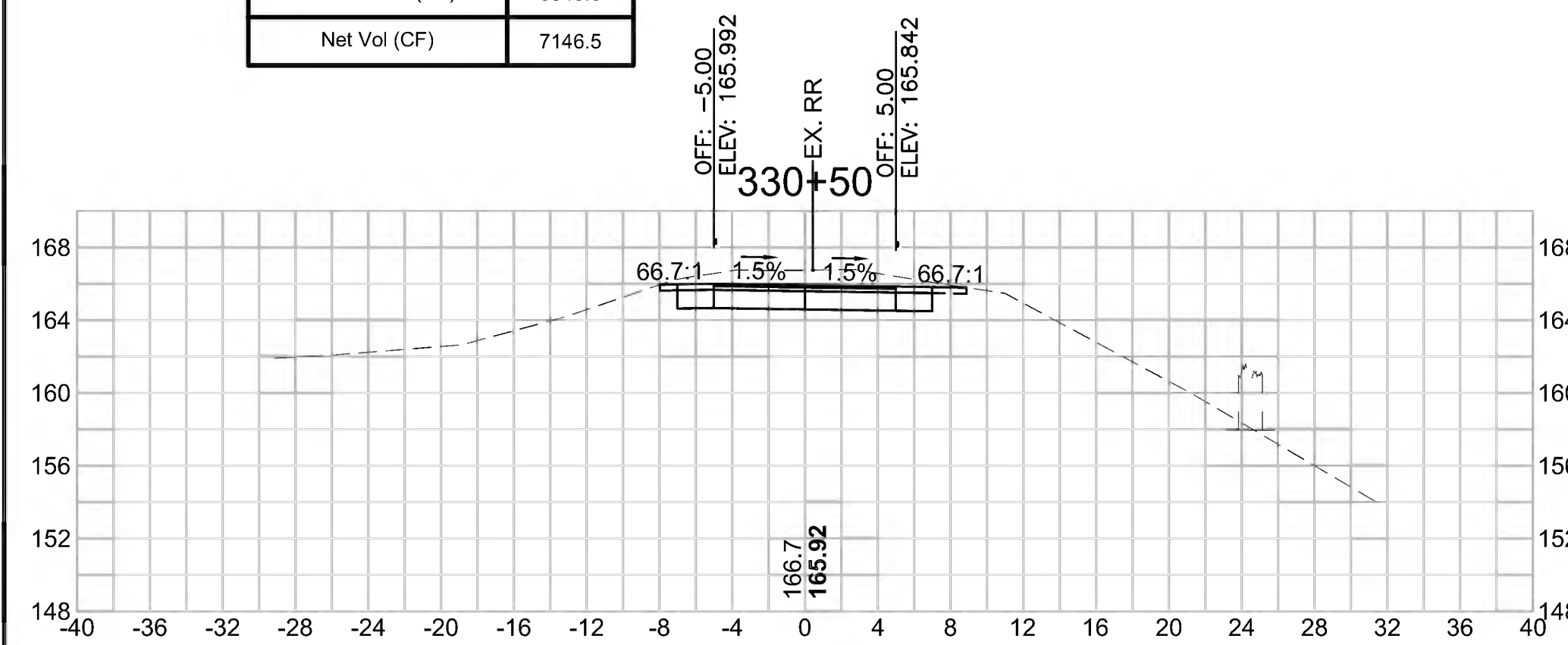
PROJECT FILE NO. 608164

CROSS SECTIONS

608164.XSEC(CROSS SECTION LAYOUTS).DWG 27-Jun-2022

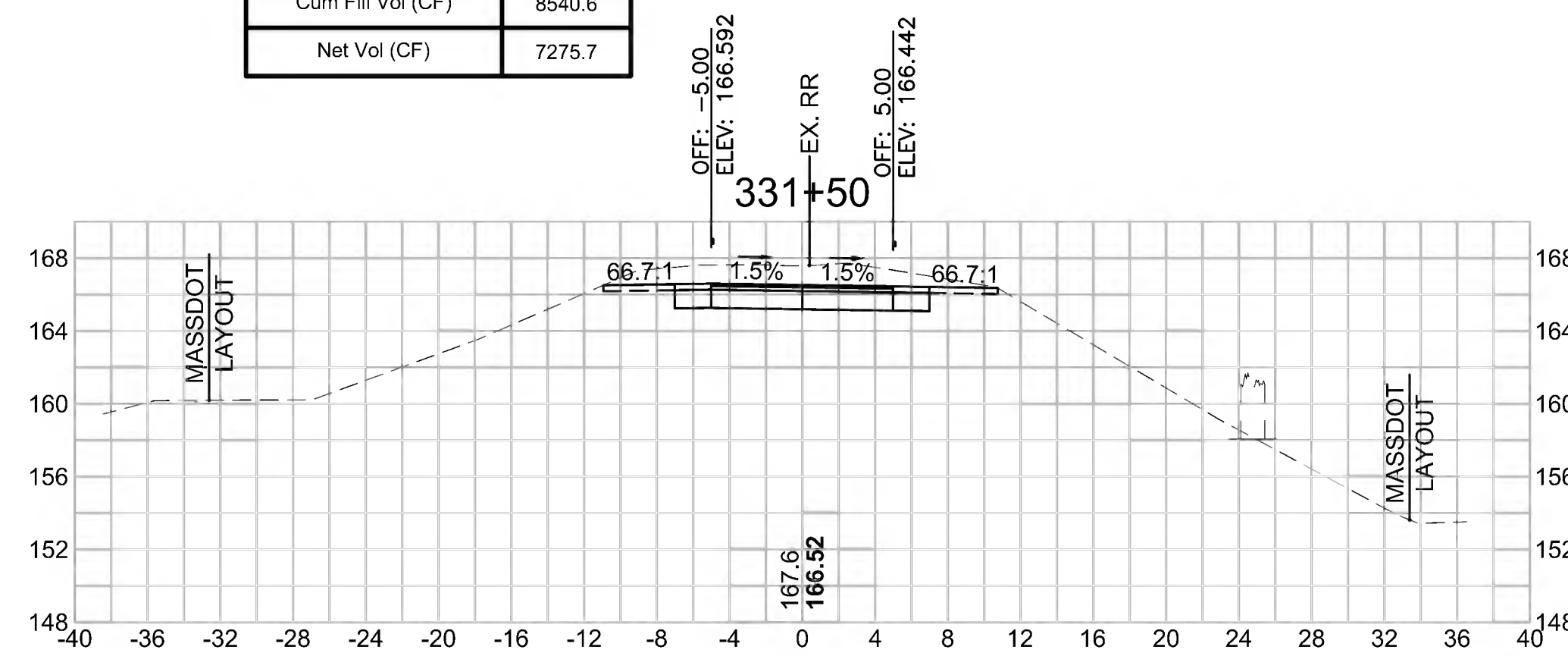
**Total Volume at Station 330+50.00**

Cut Area (SF)	31.474
Fill Area (SF)	0.000
Cut Vol (CF)	55.7
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	15687.1
Cum Fill Vol (CF)	8540.6
Net Vol (CF)	7146.5



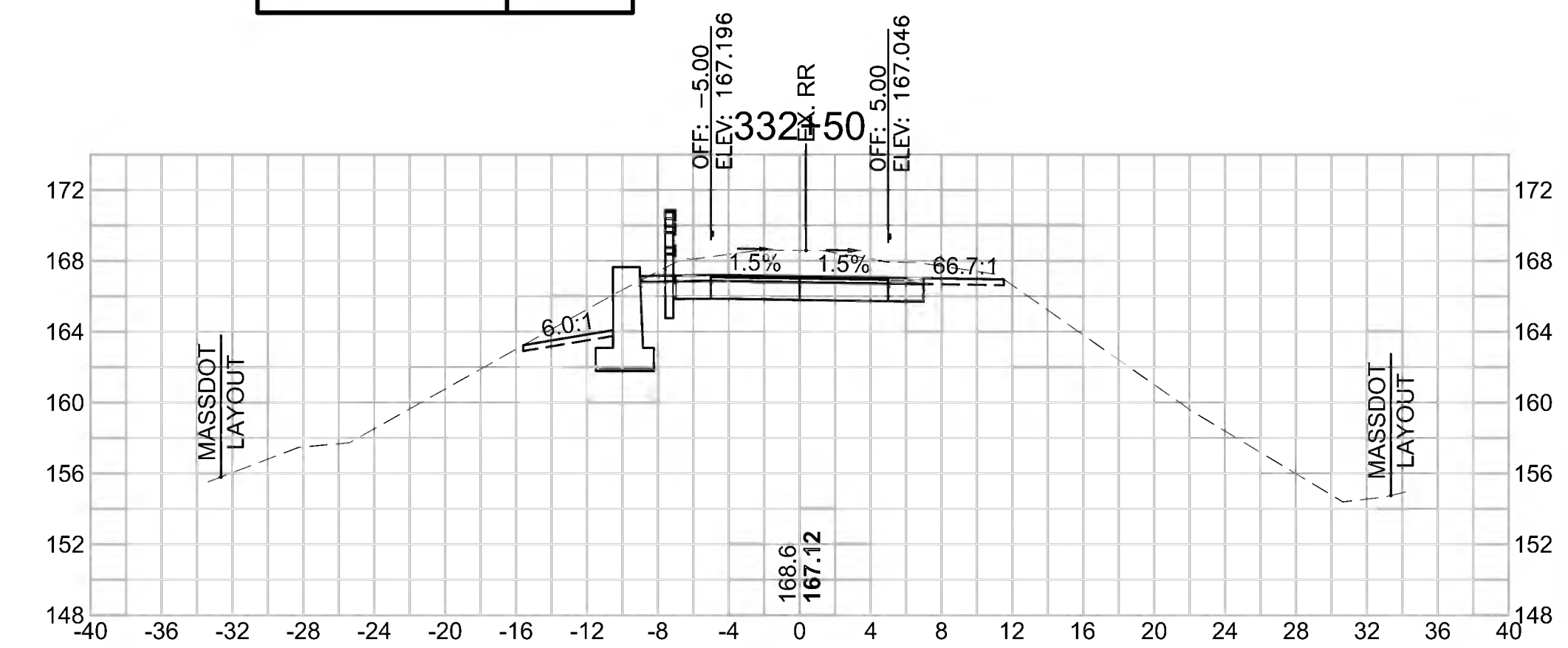
**Total Volume at Station 331+50.00**

Cut Area (SF)	39.244
Fill Area (SF)	0.000
Cut Vol (CF)	68.2
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	15816.3
Cum Fill Vol (CF)	8540.6
Net Vol (CF)	7275.7



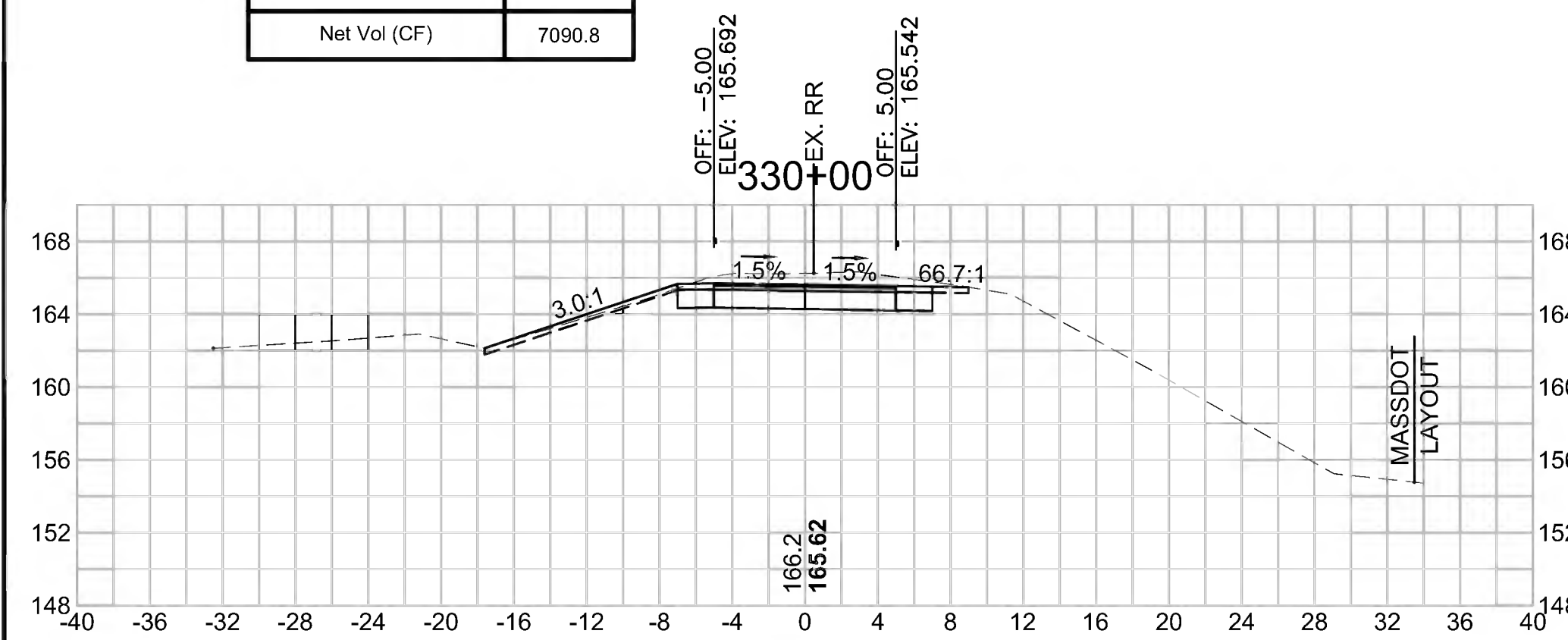
**Total Volume at Station 332+50.00**

Cut Area (SF)	49.165
Fill Area (SF)	0.634
Cut Vol (CF)	85.6
Fill Vol (CF)	0.6
Cum Cut Vol (CF)	15978.3
Cum Fill Vol (CF)	8541.2
Net Vol (CF)	7437.1



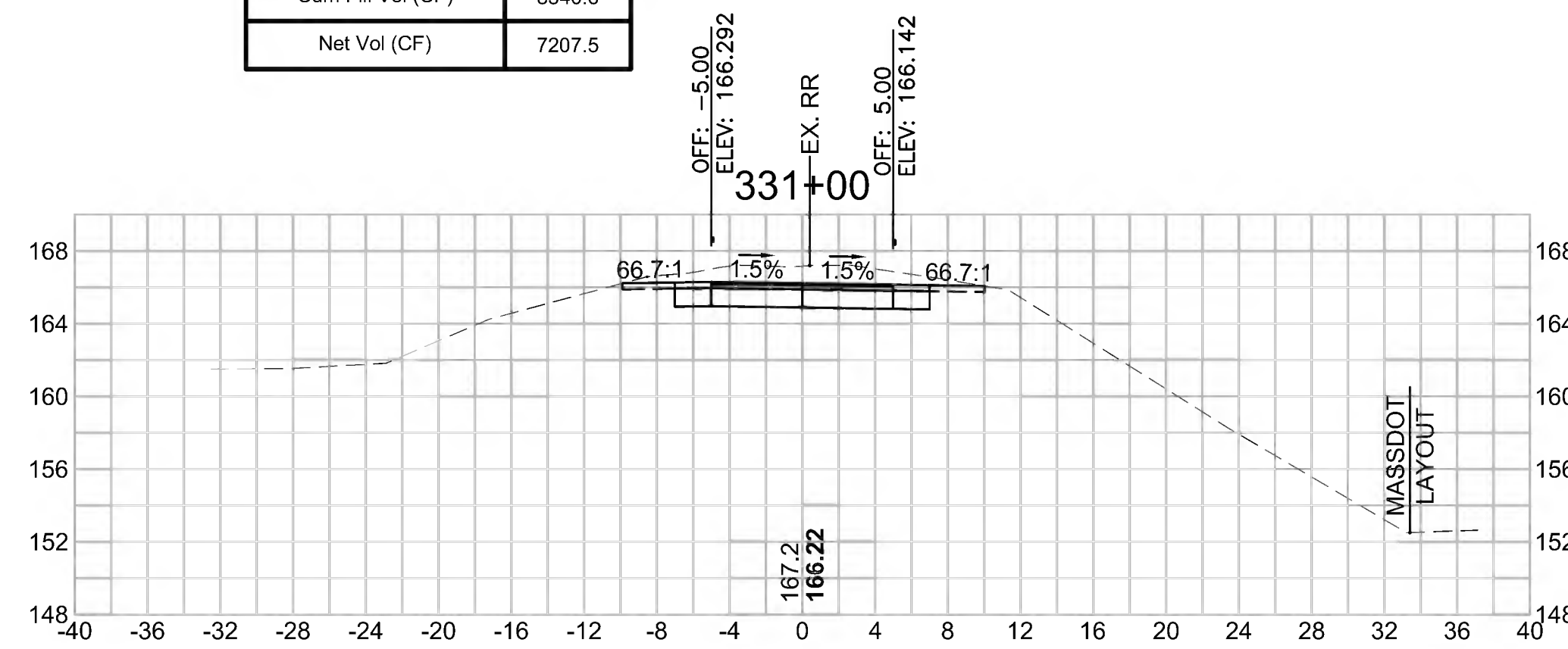
**Total Volume at Station 330+00.00**

Cut Area (SF)	28.671
Fill Area (SF)	0.000
Cut Vol (CF)	49.6
Fill Vol (CF)	0.6
Cum Cut Vol (CF)	15631.4
Cum Fill Vol (CF)	8540.6
Net Vol (CF)	7090.8



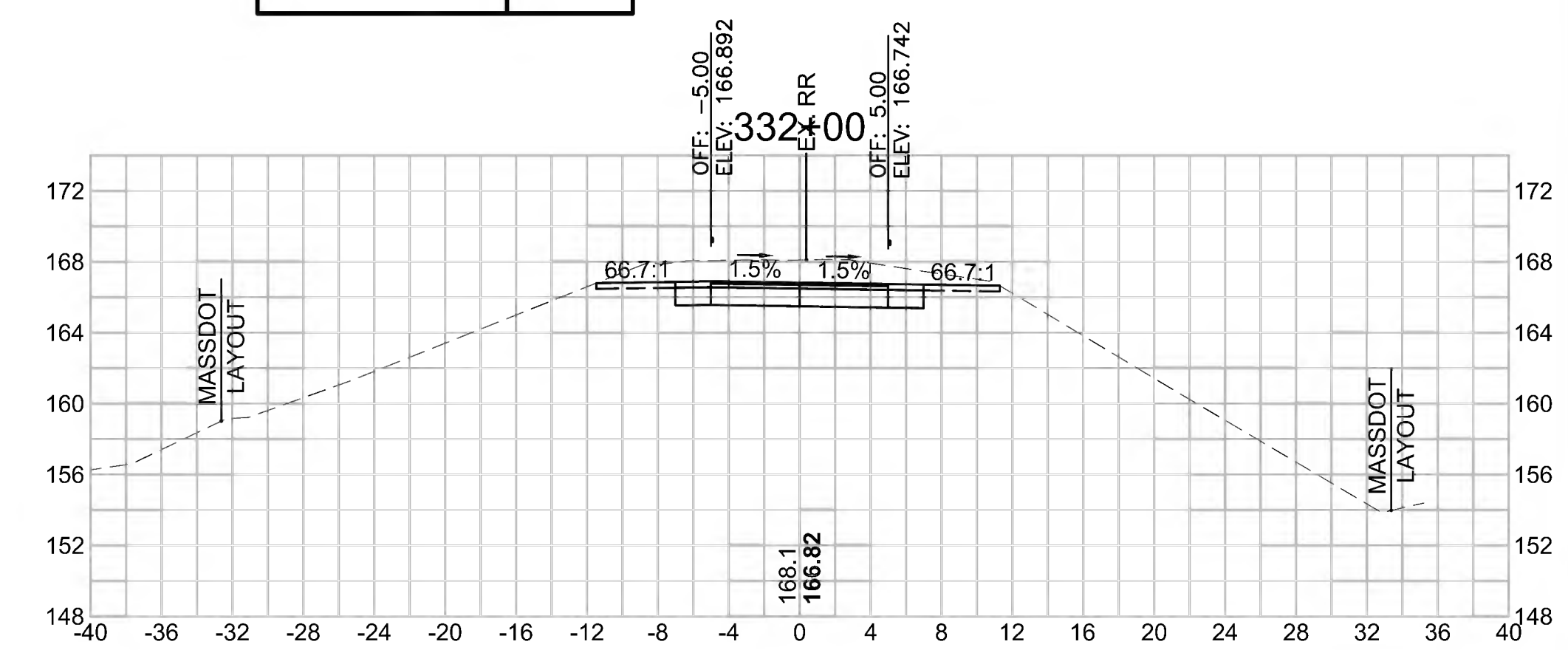
**Total Volume at Station 331+00.00**

Cut Area (SF)	34.386
Fill Area (SF)	0.000
Cut Vol (CF)	61.0
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	15748.1
Cum Fill Vol (CF)	8540.6
Net Vol (CF)	7207.5



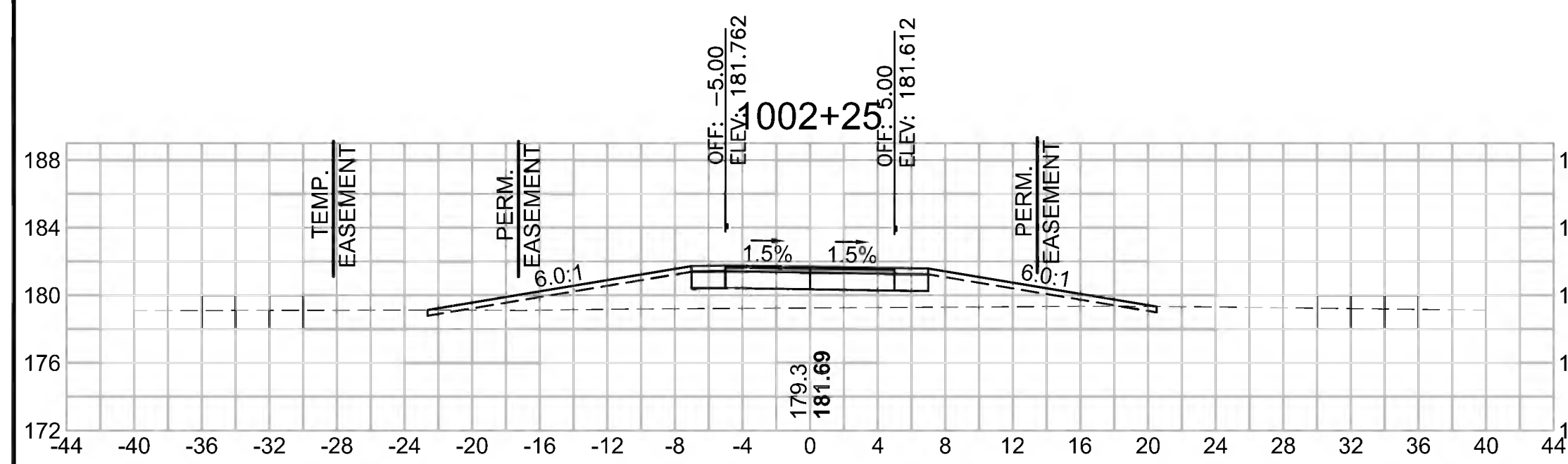
**Total Volume at Station 332+00.00**

Cut Area (SF)	43.286
Fill Area (SF)	0.000
Cut Vol (CF)	76.4
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	15892.7
Cum Fill Vol (CF)	8540.6
Net Vol (CF)	7352.1

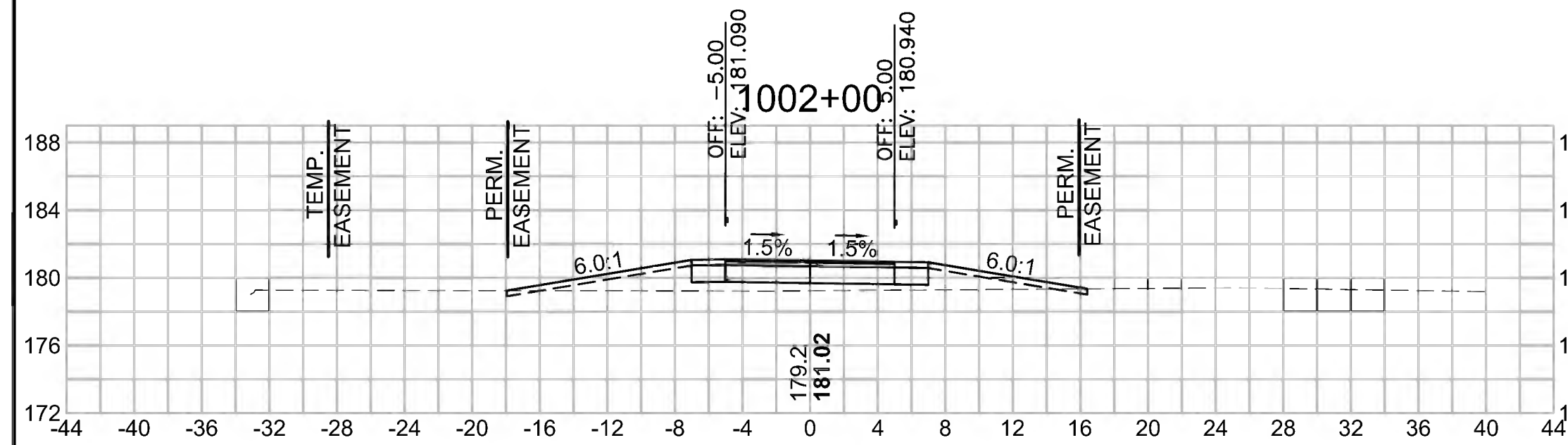




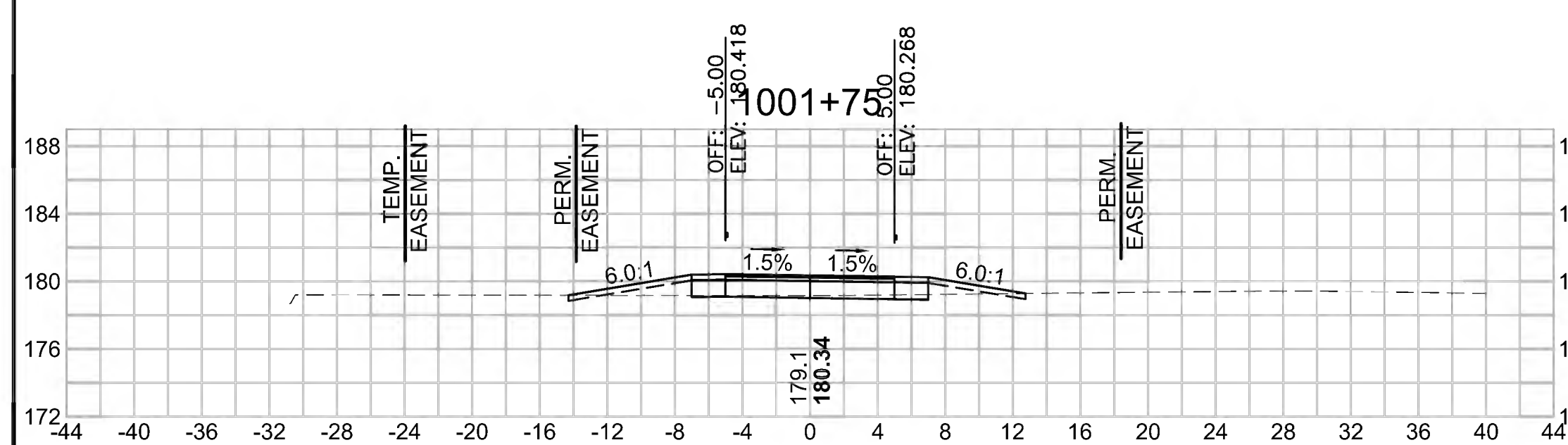




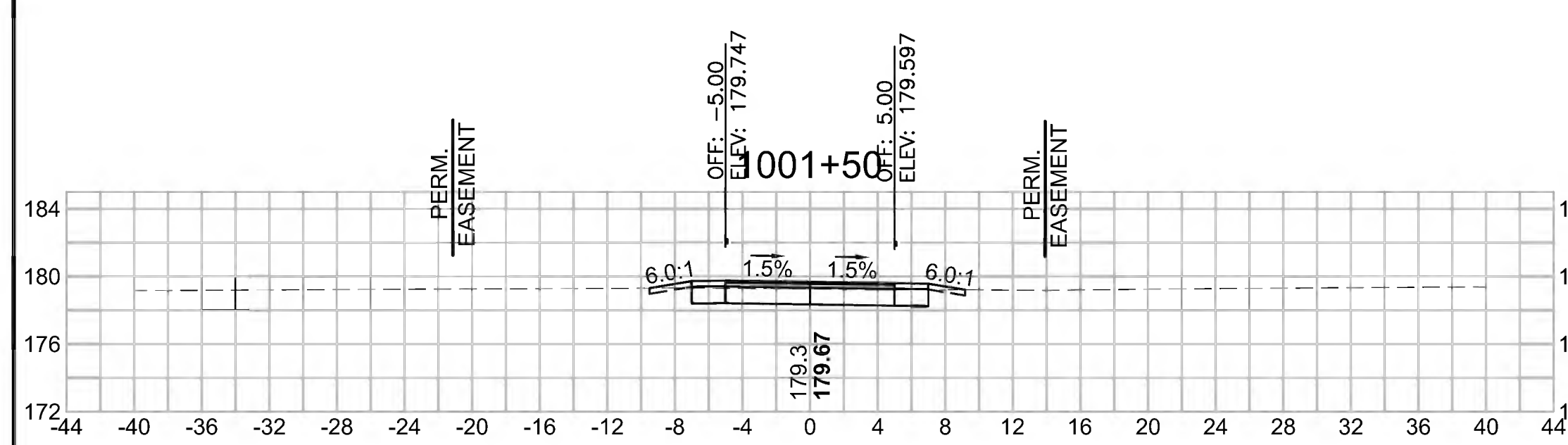
Total Volume at Station 1002+25.00	
Cut Area (SF)	7.878
Fill Area (SF)	41.517
Cut Vol (CF)	8.8
Fill Vol (CF)	27.4
Cum Cut Vol (CF)	120.8
Cum Fill Vol (CF)	39.0
Net Vol (CF)	81.8



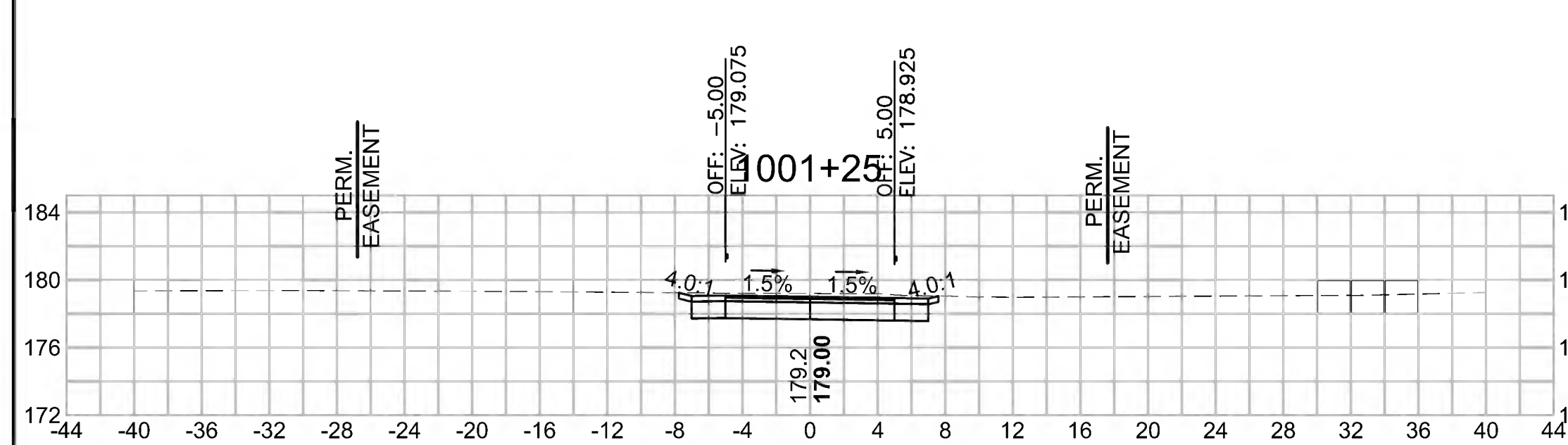
Total Volume at Station 1002+00.00	
Cut Area (SF)	11.225
Fill Area (SF)	17.705
Cut Vol (CF)	13.4
Fill Vol (CF)	9.9
Cum Cut Vol (CF)	112.0
Cum Fill Vol (CF)	11.6
Net Vol (CF)	100.4



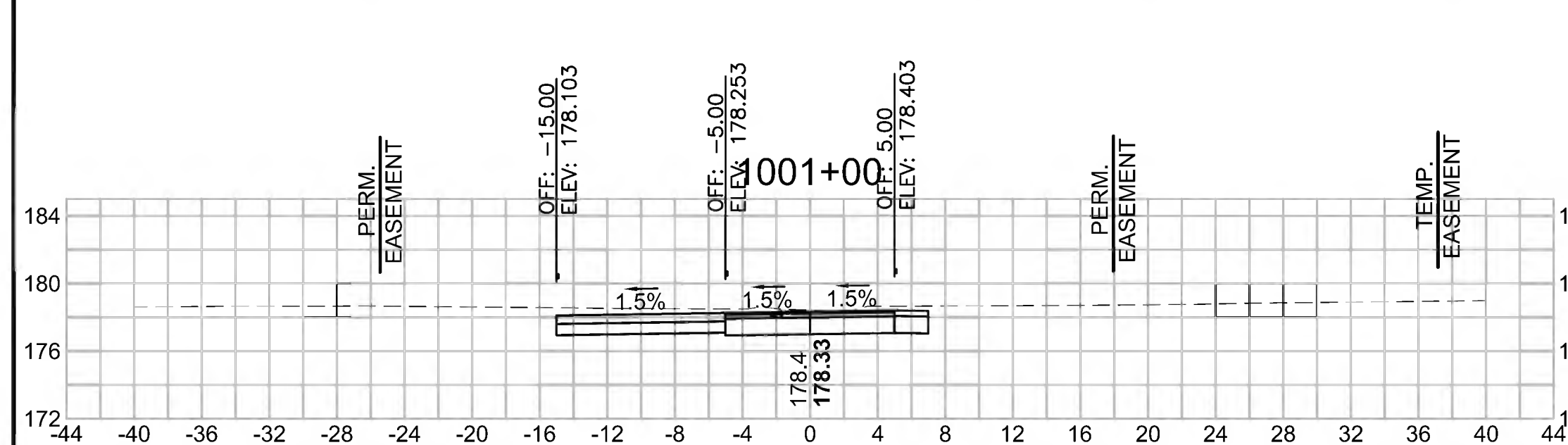
Total Volume at Station 1001+75.00	
Cut Area (SF)	17.683
Fill Area (SF)	3.690
Cut Vol (CF)	22.5
Fill Vol (CF)	1.7
Cum Cut Vol (CF)	98.6
Cum Fill Vol (CF)	1.7
Net Vol (CF)	96.9



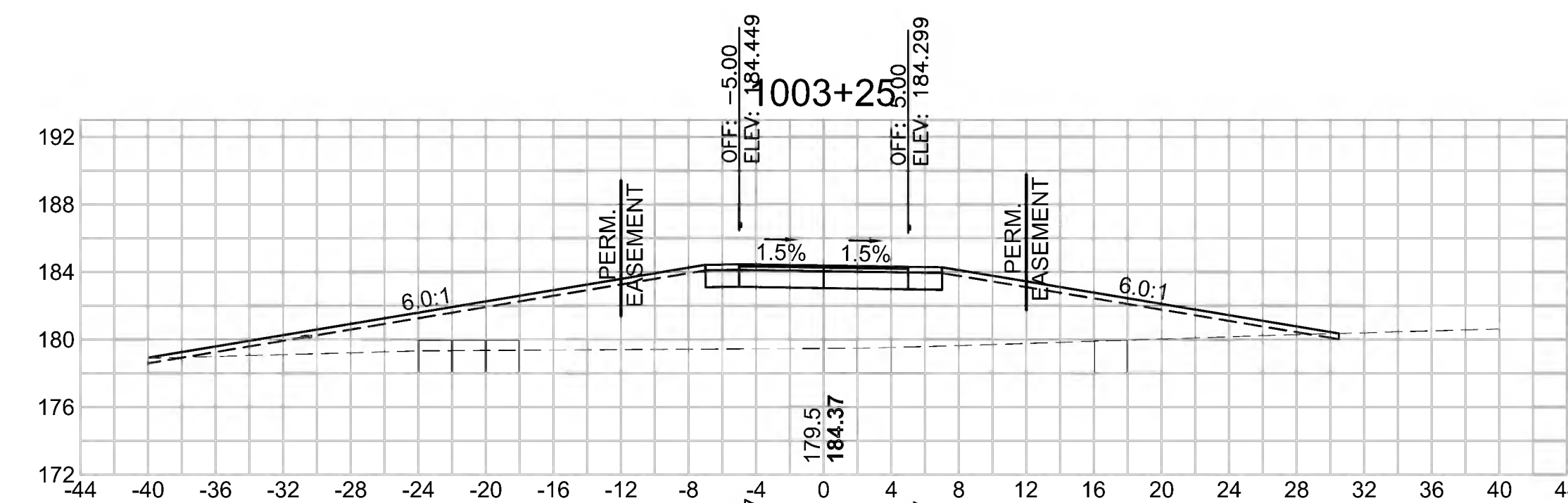
Total Volume at Station 1001+50.00	
Cut Area (SF)	30.927
Fill Area (SF)	0.016
Cut Vol (CF)	33.7
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	76.1
Cum Fill Vol (CF)	0.0
Net Vol (CF)	76.1



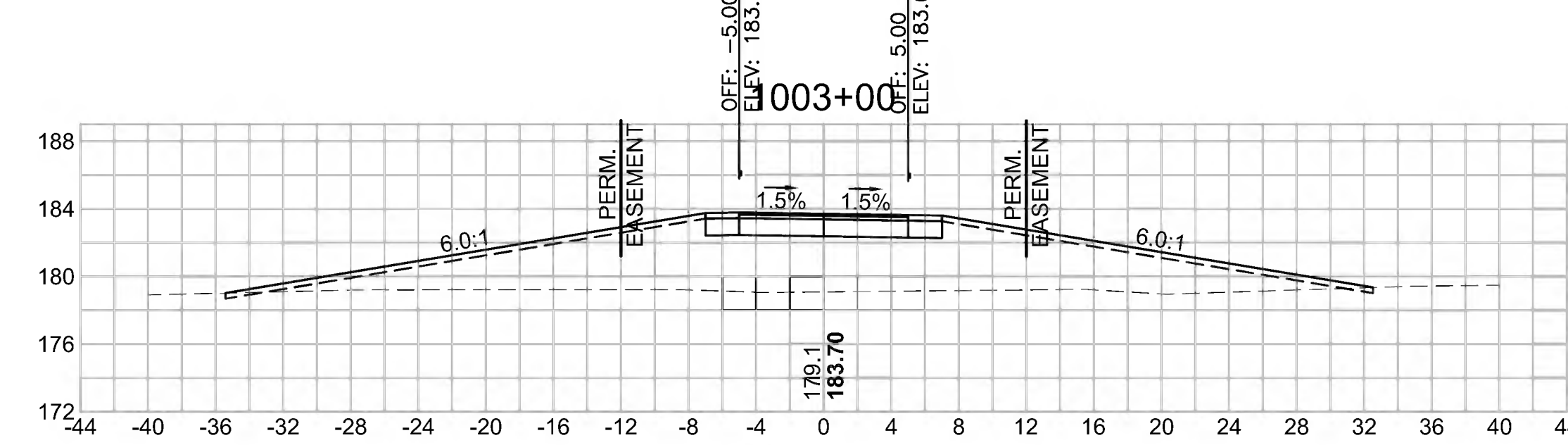
Total Volume at Station 1001+25.00	
Cut Area (SF)	41.878
Fill Area (SF)	0.000
Cut Vol (CF)	42.4
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	42.4
Cum Fill Vol (CF)	0.0
Net Vol (CF)	42.4



