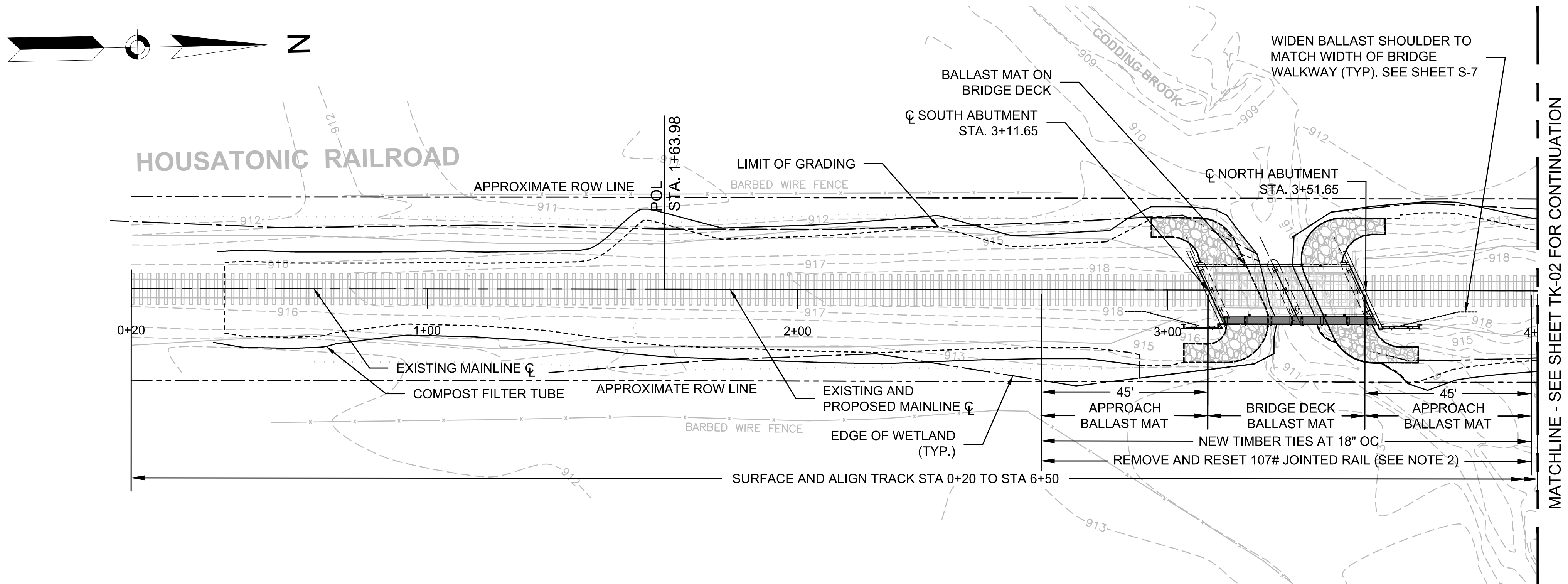
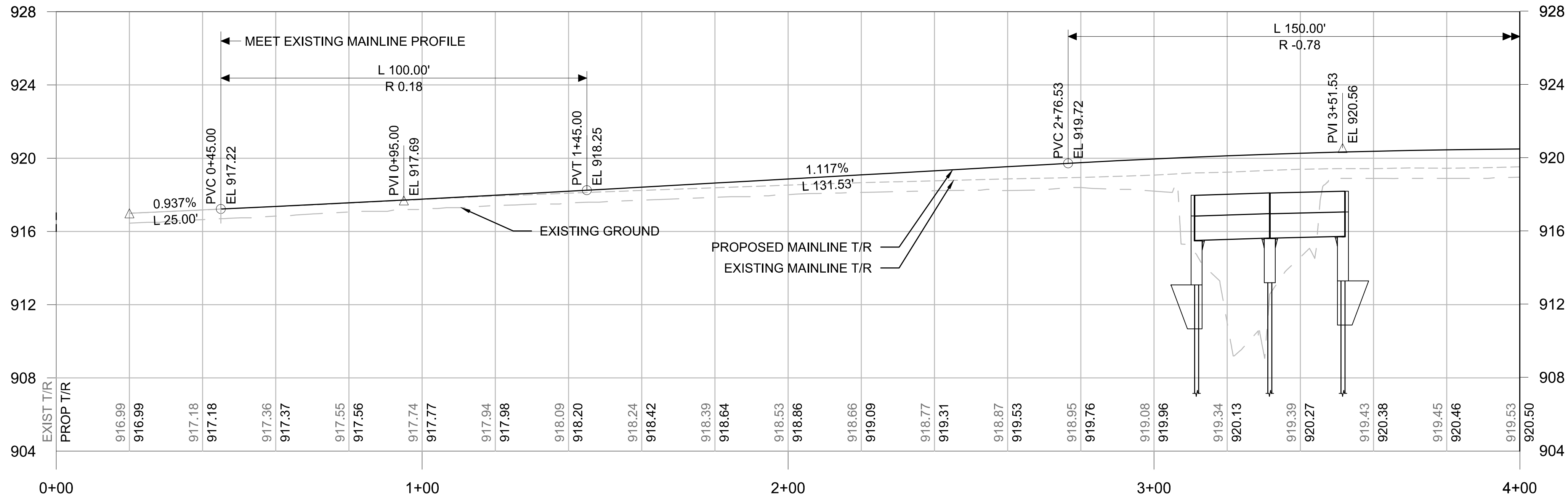


← TO LEE

TO PITTSFIELD →



PLAN



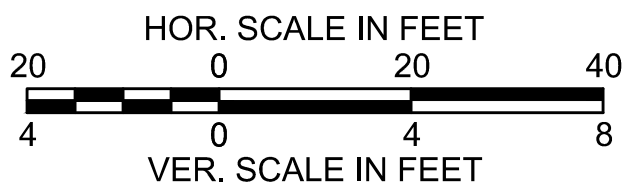
PROFILE

MAINLINE HORIZONTAL GEOMETRY DATA

ELEMENT	POINT	STATION	BEARING	COORDINATES	
				NORTHING	EASTING
TANGENT	POB	1+63.98	N 01°11'22" E	2947808.77	185234.09
	POE	5+00.28	N 01°11'22" E	2948144.99	185241.07

NOTES:

- EXISTING TIES SHALL BE REMOVED WITHIN THE LIMITS SHOWN ON THE PLANS. TIES NOT IDENTIFIED FOR SALVAGE BY THE ENGINEER SHALL BE DISPOSED OF IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
- EXISTING RAIL, PLATES, AND JOINT BARS TO BE REMOVED AND RESET. LIMIT OF RAIL REMOVAL SHALL BE AT THE FIRST RAIL JOINT LOCATED BEYOND THE TIE REPLACEMENT LIMIT.
- BALLAST SHALL BE REMOVED TO A DEPTH OF 9" BELOW THE PROPOSED BOTTOM OF TIE ELEVATION IN TIE REPLACEMENT AREAS TO ALLOW FOR INSTALLATION OF APPROACH BALLAST MAT.
- THE BRIDGE DECK BALLAST MAT SHALL EXTEND A MINIMUM OF THREE FEET BEYOND THE BRIDGE ABUTMENT.
- EXISTING TRACK TO BE SURFACED AND ALIGNED TO MEET PROPOSED TRACK.



MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

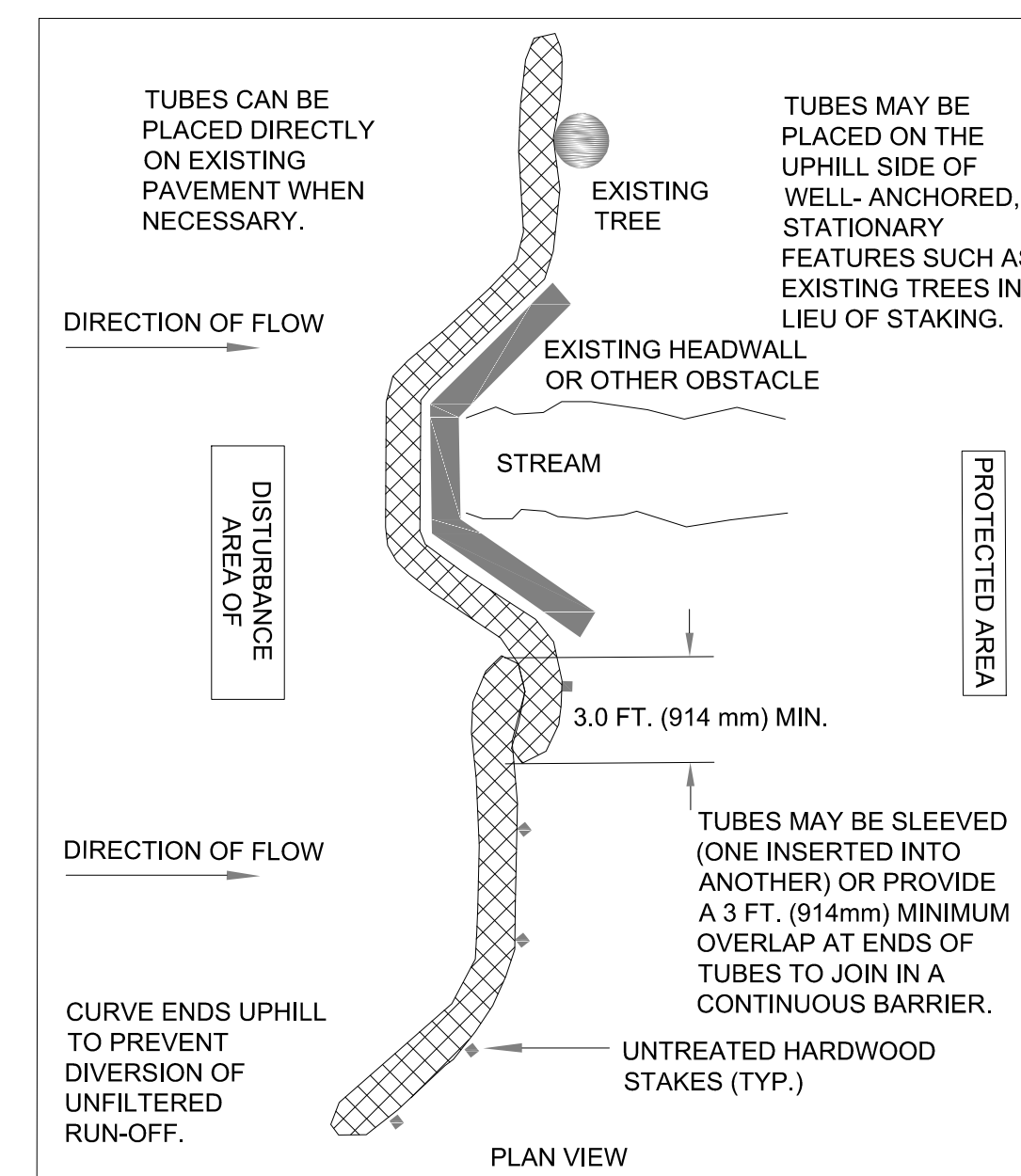
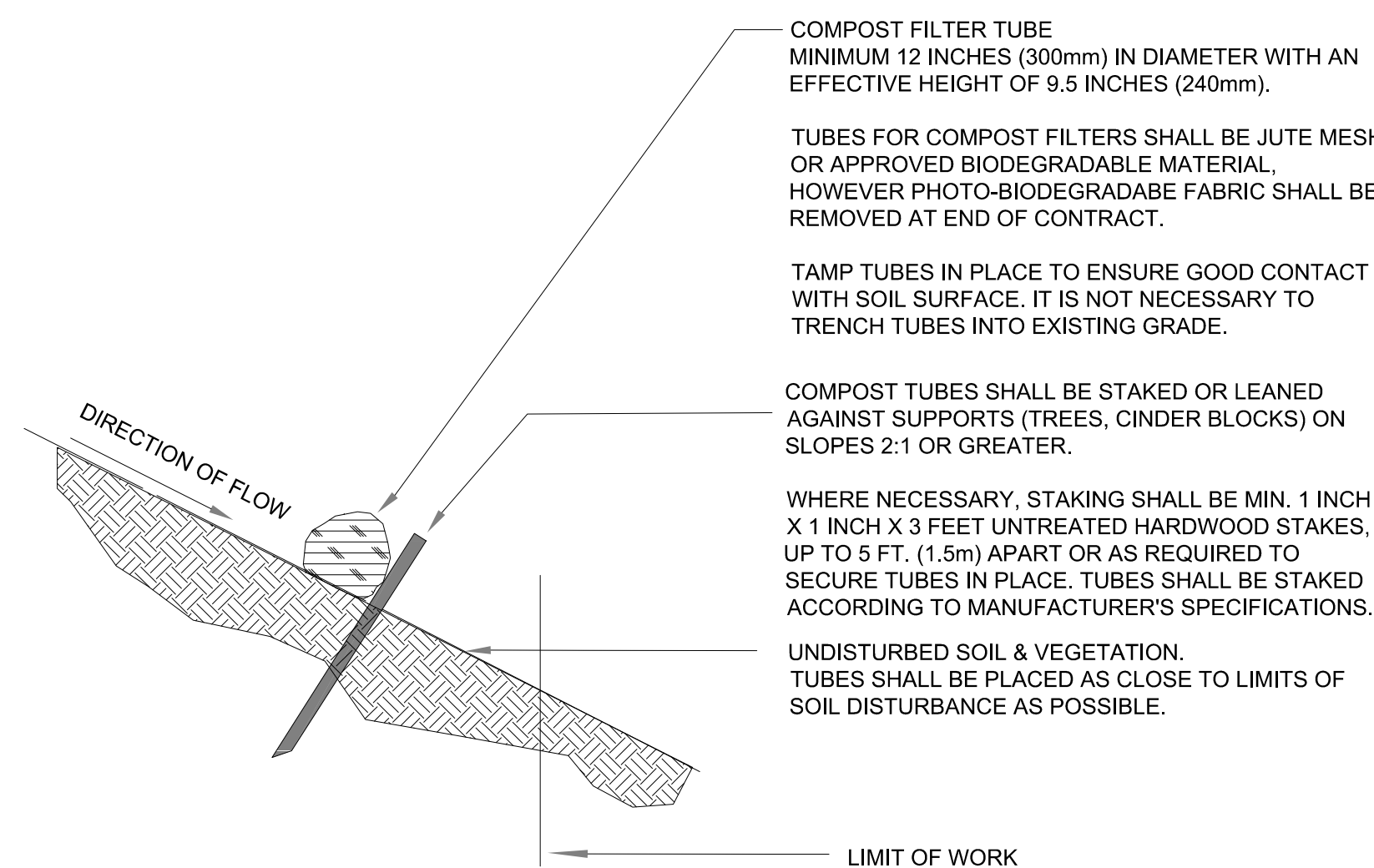
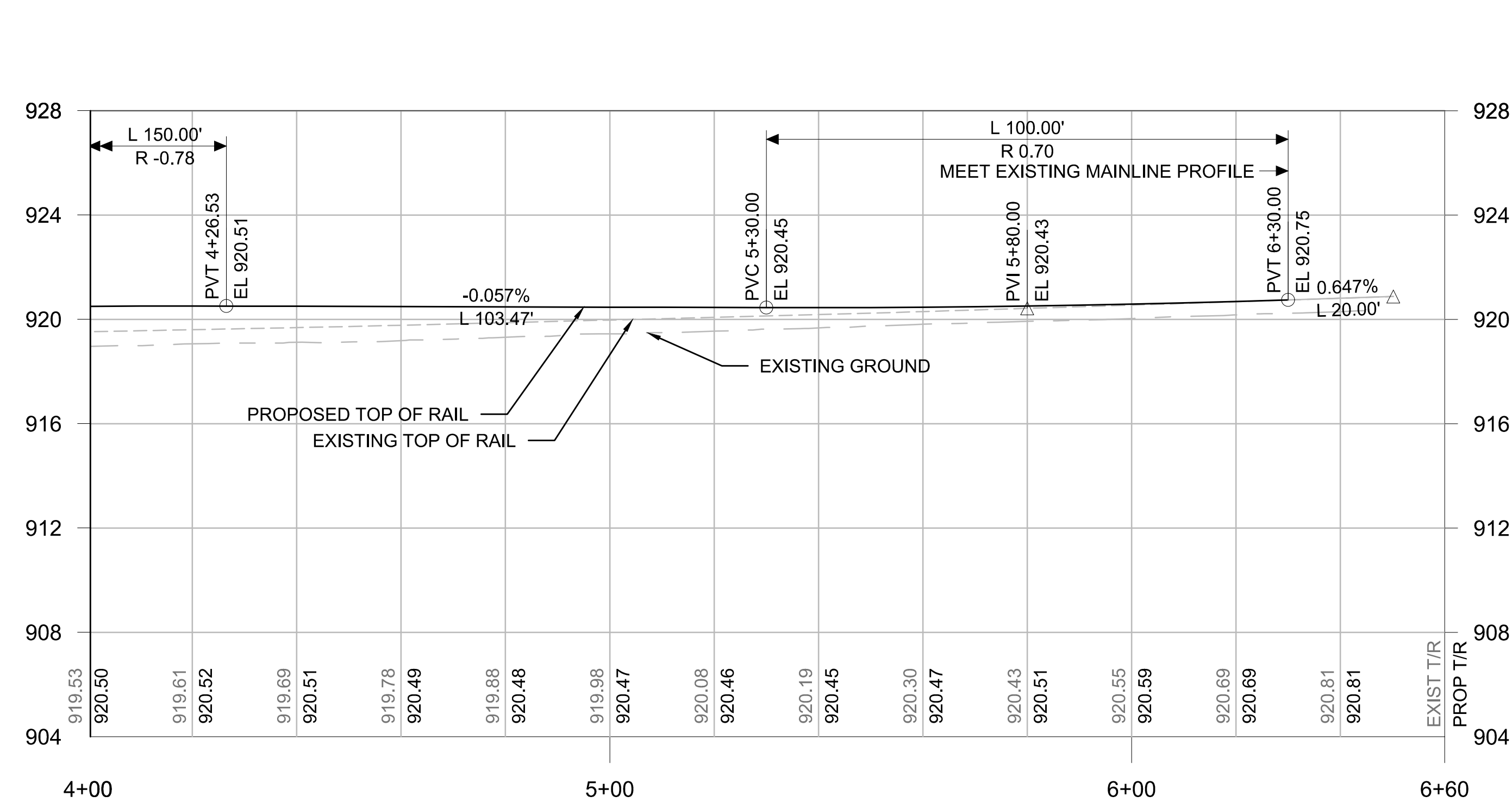
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
MAINLINE PLAN AND PROFILE
STA. 0+00 TO STA. 4+00



HDR, INC.
90 HIGH STREET, SUITE 2300
BOSTON, MA 02110
(617) 357-7700



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GENERAL NOTES:

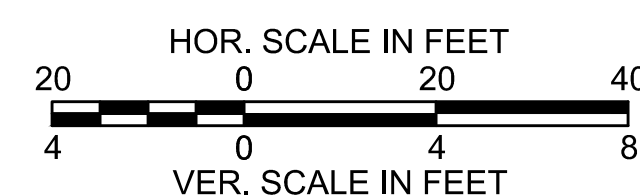
1. PROVIDE A MINIMUM TUBE DIAMETER OF 12 INCHES (300mm) FOR SLOPES UP TO 50 FEET (15.24m) IN LENGTH WITH A SLOPE RATIO OF 3H:1V OR STEEPER. LONGER SLOPES OF 3H:1V MAY REQUIRE LARGER TUBE DIAMETER OR ADDITIONAL COURSING OF FILTER TUBES TO CREATE A FILTER BERM. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SITUATIONS WITH LONGER OR STEEPER SLOPES.
2. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
3. TUBE LOCATION MAY BE SHIFTED TO ADJUST TO LANDSCAPE FEATURES, BUT SHALL PROTECT UNDISTURBED AREAS AND VEGETATION TO MAXIMUM EXTENT POSSIBLE.
4. DO NOT INSTALL IN PERENNIAL, EPHEMERAL OR INTERMITTENT STREAMS.
5. ADDITIONAL TUBES SHALL BE USED AT THE DIRECTION OF THE ENGINEER.
6. ADDITIONAL STAKING SHALL BE USED AT THE DIRECTION OF THE ENGINEER.

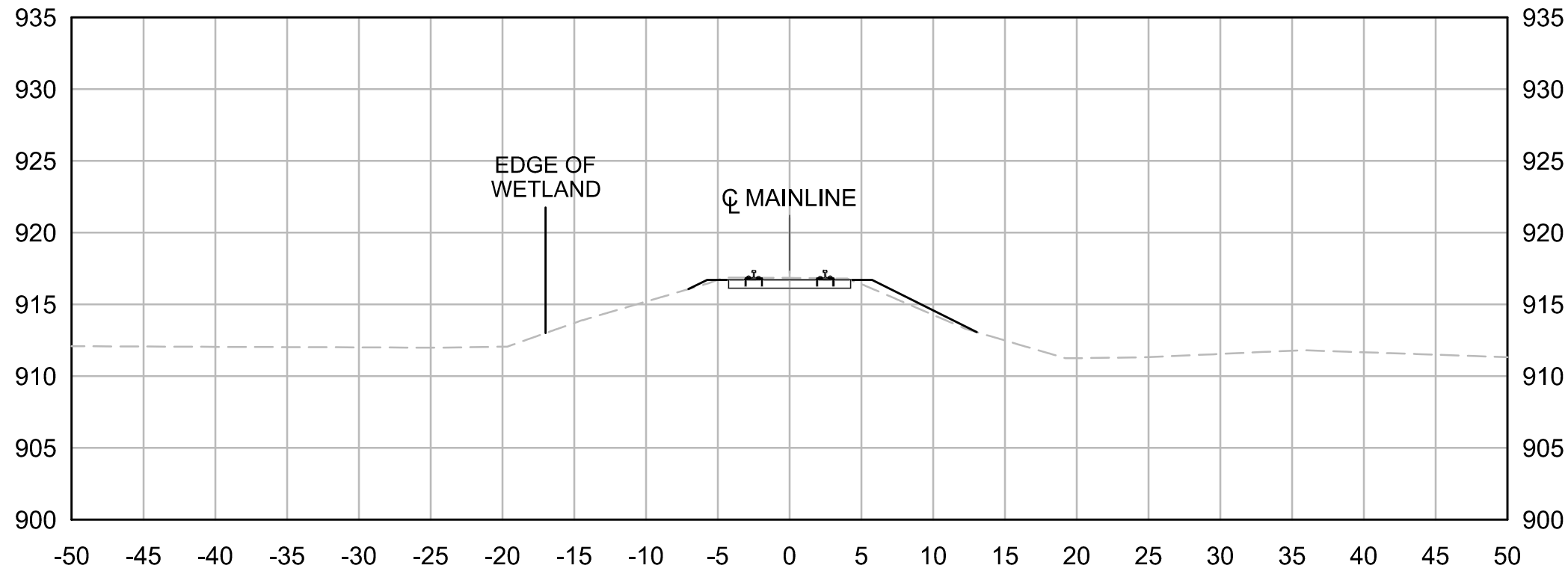
DETAIL 1 – COMPOST FILTER TUBE

NOT TO SCALE

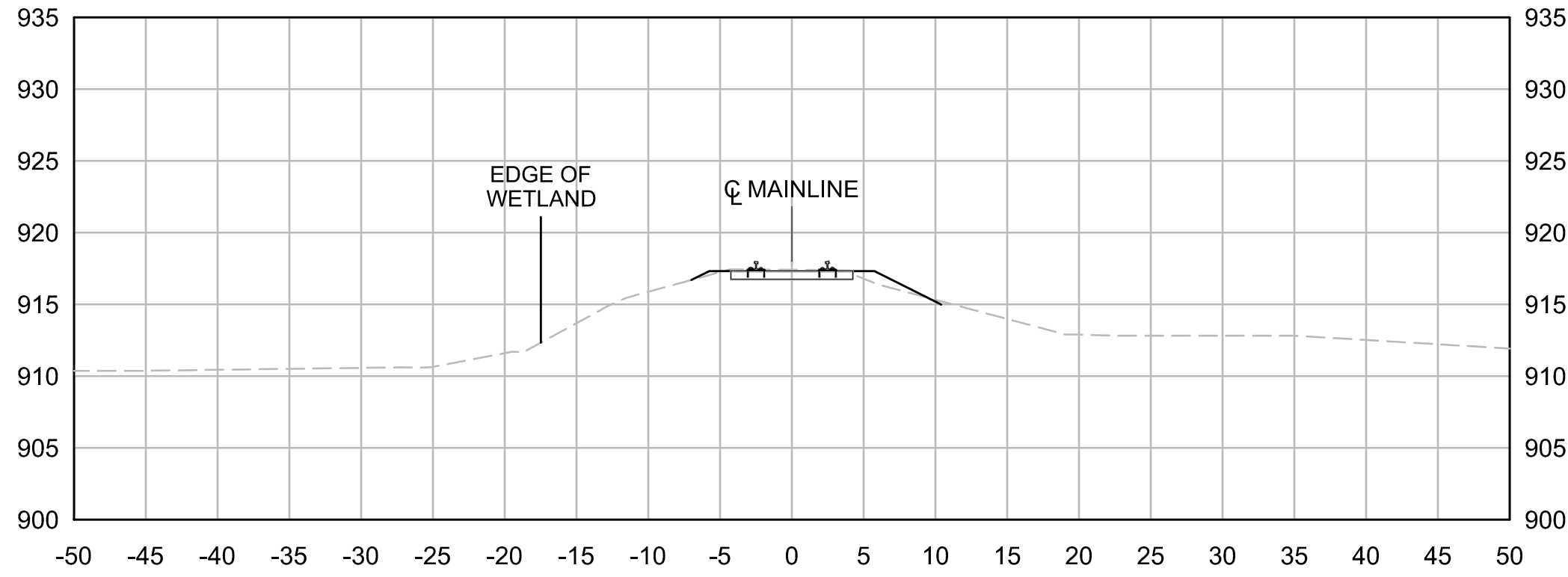
NOTES:

1. BALLAST SHALL BE REMOVED TO A DEPTH OF 9" BELOW THE PROPOSED BOTTOM OF TIE ELEVATION IN THE TIE REPLACEMENT AREAS TO ALLOW FOR INSTALLATION OF APPROACH BALLAST MAT AND A MINIMUM OF 8" OF BALLAST.

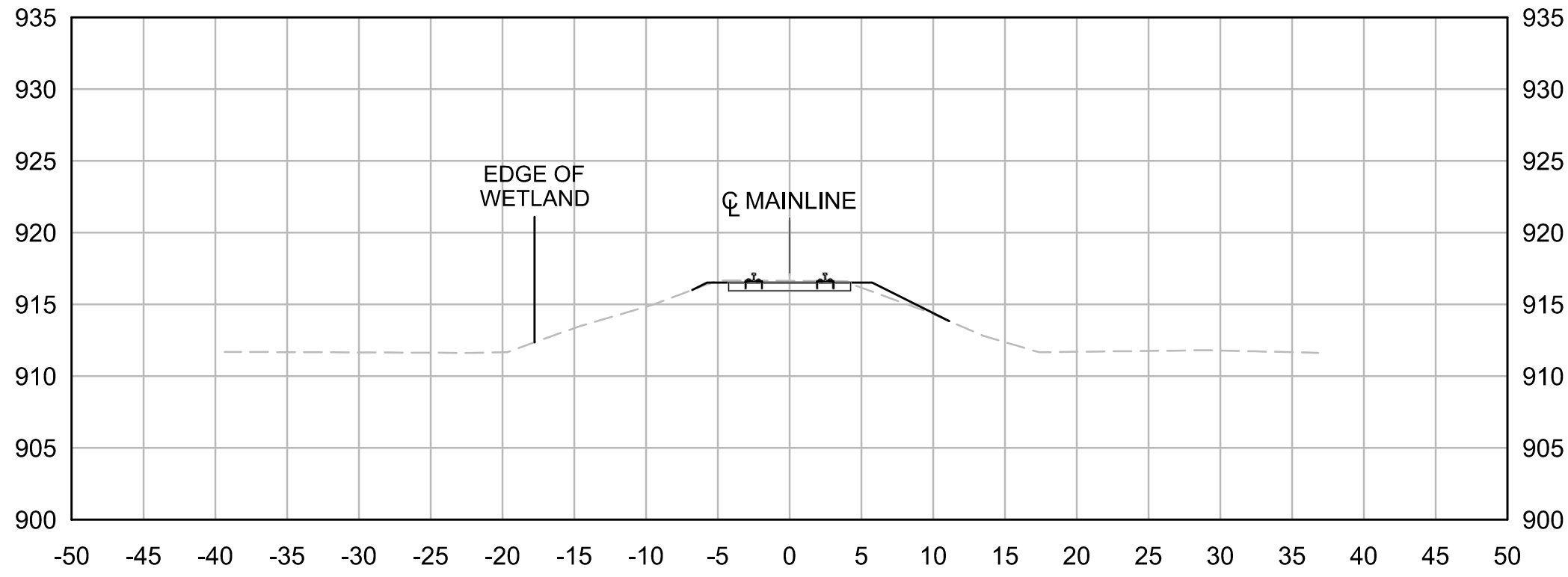
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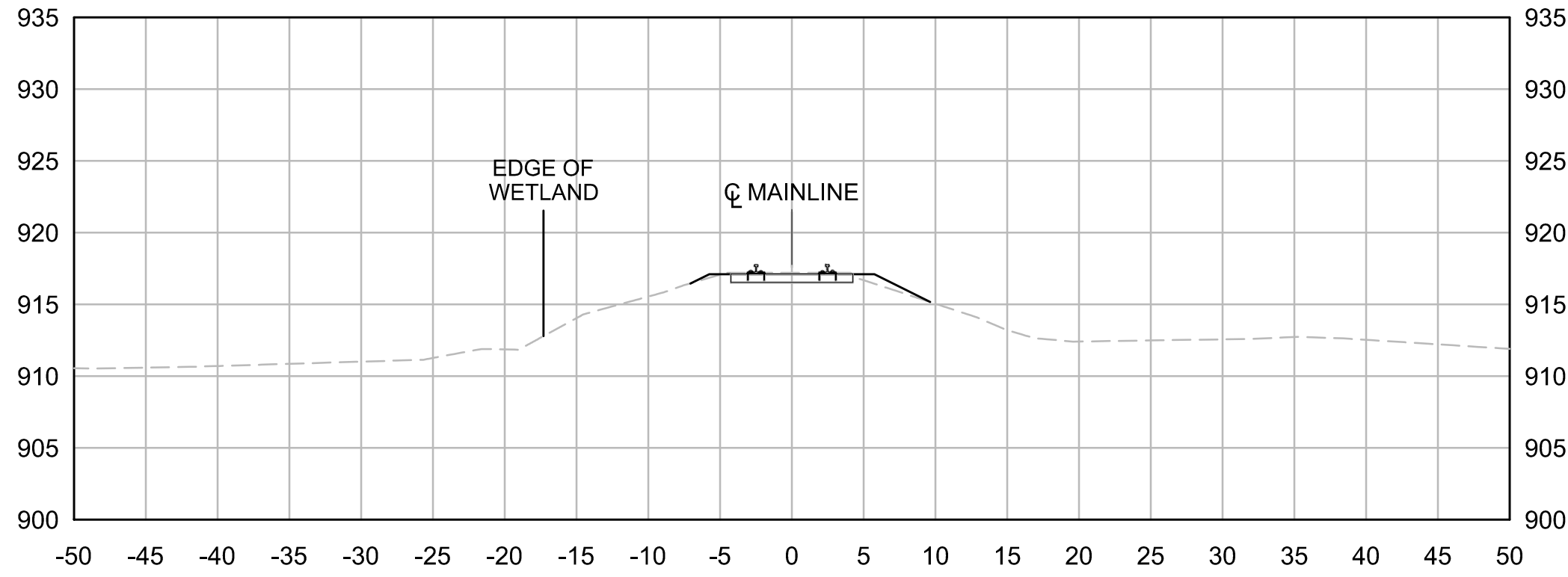
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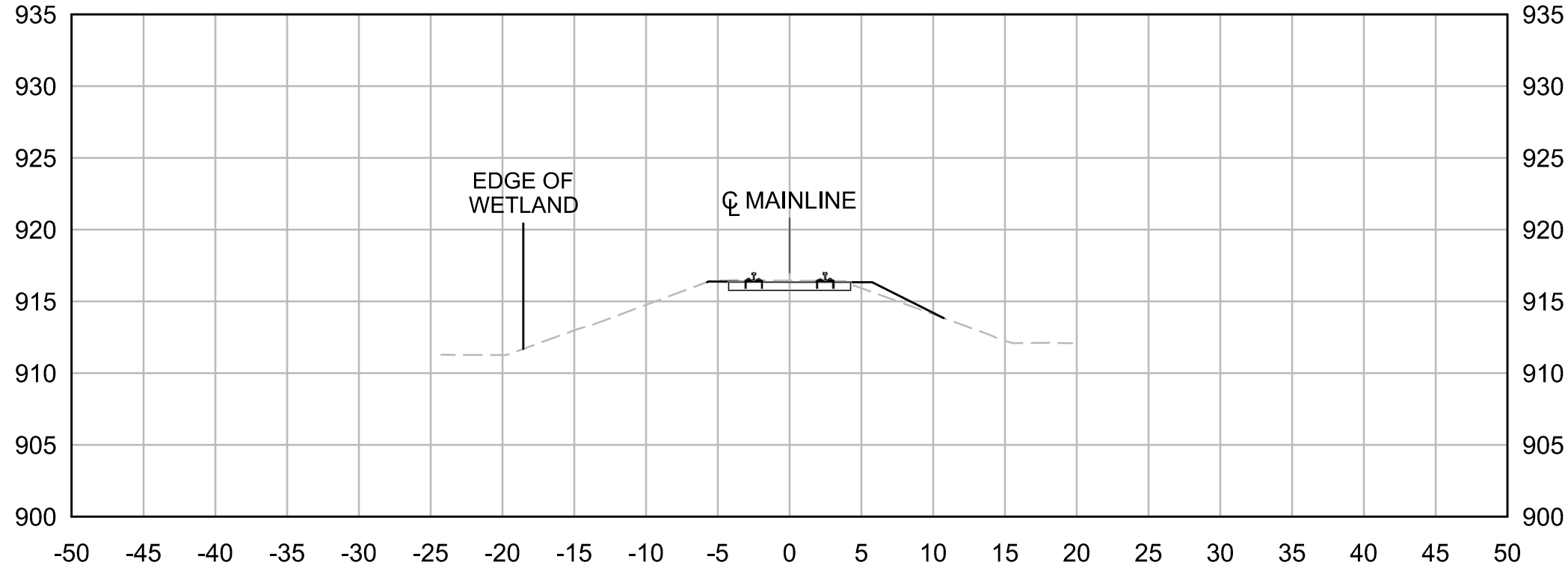