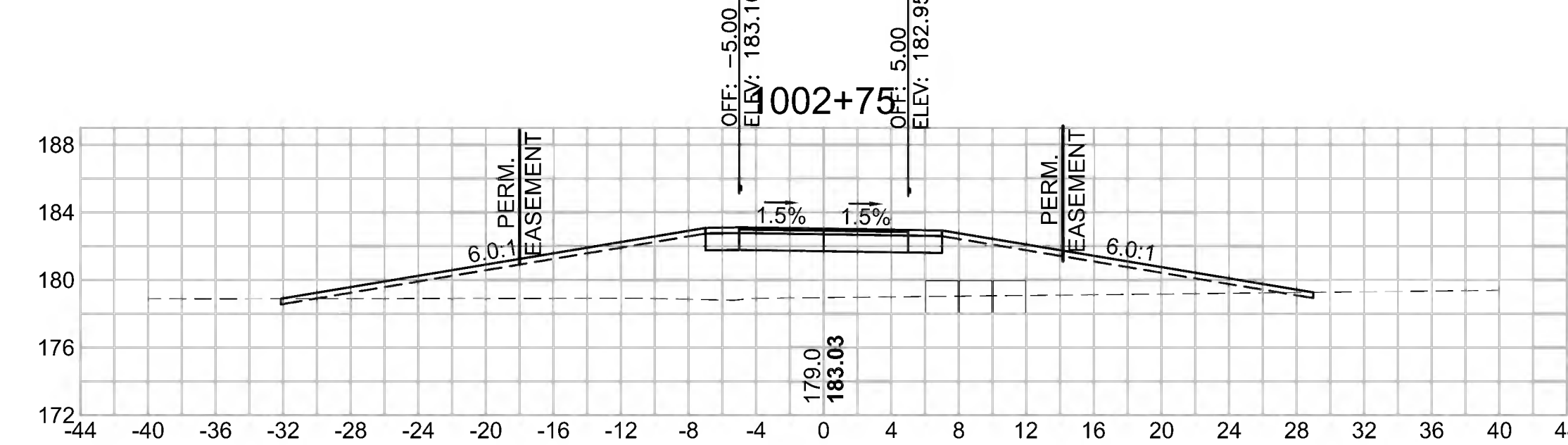
Total Volume at Station 1001+00.00	
Cut Area (SF)	49.693
Fill Area (SF)	0.000
Cut Vol (CF)	0.0
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	0.0
Cum Fill Vol (CF)	0.0
Net Vol (CF)	0.0



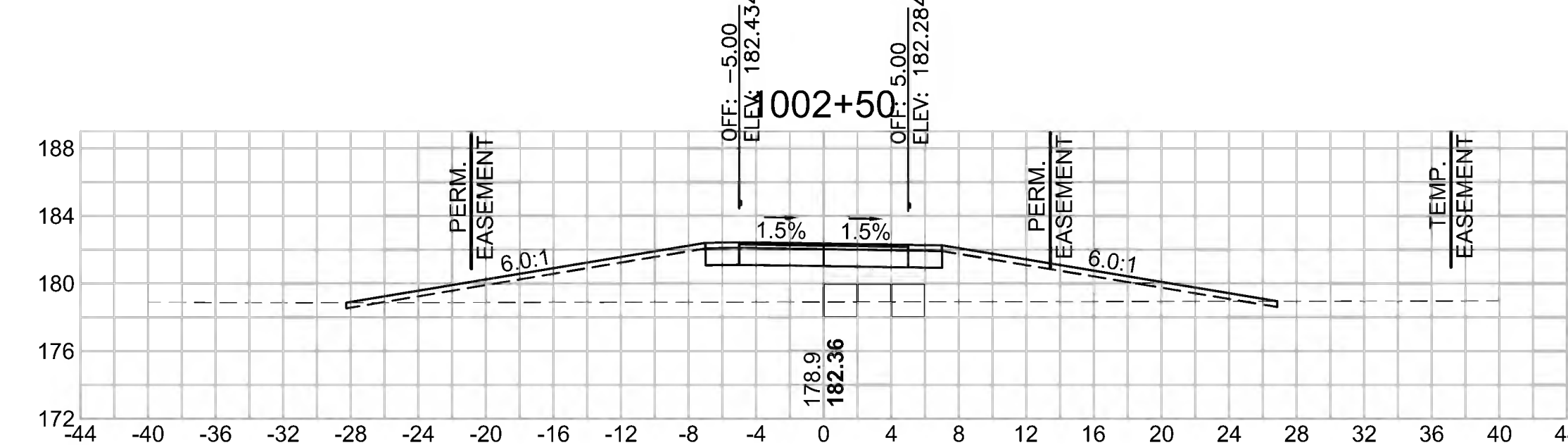
Total Volume at Station 1003+25.00	
Cut Area (SF)	1.211
Fill Area (SF)	166.250
Cut Vol (CF)	1.0
Fill Vol (CF)	146.5
Cum Cut Vol (CF)	131.9
Cum Fill Vol (CF)	464.6
Net Vol (CF)	-332.6



Total Volume at Station 1003+00.00	
Cut Area (SF)	0.999
Fill Area (SF)	150.119
Cut Vol (CF)	1.3
Fill Vol (CF)	124.4
Cum Cut Vol (CF)	130.9
Cum Fill Vol (CF)	318.1
Net Vol (CF)	-187.2



Total Volume at Station 1002+75.00	
Cut Area (SF)	1.852
Fill Area (SF)	118.624
Cut Vol (CF)	3.0
Fill Vol (CF)	95.2
Cum Cut Vol (CF)	129.6
Cum Fill Vol (CF)	193.7
Net Vol (CF)	-64.1



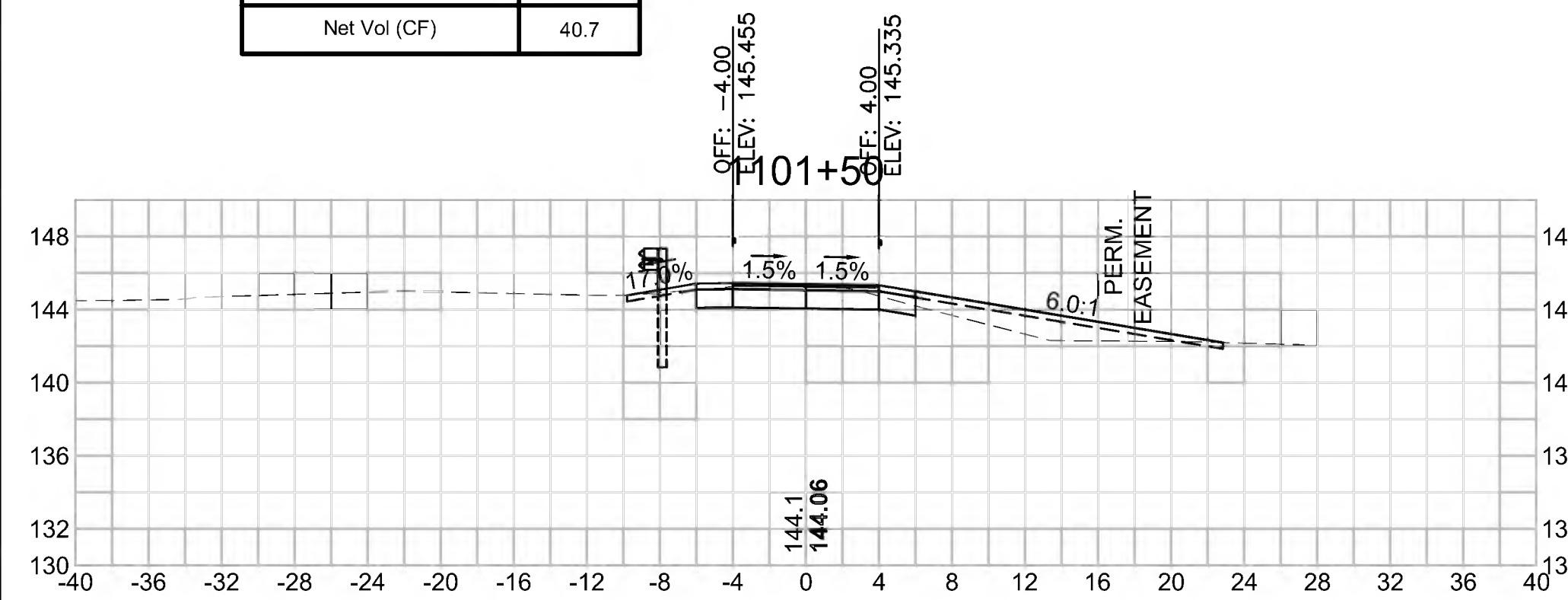
Total Volume at Station 1002+50.00	
Cut Area (SF)	4.605
Fill Area (SF)	86.940
Cut Vol (CF)	5.8
Fill Vol (CF)	59.5
Cum Cut Vol (CF)	126.6
Cum Fill Vol (CF)	98.5
Net Vol (CF)	28.1



CROSS SECTIONS  
DAVIS FIELD ACCESS PATH

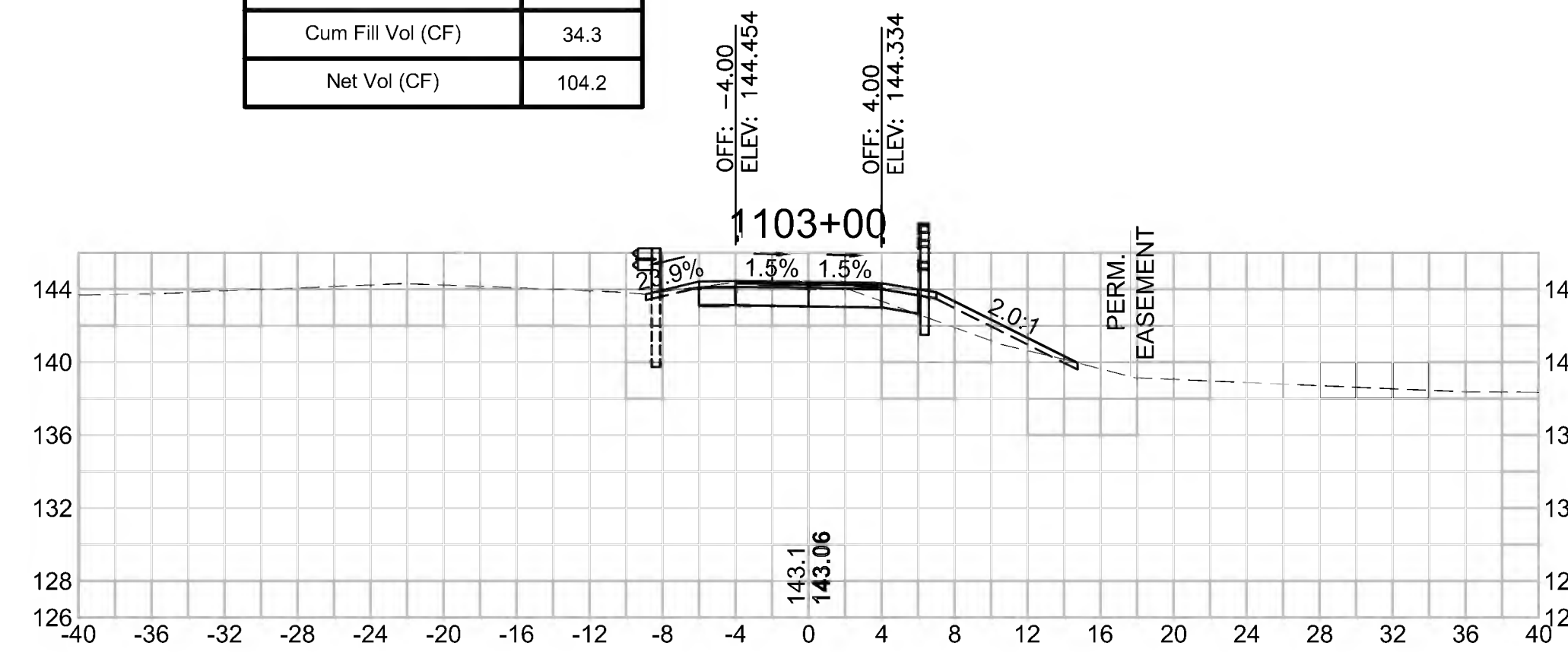
**Total Volume at Station 1101+50.00**

Cut Area (SF)	13.904
Fill Area (SF)	9.861
Cut Vol (CF)	26.4
Fill Vol (CF)	9.2
Cum Cut Vol (CF)	50.2
Cum Fill Vol (CF)	9.6
Net Vol (CF)	40.7



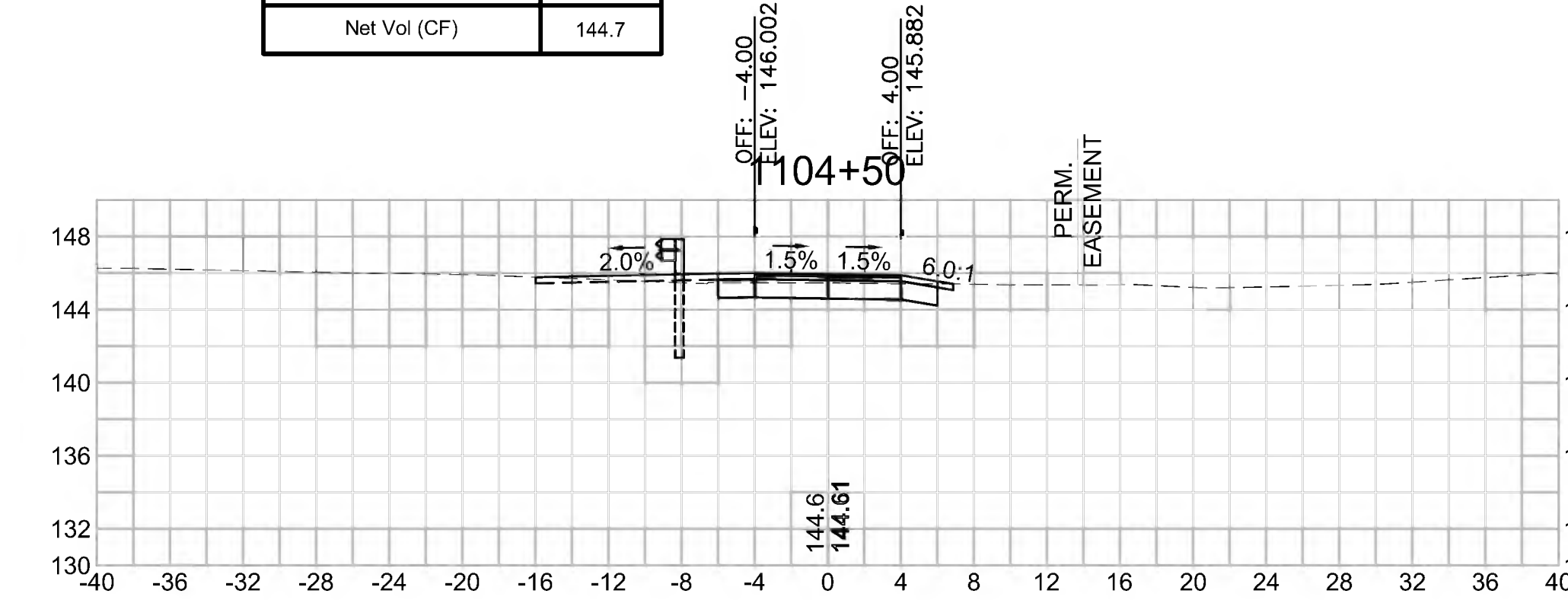
**Total Volume at Station 1103+00.00**

Cut Area (SF)	12.615
Fill Area (SF)	5.526
Cut Vol (CF)	24.9
Fill Vol (CF)	7.0
Cum Cut Vol (CF)	138.5
Cum Fill Vol (CF)	34.3
Net Vol (CF)	104.2



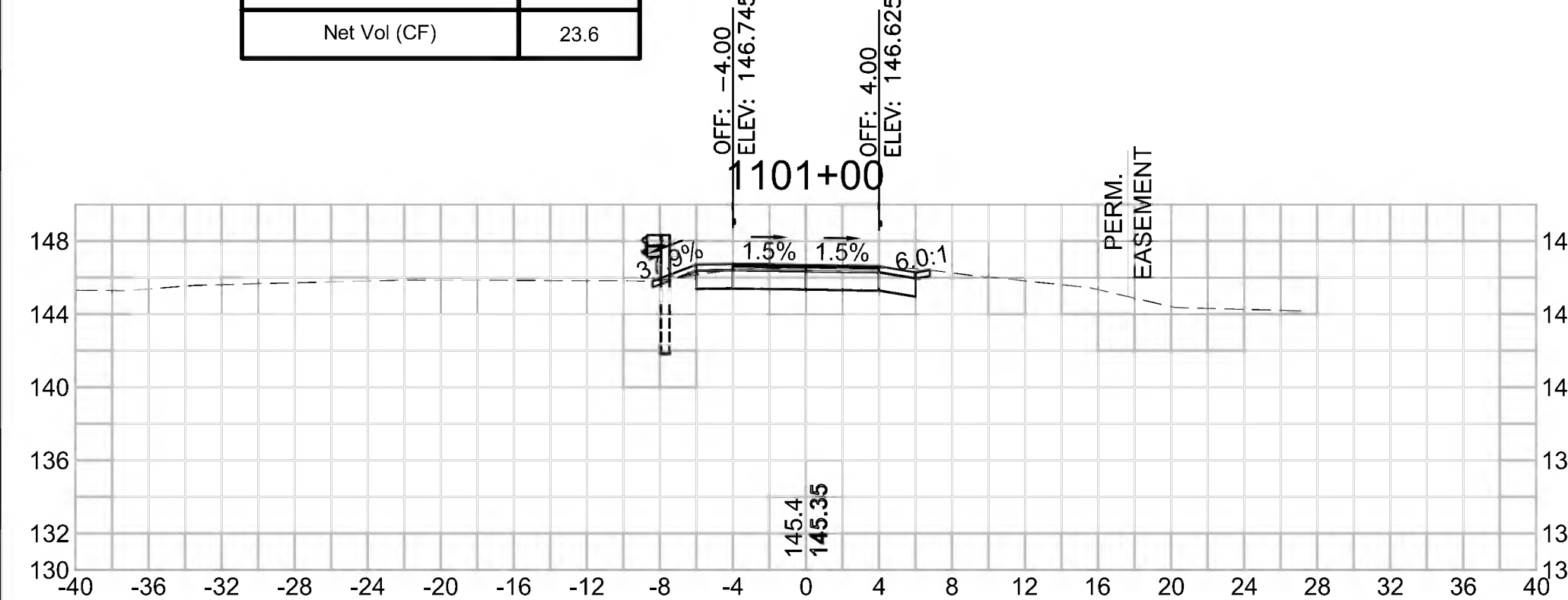
**Total Volume at Station 1104+50.00**

Cut Area (SF)	11.597
Fill Area (SF)	0.482
Cut Vol (CF)	21.1
Fill Vol (CF)	0.7
Cum Cut Vol (CF)	199.4
Cum Fill Vol (CF)	54.7
Net Vol (CF)	144.7



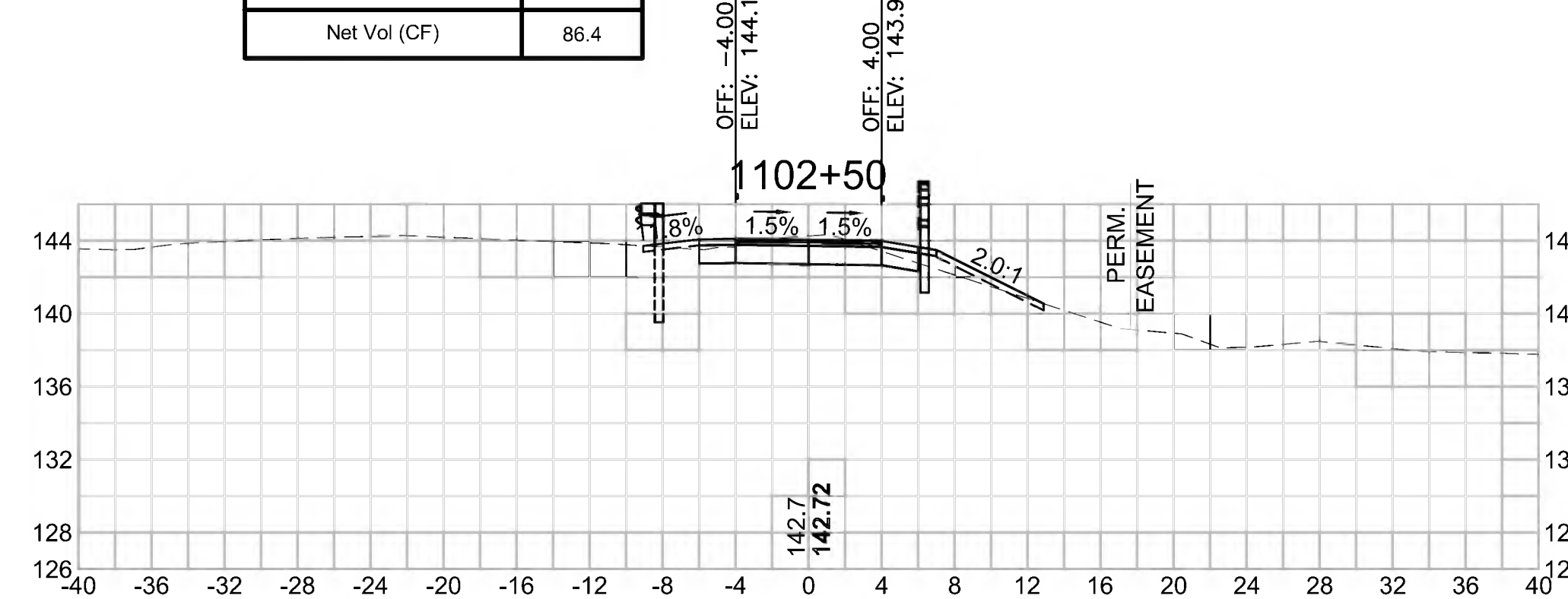
**Total Volume at Station 1101+00.00**

Cut Area (SF)	14.578
Fill Area (SF)	0.125
Cut Vol (CF)	23.9
Fill Vol (CF)	0.3
Cum Cut Vol (CF)	23.9
Cum Fill Vol (CF)	0.3
Net Vol (CF)	23.6



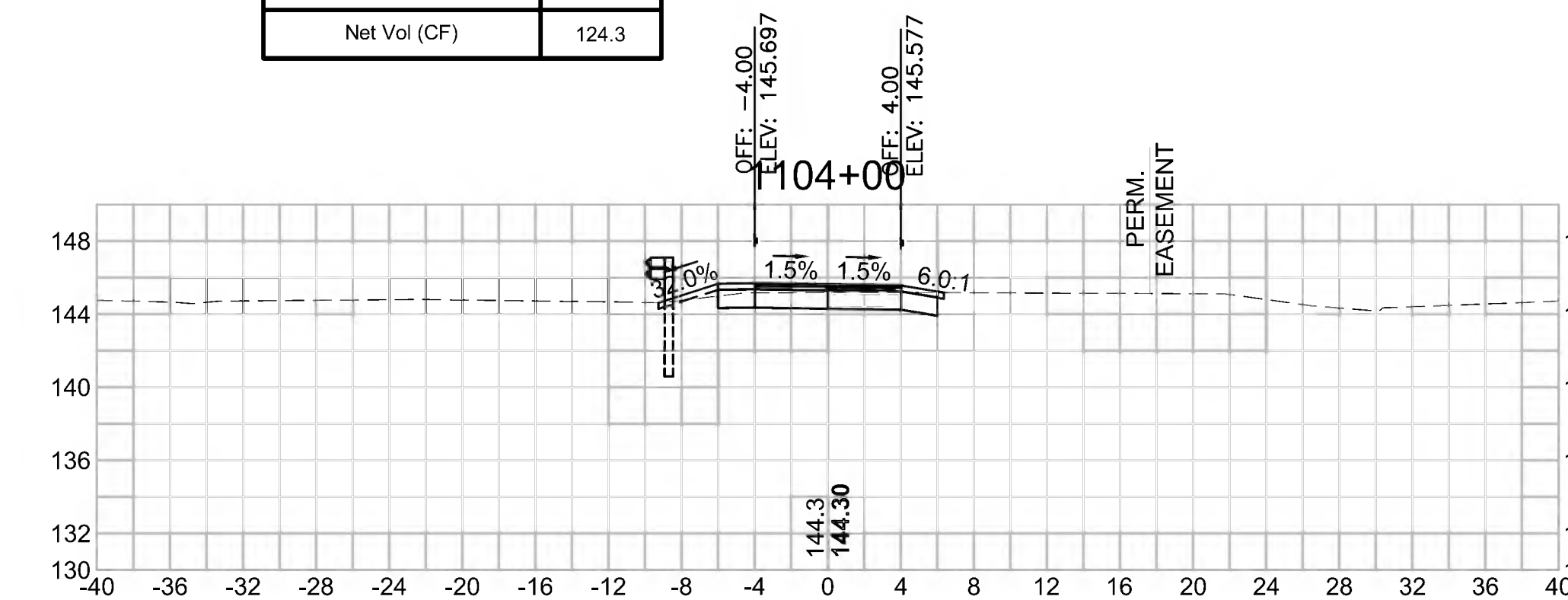
**Total Volume at Station 1102+50.00**

Cut Area (SF)	14.264
Fill Area (SF)	2.044
Cut Vol (CF)	31.9
Fill Vol (CF)	5.2
Cum Cut Vol (CF)	113.6
Cum Fill Vol (CF)	27.3
Net Vol (CF)	86.4



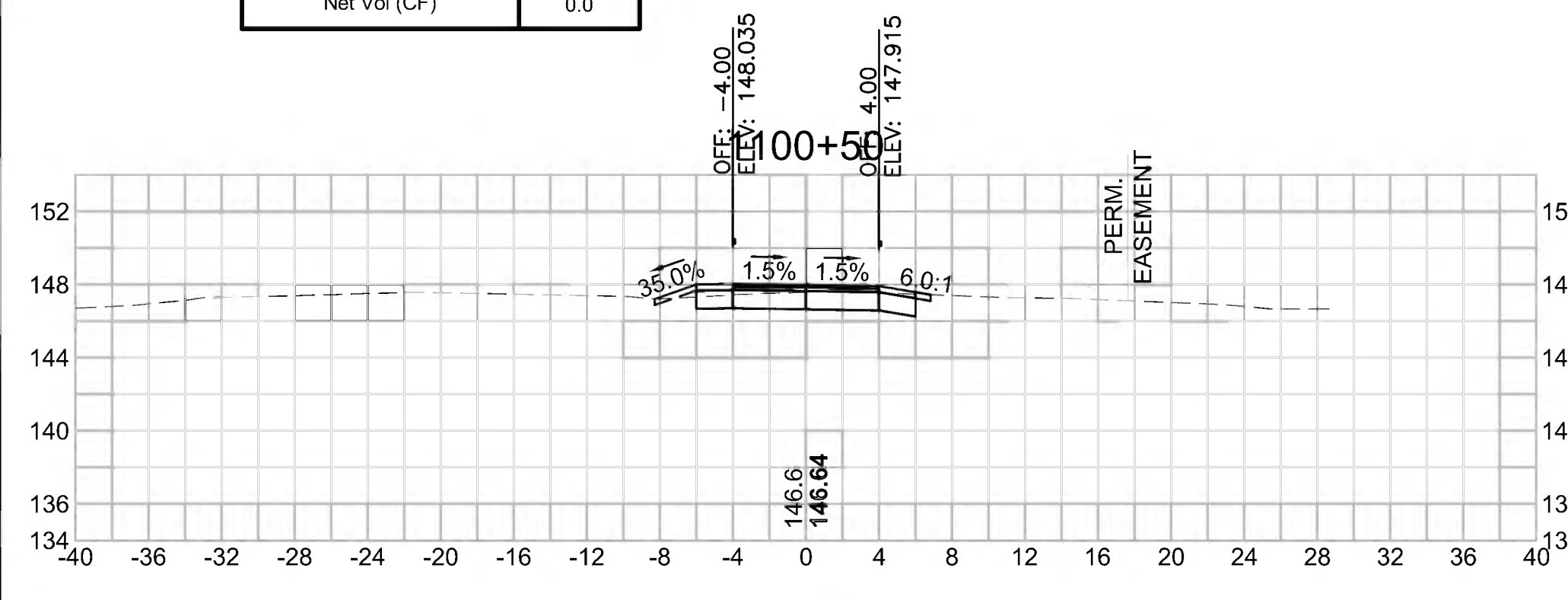
**Total Volume at Station 1104+00.00**

Cut Area (SF)	11.153
Fill Area (SF)	0.287
Cut Vol (CF)	19.2
Fill Vol (CF)	7.4
Cum Cut Vol (CF)	178.3
Cum Fill Vol (CF)	54.0
Net Vol (CF)	124.3



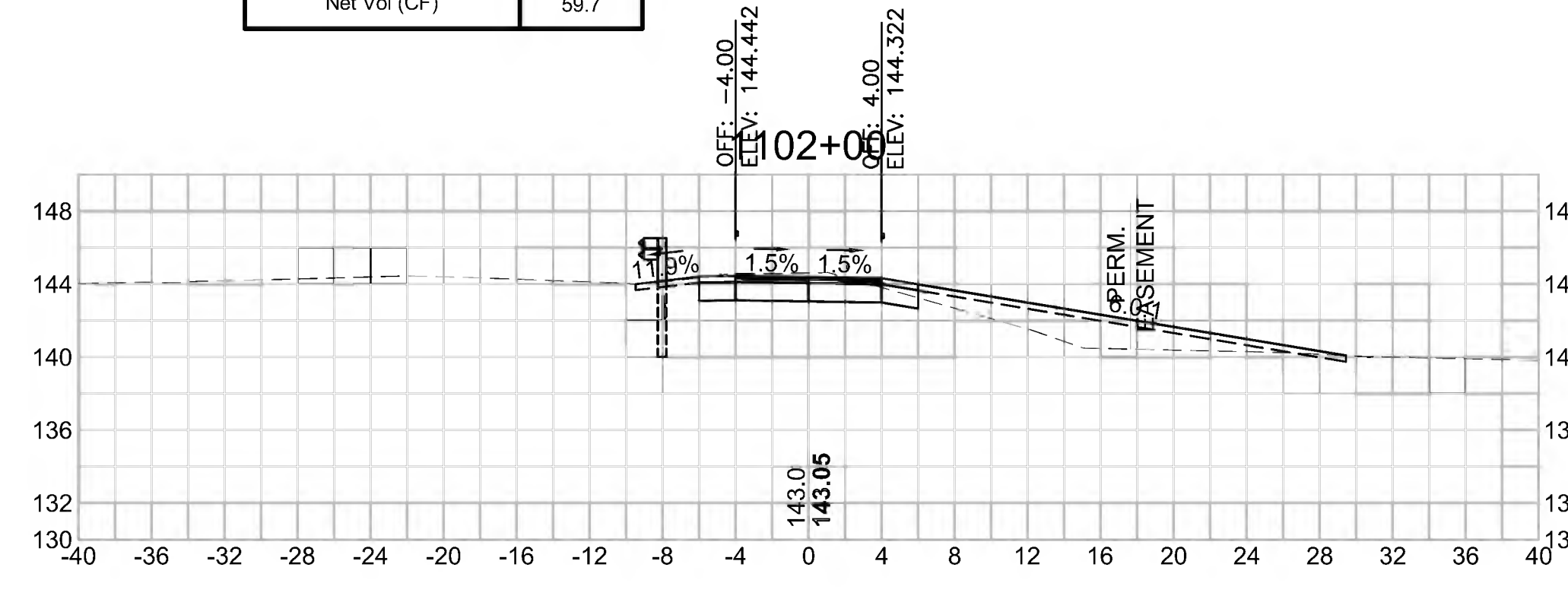
**Total Volume at Station 1100+50.00**

Cut Area (SF)	11.207
Fill Area (SF)	0.211
Cut Vol (CF)	0.0
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	0.0
Cum Fill Vol (CF)	0.0
Net Vol (CF)	0.0



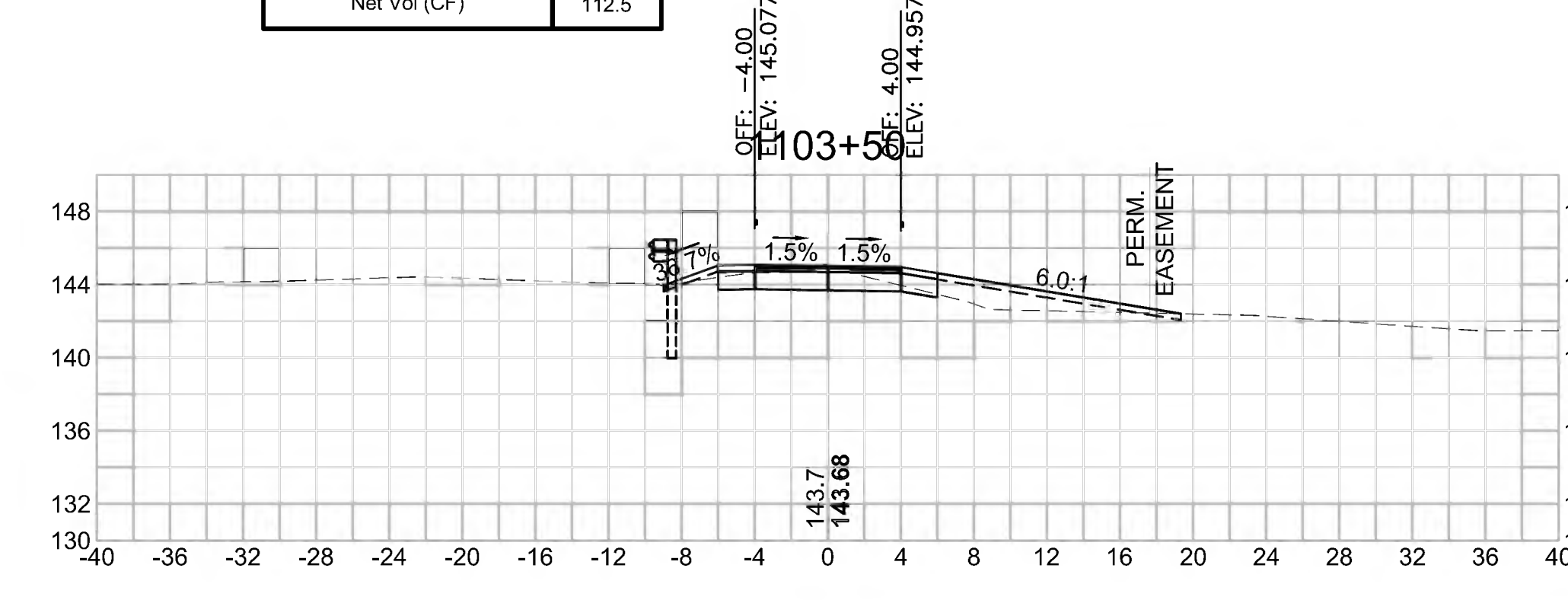
**Total Volume at Station 1102+00.00**

Cut Area (SF)	20.149
Fill Area (SF)	3.620
Cut Vol (CF)	31.5
Fill Vol (CF)	12.5
Cum Cut Vol (CF)	81.8
Cum Fill Vol (CF)	22.0
Net Vol (CF)	59.7



**Total Volume at Station 1103+50.00**

Cut Area (SF)	9.600
Fill Area (SF)	7.733
Cut Vol (CF)	20.6
Fill Vol (CF)	12.3
Cum Cut Vol (CF)	159.1
Cum Fill Vol (CF)	46.6
Net Vol (CF)	112.5

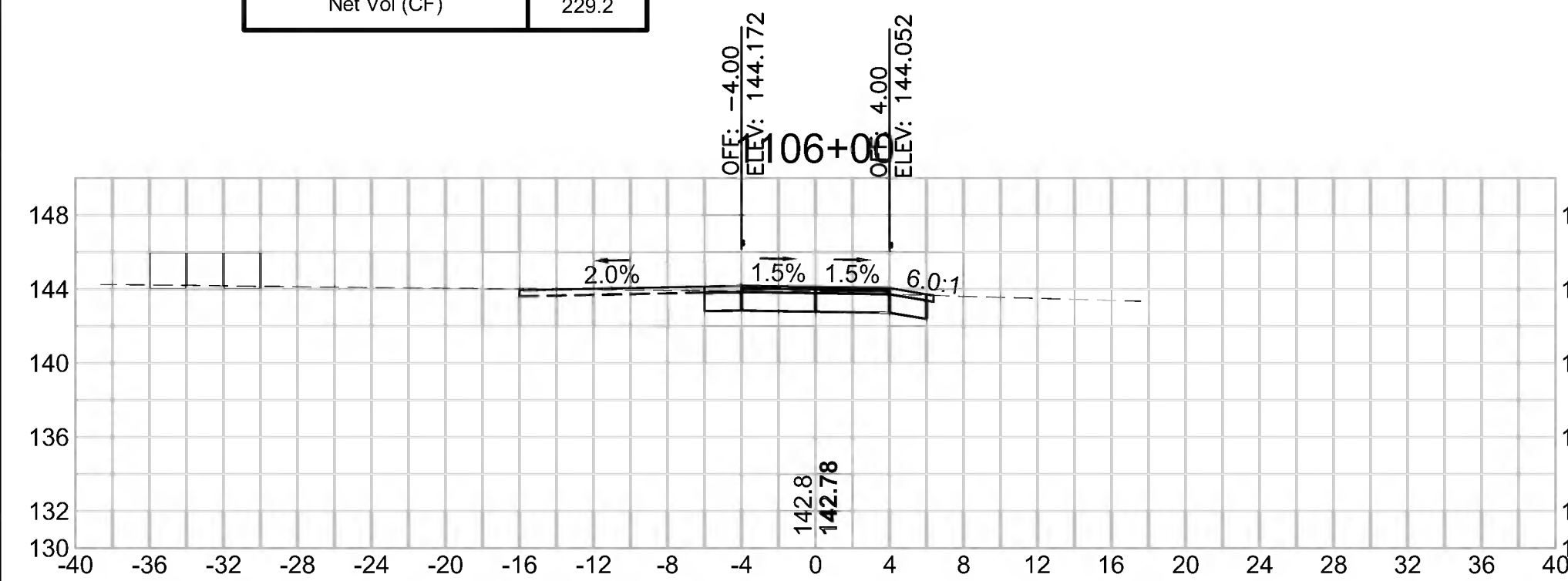


SUDBURY BRUCE FREEMAN RAIL TRAIL			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	304	319
PROJECT FILE NO. 608164			

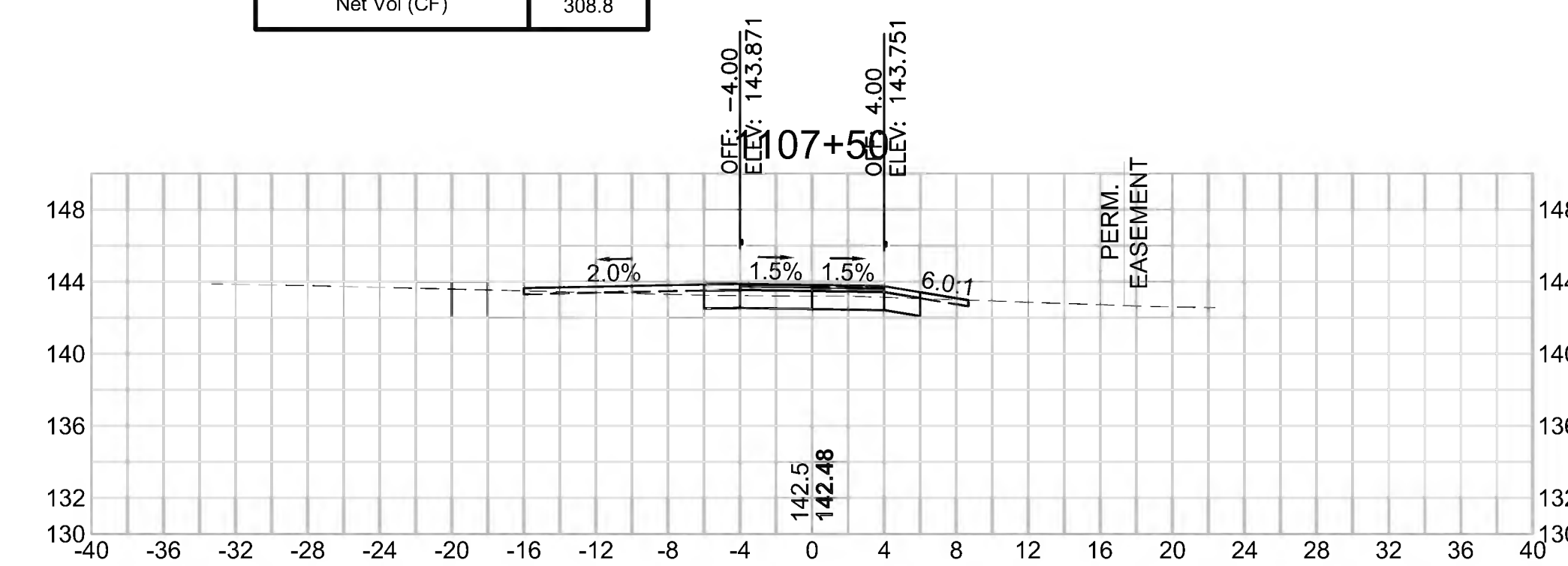
CROSS SECTIONS  
DAVIS FIELD ACCESS PATH

608164\_XSEC(CROSS SECTION LAYOUTS).DWG 27-Jun-2022

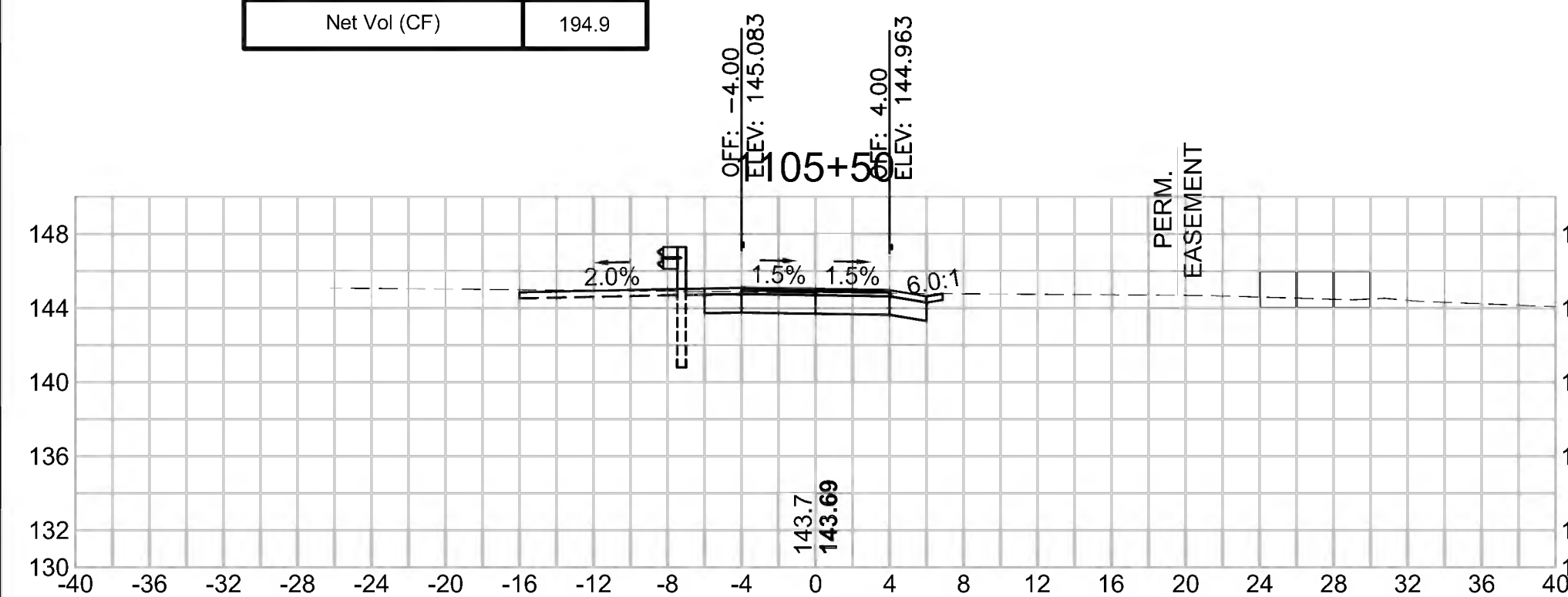
Total Volume at Station 1106+00.00	
Cut Area (SF)	17.731
Fill Area (SF)	1.024
Cut Vol (CF)	35.3
Fill Vol (CF)	0.9
Cum Cut Vol (CF)	285.7
Cum Fill Vol (CF)	56.4
Net Vol (CF)	229.2



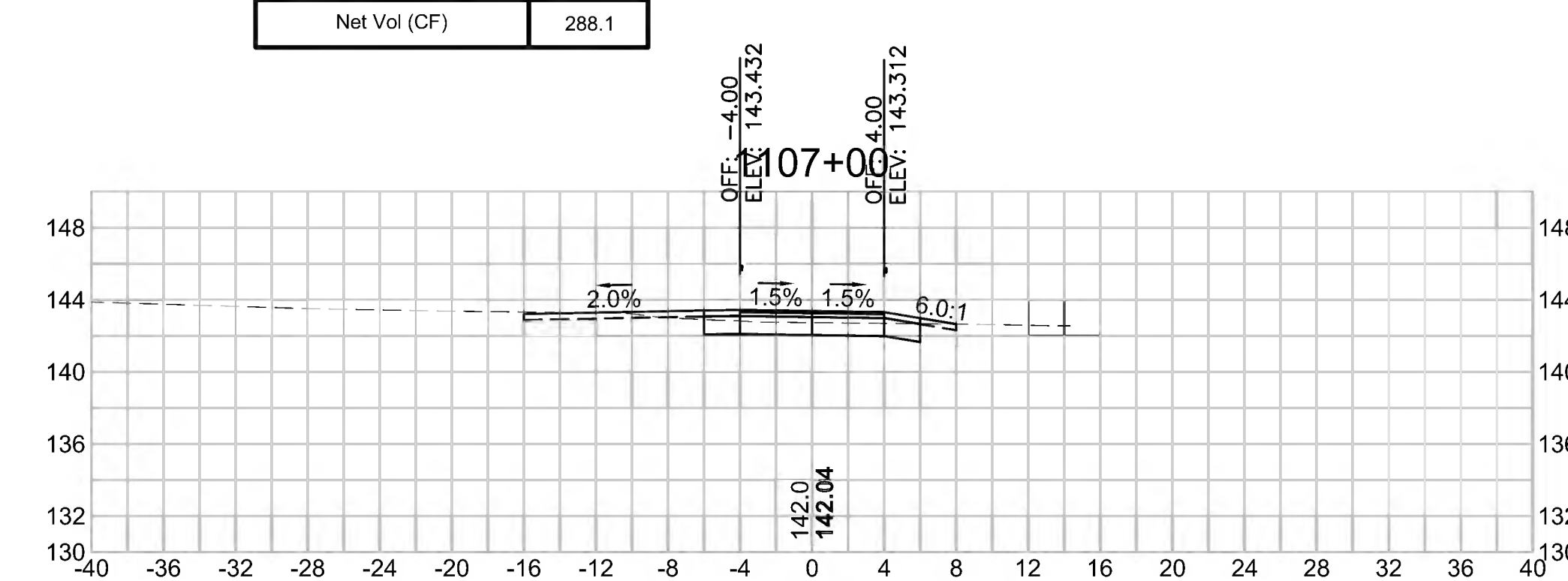
Total Volume at Station 1107+50.00	
Cut Area (SF)	10.345
Fill Area (SF)	0.776
Cut Vol (CF)	21.6
Fill Vol (CF)	0.9
Cum Cut Vol (CF)	368.4
Cum Fill Vol (CF)	59.6
Net Vol (CF)	308.8



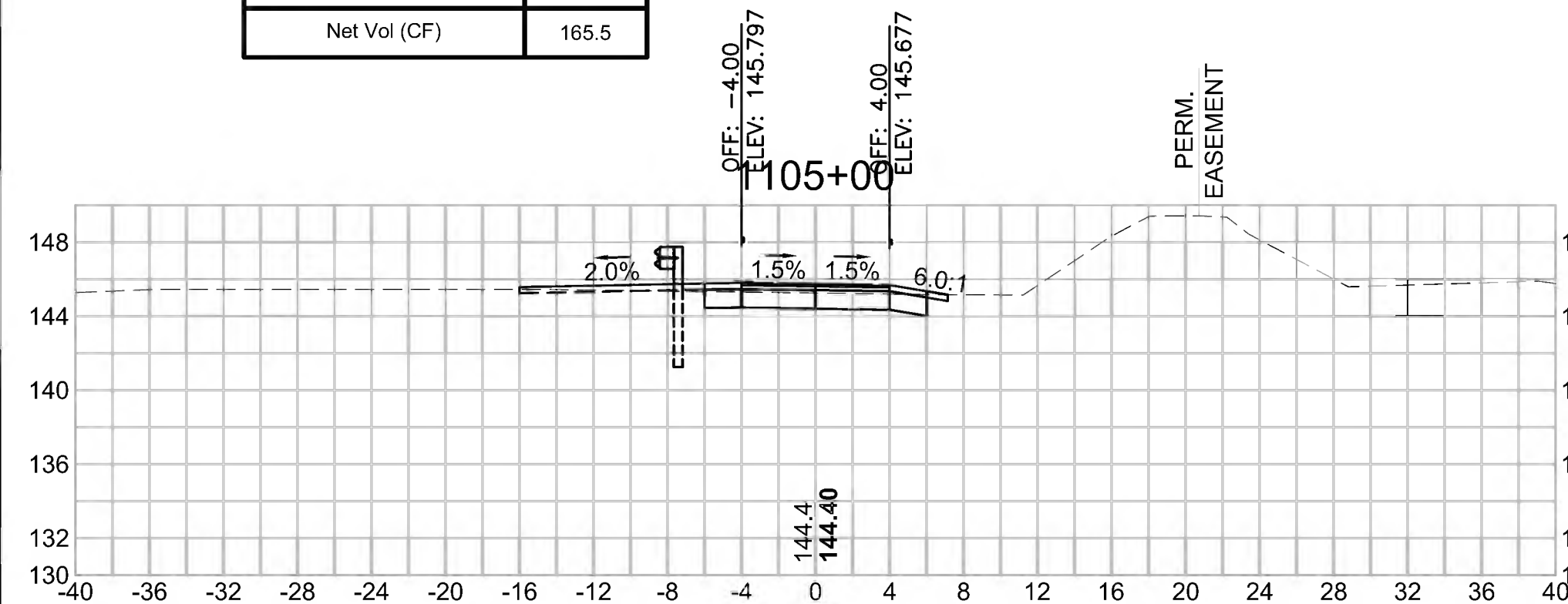
Total Volume at Station 1105+50.00	
Cut Area (SF)	20.410
Fill Area (SF)	0.000
Cut Vol (CF)	29.6
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	250.3
Cum Fill Vol (CF)	55.5
Net Vol (CF)	194.9



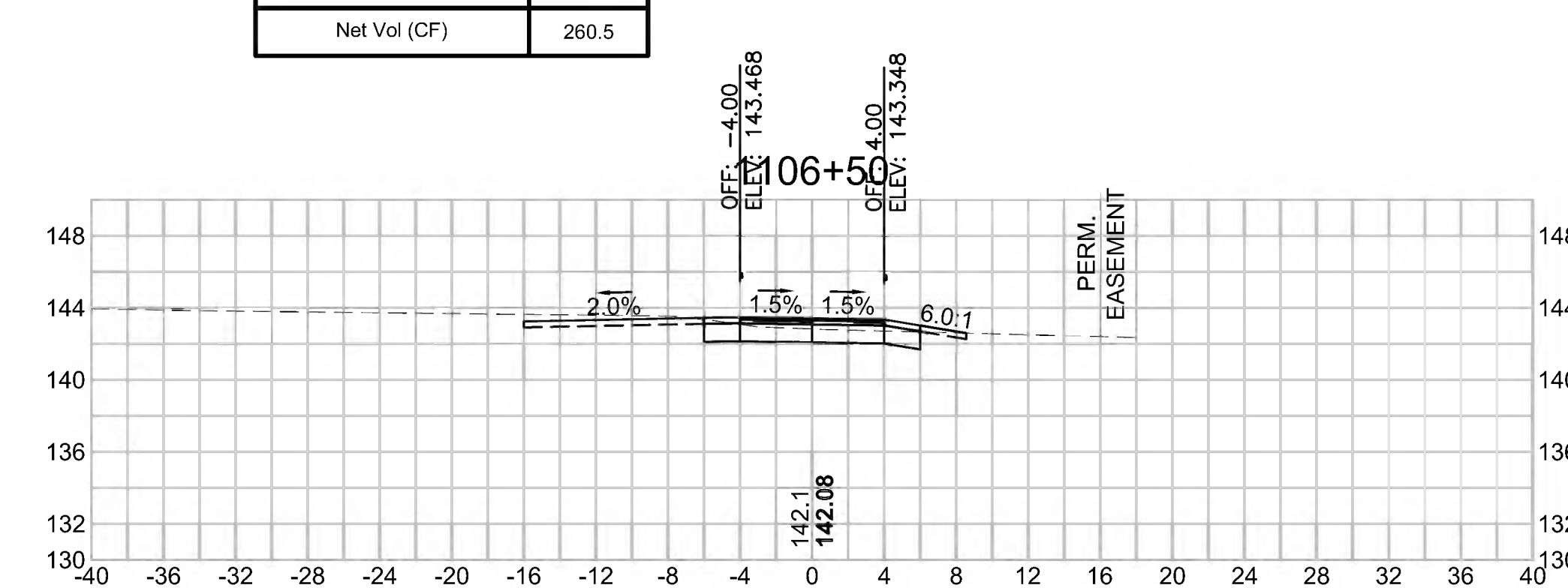
Total Volume at Station 1107+00.00	
Cut Area (SF)	13.009
Fill Area (SF)	0.228
Cut Vol (CF)	28.4
Fill Vol (CF)	0.8
Cum Cut Vol (CF)	346.8
Cum Fill Vol (CF)	58.7
Net Vol (CF)	288.1



Total Volume at Station 1105+00.00	
Cut Area (SF)	11.513
Fill Area (SF)	0.178
Cut Vol (CF)	21.4
Fill Vol (CF)	0.6
Cum Cut Vol (CF)	220.8
Cum Fill Vol (CF)	55.3
Net Vol (CF)	165.5



Total Volume at Station 1106+50.00	
Cut Area (SF)	17.660
Fill Area (SF)	0.606
Cut Vol (CF)	32.8
Fill Vol (CF)	1.5
Cum Cut Vol (CF)	318.4
Cum Fill Vol (CF)	57.9
Net Vol (CF)	260.5

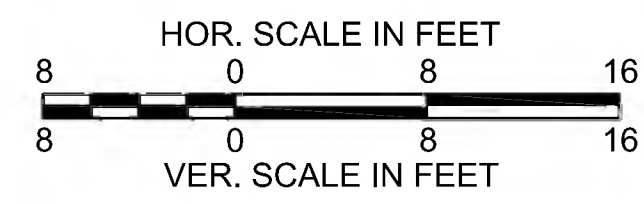




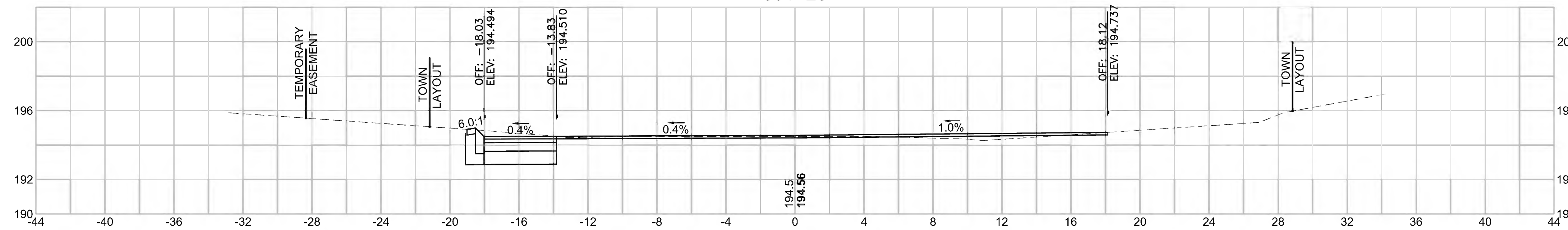
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	305	319

CROSS SECTIONS  
HUDSON ROAD

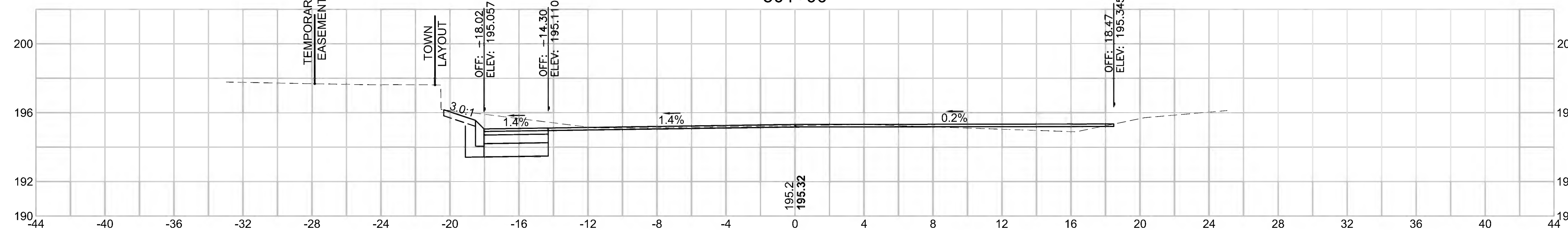


501+25



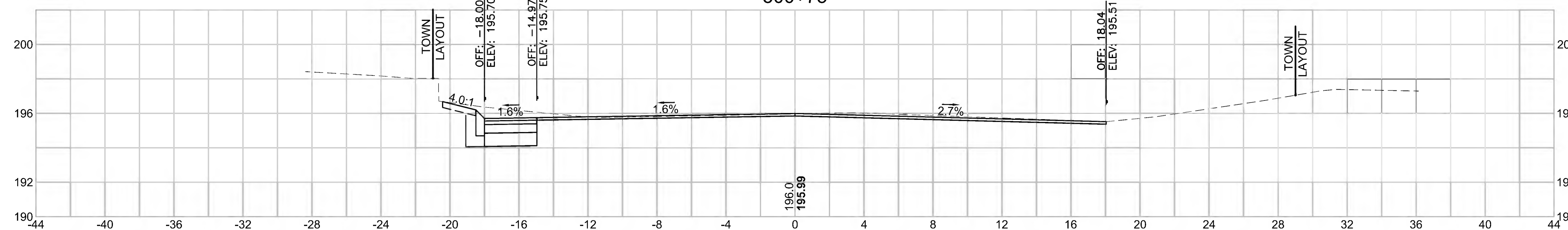
Total Volume at Station 501+25.00	
Cut Area (SF)	19.339
Fill Area (SF)	1.373
Cut Vol (CF)	18.8
Fill Vol (CF)	1.3
Cum Cut Vol (CF)	43.3
Cum Fill Vol (CF)	2.0
Net Vol (CF)	41.3

501+00



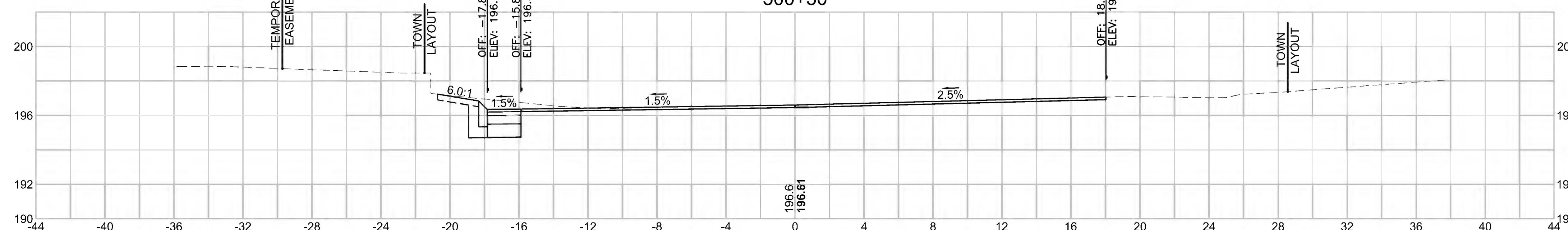
Total Volume at Station 501+00.00	
Cut Area (SF)	21.351
Fill Area (SF)	1.499
Cut Vol (CF)	15.0
Fill Vol (CF)	0.7
Cum Cut Vol (CF)	24.4
Cum Fill Vol (CF)	0.7
Net Vol (CF)	23.7

500+75



Total Volume at Station 500+75.00	
Cut Area (SF)	11.018
Fill Area (SF)	0.000
Cut Vol (CF)	9.5
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	9.5
Cum Fill Vol (CF)	0.0
Net Vol (CF)	9.5

500+50

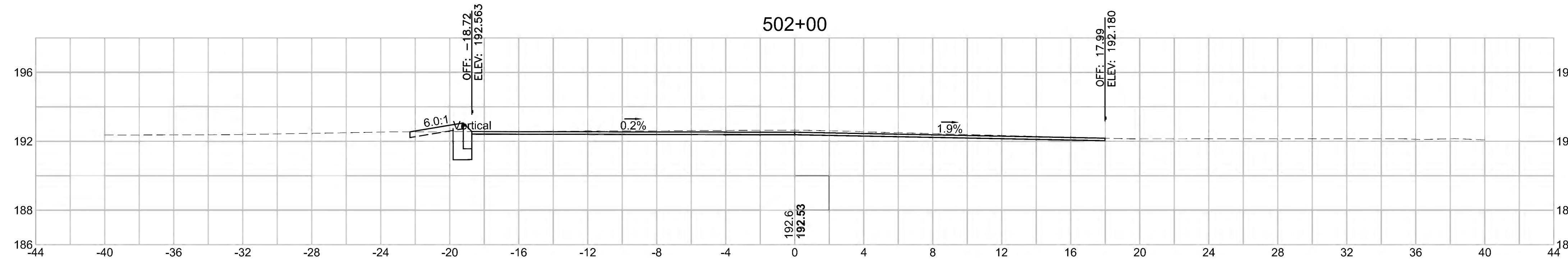
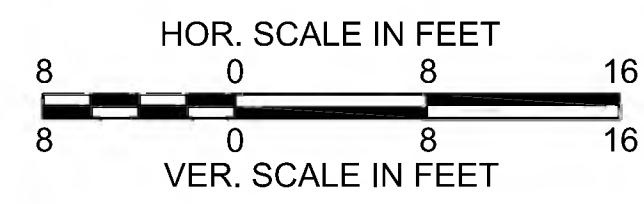


Total Volume at Station 500+50.00	
Cut Area (SF)	9.404
Fill Area (SF)	0.000
Cut Vol (CF)	0.0
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	0.0
Cum Fill Vol (CF)	0.0
Net Vol (CF)	0.0

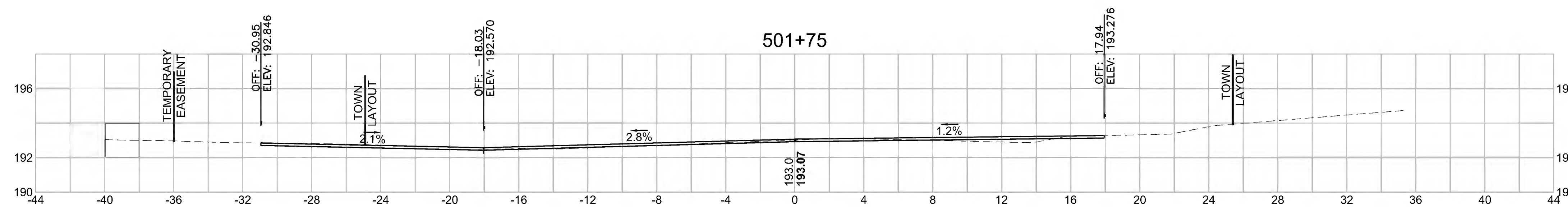
SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	306	319

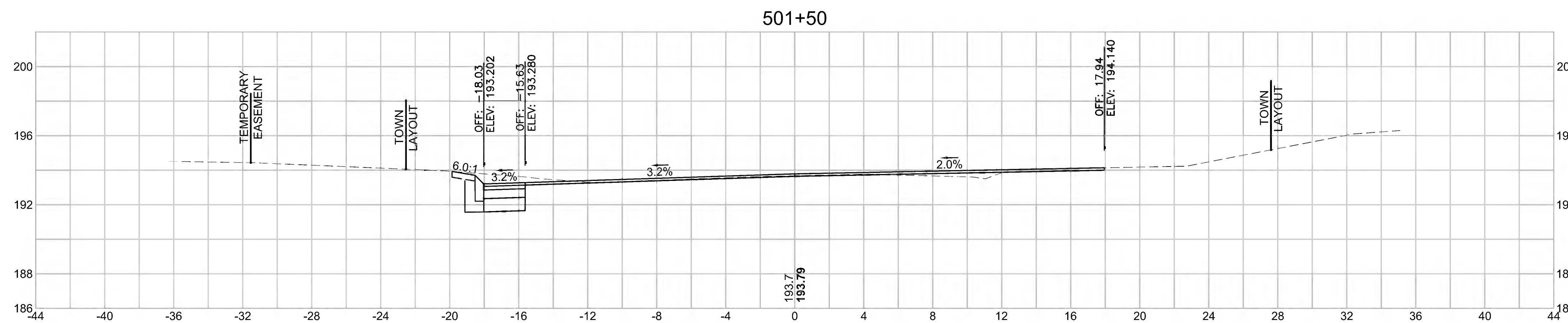
CROSS SECTIONS  
HUDSON ROAD



Total Volume at Station 502+00.00	
Cut Area (SF)	22.126
Fill Area (SF)	0.086
Cut Vol (CF)	11.4
Fill Vol (CF)	0.9
Cum Cut Vol (CF)	85.2
Cum Fill Vol (CF)	5.4
Net Vol (CF)	79.8



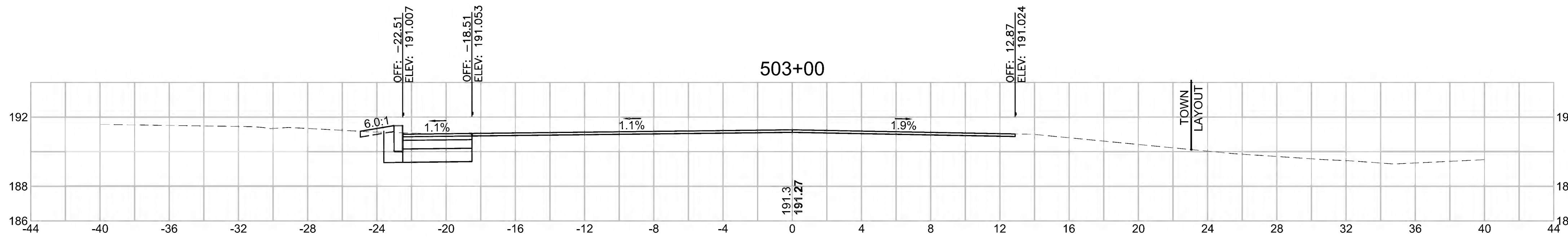
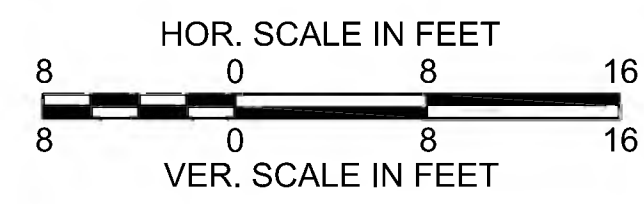
Total Volume at Station 501+75.00	
Cut Area (SF)	2.528
Fill Area (SF)	1.892
Cut Vol (CF)	11.4
Fill Vol (CF)	1.4
Cum Cut Vol (CF)	73.8
Cum Fill Vol (CF)	4.5
Net Vol (CF)	69.3



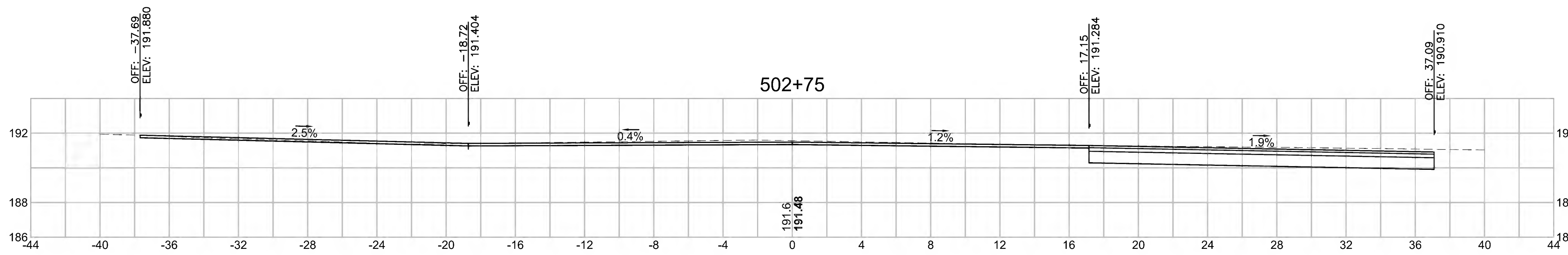
Total Volume at Station 501+50.00	
Cut Area (SF)	22.022
Fill Area (SF)	1.027
Cut Vol (CF)	19.1
Fill Vol (CF)	1.1
Cum Cut Vol (CF)	62.4
Cum Fill Vol (CF)	3.1
Net Vol (CF)	59.3



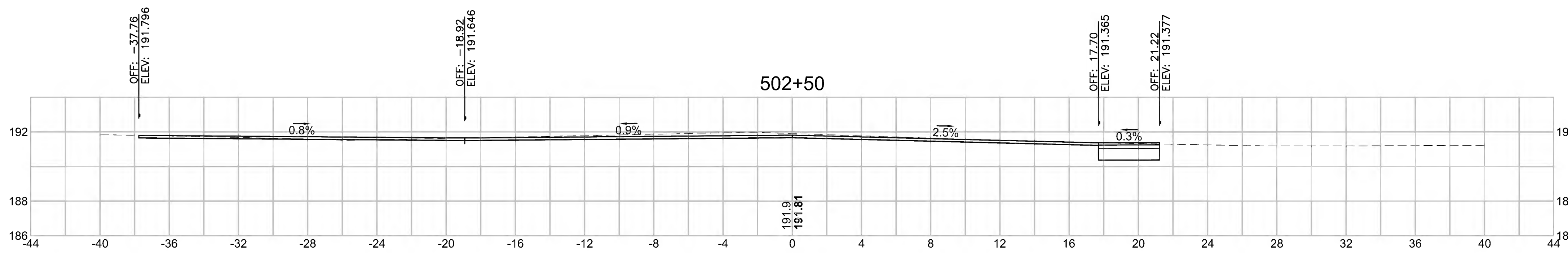
CROSS SECTIONS  
HUDSON ROAD



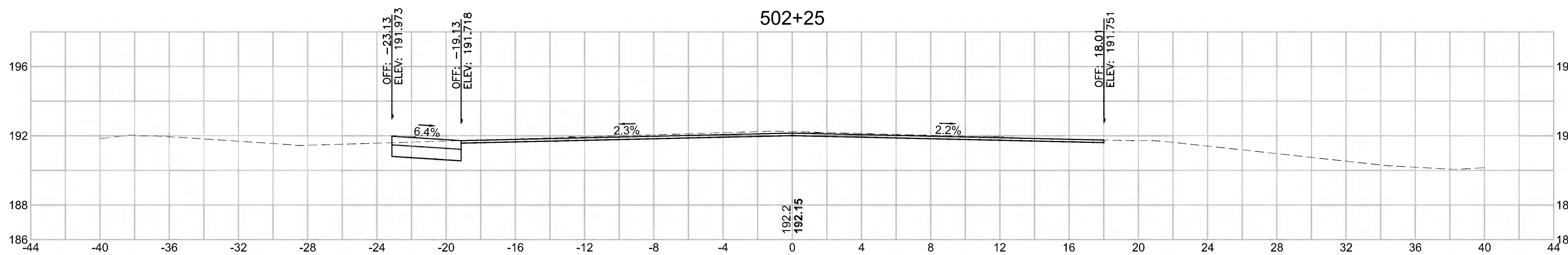
Total Volume at Station 503+00.00	
Cut Area (SF)	29,184
Fill Area (SF)	5,560
Cut Vol (CF)	29.8
Fill Vol (CF)	2.8
Cum Cut Vol (CF)	175.3
Cum Fill Vol (CF)	8.8
Net Vol (CF)	166.4



Total Volume at Station 502+75.00	
Cut Area (SF)	35,160
Fill Area (SF)	0,535
Cut Vol (CF)	26.6
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	145.5
Cum Fill Vol (CF)	6.0
Net Vol (CF)	139.5



Total Volume at Station 502+50.00	
Cut Area (SF)	22,276
Fill Area (SF)	0,000
Cut Vol (CF)	16.9
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	118.9
Cum Fill Vol (CF)	5.8
Net Vol (CF)	113.1



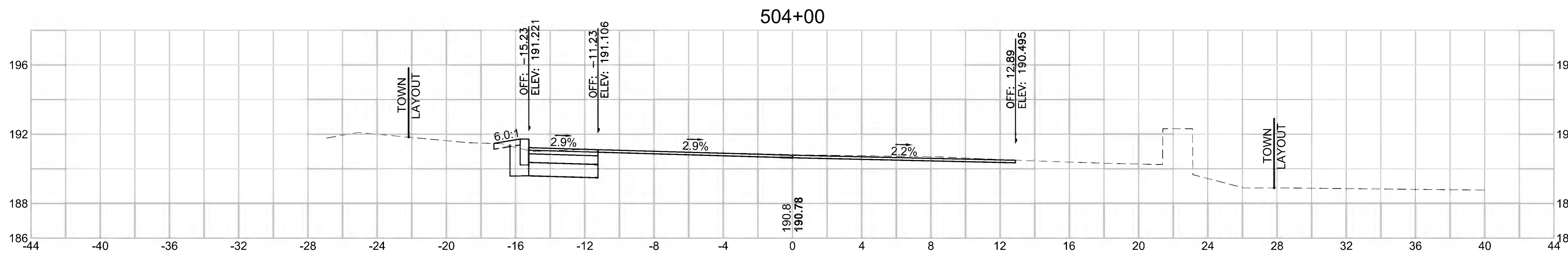
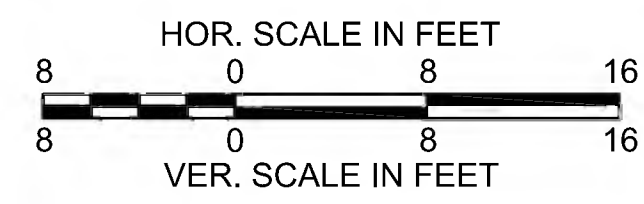
Total Volume at Station 502+25.00	
Cut Area (SF)	14,164
Fill Area (SF)	0,336
Cut Vol (CF)	16.8
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	102.0
Cum Fill Vol (CF)	5.6
Net Vol (CF)	96.4

SUDBURY  
BRUCE FREEMAN RAIL TRAIL

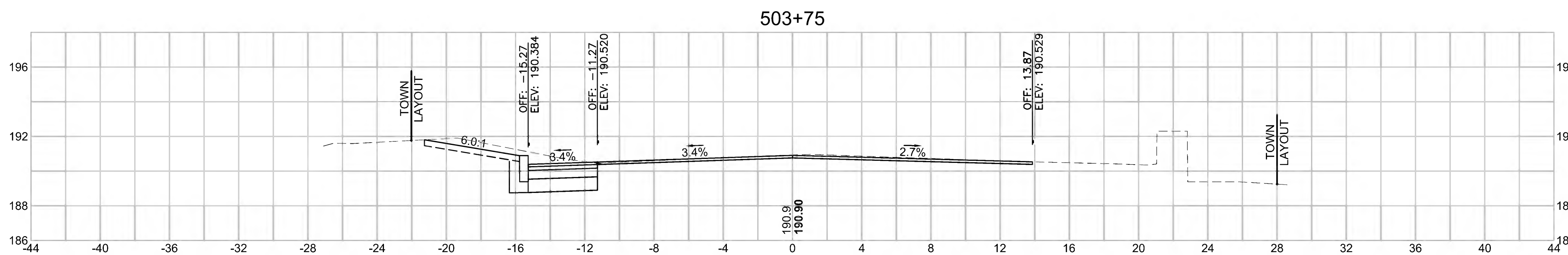
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	308	319