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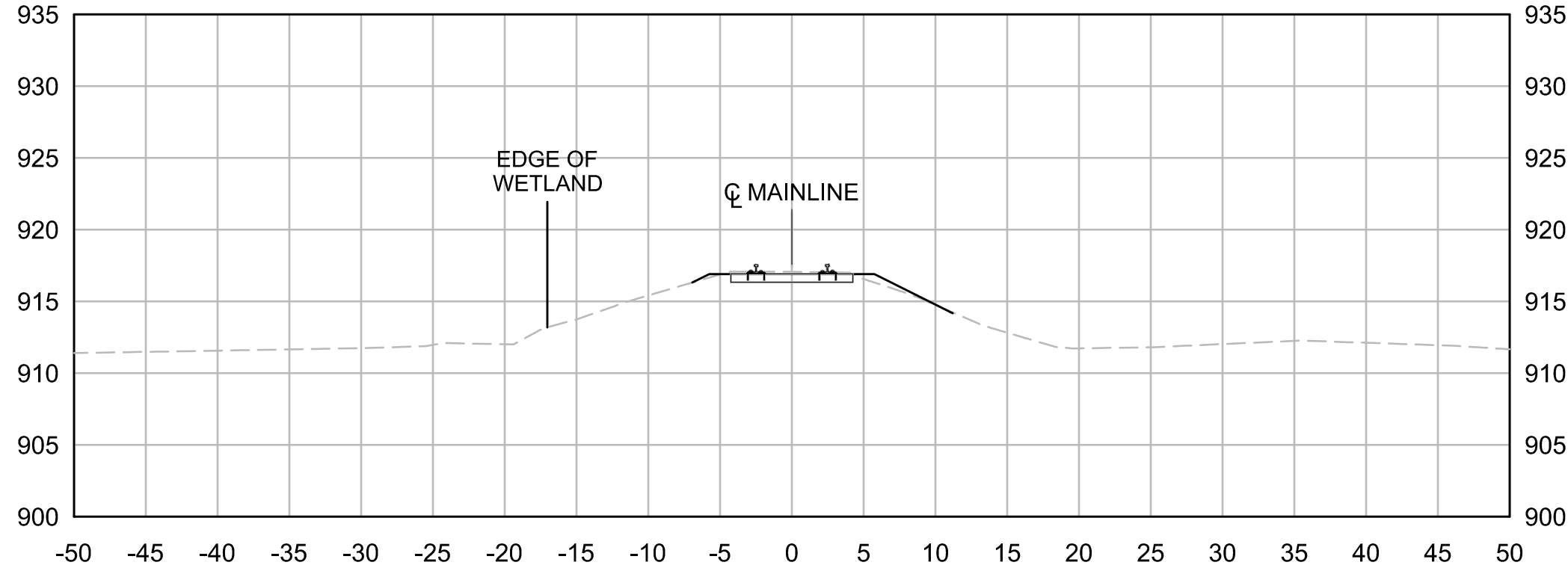
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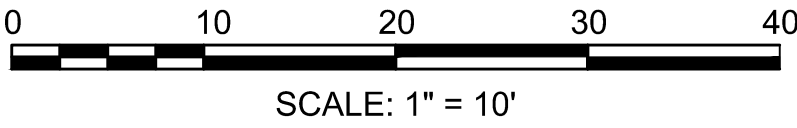
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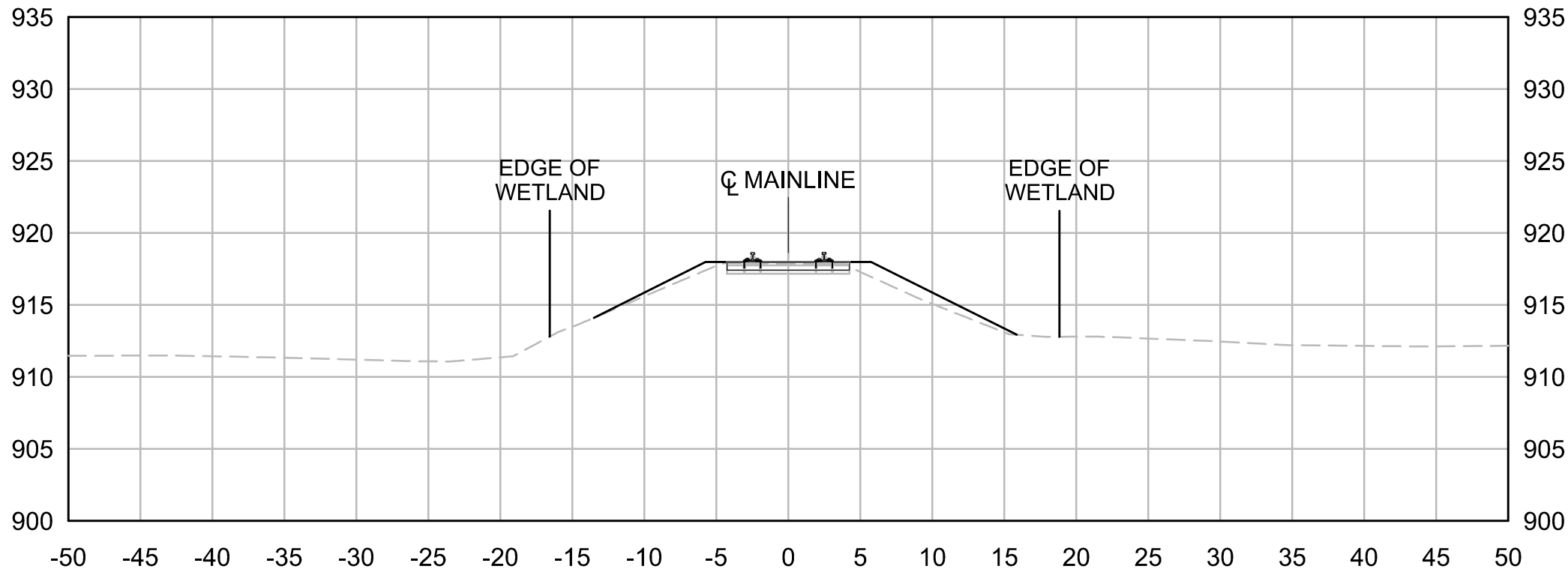
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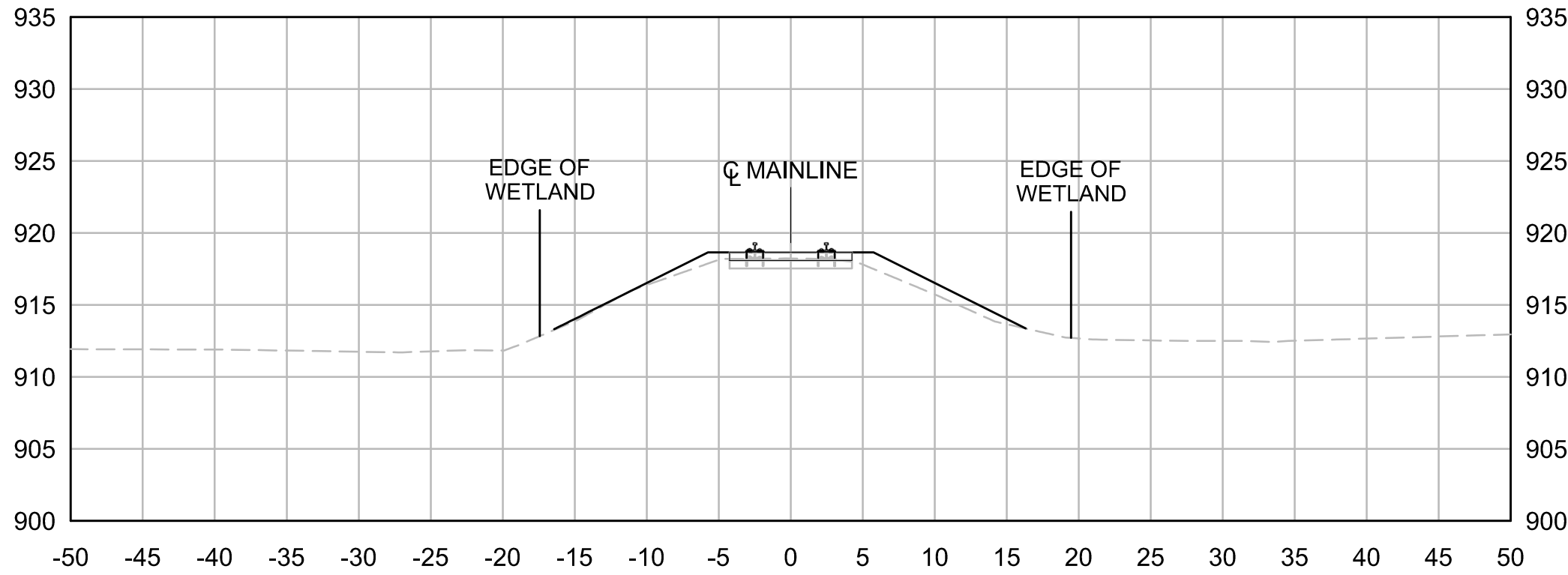