PROJECT FILE NO. 608164

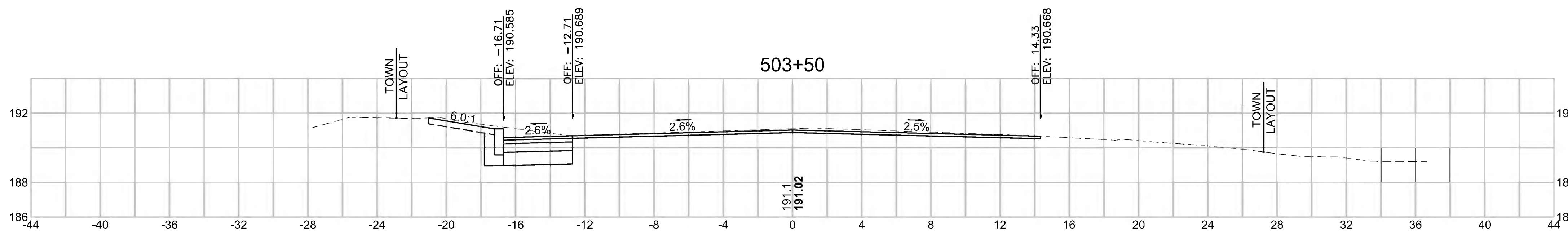
CROSS SECTIONS  
HUDSON ROAD



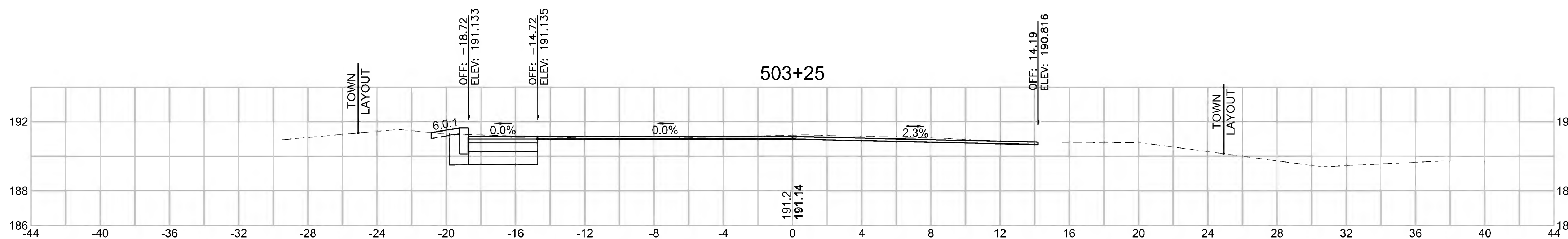
Total Volume at Station 504+00.00	
Cut Area (SF)	9.026
Fill Area (SF)	0.055
Cut Vol (CF)	16.0
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	239.4
Cum Fill Vol (CF)	13.8
Net Vol (CF)	225.6



Total Volume at Station 503+75.00	
Cut Area (SF)	25.454
Fill Area (SF)	0.000
Cut Vol (CF)	17.7
Fill Vol (CF)	0.2
Cum Cut Vol (CF)	223.4
Cum Fill Vol (CF)	13.8
Net Vol (CF)	209.6



Total Volume at Station 503+50.00	
Cut Area (SF)	12.869
Fill Area (SF)	0.405
Cut Vol (CF)	11.4
Fill Vol (CF)	1.2
Cum Cut Vol (CF)	205.7
Cum Fill Vol (CF)	13.6
Net Vol (CF)	192.1



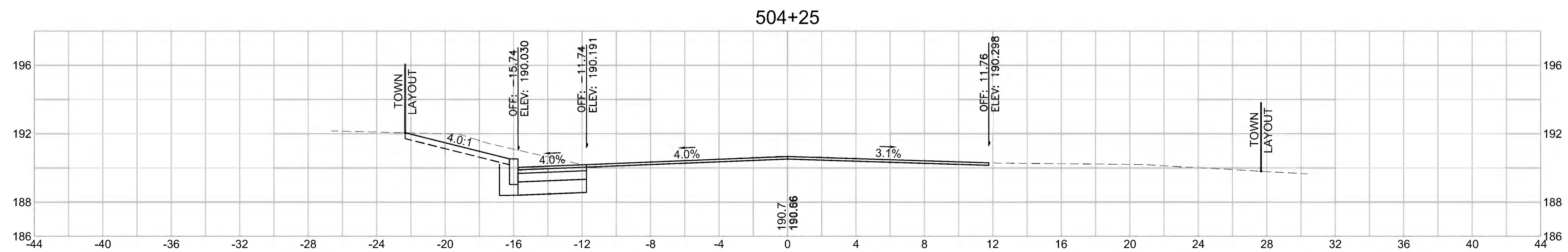
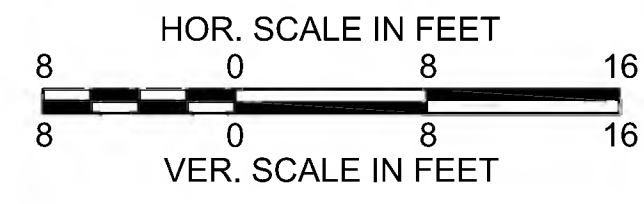
Total Volume at Station 503+25.00	
Cut Area (SF)	11.807
Fill Area (SF)	2.169
Cut Vol (CF)	19.0
Fill Vol (CF)	3.6
Cum Cut Vol (CF)	194.2
Cum Fill Vol (CF)	12.4
Net Vol (CF)	181.8



SUDBURY  
BRUCE FREEMAN RAIL TRAIL

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	309	319

PROJECT FILE NO. 608164  
CROSS SECTIONS  
HUDSON ROAD

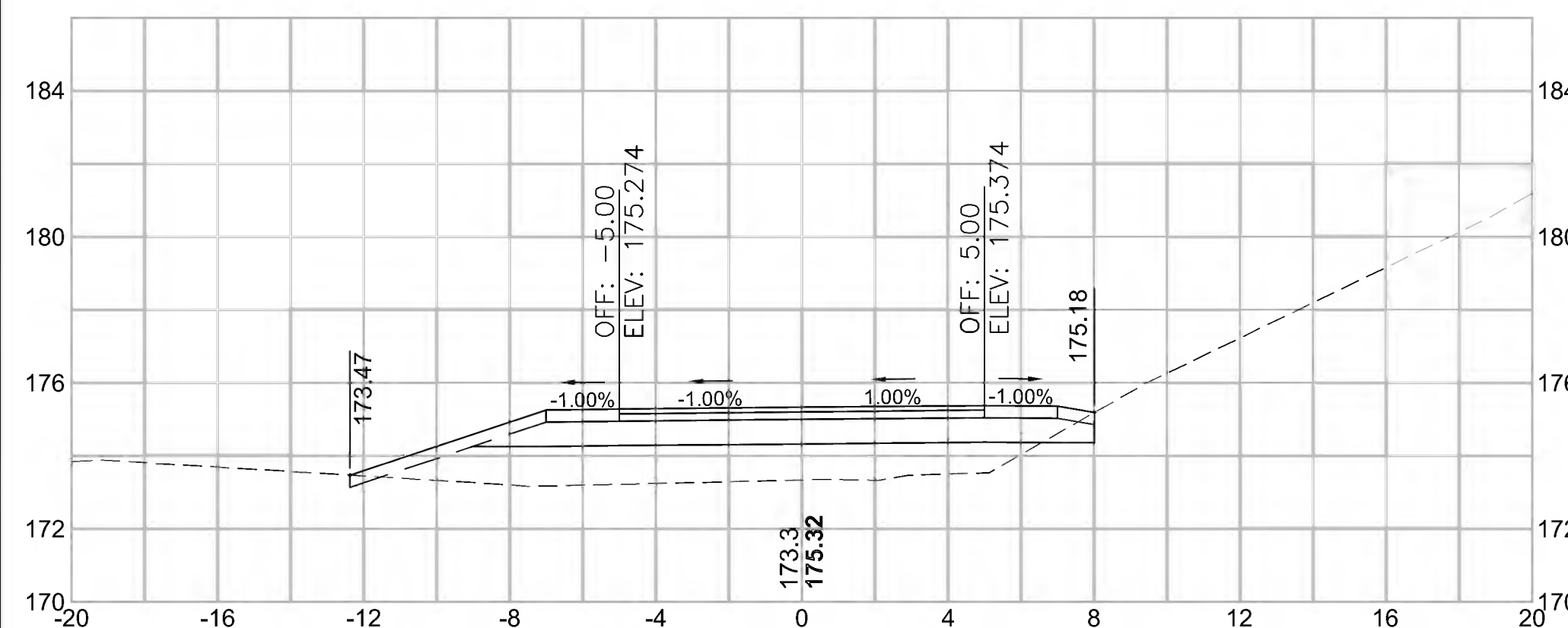


Total Volume at Station 504+25.00	
Cut Area (SF)	15.866
Fill Area (SF)	0.000
Cut Vol (CF)	11.5
Fill Vol (CF)	0.0
Cum Cut Vol (CF)	250.9
Cum Fill Vol (CF)	13.8
Net Vol (CF)	237.1

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	310	319
PROJECT FILE NO.		608164	

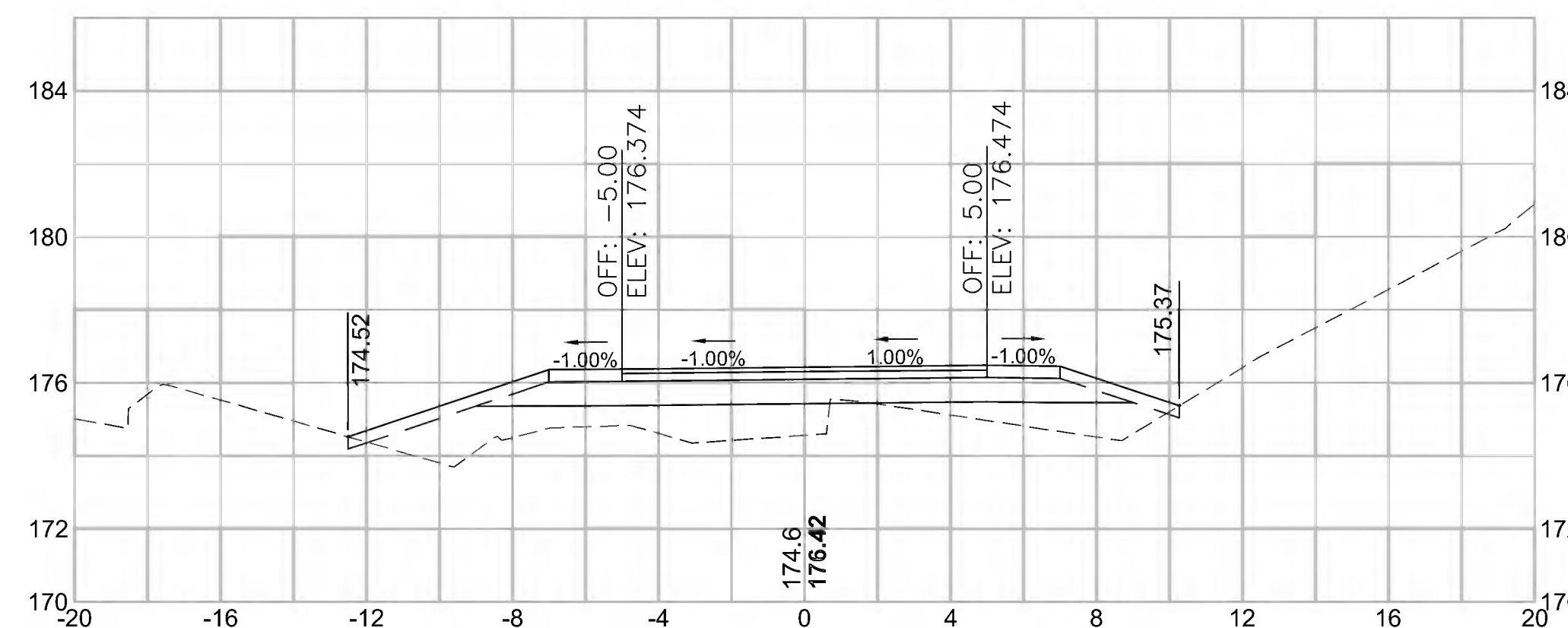
CROSS SECTIONS

2+00



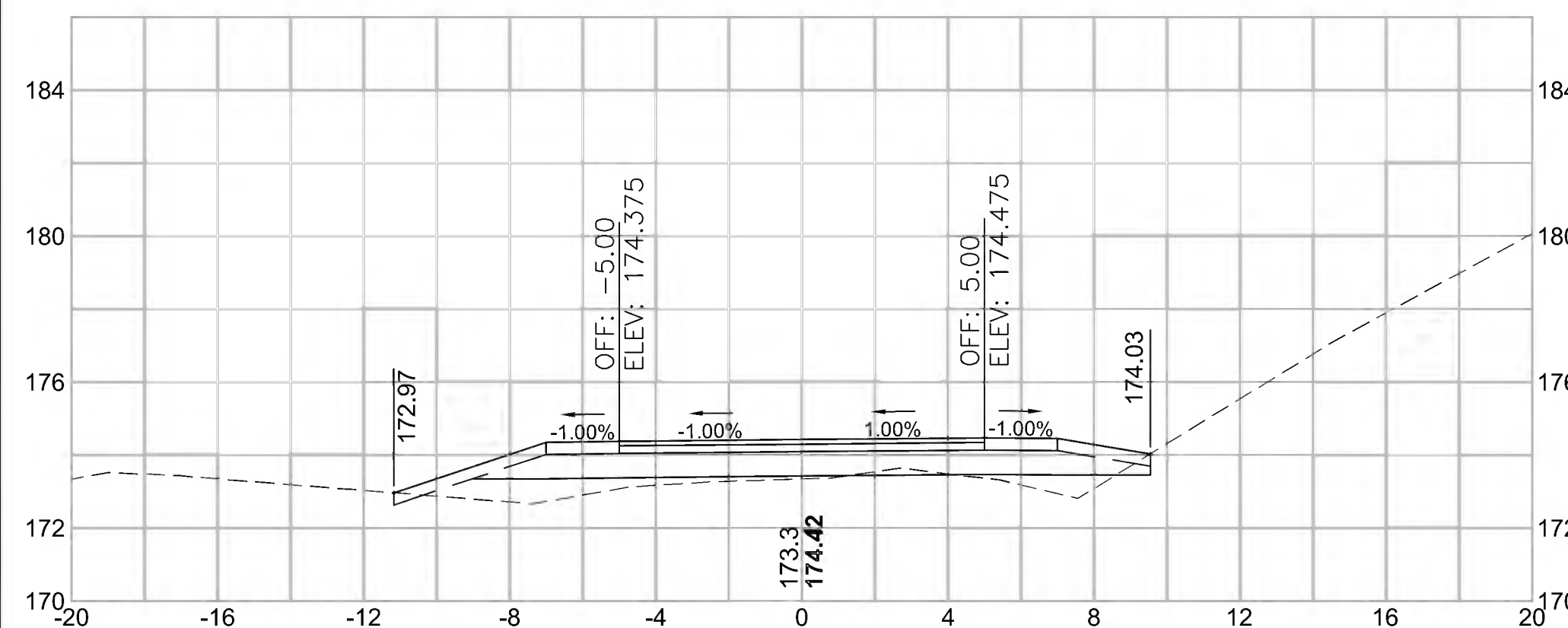
Total Volume at Station 2+00.00	
Cut Area (SF)	7.004
Fill Area (SF)	22.953
Cut Vol (CY)	12.9
Fill Vol (CY)	32.0
Cum Cut Vol (CY)	32.5
Cum Fill Vol (CY)	66.1
Net Vol (CY)	-33.6

3+50



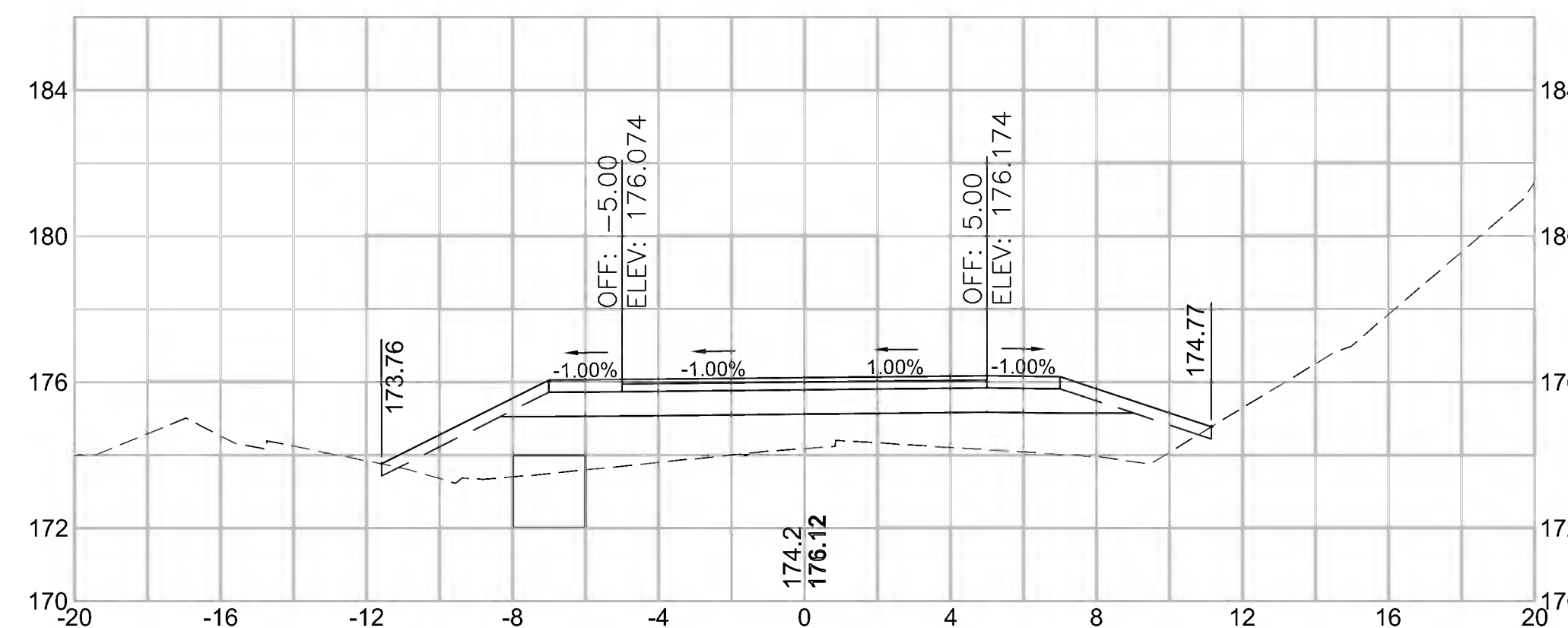
Total Volume at Station 3+50.00	
Cut Area (SF)	7.583
Fill Area (SF)	22.745
Cut Vol (CY)	14.0
Fill Vol (CY)	50.5
Cum Cut Vol (CY)	74.3
Cum Fill Vol (CY)	227.9
Net Vol (CY)	-153.6

1+50



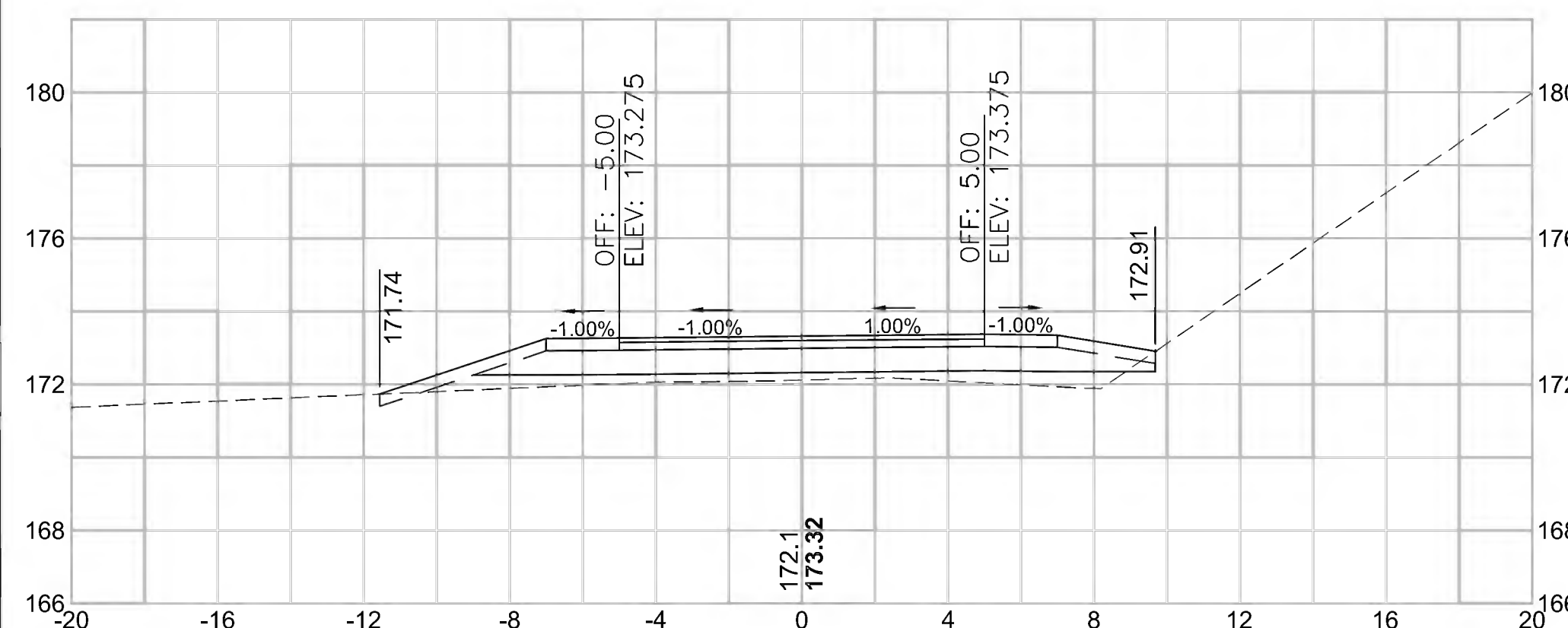
Total Volume at Station 1+50.00	
Cut Area (SF)	6.945
Fill Area (SF)	11.633
Cut Vol (CY)	6.4
Fill Vol (CY)	11.0
Cum Cut Vol (CY)	19.5
Cum Fill Vol (CY)	34.1
Net Vol (CY)	-14.5

3+00



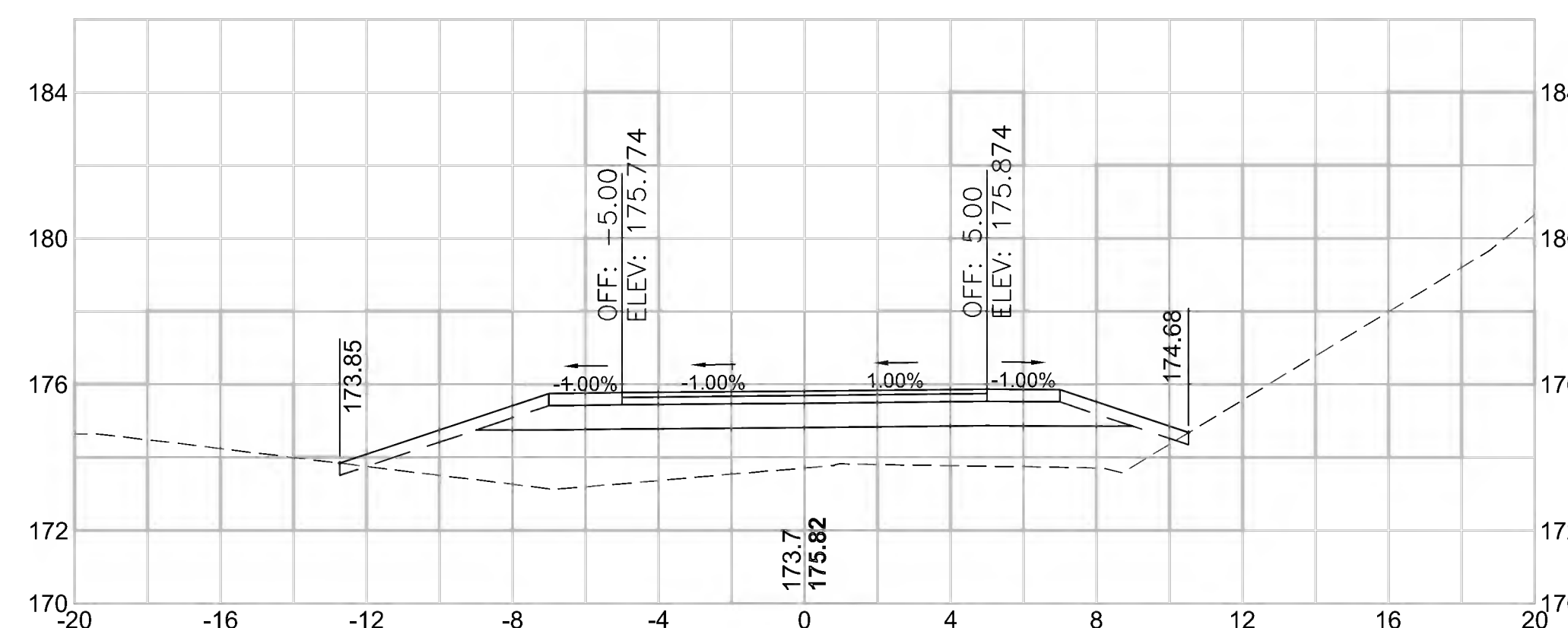
Total Volume at Station 3+00.00	
Cut Area (SF)	7.570
Fill Area (SF)	31.821
Cut Vol (CY)	14.2
Fill Vol (CY)	59.8
Cum Cut Vol (CY)	60.3
Cum Fill Vol (CY)	177.4
Net Vol (CY)	-117.1

1+00

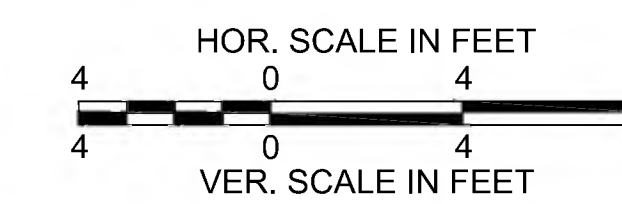


Total Volume at Station 1+00.00	
Cut Area (SF)	7.105
Fill Area (SF)	12.542
Cut Vol (CY)	6.6
Fill Vol (CY)	11.6
Cum Cut Vol (CY)	6.6
Cum Fill Vol (CY)	11.6
Net Vol (CY)	-5.0

2+50



Total Volume at Station 2+50.00	
Cut Area (SF)	7.743
Fill Area (SF)	32.725
Cut Vol (CY)	13.7
Fill Vol (CY)	51.6
Cum Cut Vol (CY)	46.1
Cum Fill Vol (CY)	117.6
Net Vol (CY)	-71.5

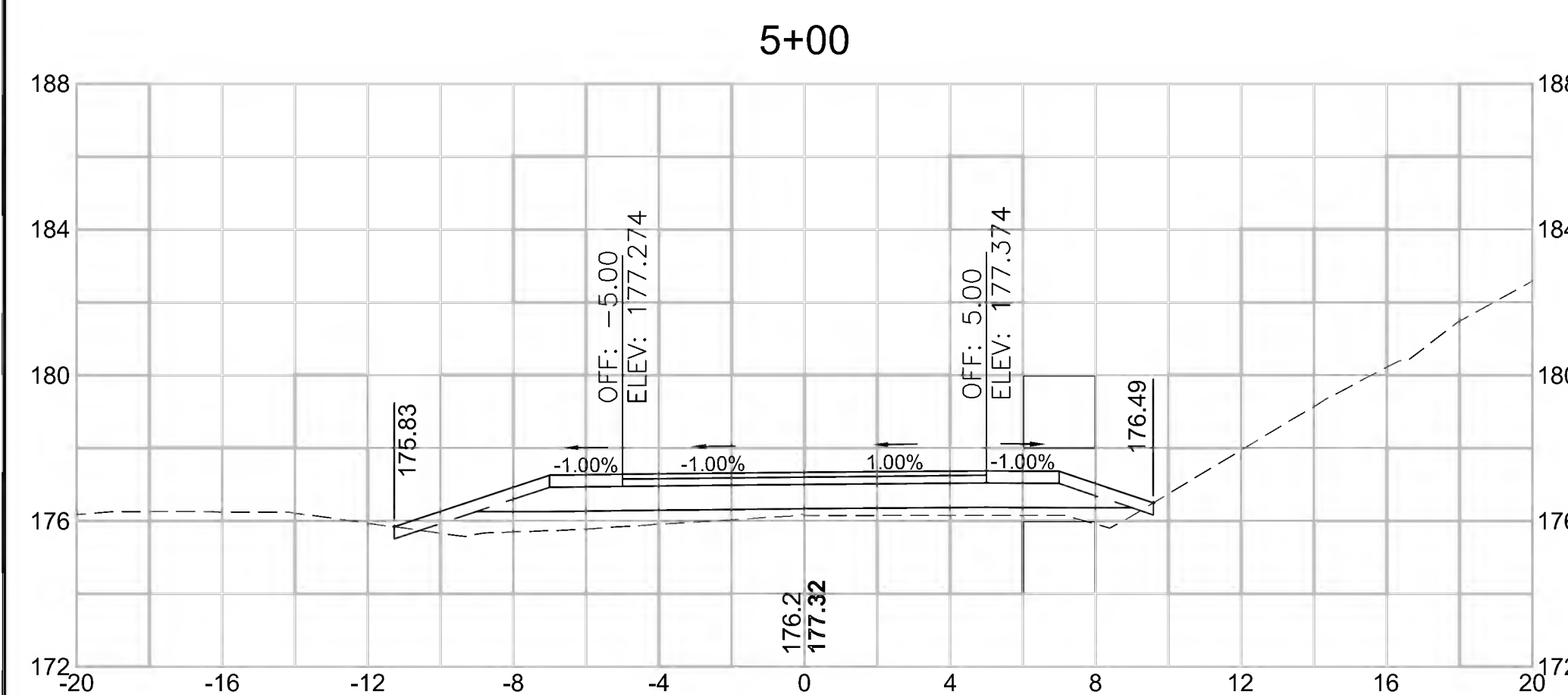




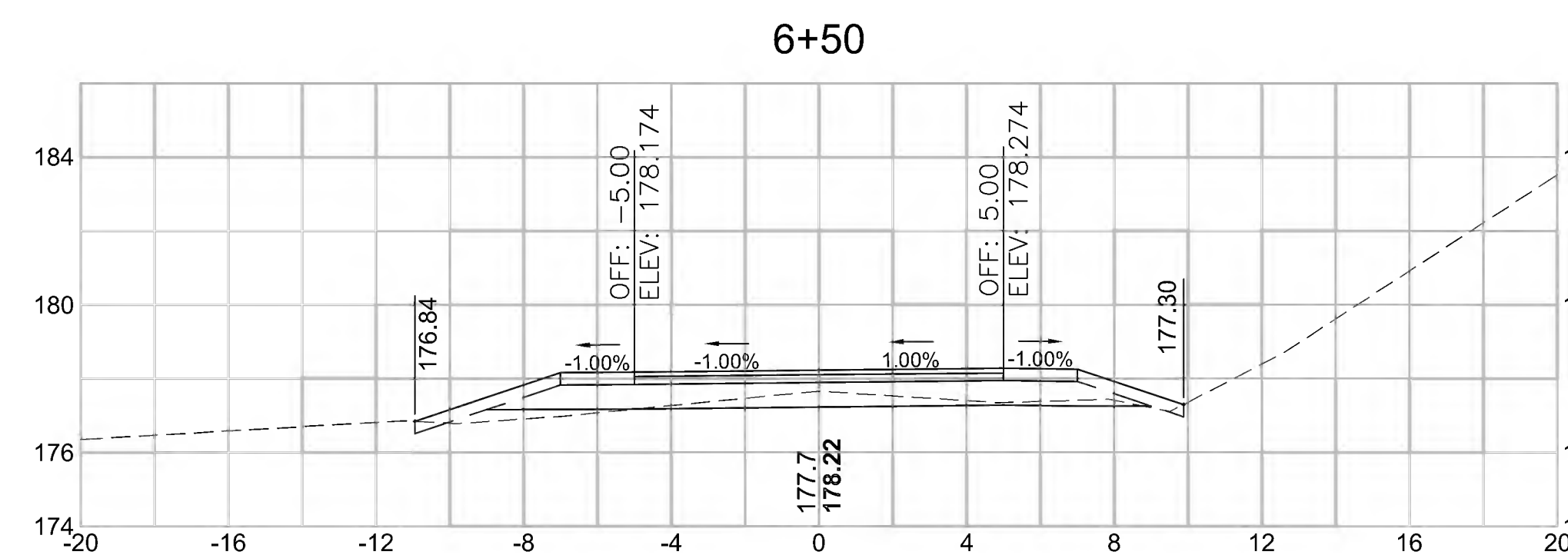
CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	311	319
PROJECT FILE NO.		608164	

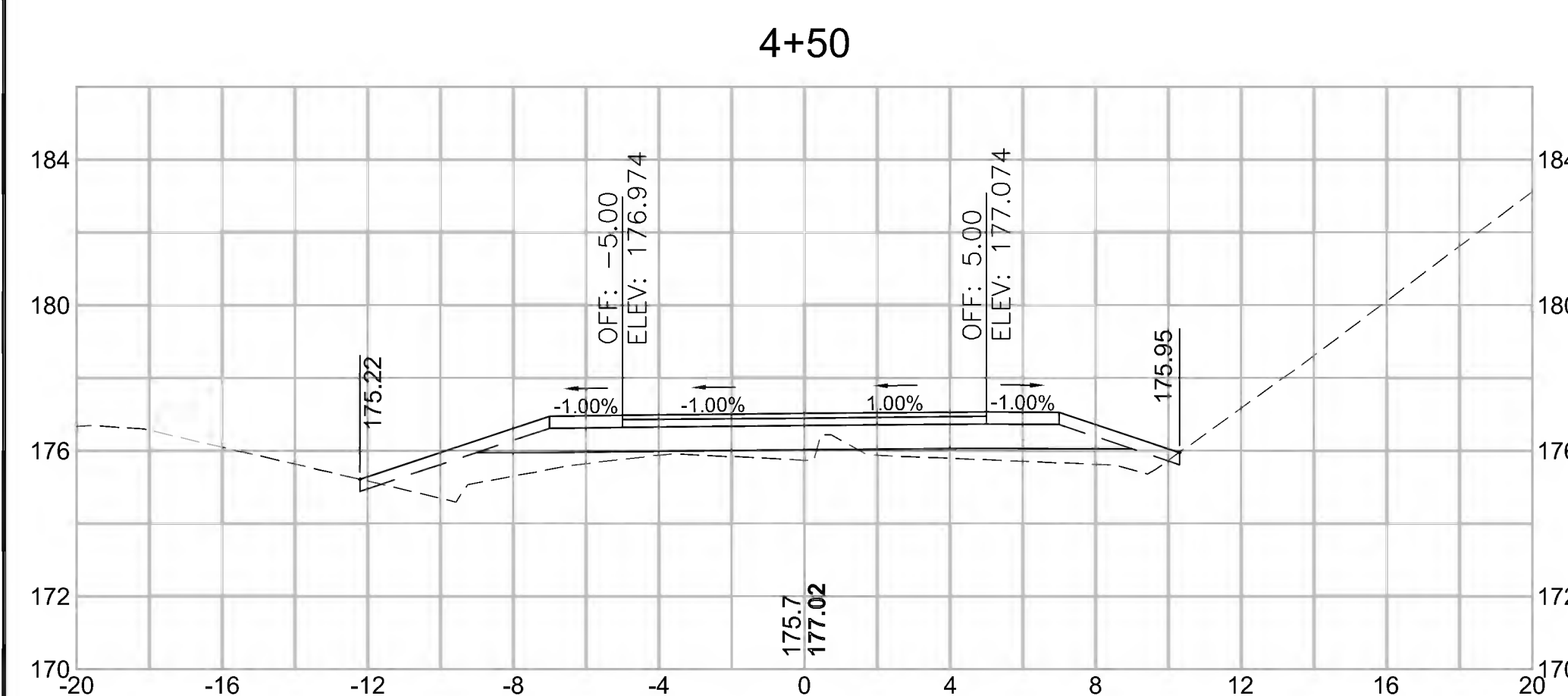
CROSS SECTIONS



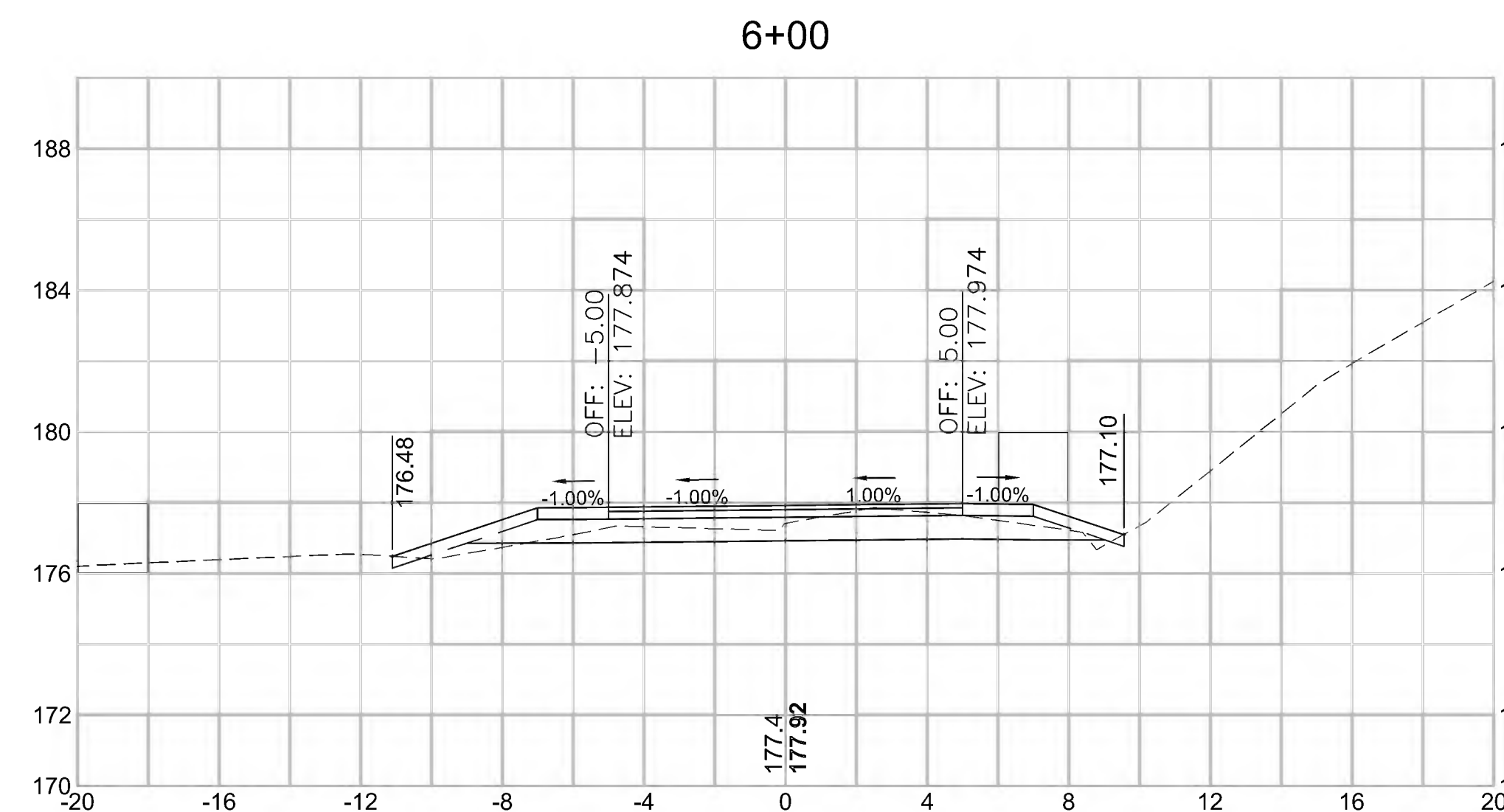
Total Volume at Station 5+00.00	
Cut Area (SF)	6.944
Fill Area (SF)	13.193
Cut Vol (CY)	13.4
Fill Vol (CY)	26.2
Cum Cut Vol (CY)	115.5
Cum Fill Vol (CY)	321.2
Net Vol (CY)	-205.7