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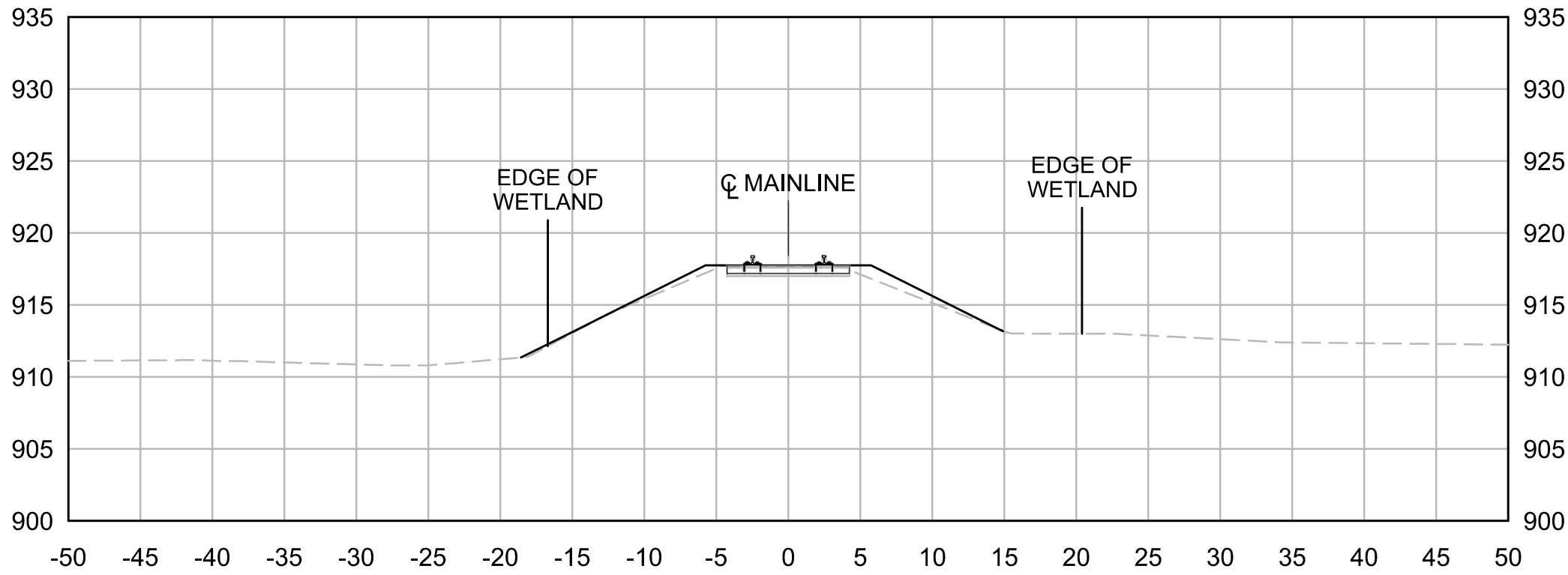
						 HDR, INC. 90 HIGH STREET, SUITE 2300 BOSTON, MA 02110 (617) 357-7700  Massachusetts Department of Transportation Rail & Transit Division					
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DATE: 12/12/2022		CNL	CNL	NLK	SHEET: XS-01						
ISSUE	DATE	DESCRIPTION				BY	CHK'D	APP.			