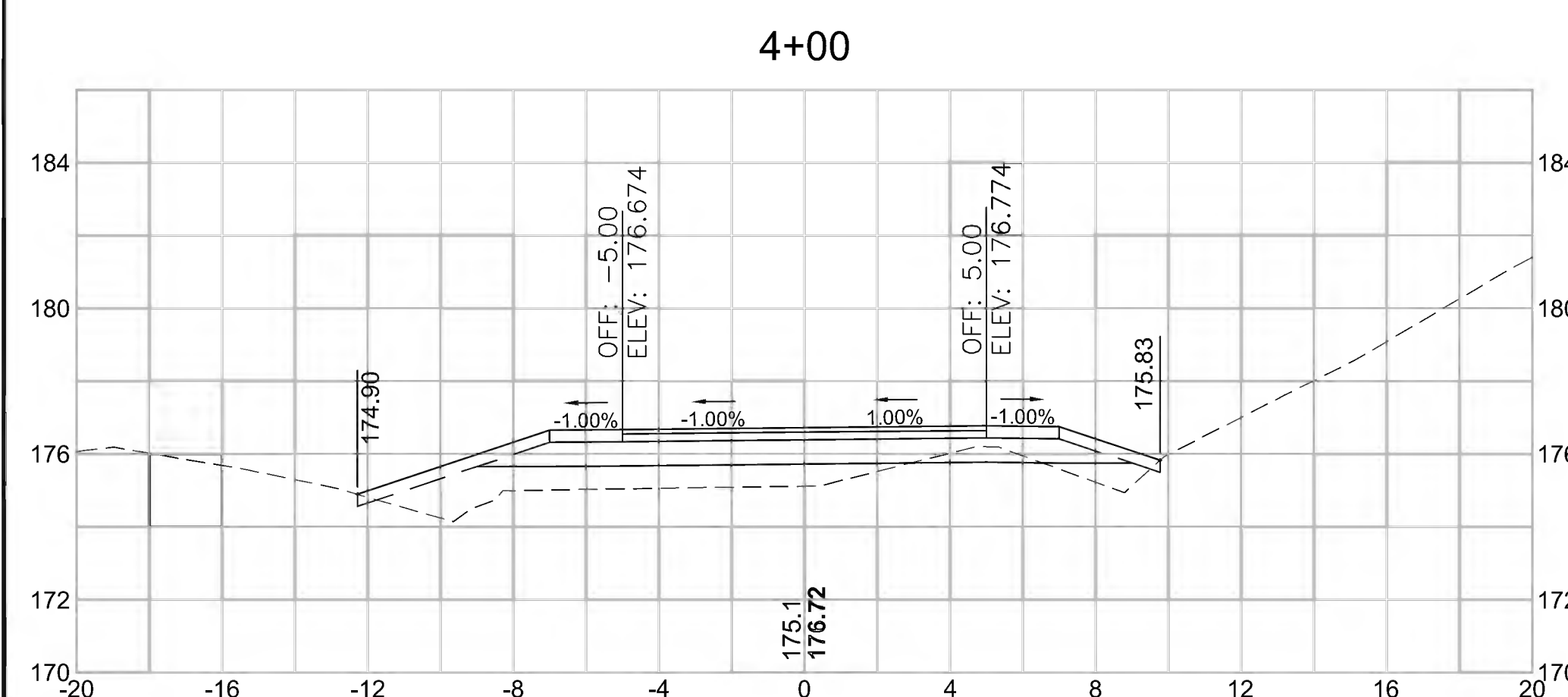
Total Volume at Station 6+50.00	
Cut Area (SF)	7.059
Fill Area (SF)	5.676
Cut Vol (CY)	15.5
Fill Vol (CY)	7.5
Cum Cut Vol (CY)	159.3
Cum Fill Vol (CY)	360.9
Net Vol (CY)	-201.6



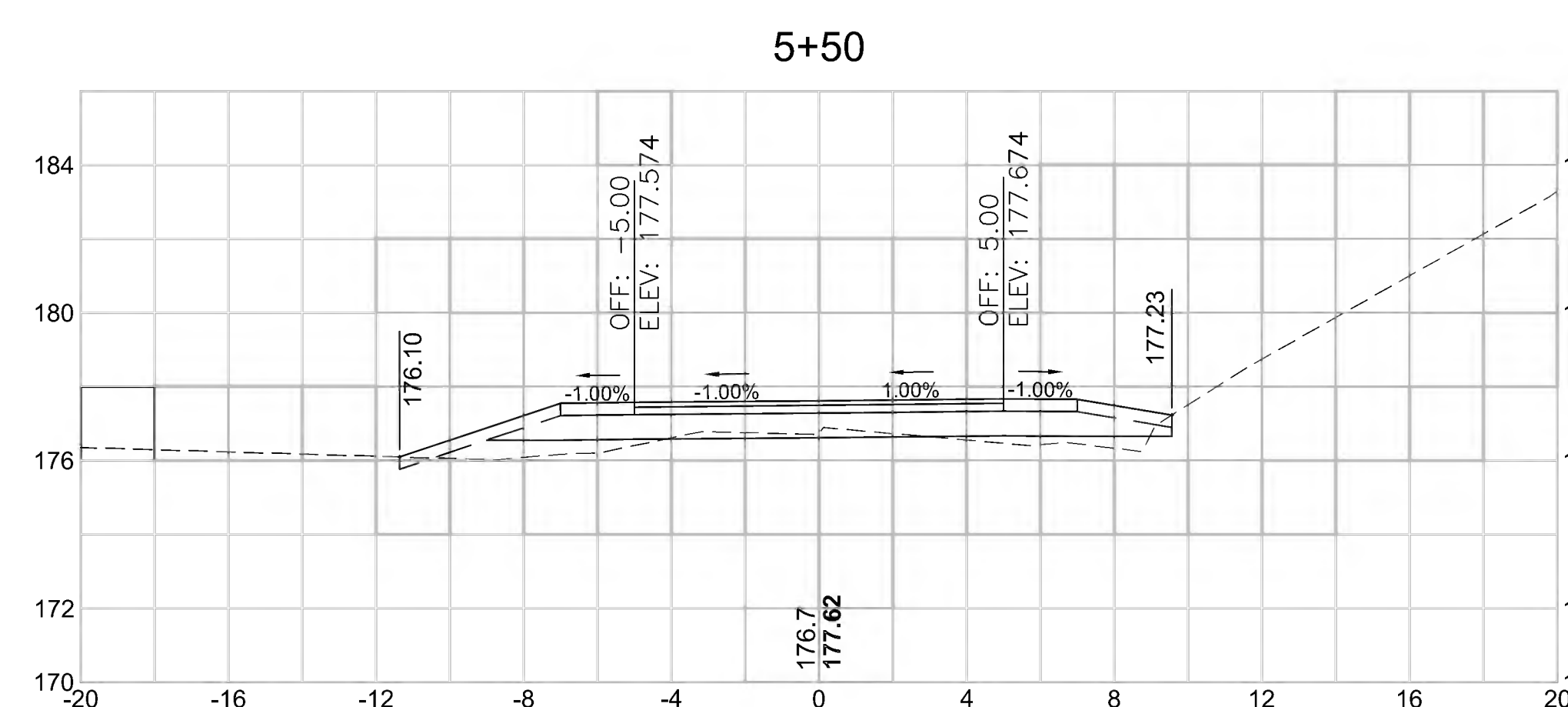
Total Volume at Station 4+50.00	
Cut Area (SF)	7.526
Fill Area (SF)	15.131
Cut Vol (CY)	13.8
Fill Vol (CY)	30.0
Cum Cut Vol (CY)	102.1
Cum Fill Vol (CY)	295.0
Net Vol (CY)	-192.9



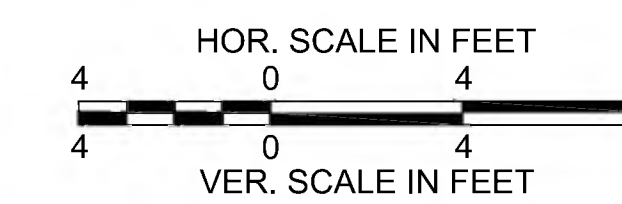
Total Volume at Station 6+00.00	
Cut Area (SF)	9.639
Fill Area (SF)	2.378
Cut Vol (CY)	15.4
Fill Vol (CY)	11.1
Cum Cut Vol (CY)	143.8
Cum Fill Vol (CY)	353.5
Net Vol (CY)	-209.6



Total Volume at Station 4+00.00	
Cut Area (SF)	7.432
Fill Area (SF)	17.266
Cut Vol (CY)	13.9
Fill Vol (CY)	37.0
Cum Cut Vol (CY)	88.2
Cum Fill Vol (CY)	265.0
Net Vol (CY)	-176.8

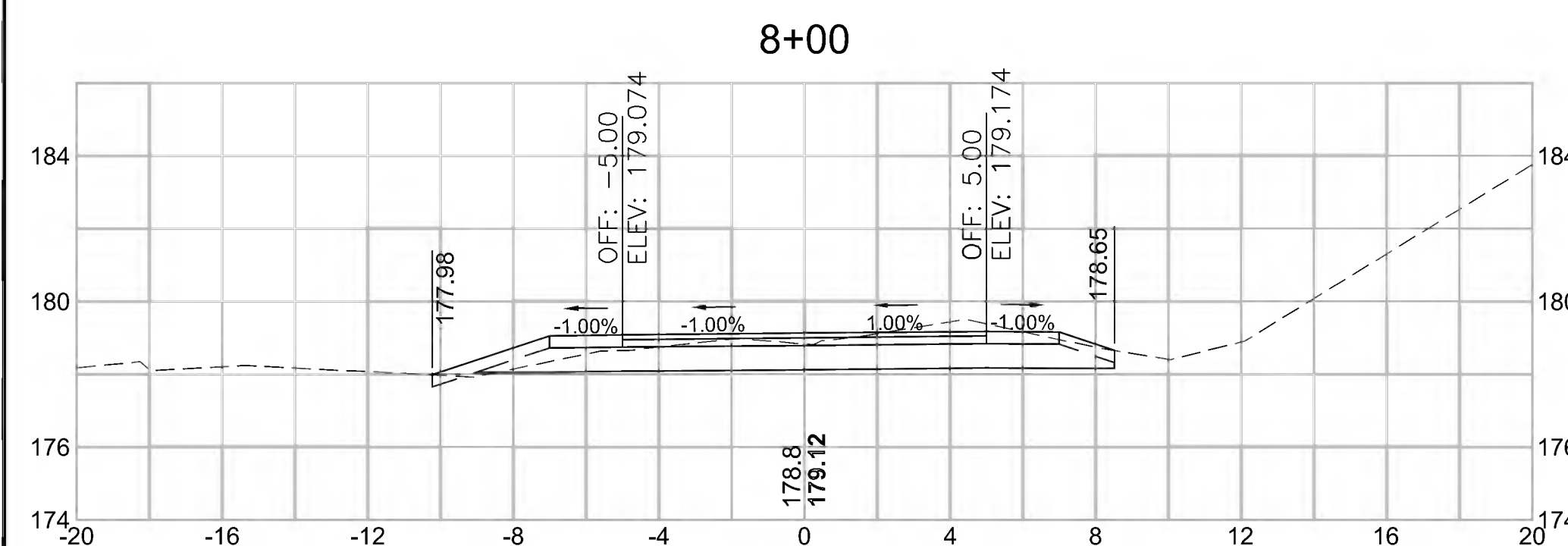


Total Volume at Station 5+50.00	
Cut Area (SF)	7.015
Fill Area (SF)	9.628
Cut Vol (CY)	12.9
Fill Vol (CY)	21.1
Cum Cut Vol (CY)	128.4
Cum Fill Vol (CY)	342.3
Net Vol (CY)	-213.9

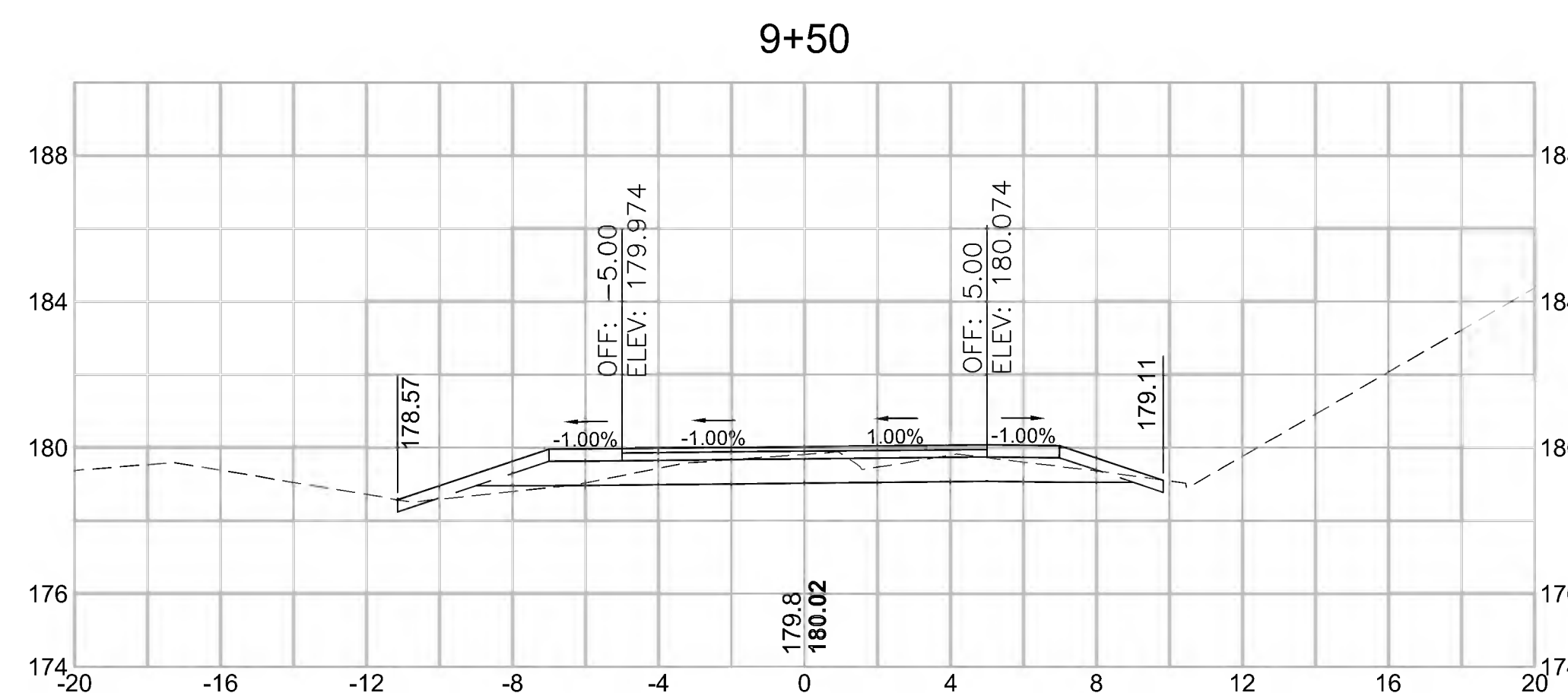


STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	312	319
PROJECT FILE NO.		608164	

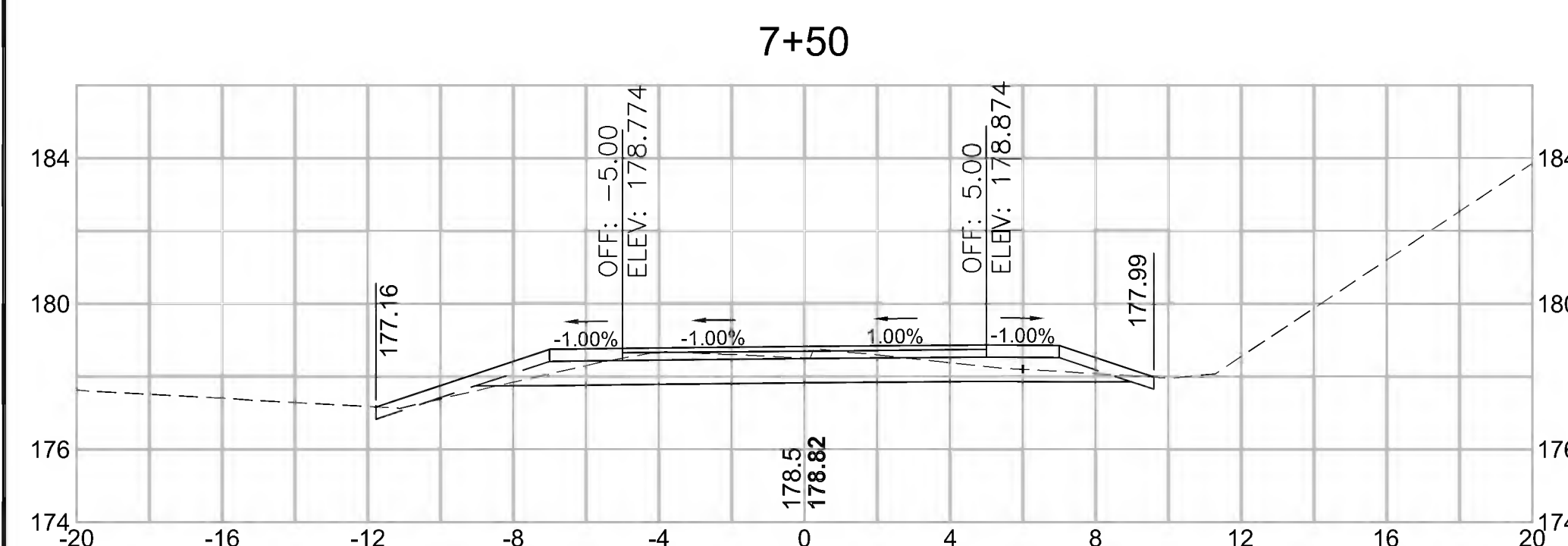
CROSS SECTIONS



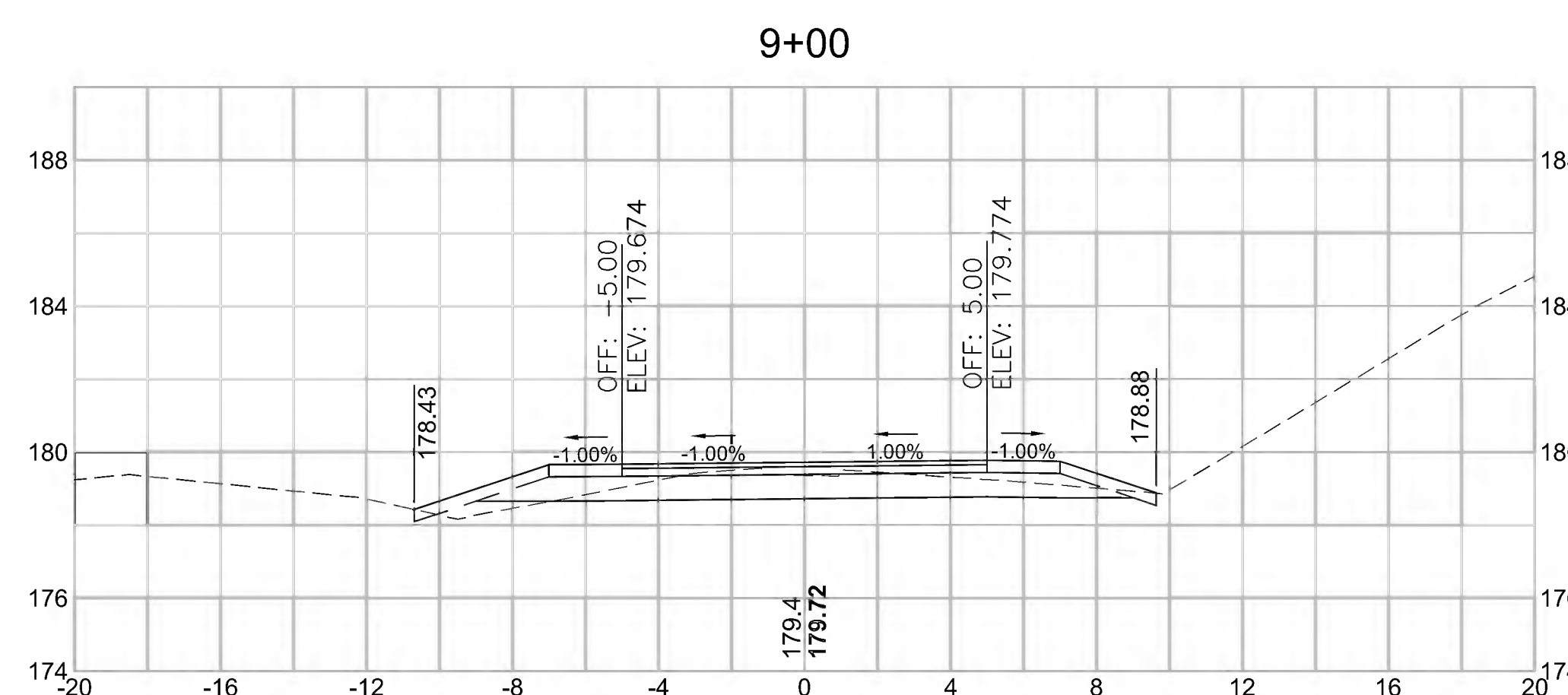
Total Volume at Station 8+00.00	
Cut Area (SF)	13.893
Fill Area (SF)	0.790
Cut Vol (CY)	23.6
Fill Vol (CY)	2.9
Cum Cut Vol (CY)	226.3
Cum Fill Vol (CY)	381.3
Net Vol (CY)	-155.1



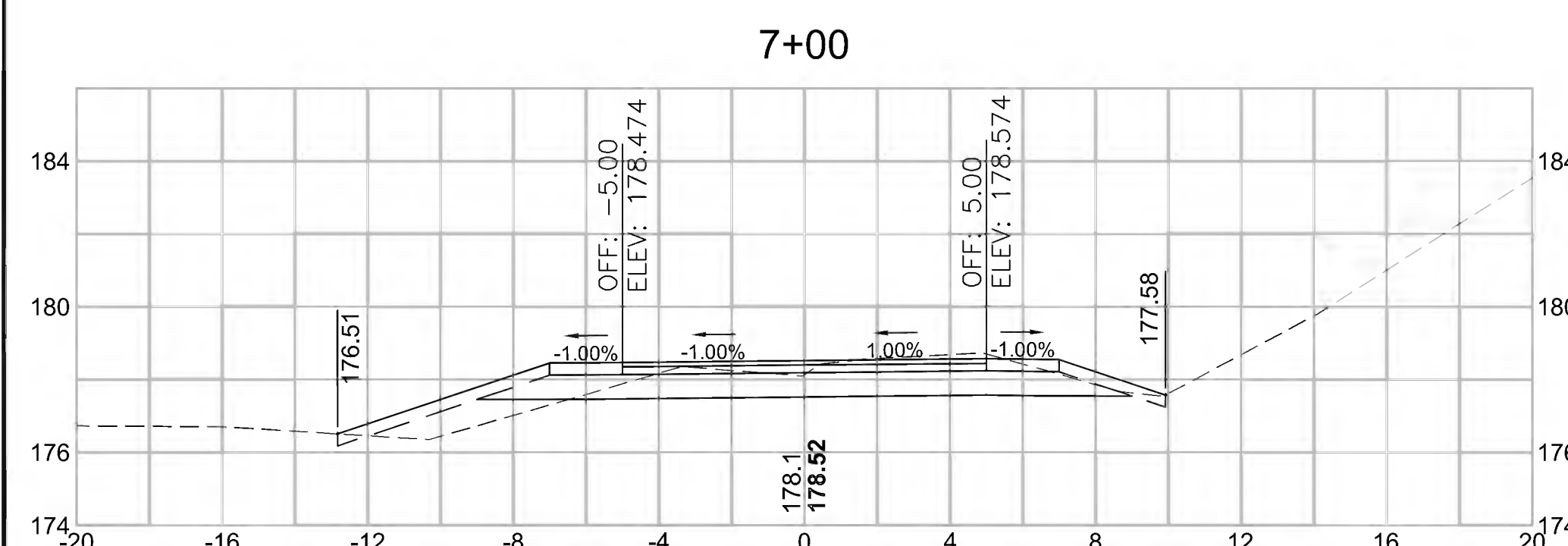
Total Volume at Station 9+50.00	
Cut Area (SF)	10.262
Fill Area (SF)	3.063
Cut Vol (CY)	18.8
Fill Vol (CY)	5.0
Cum Cut Vol (CY)	291.4
Cum Fill Vol (CY)	392.7
Net Vol (CY)	-101.4



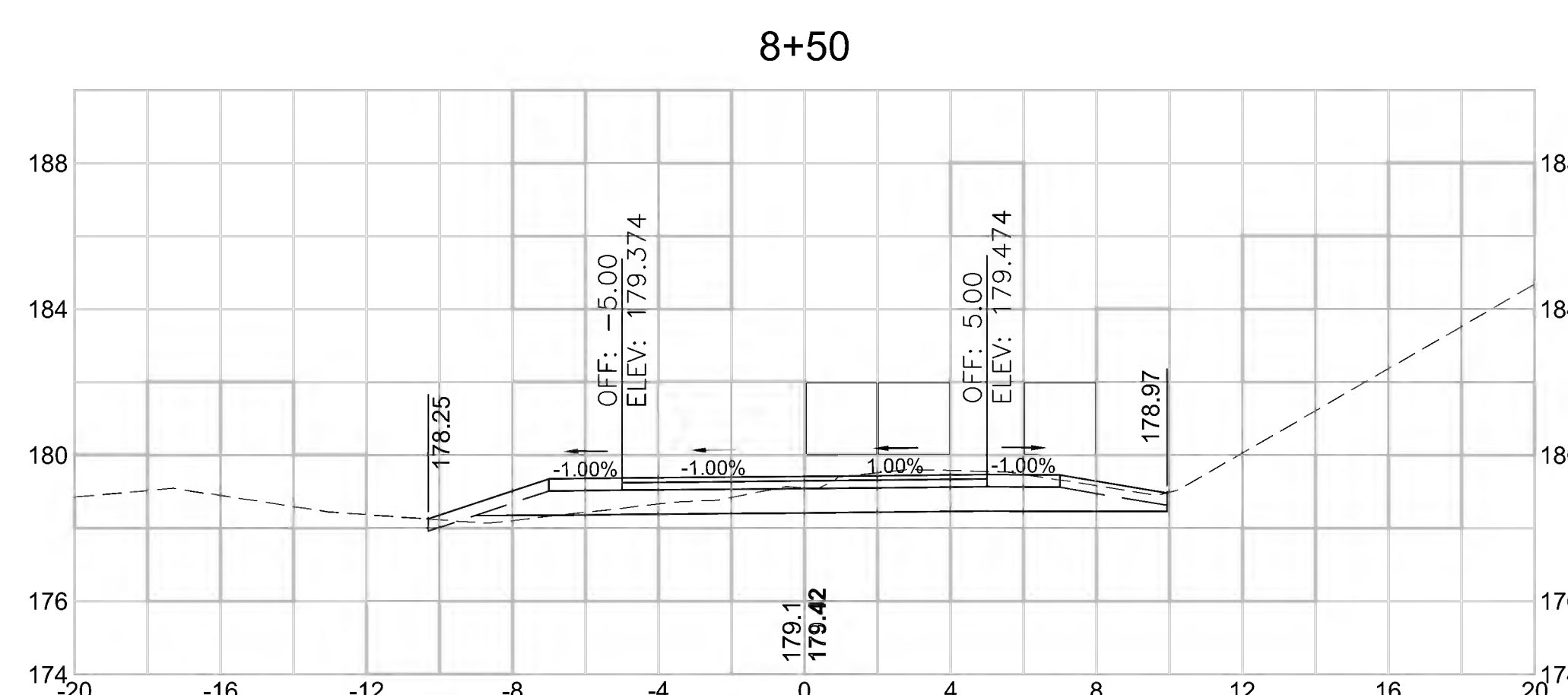
Total Volume at Station 7+50.00	
Cut Area (SF)	11.605
Fill Area (SF)	2.296
Cut Vol (CY)	23.8
Fill Vol (CY)	7.2
Cum Cut Vol (CY)	202.7
Cum Fill Vol (CY)	378.5
Net Vol (CY)	-175.8



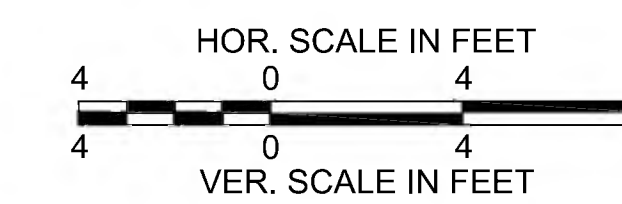
Total Volume at Station 9+00.00	
Cut Area (SF)	10.017
Fill Area (SF)	2.326
Cut Vol (CY)	21.4
Fill Vol (CY)	3.9
Cum Cut Vol (CY)	272.6
Cum Fill Vol (CY)	387.8
Net Vol (CY)	-115.2



Total Volume at Station 7+00.00	
Cut Area (SF)	14.090
Fill Area (SF)	5.492
Cut Vol (CY)	19.6
Fill Vol (CY)	10.3
Cum Cut Vol (CY)	178.9
Cum Fill Vol (CY)	371.2
Net Vol (CY)	-192.4



Total Volume at Station 8+50.00	
Cut Area (SF)	13.075
Fill Area (SF)	1.921
Cut Vol (CY)	25.0
Fill Vol (CY)	2.5
Cum Cut Vol (CY)	251.2
Cum Fill Vol (CY)	383.8
Net Vol (CY)	-132.6

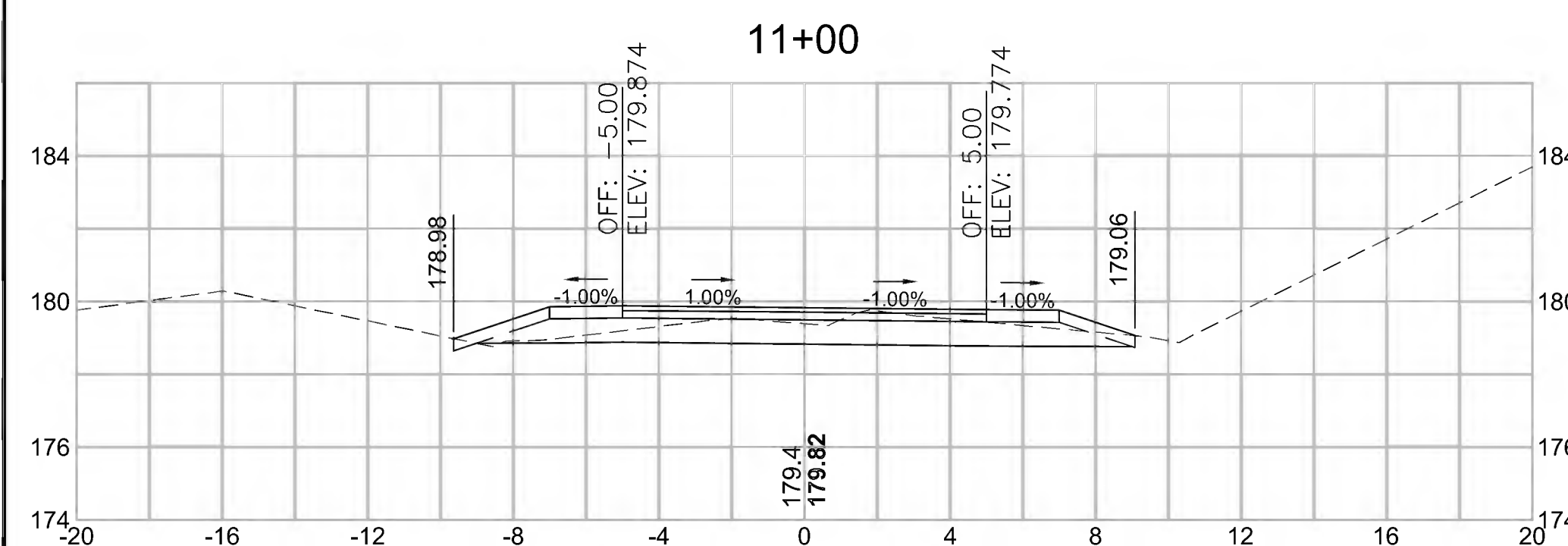




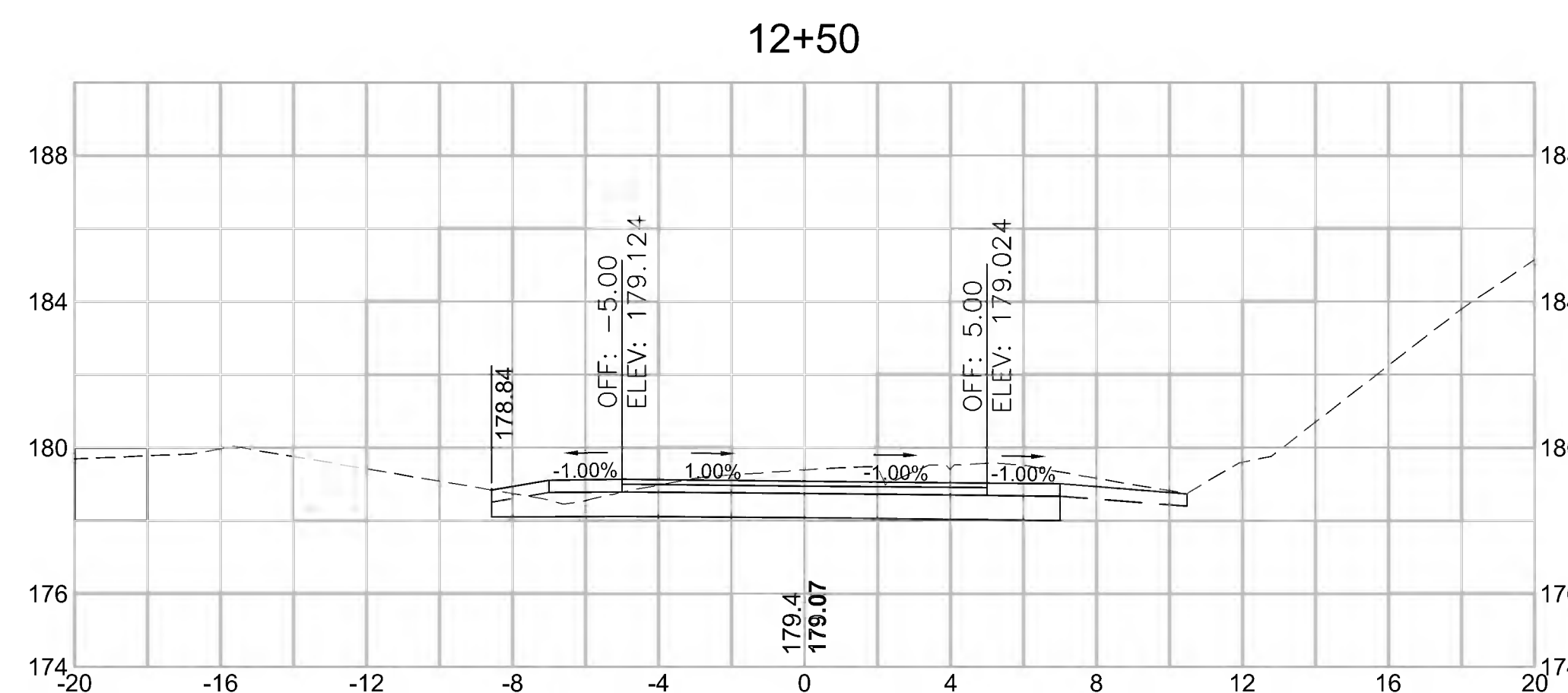
CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	313	319
PROJECT FILE NO.		608164	

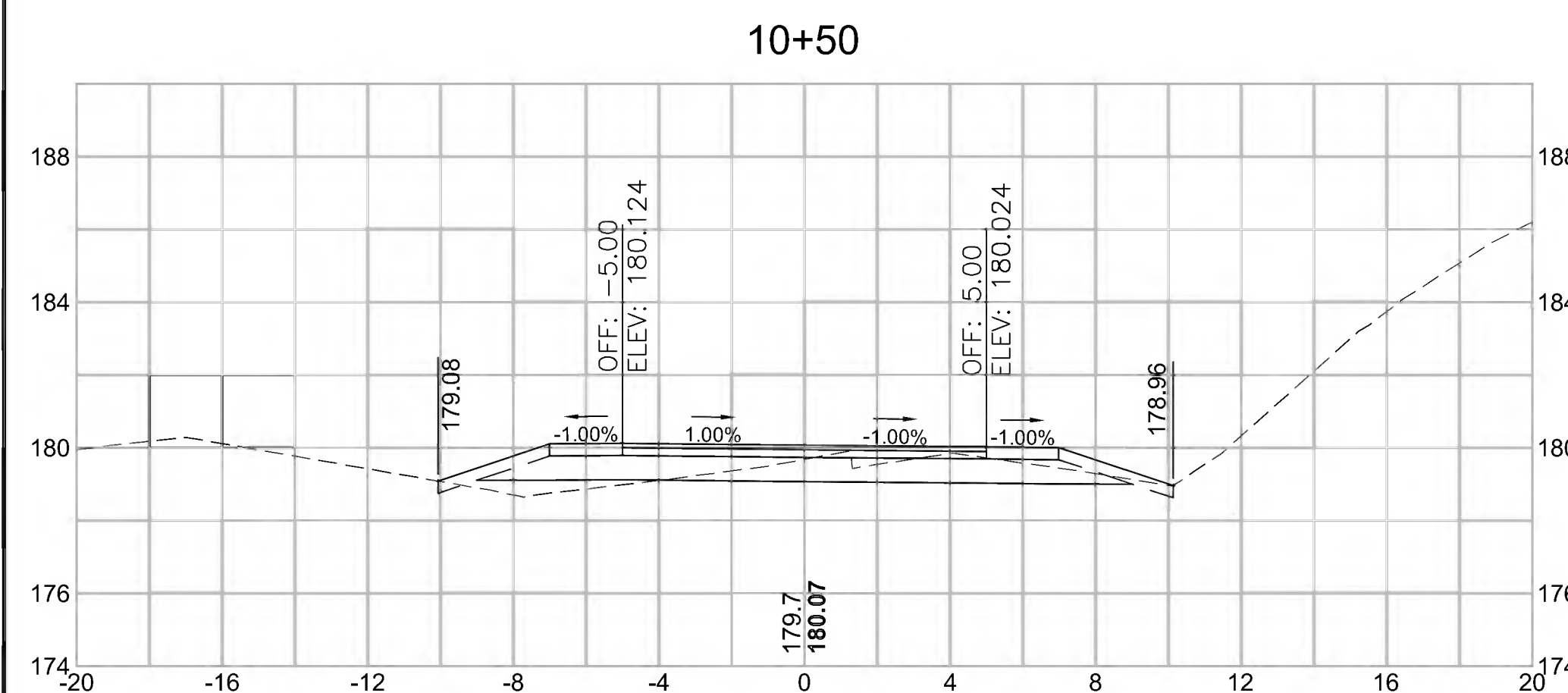
CROSS SECTIONS



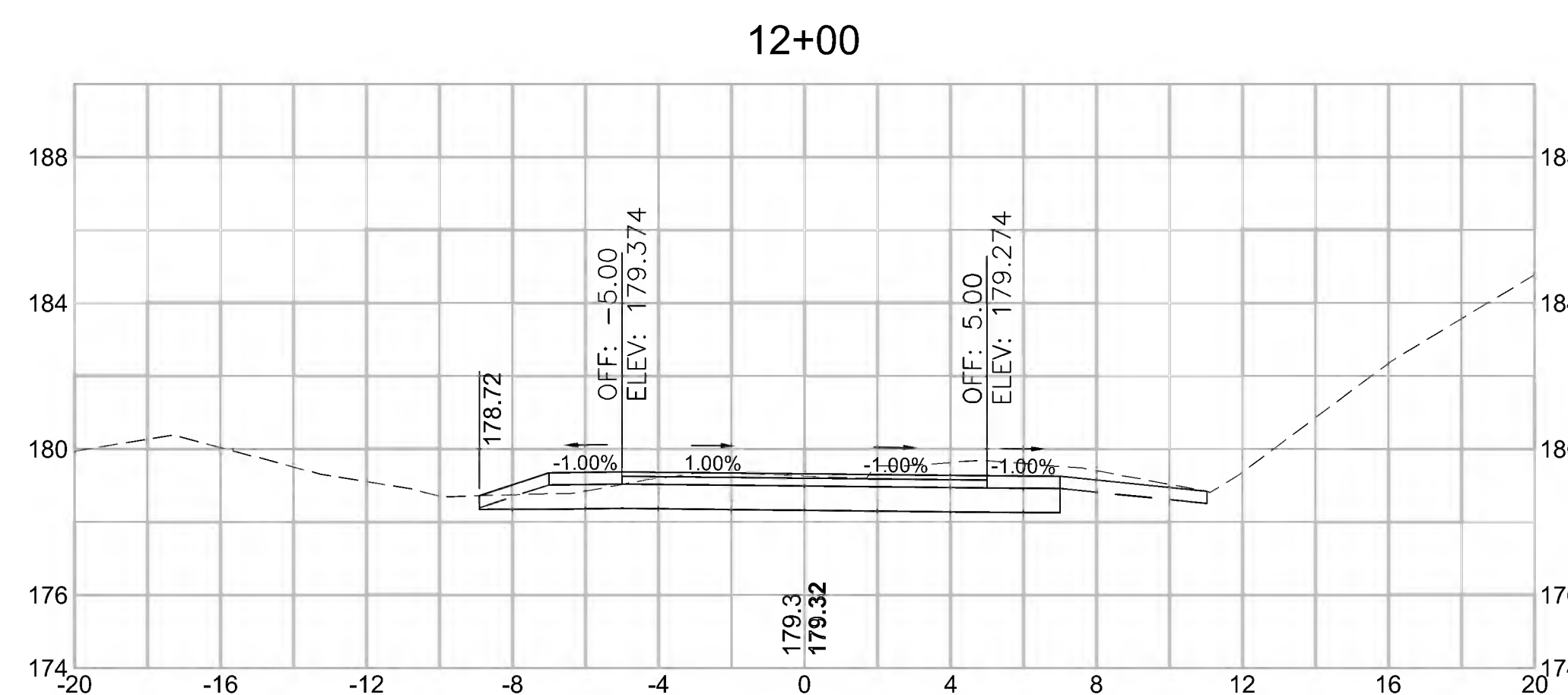
Total Volume at Station 11+00.00	
Cut Area (SF)	10.051
Fill Area (SF)	0.982
Cut Vol (CY)	17.7
Fill Vol (CY)	4.5
Cum Cut Vol (CY)	343.9
Cum Fill Vol (CY)	408.8
Net Vol (CY)	-64.9



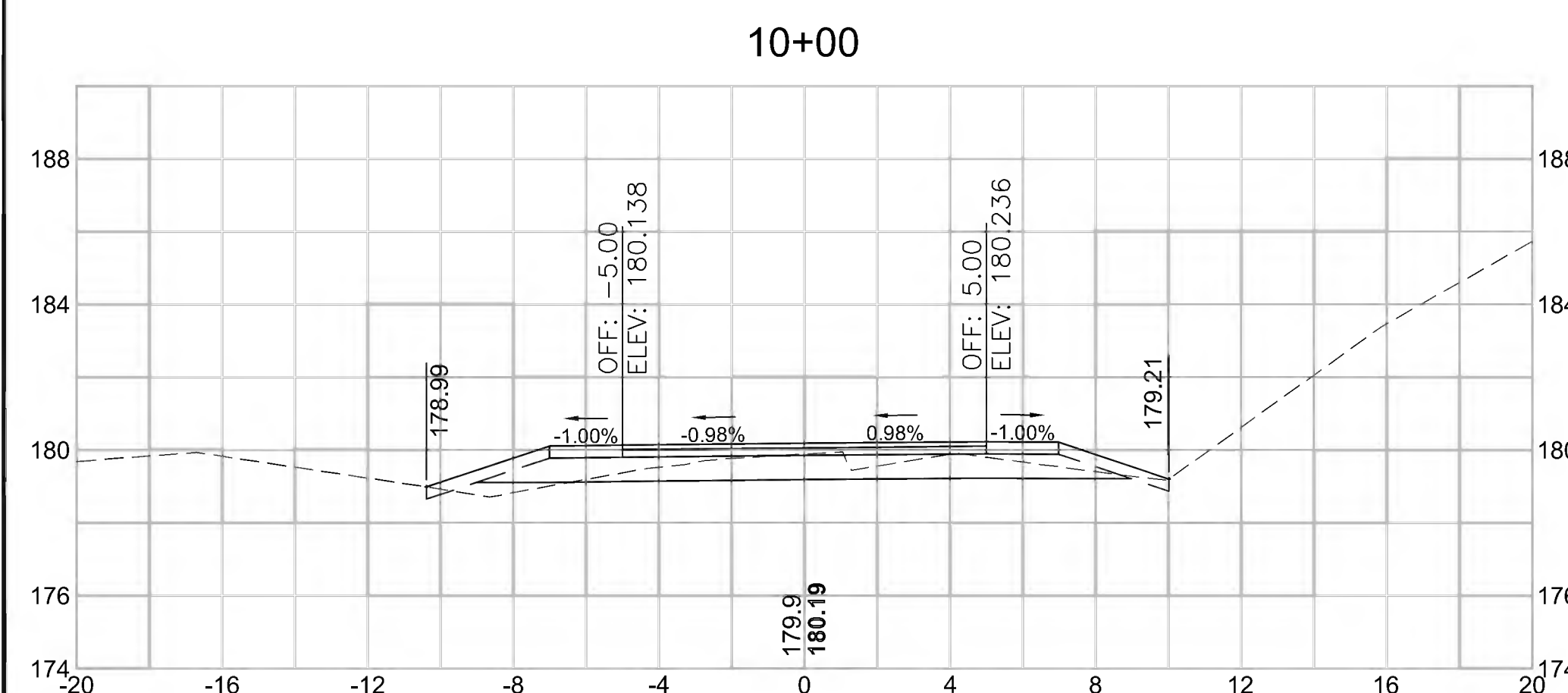
Total Volume at Station 12+50.00	
Cut Area (SF)	18.691
Fill Area (SF)	0.000
Cut Vol (CY)	32.9
Fill Vol (CY)	0.0
Cum Cut Vol (CY)	427.6
Cum Fill Vol (CY)	409.8
Net Vol (CY)	17.7



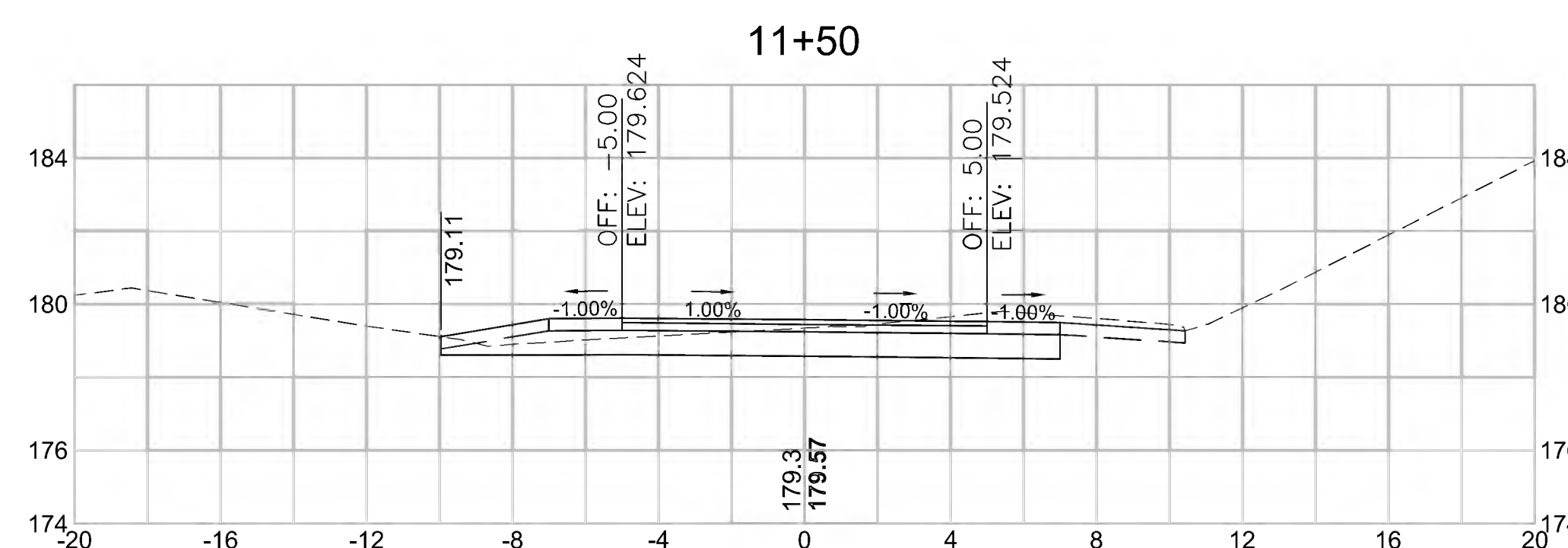
Total Volume at Station 10+50.00	
Cut Area (SF)	9.059
Fill Area (SF)	3.926
Cut Vol (CY)	16.8
Fill Vol (CY)	6.1
Cum Cut Vol (CY)	326.2
Cum Fill Vol (CY)	404.2
Net Vol (CY)	-78.1



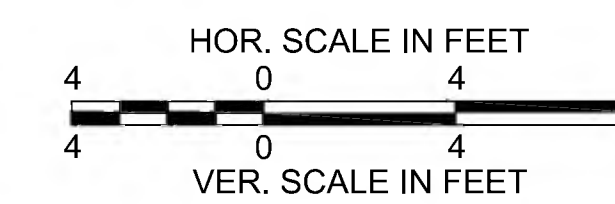
Total Volume at Station 12+00.00	
Cut Area (SF)	16.834
Fill Area (SF)	0.000
Cut Vol (CY)	28.5
Fill Vol (CY)	0.1
Cum Cut Vol (CY)	394.7
Cum Fill Vol (CY)	409.8
Net Vol (CY)	-15.1



Total Volume at Station 10+00.00	
Cut Area (SF)	9.136
Fill Area (SF)	2.714
Cut Vol (CY)	18.0
Fill Vol (CY)	5.3
Cum Cut Vol (CY)	309.3
Cum Fill Vol (CY)	398.1
Net Vol (CY)	-88.8



Total Volume at Station 11+50.00	
Cut Area (SF)	13.984
Fill Area (SF)	0.067
Cut Vol (CY)	22.3
Fill Vol (CY)	1.0
Cum Cut Vol (CY)	366.1
Cum Fill Vol (CY)	409.8
Net Vol (CY)	-43.6

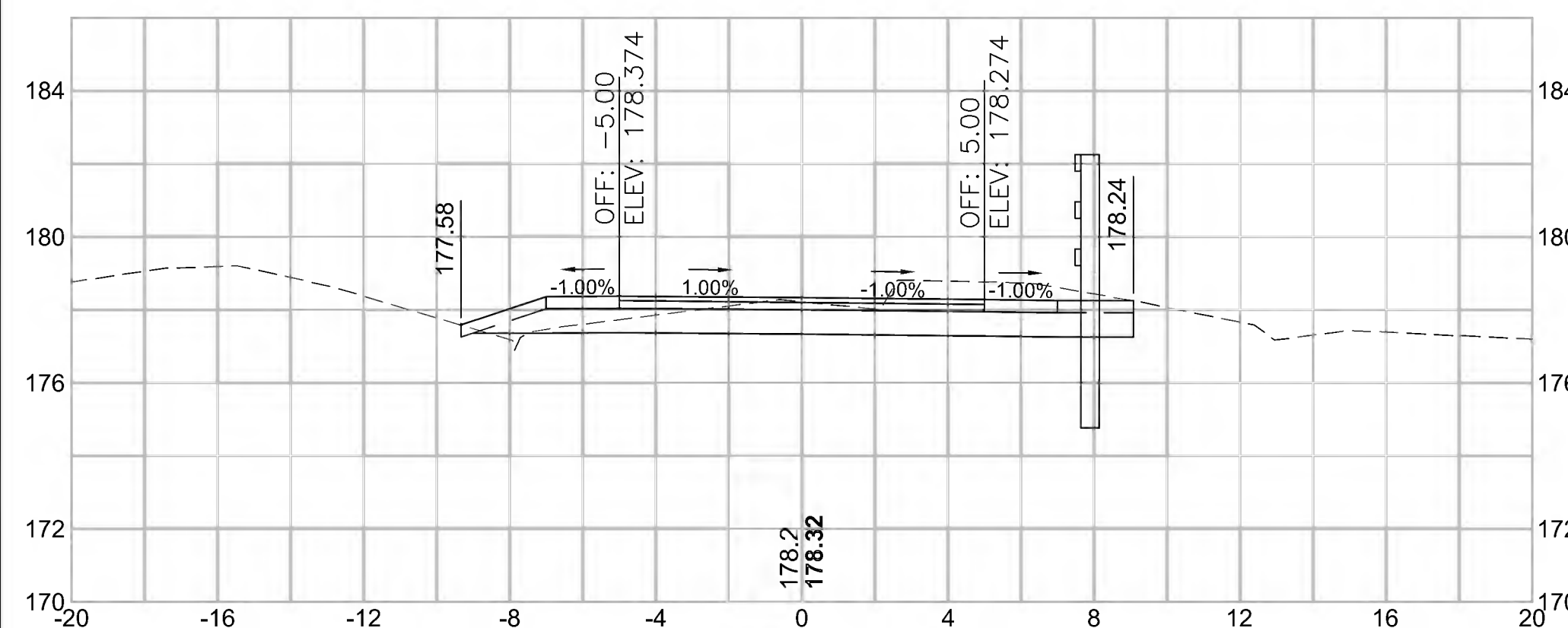


CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	314	319
PROJECT FILE NO.		608164	

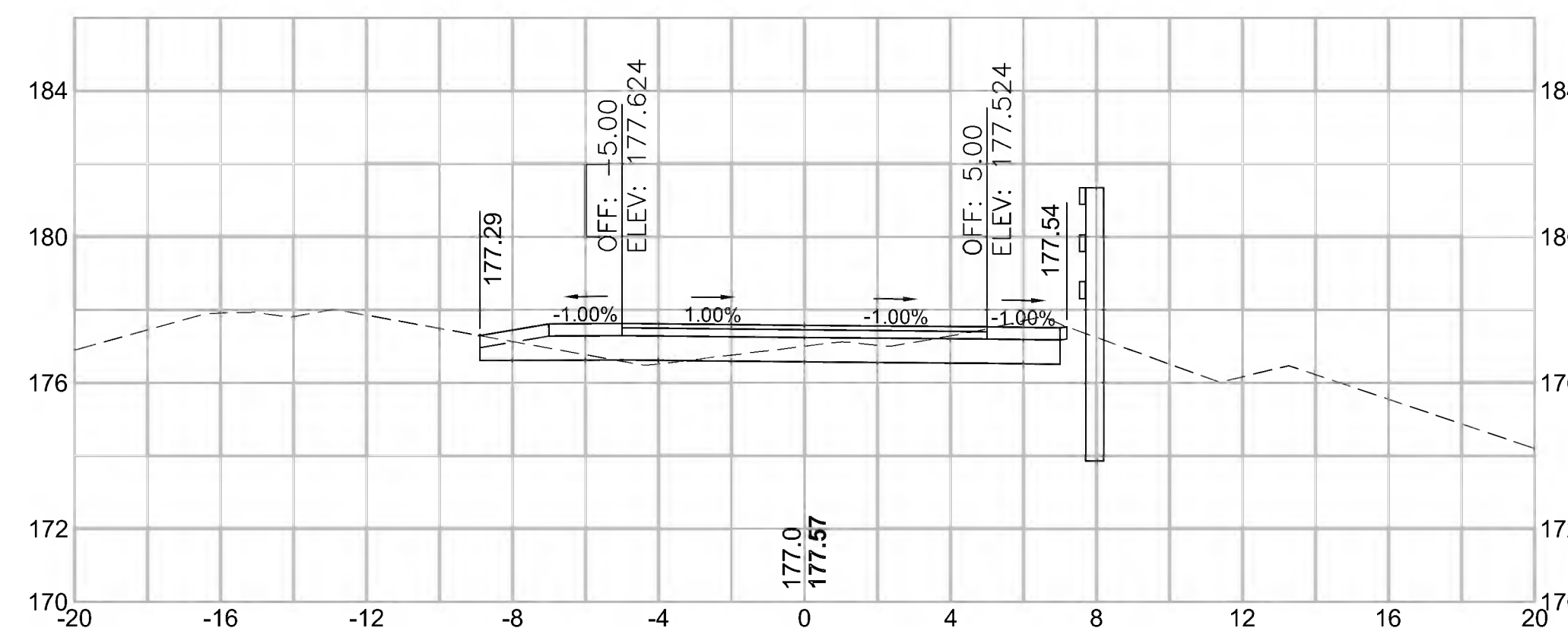
CROSS SECTIONS

14+00



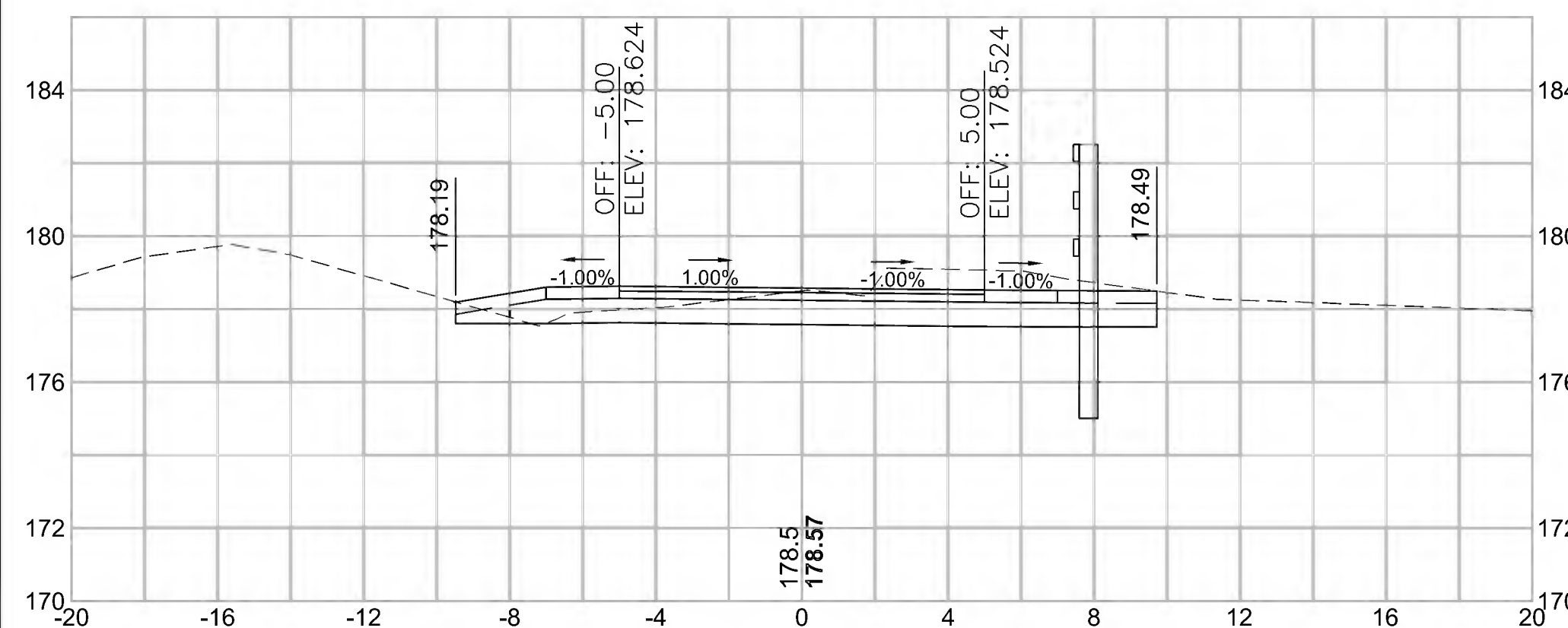
Total Volume at Station 14+00.00	
Cut Area (SF)	15.973
Fill Area (SF)	1.655
Cut Vol (CY)	30.7
Fill Vol (CY)	2.0
Cum Cut Vol (CY)	528.1
Cum Fill Vol (CY)	412.1
Net Vol (CY)	116.0

15+50



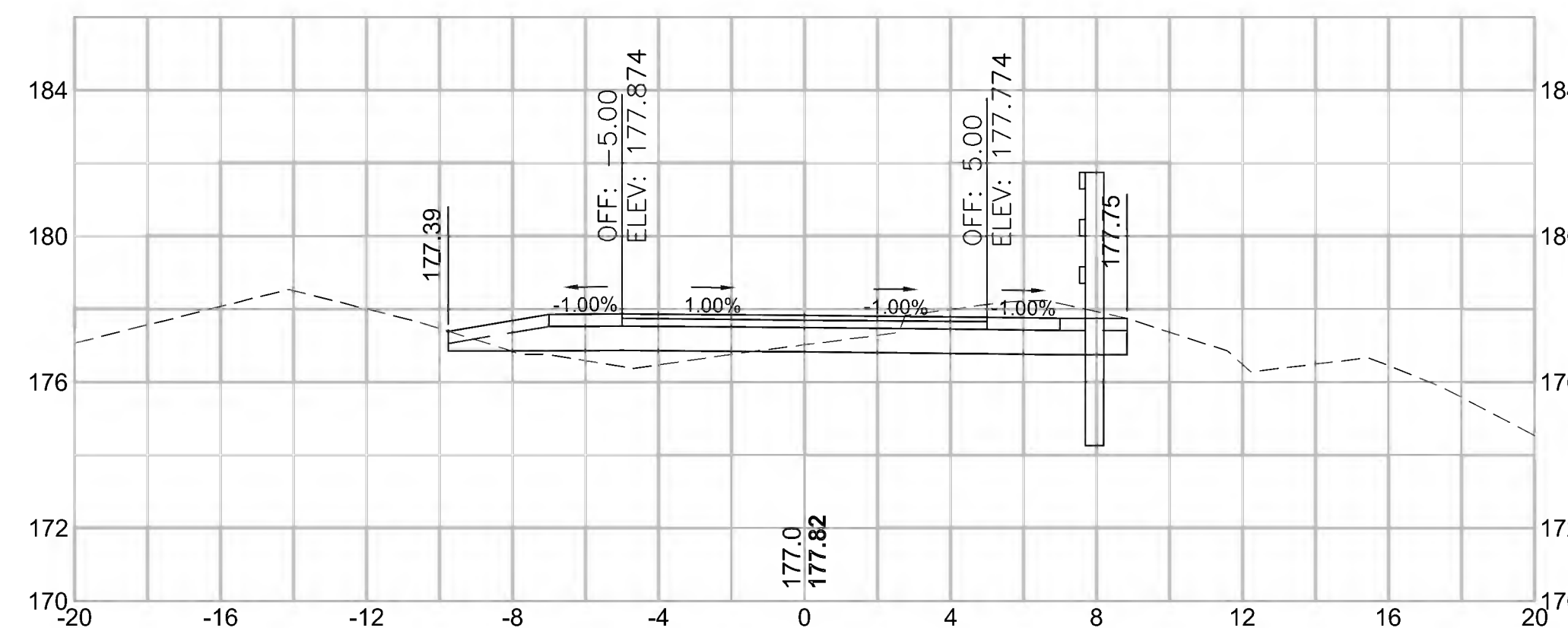
Total Volume at Station 15+50.00	
Cut Area (SF)	8.693
Fill Area (SF)	1.502
Cut Vol (CY)	19.4
Fill Vol (CY)	5.4
Cum Cut Vol (CY)	596.1
Cum Fill Vol (CY)	431.8
Net Vol (CY)	164.3

13+50



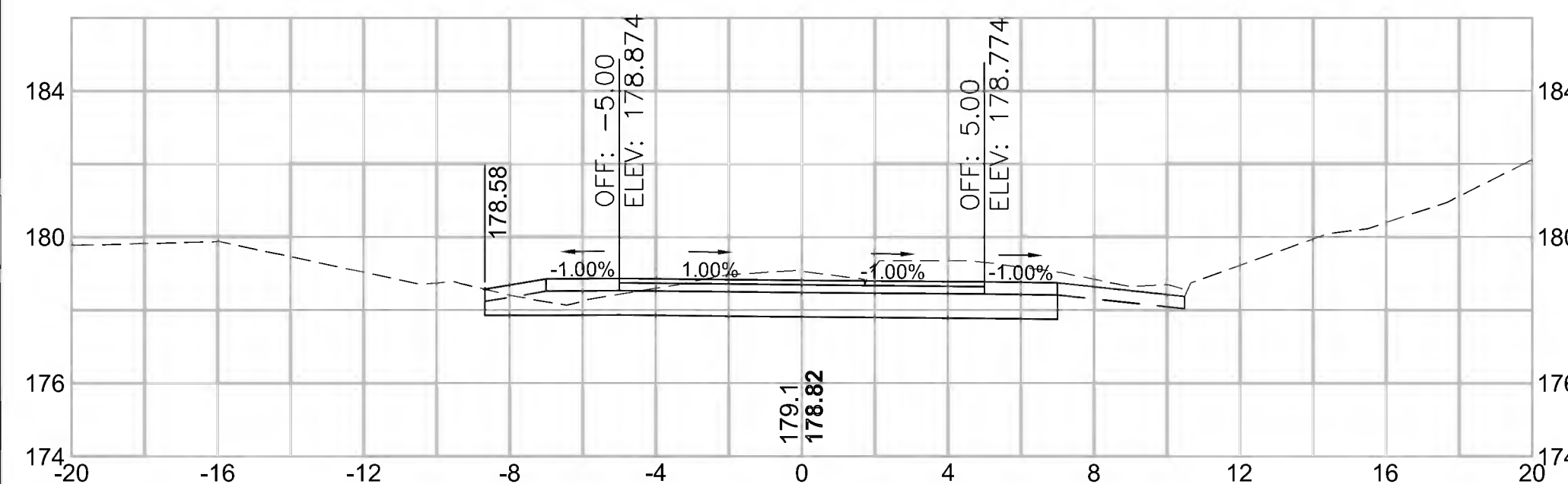
Total Volume at Station 13+50.00	
Cut Area (SF)	17.194
Fill Area (SF)	0.491
Cut Vol (CY)	17.6
Fill Vol (CY)	0.3
Cum Cut Vol (CY)	497.4
Cum Fill Vol (CY)	410.2
Net Vol (CY)	87.3

15+00



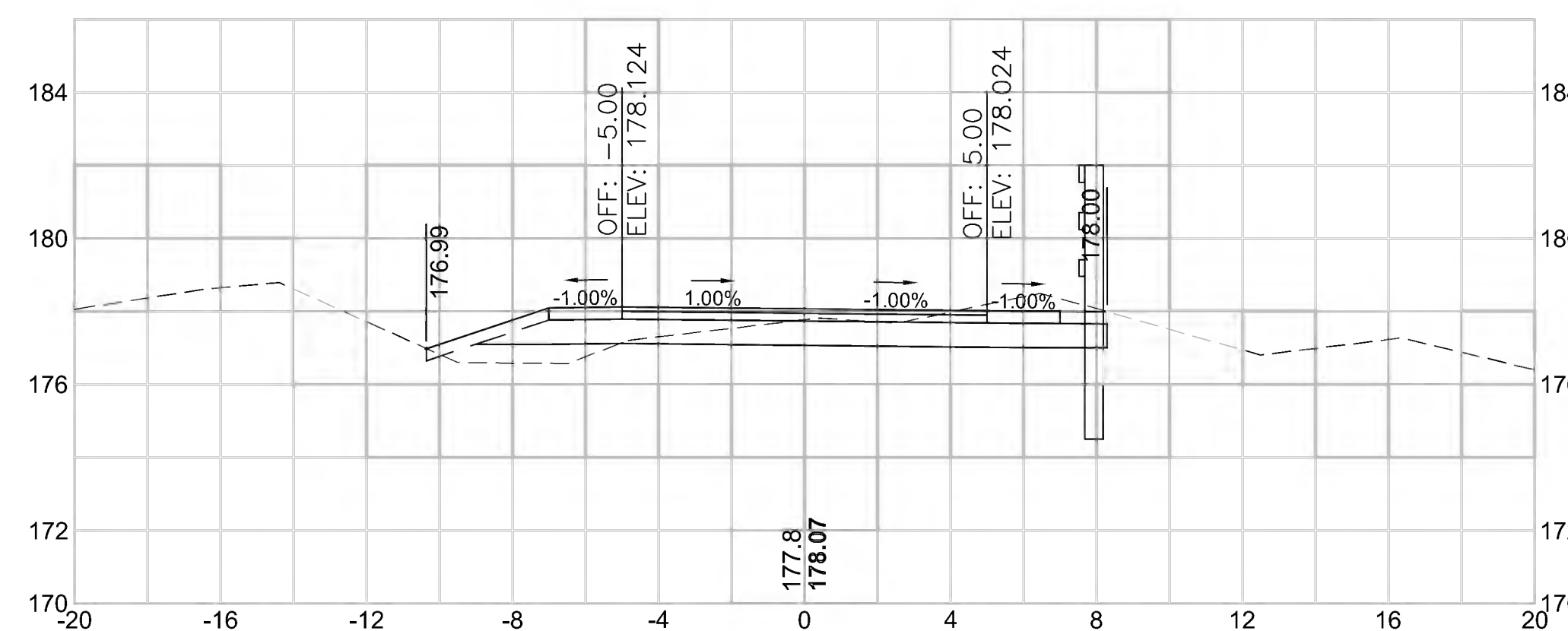
Total Volume at Station 15+00.00	
Cut Area (SF)	12.218
Fill Area (SF)	4.376
Cut Vol (CY)	22.6
Fill Vol (CY)	8.4
Cum Cut Vol (CY)	576.8
Cum Fill Vol (CY)	426.3
Net Vol (CY)	150.4

13+00

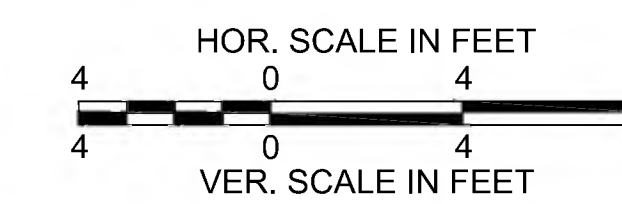


Total Volume at Station 13+00.00	
Cut Area (SF)	18.289
Fill Area (SF)	0.017
Cut Vol (CY)	34.2
Fill Vol (CY)	0.0
Cum Cut Vol (CY)	461.8
Cum Fill Vol (CY)	409.8
Net Vol (CY)	52.0

14+50



Total Volume at Station 14+50.00	
Cut Area (SF)	12.167
Fill Area (SF)	4.654
Cut Vol (CY)	26.1
Fill Vol (CY)	5.8
Cum Cut Vol (CY)	554.2
Cum Fill Vol (CY)	418.0
Net Vol (CY)	136.2

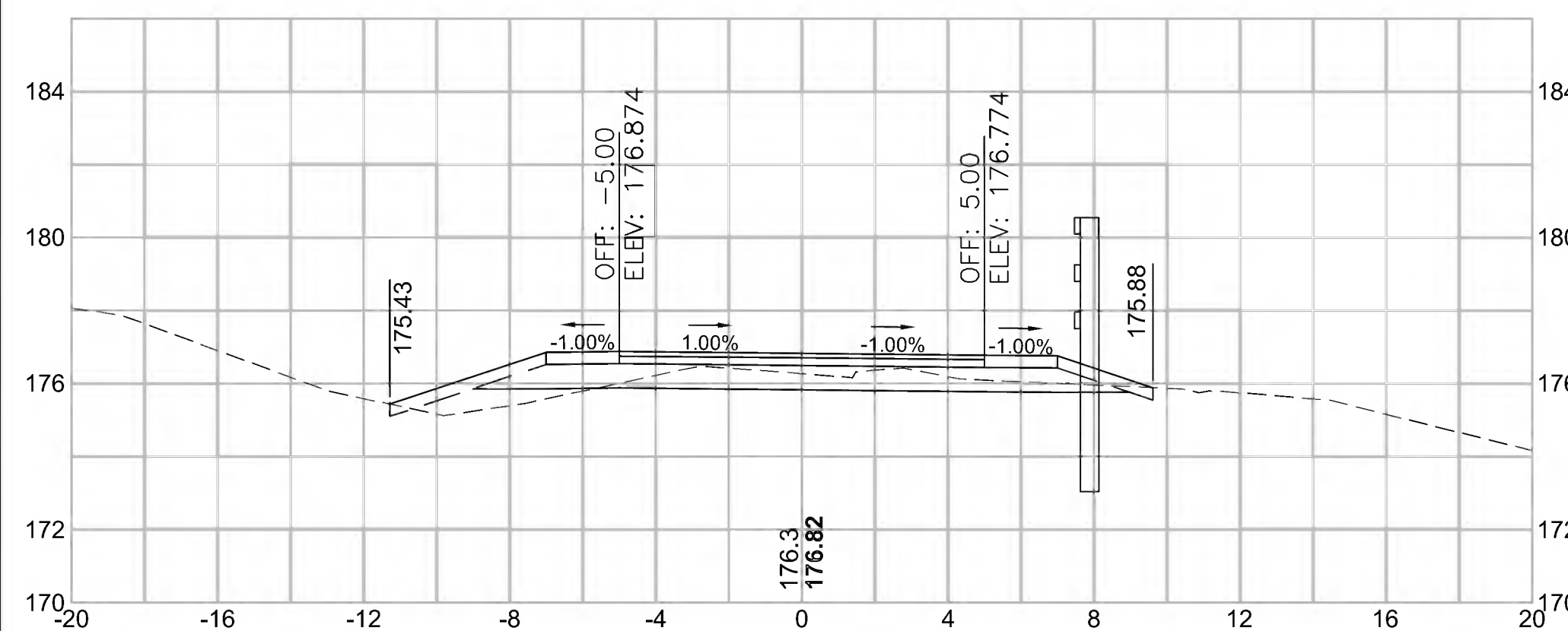




STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	315	319
PROJECT FILE NO.		608164	

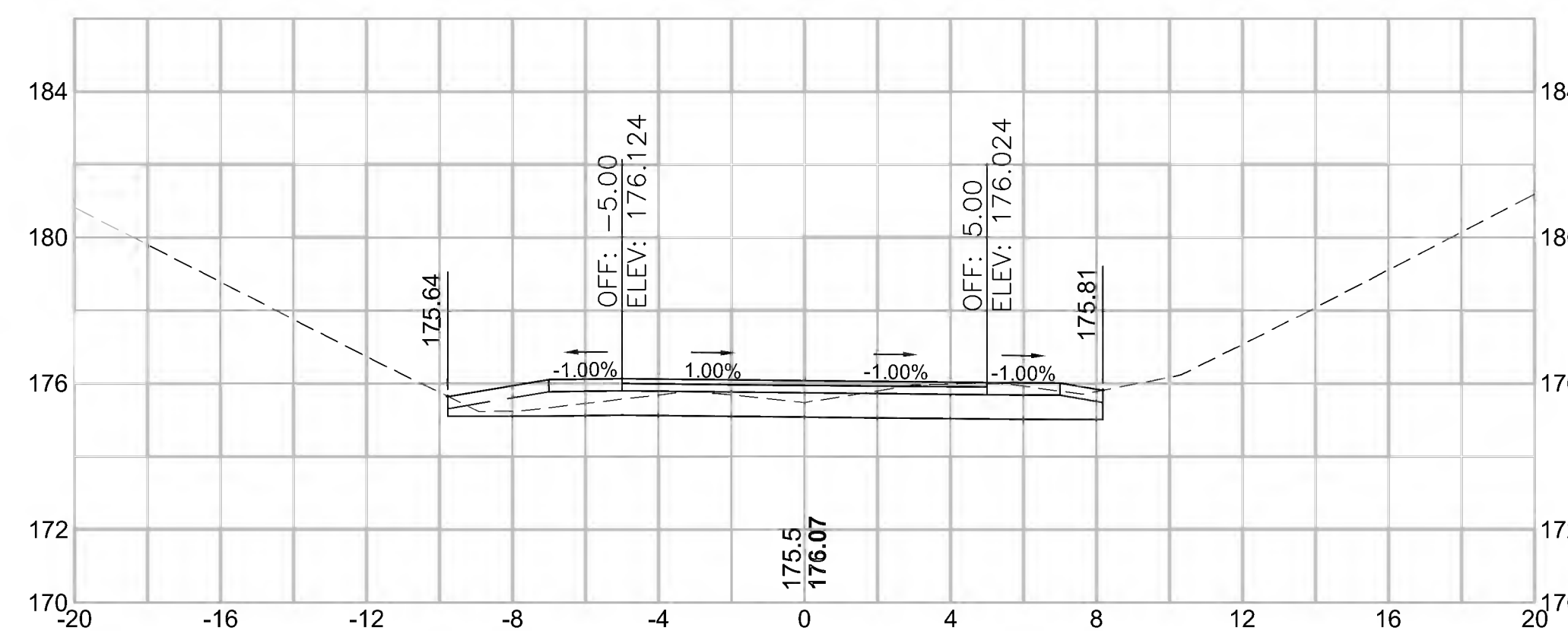
CROSS SECTIONS

17+00



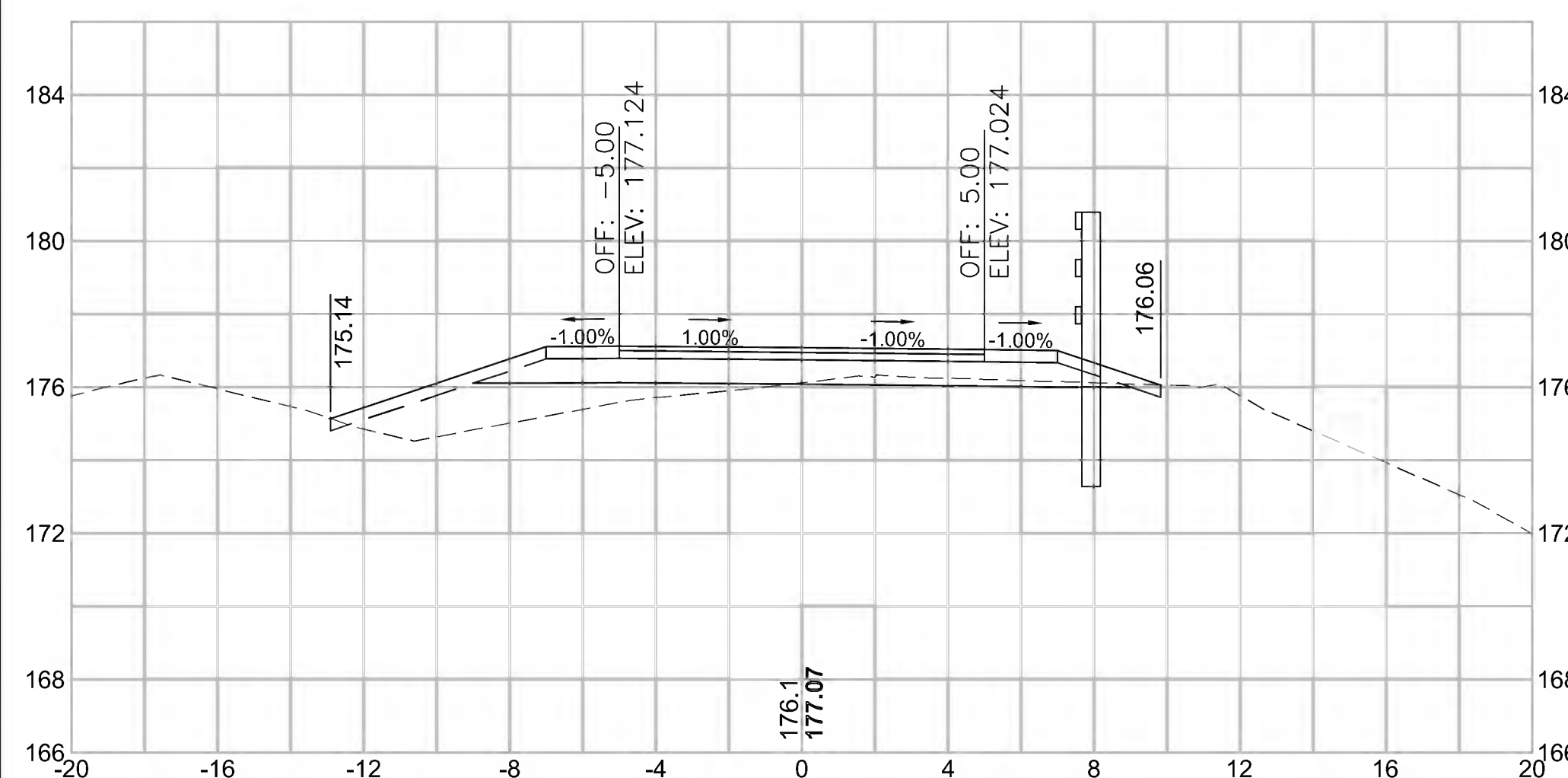
Total Volume at Station 17+00.00	
Cut Area (SF)	8.320
Fill Area (SF)	4.892
Cut Vol (CY)	14.7
Fill Vol (CY)	17.0
Cum Cut Vol (CY)	644.0
Cum Fill Vol (CY)	481.3
Net Vol (CY)	162.7

18+50



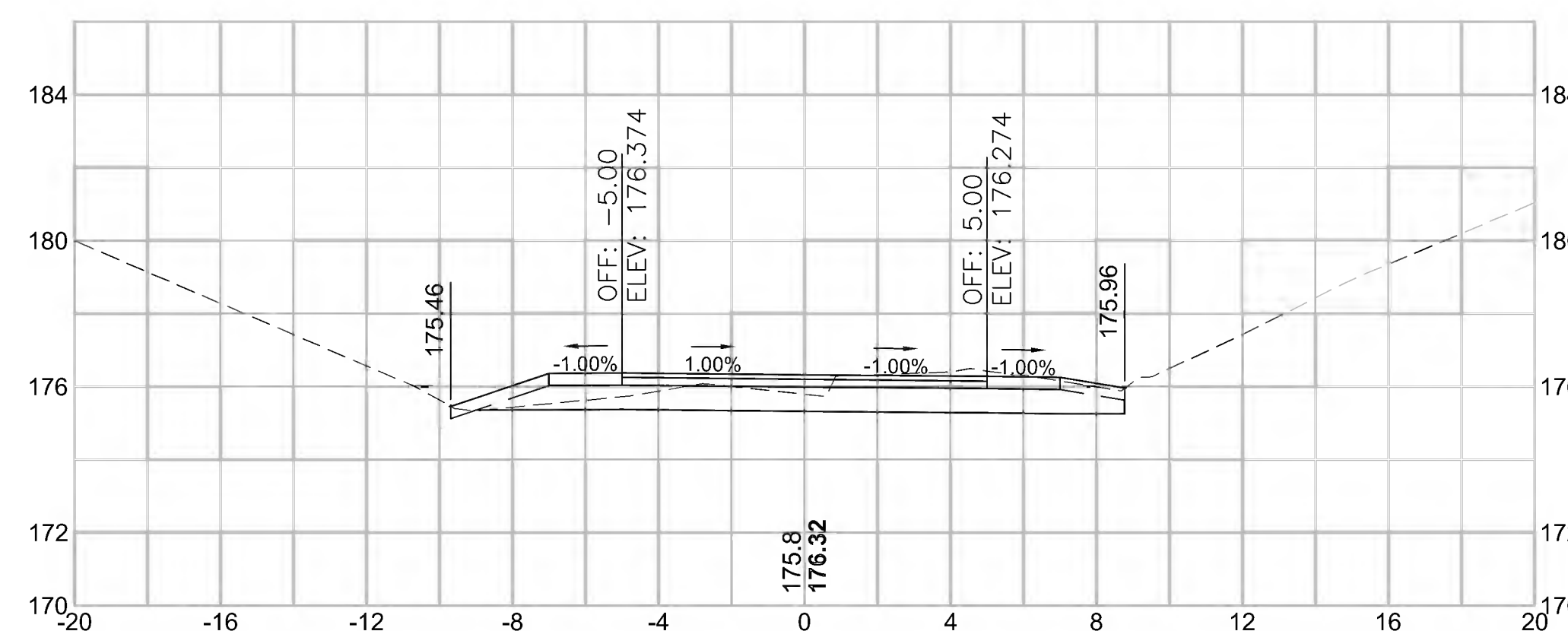
Total Volume at Station 18+50.00	
Cut Area (SF)	11.002
Fill Area (SF)	0.444
Cut Vol (CY)	21.9
Fill Vol (CY)	1.1
Cum Cut Vol (CY)	705.3
Cum Fill Vol (CY)	493.6
Net Vol (CY)	211.7

16+50



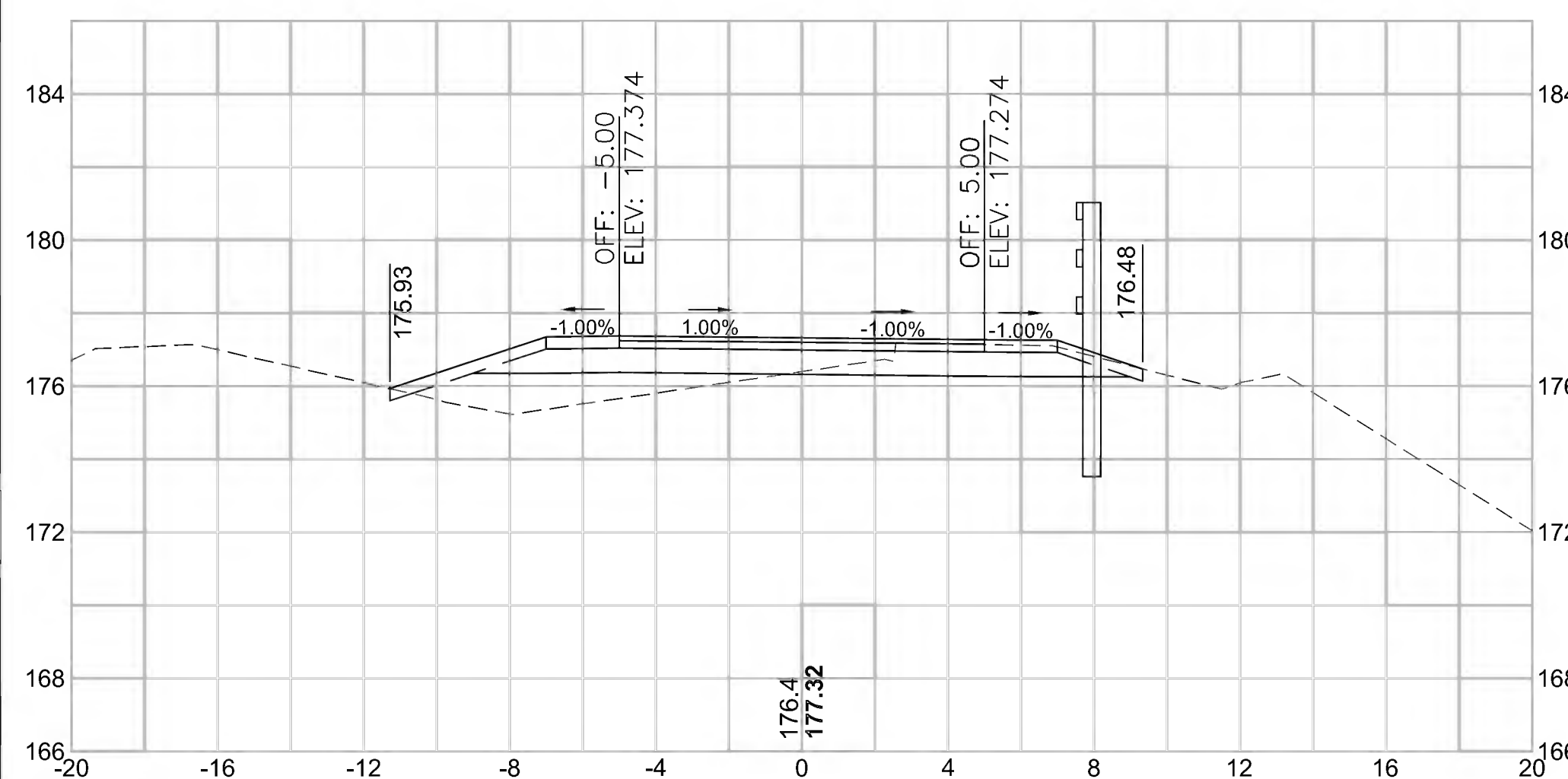
Total Volume at Station 16+50.00	
Cut Area (SF)	7.572
Fill Area (SF)	13.471
Cut Vol (CY)	16.1
Fill Vol (CY)	21.8
Cum Cut Vol (CY)	629.3
Cum Fill Vol (CY)	464.3
Net Vol (CY)	165.0

18+00



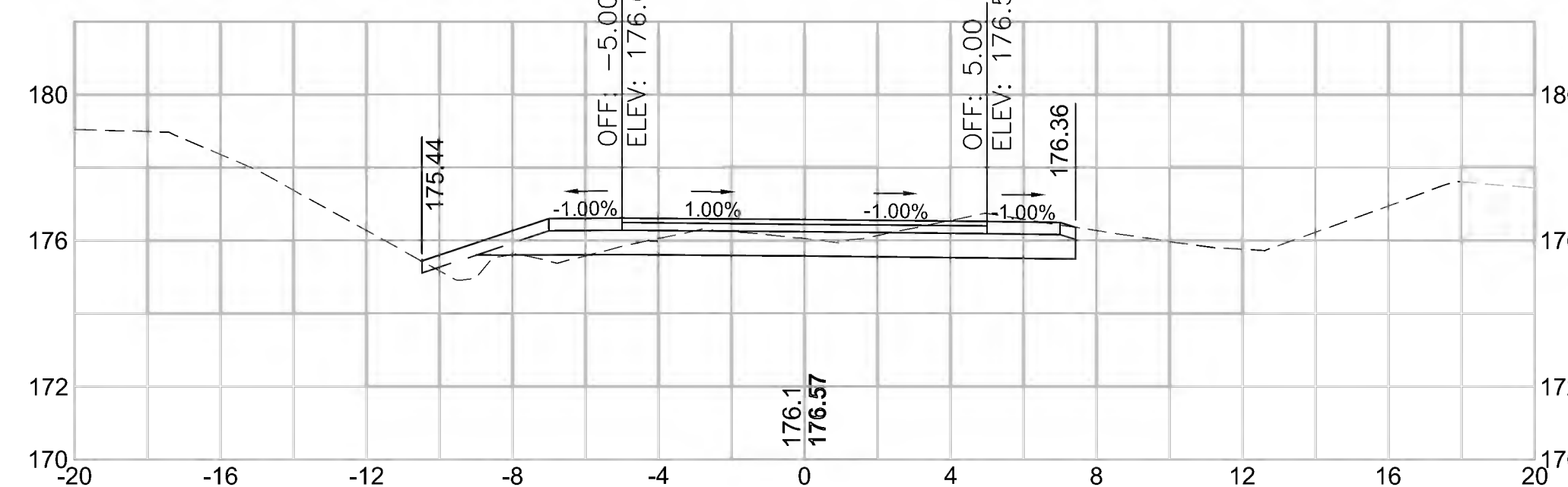
Total Volume at Station 18+00.00	
Cut Area (SF)	12.694
Fill Area (SF)	0.796
Cut Vol (CY)	21.7
Fill Vol (CY)	3.7
Cum Cut Vol (CY)	683.4
Cum Fill Vol (CY)	492.5
Net Vol (CY)	190.9

16+00

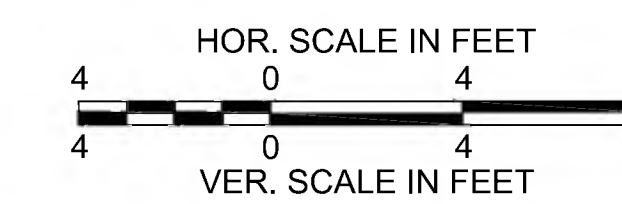


Total Volume at Station 16+00.00	
Cut Area (SF)	9.768
Fill Area (SF)	10.047
Cut Vol (CY)	17.1
Fill Vol (CY)	10.7
Cum Cut Vol (CY)	613.2
Cum Fill Vol (CY)	442.5
Net Vol (CY)	170.7

17+50



Total Volume at Station 17+50.00	
Cut Area (SF)	10.750
Fill Area (SF)	3.197
Cut Vol (CY)	17.7
Fill Vol (CY)	7.5
Cum Cut Vol (CY)	661.7
Cum Fill Vol (CY)	488.8
Net Vol (CY)	172.9

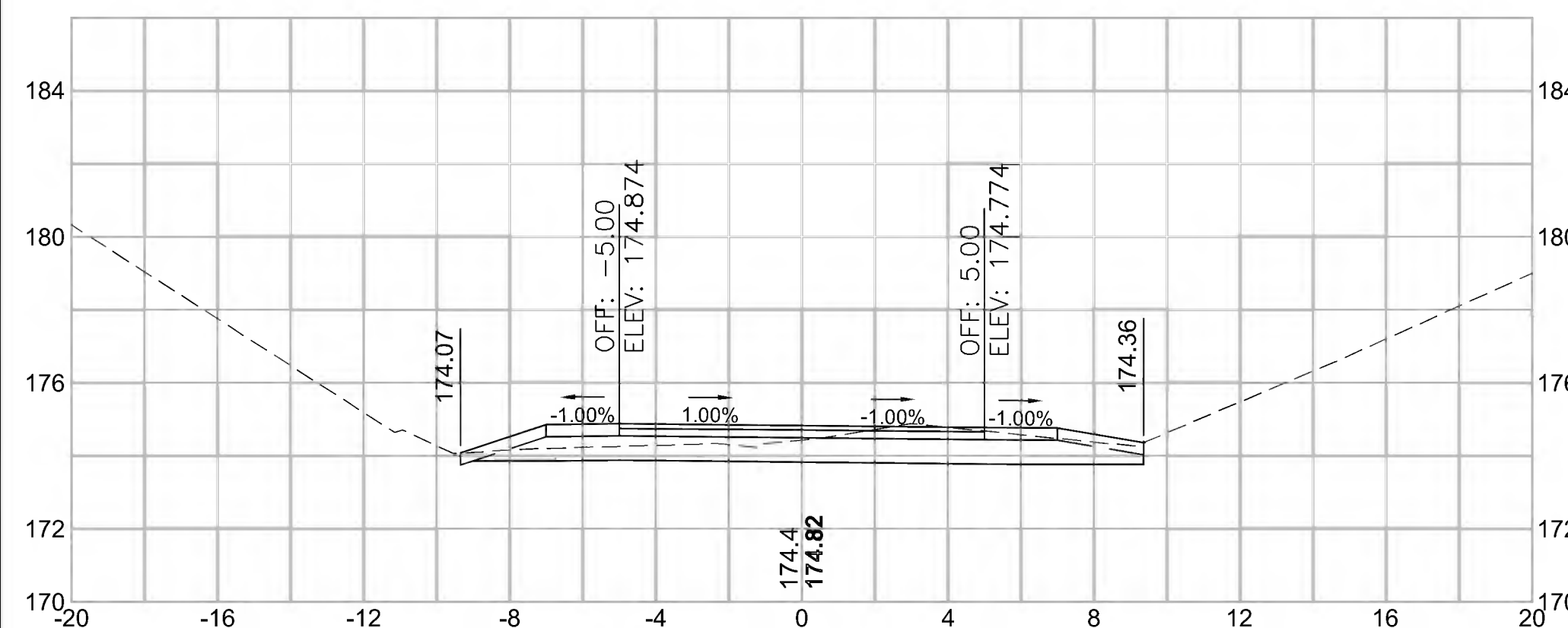


CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	316	319
PROJECT FILE NO.		608164	

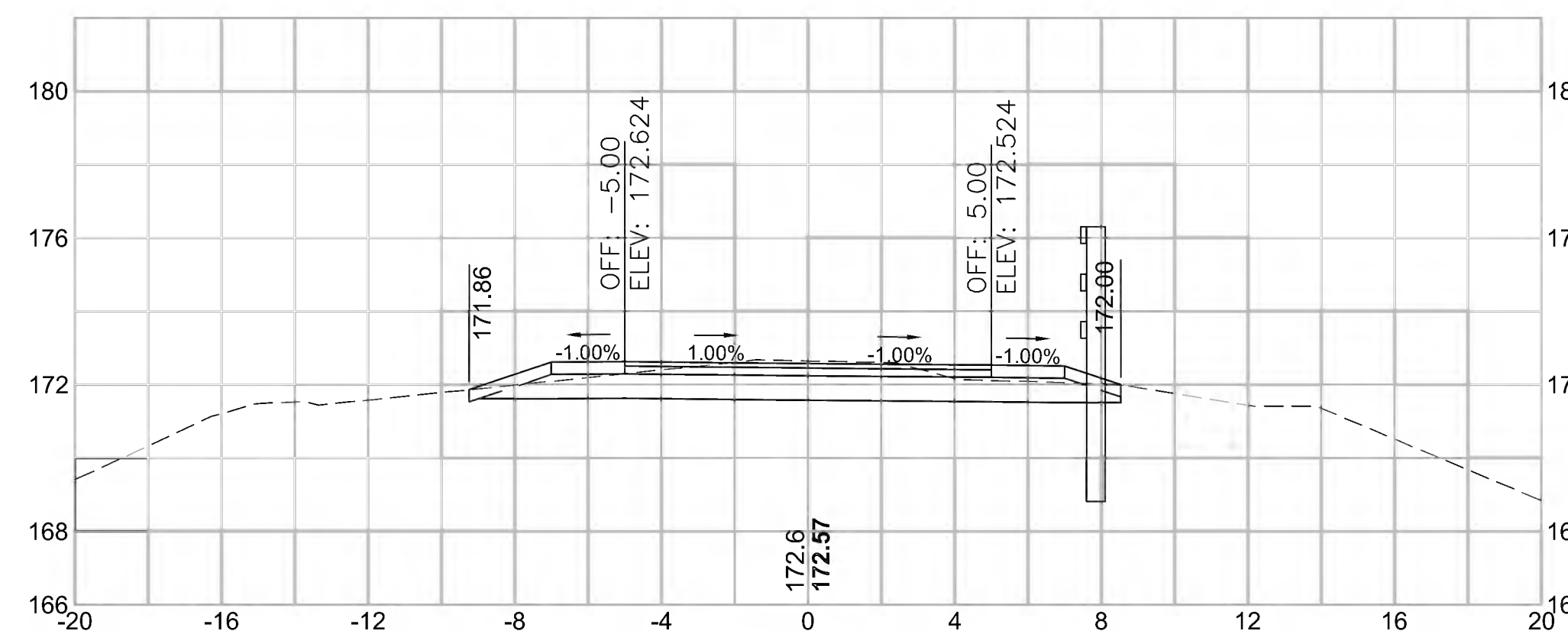
CROSS SECTIONS

20+00



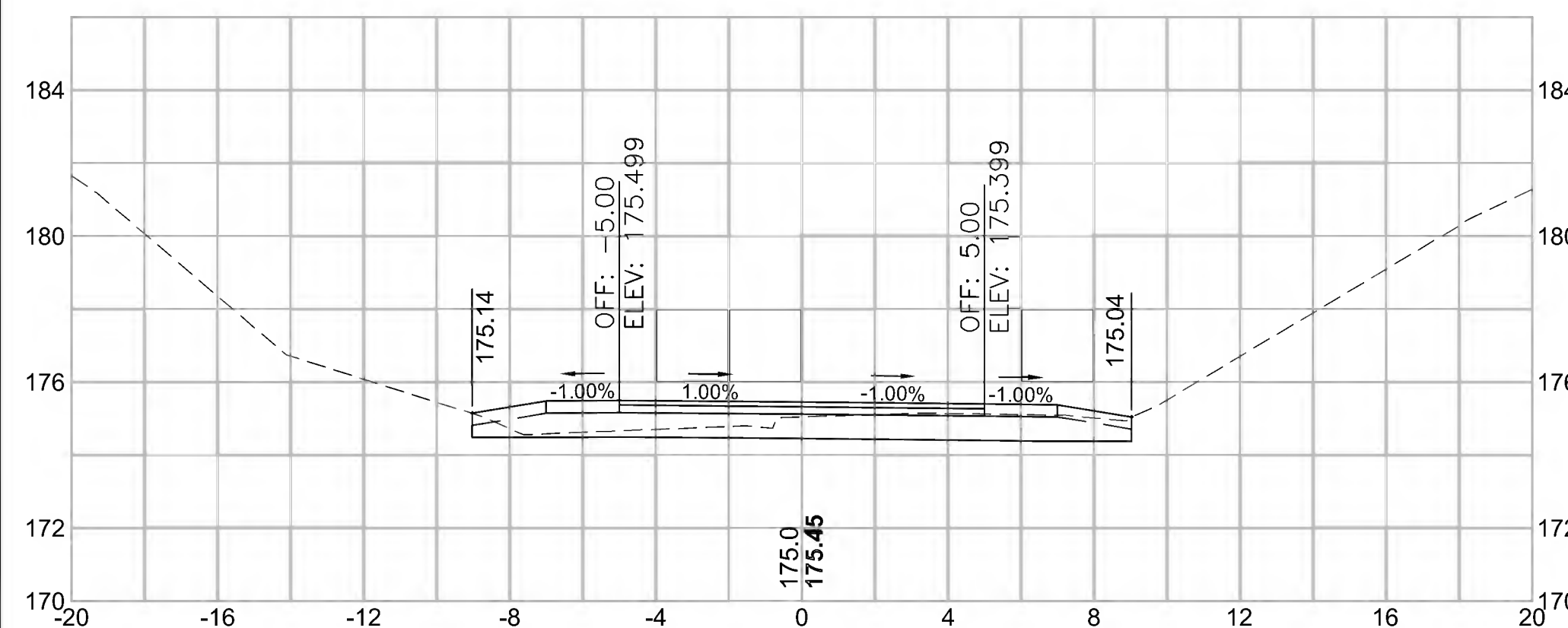
Total Volume at Station 20+00.00	
Cut Area (SF)	11.325
Fill Area (SF)	0.753
Cut Vol (CY)	19.3
Fill Vol (CY)	1.6
Cum Cut Vol (CY)	763.2
Cum Fill Vol (CY)	497.3
Net Vol (CY)	265.9

21+50



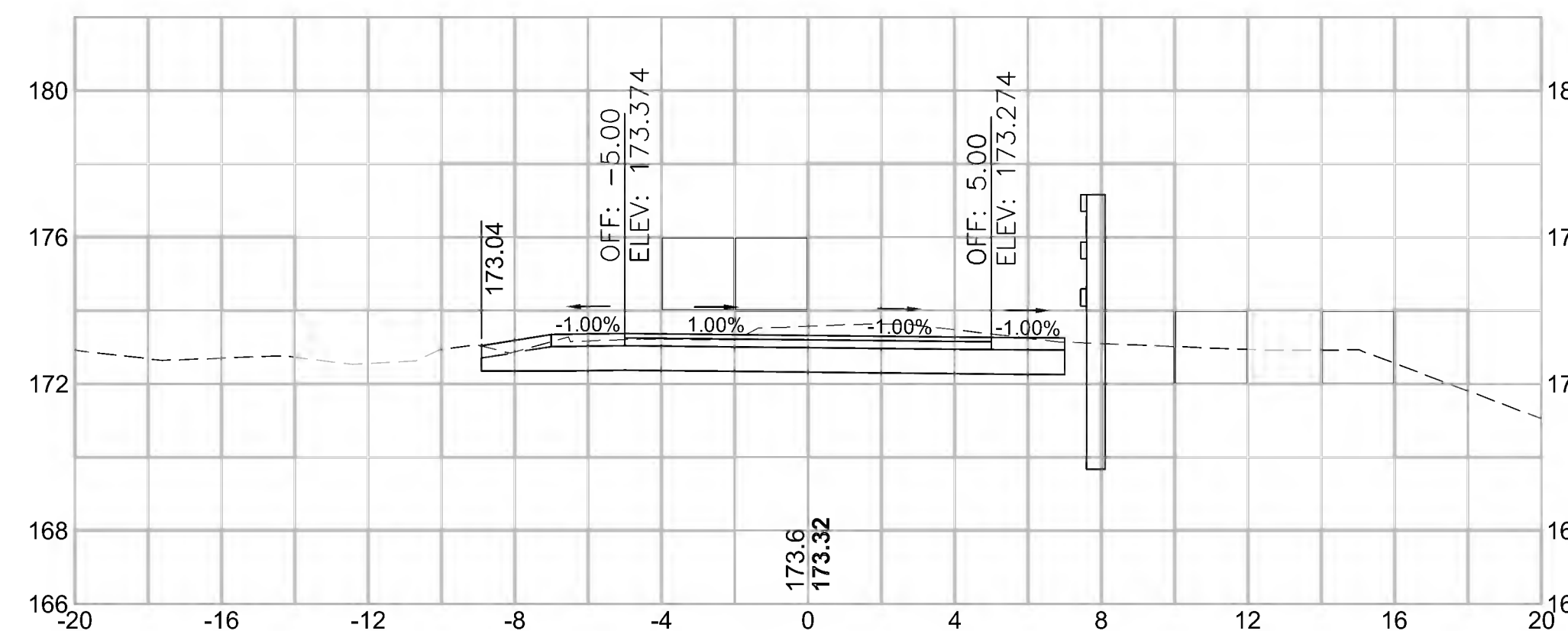
Total Volume at Station 21+50.00	
Cut Area (SF)	12.942
Fill Area (SF)	0.578
Cut Vol (CY)	26.7
Fill Vol (CY)	0.5
Cum Cut Vol (CY)	841.9
Cum Fill Vol (CY)	498.5
Net Vol (CY)	343.4

19+50



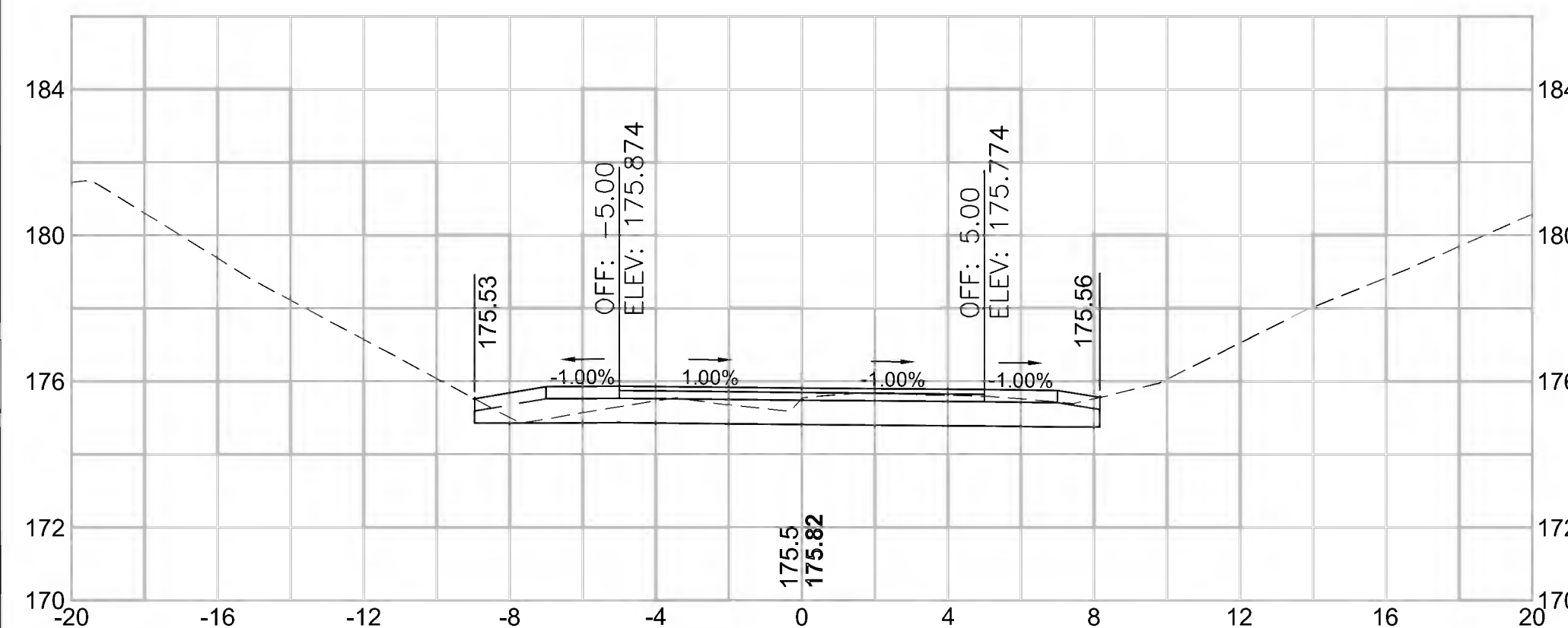
Total Volume at Station 19+50.00	
Cut Area (SF)	9.507
Fill Area (SF)	0.932
Cut Vol (CY)	18.6
Fill Vol (CY)	1.3
Cum Cut Vol (CY)	743.9
Cum Fill Vol (CY)	495.7
Net Vol (CY)	248.2

21+00



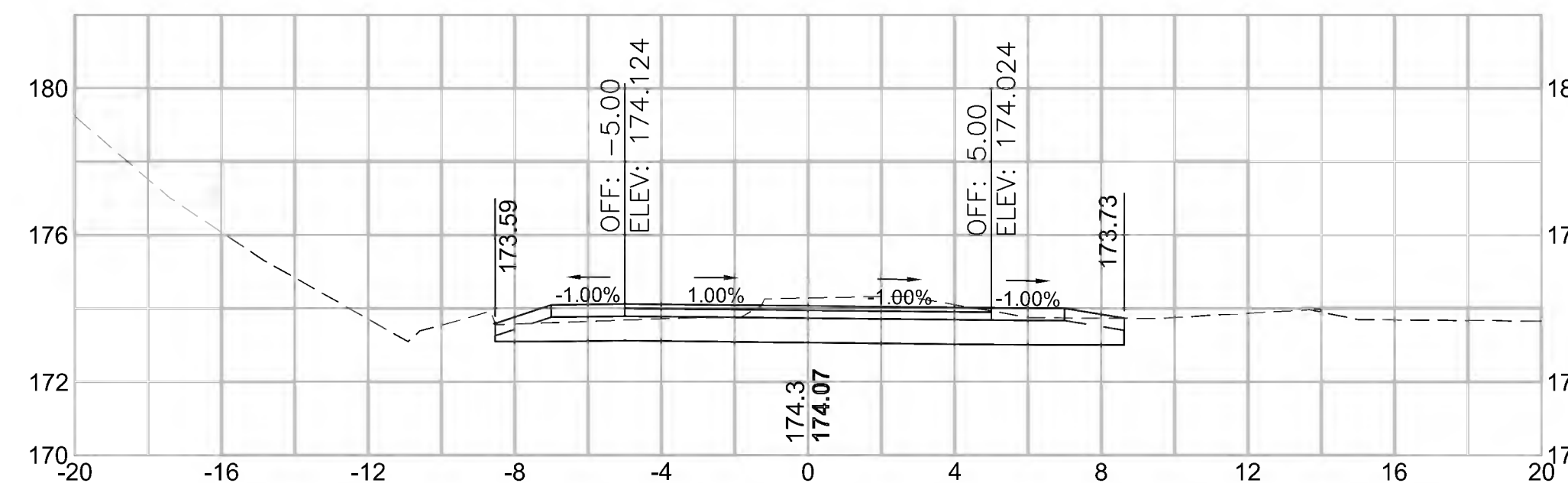
Total Volume at Station 21+00.00	
Cut Area (SF)	15.924
Fill Area (SF)	0.000
Cut Vol (CY)	28.1
Fill Vol (CY)	0.0
Cum Cut Vol (CY)	815.1
Cum Fill Vol (CY)	497.9
Net Vol (CY)	317.2

19+00

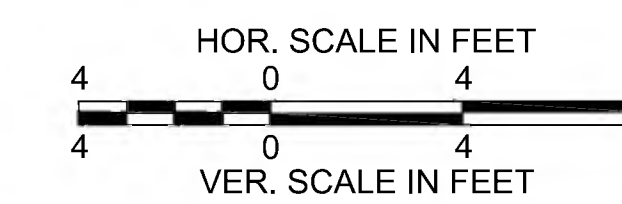


Total Volume at Station 19+00.00	
Cut Area (SF)	10.584
Fill Area (SF)	0.441
Cut Vol (CY)	20.0
Fill Vol (CY)	0.8
Cum Cut Vol (CY)	725.3
Cum Fill Vol (CY)	494.4
Net Vol (CY)	230.9

20+50



Total Volume at Station 20+50.00	
Cut Area (SF)	14.431
Fill Area (SF)	0.000
Cut Vol (CY)	23.8
Fill Vol (CY)	0.7
Cum Cut Vol (CY)	787.0
Cum Fill Vol (CY)	497.9
Net Vol (CY)	289.1



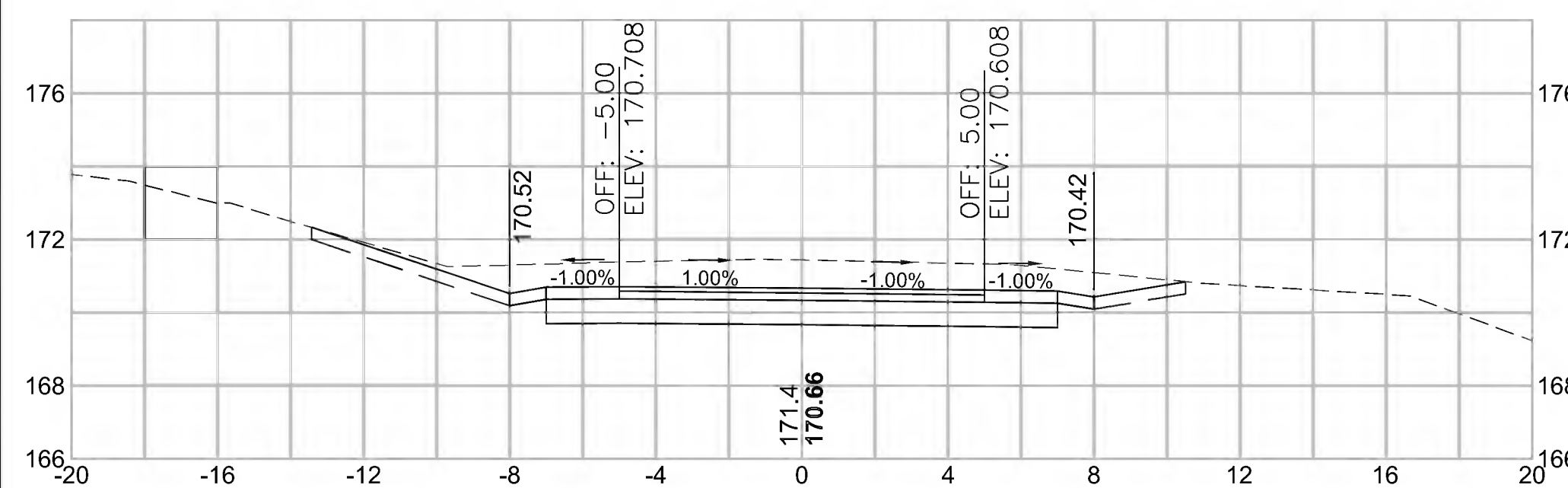


CONCORD  
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STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	317	319
PROJECT FILE NO.		608164	

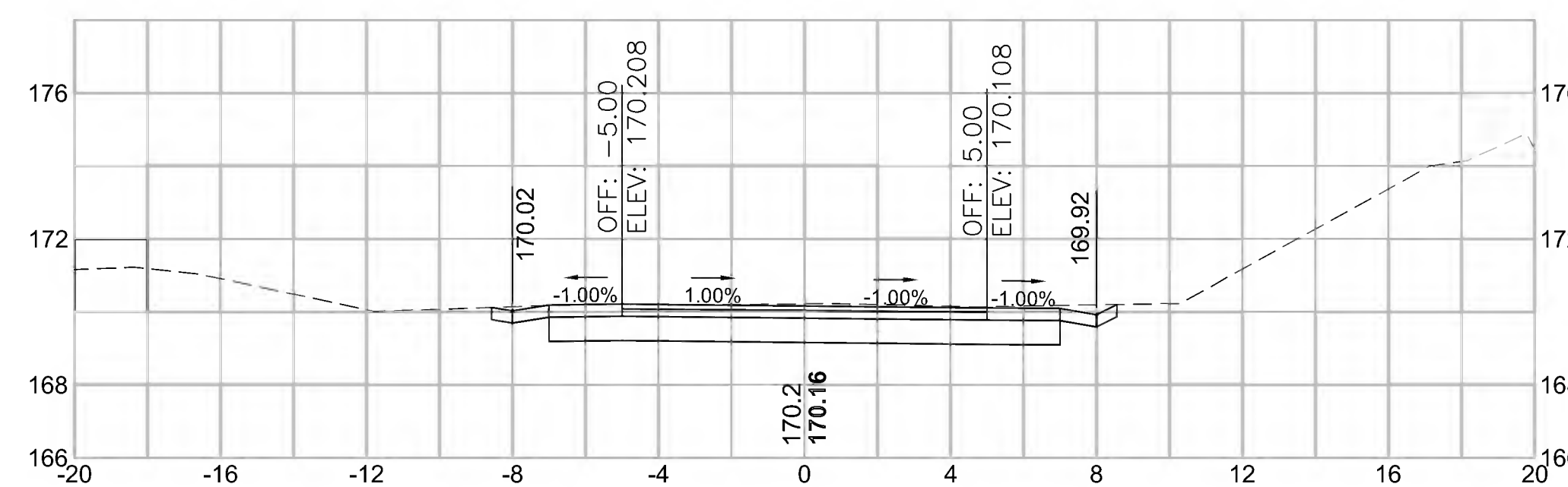
CROSS SECTIONS

23+00



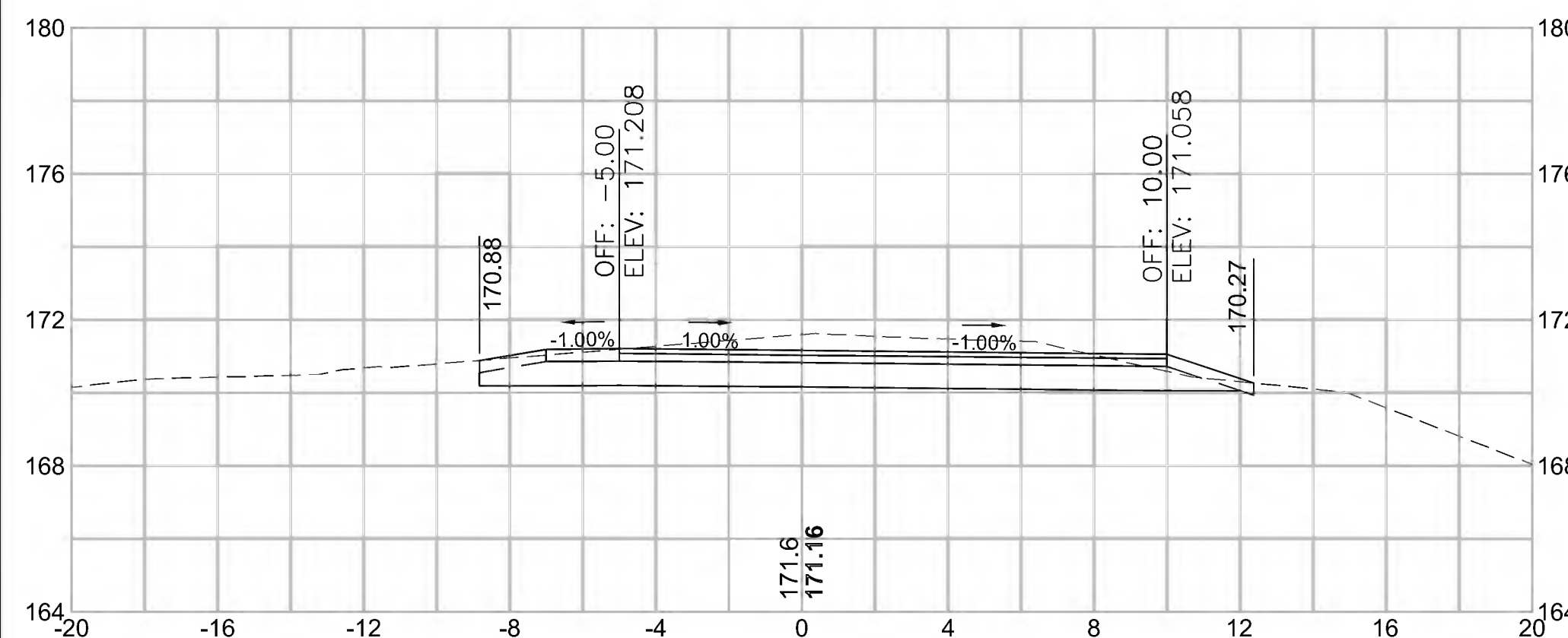
Total Volume at Station 23+00.00	
Cut Area (SF)	30.688
Fill Area (SF)	0.000
Cut Vol (CY)	49.0
Fill Vol (CY)	0.1
Cum Cut Vol (CY)	951.8
Cum Fill Vol (CY)	499.1
Net Vol (CY)	452.7

24+50



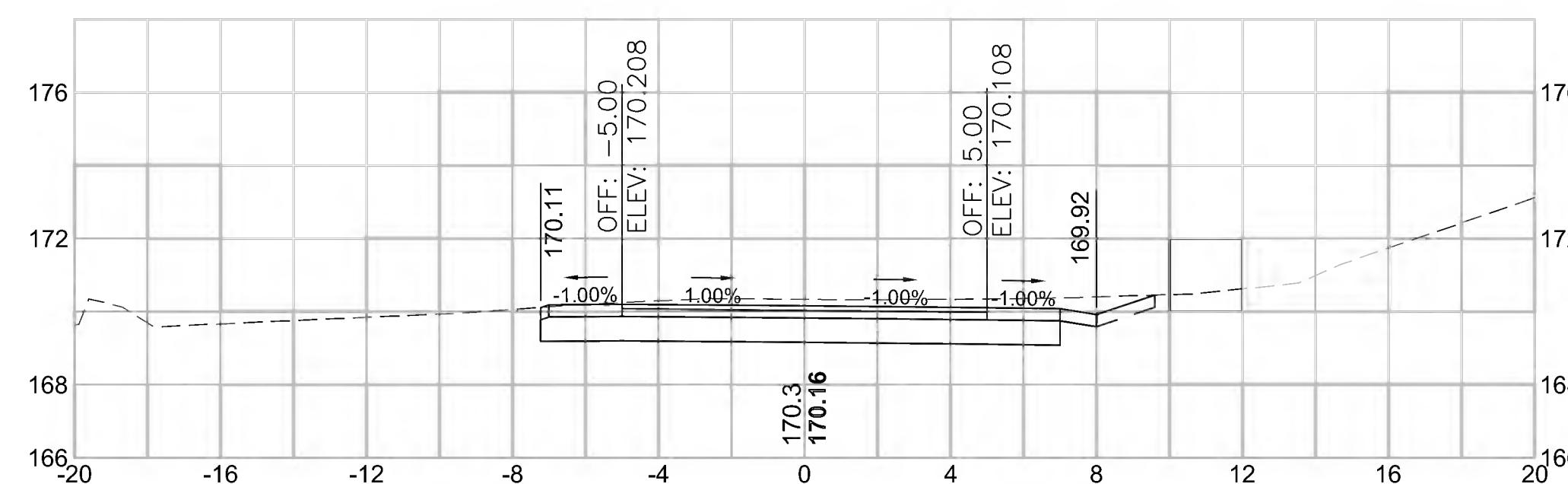
Total Volume at Station 24+50.00	
Cut Area (SF)	15.802
Fill Area (SF)	0.002
Cut Vol (CY)	31.3
Fill Vol (CY)	0.0
Cum Cut Vol (CY)	1089.8
Cum Fill Vol (CY)	499.1
Net Vol (CY)	590.7

22+50



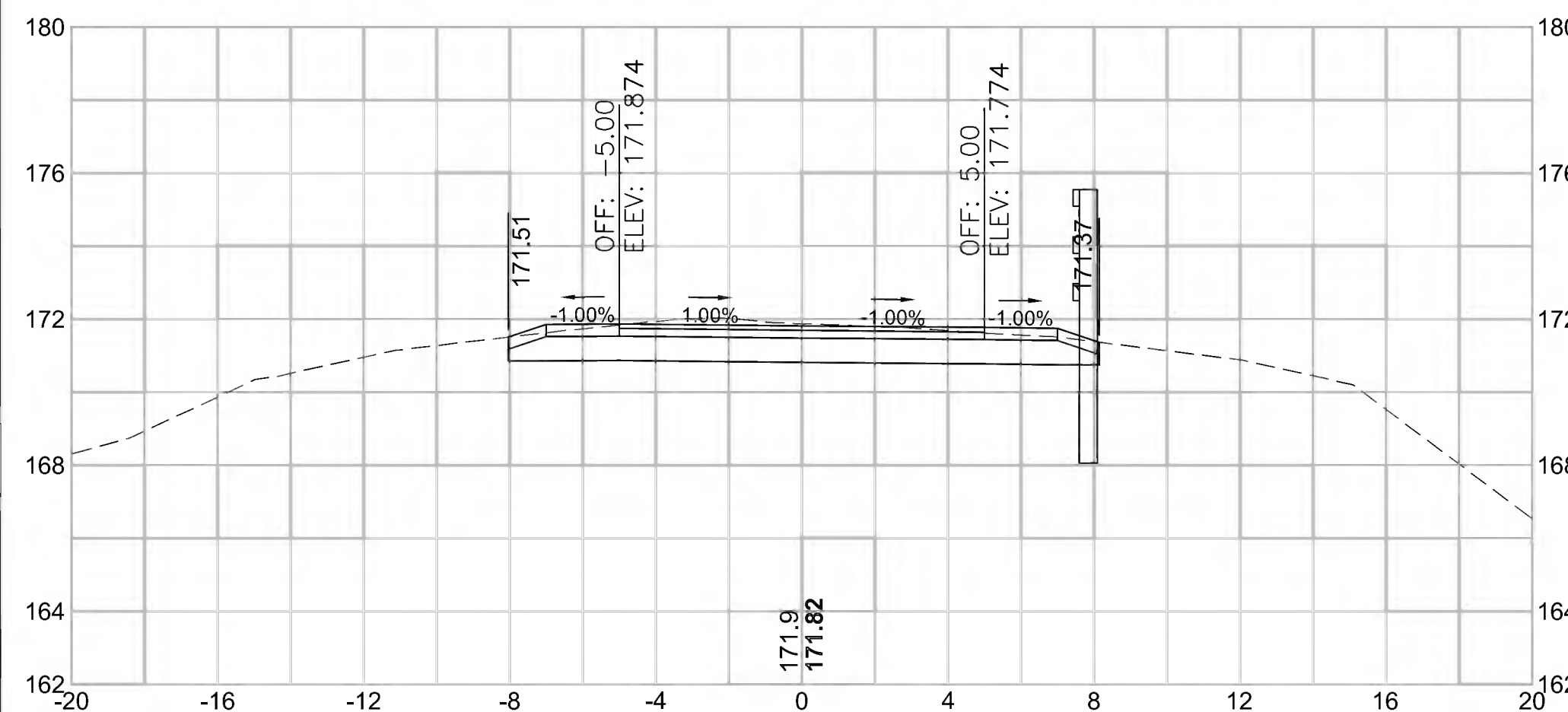
Total Volume at Station 22+50.00	
Cut Area (SF)	22.267
Fill Area (SF)	0.055
Cut Vol (CY)	34.8
Fill Vol (CY)	0.1
Cum Cut Vol (CY)	902.8
Cum Fill Vol (CY)	499.1
Net Vol (CY)	403.7

24+00



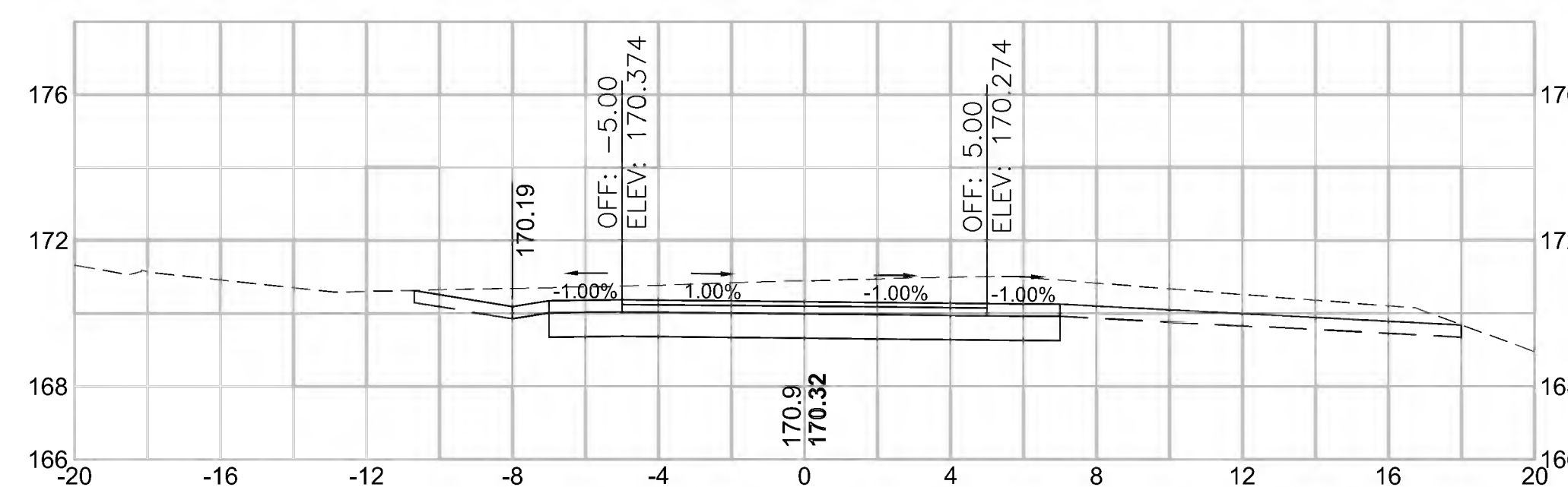
Total Volume at Station 24+00.00	
Cut Area (SF)	18.056
Fill Area (SF)	0.000
Cut Vol (CY)	47.5
Fill Vol (CY)	0.0
Cum Cut Vol (CY)	1058.5
Cum Fill Vol (CY)	499.1
Net Vol (CY)	559.4

22+00

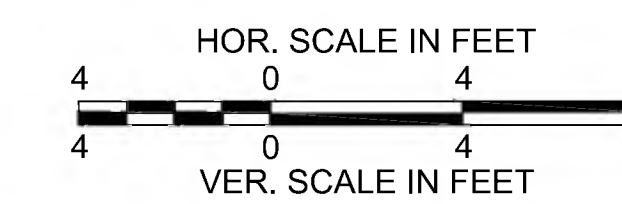


Total Volume at Station 22+00.00	
Cut Area (SF)	15.275
Fill Area (SF)	0.000
Cut Vol (CY)	26.1
Fill Vol (CY)	0.5
Cum Cut Vol (CY)	868.0
Cum Fill Vol (CY)	499.0
Net Vol (CY)	369.0

23+50



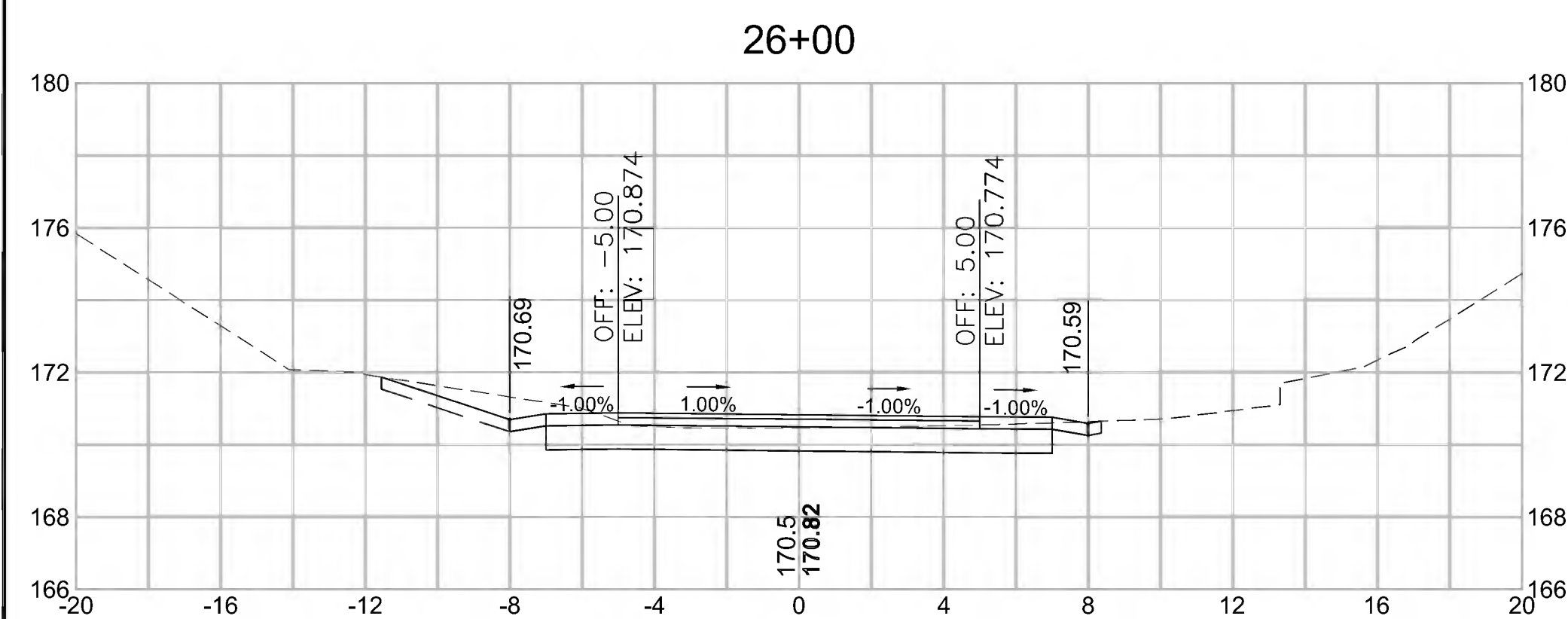
Total Volume at Station 23+50.00	
Cut Area (SF)	33.252
Fill Area (SF)	0.000
Cut Vol (CY)	59.2
Fill Vol (CY)	0.0
Cum Cut Vol (CY)	1011.0
Cum Fill Vol (CY)	499.1
Net Vol (CY)	511.9



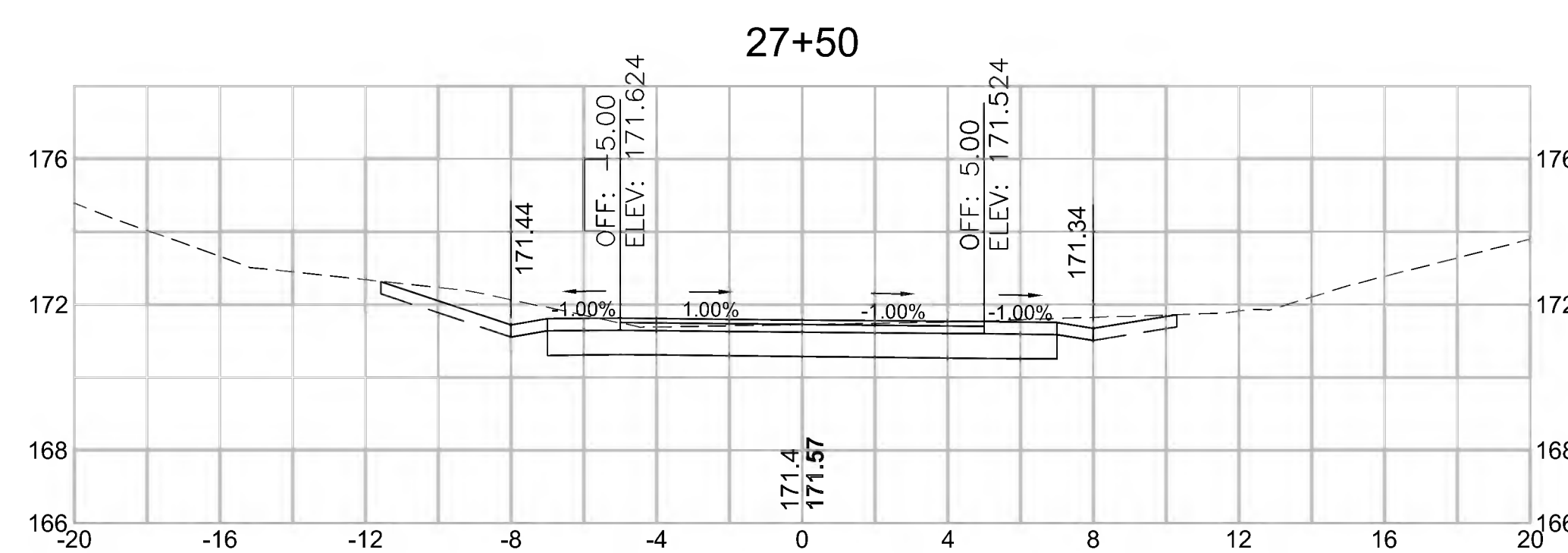
CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	318	319
PROJECT FILE NO.		608164	

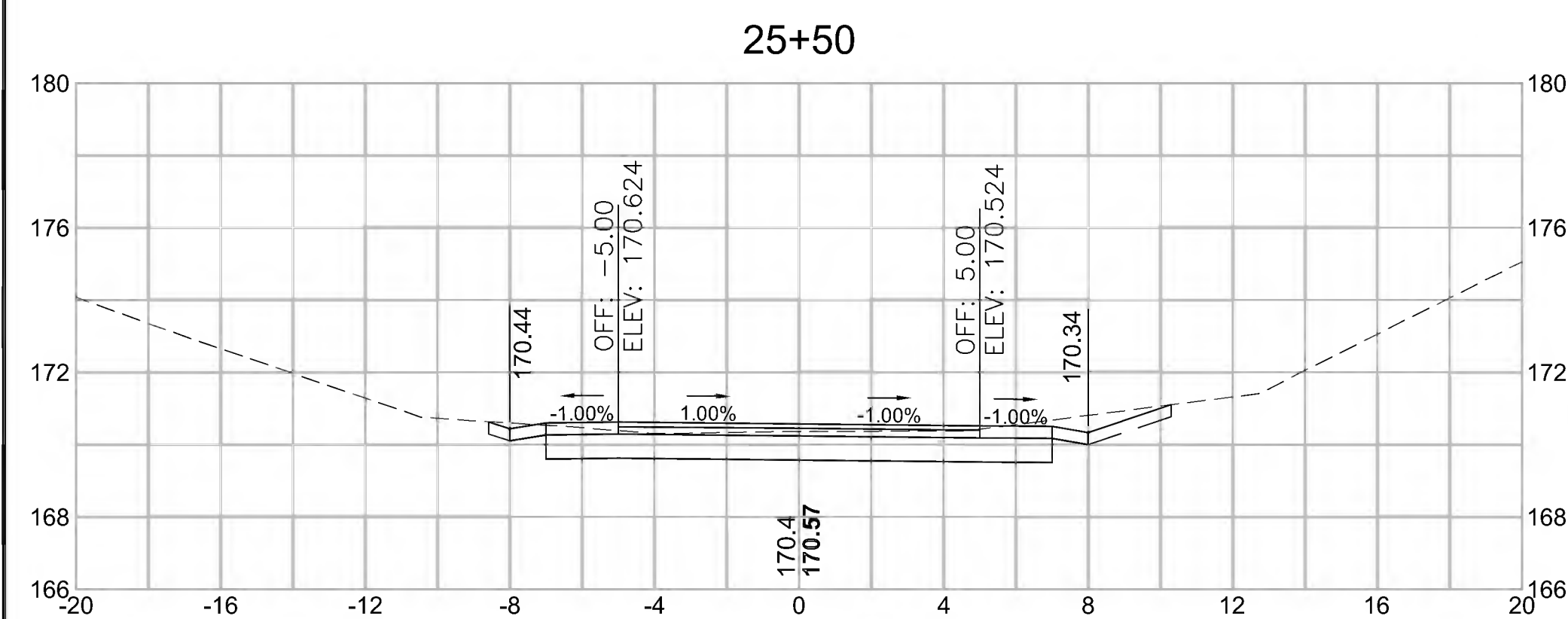
CROSS SECTIONS



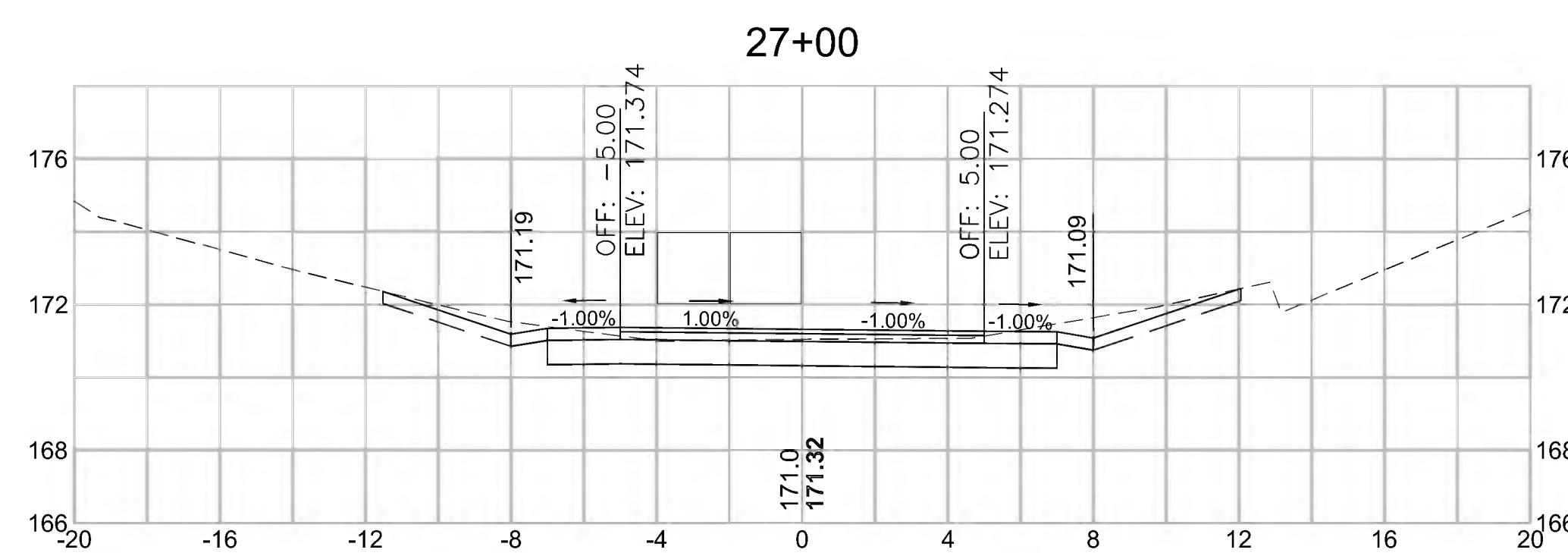
Total Volume at Station 26+00.00	
Cut Area (SF)	13.994
Fill Area (SF)	0.058
Cut Vol (CY)	26.1
Fill Vol (CY)	0.1
Cum Cut Vol (CY)	1170.4
Cum Fill Vol (CY)	499.2
Net Vol (CY)	671.2



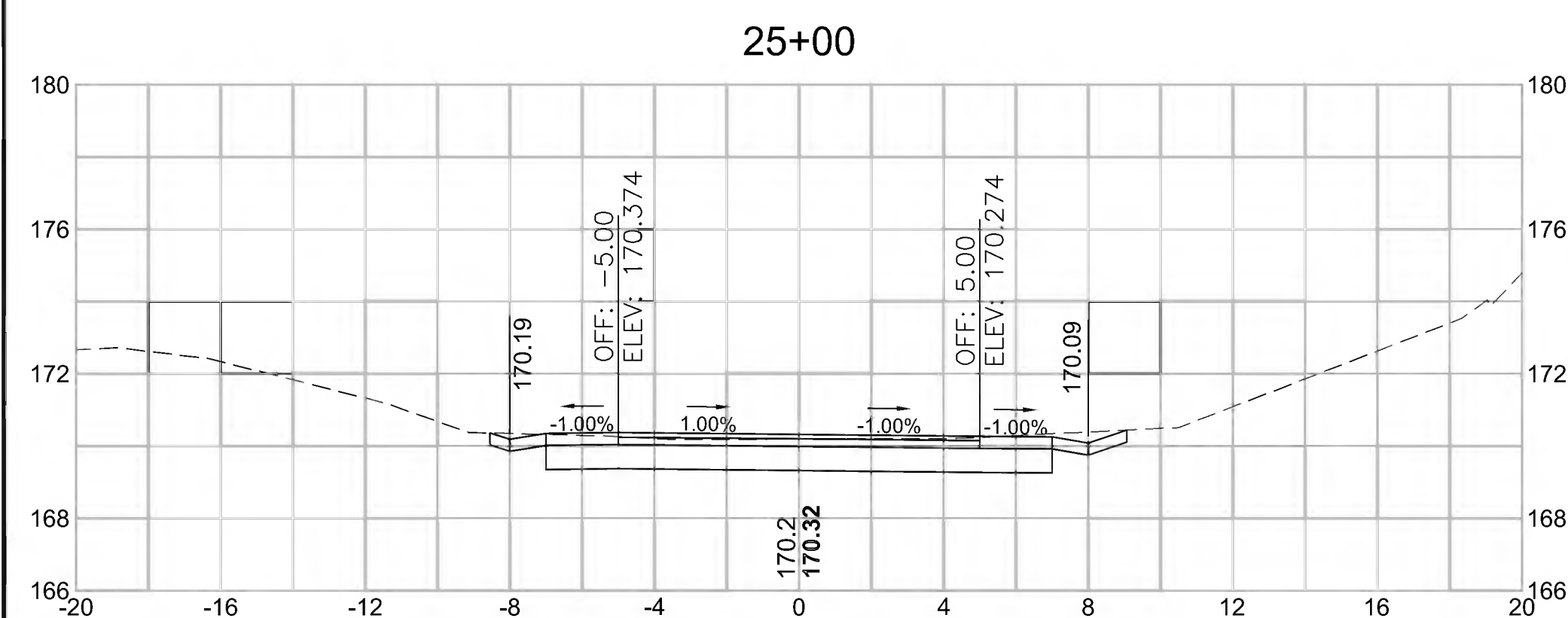
Total Volume at Station 27+50.00	
Cut Area (SF)	18.189
Fill Area (SF)	0.000
Cut Vol (CY)	32.1
Fill Vol (CY)	0.0
Cum Cut Vol (CY)	1260.7
Cum Fill Vol (CY)	499.3
Net Vol (CY)	761.4



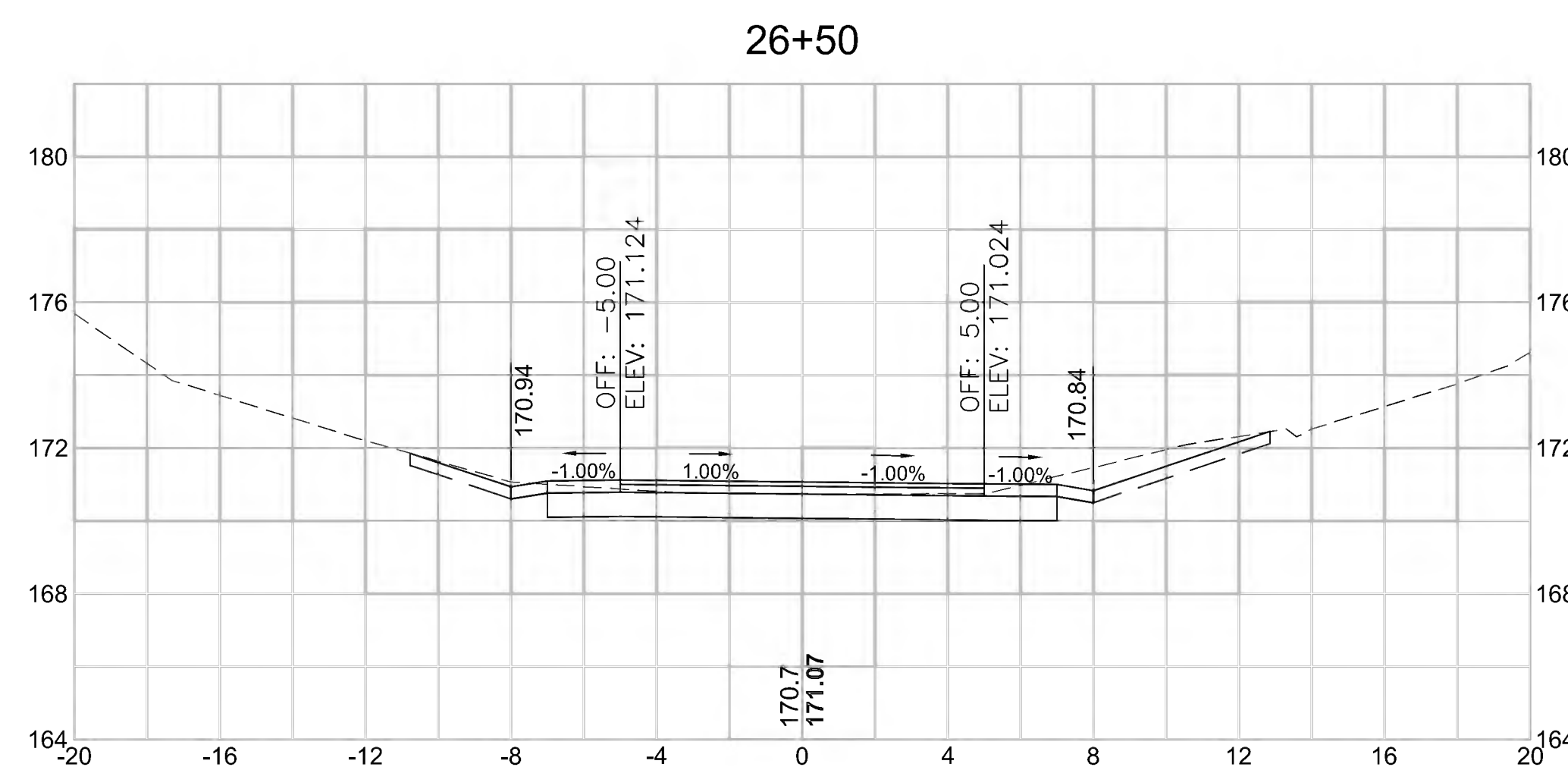
Total Volume at Station 25+50.00	
Cut Area (SF)	14.200
Fill Area (SF)	0.009
Cut Vol (CY)	26.5
Fill Vol (CY)	0.0
Cum Cut Vol (CY)	1144.3
Cum Fill Vol (CY)	499.1
Net Vol (CY)	645.2



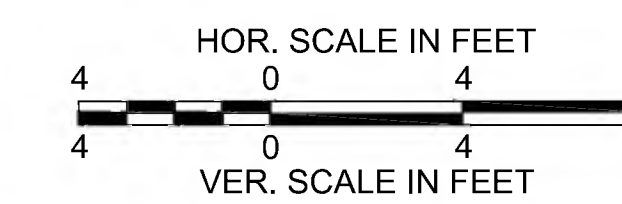
Total Volume at Station 27+00.00	
Cut Area (SF)	16.490
Fill Area (SF)	0.000
Cut Vol (CY)	30.2
Fill Vol (CY)	0.0
Cum Cut Vol (CY)	1228.6
Cum Fill Vol (CY)	499.3
Net Vol (CY)	729.3



Total Volume at Station 25+00.00	
Cut Area (SF)	14.427
Fill Area (SF)	0.002
Cut Vol (CY)	28.0
Fill Vol (CY)	0.0
Cum Cut Vol (CY)	1117.8
Cum Fill Vol (CY)	499.1
Net Vol (CY)	618.7



Total Volume at Station 26+50.00	
Cut Area (SF)	16.146
Fill Area (SF)	0.020
Cut Vol (CY)	27.9
Fill Vol (CY)	0.1
Cum Cut Vol (CY)	1198.4
Cum Fill Vol (CY)	499.3
Net Vol (CY)	699.1

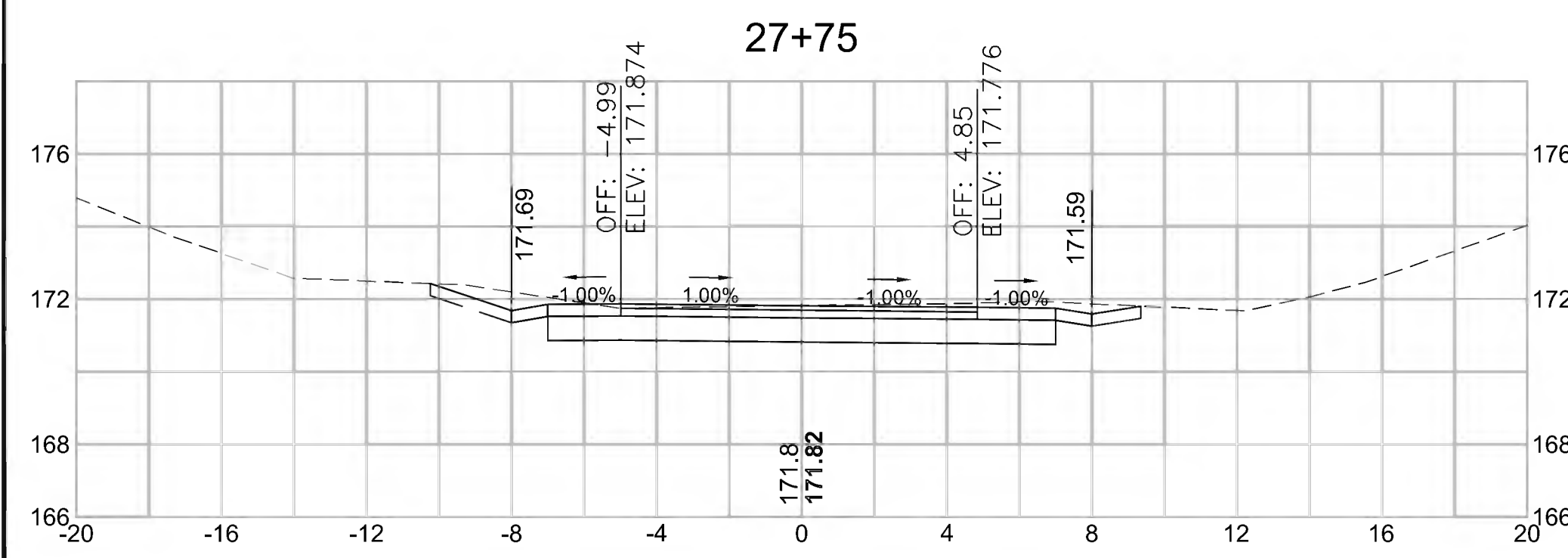




CONCORD  
BRUCE FREEMAN RAIL TRAIL PHASE 2D

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0033(028)X	319	319
PROJECT FILE NO.		608164	

CROSS SECTIONS



Total Volume at Station 27+75.00	
Cut Area (SF)	17.652
Fill Area (SF)	0.000
Cut Vol (CY)	16.6
Fill Vol (CY)	0.0
Cum Cut Vol (CY)	1277.3
Cum Fill Vol (CY)	499.3
Net Vol (CY)	778.0