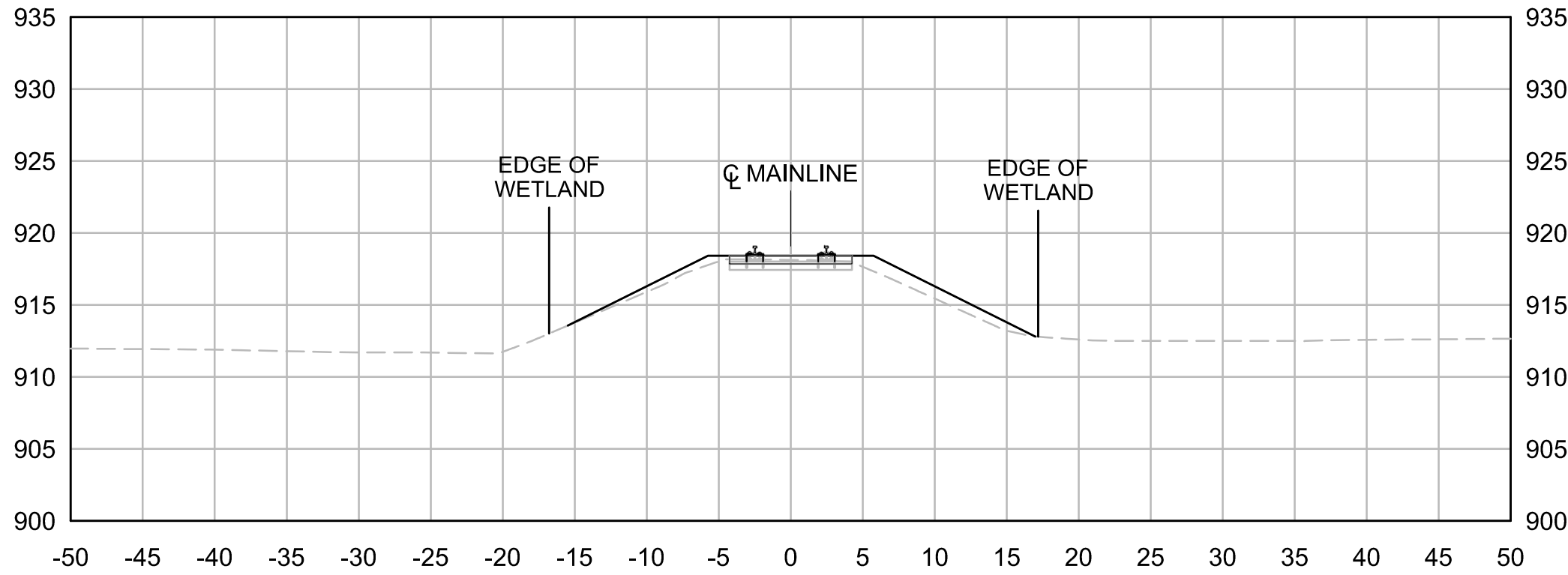
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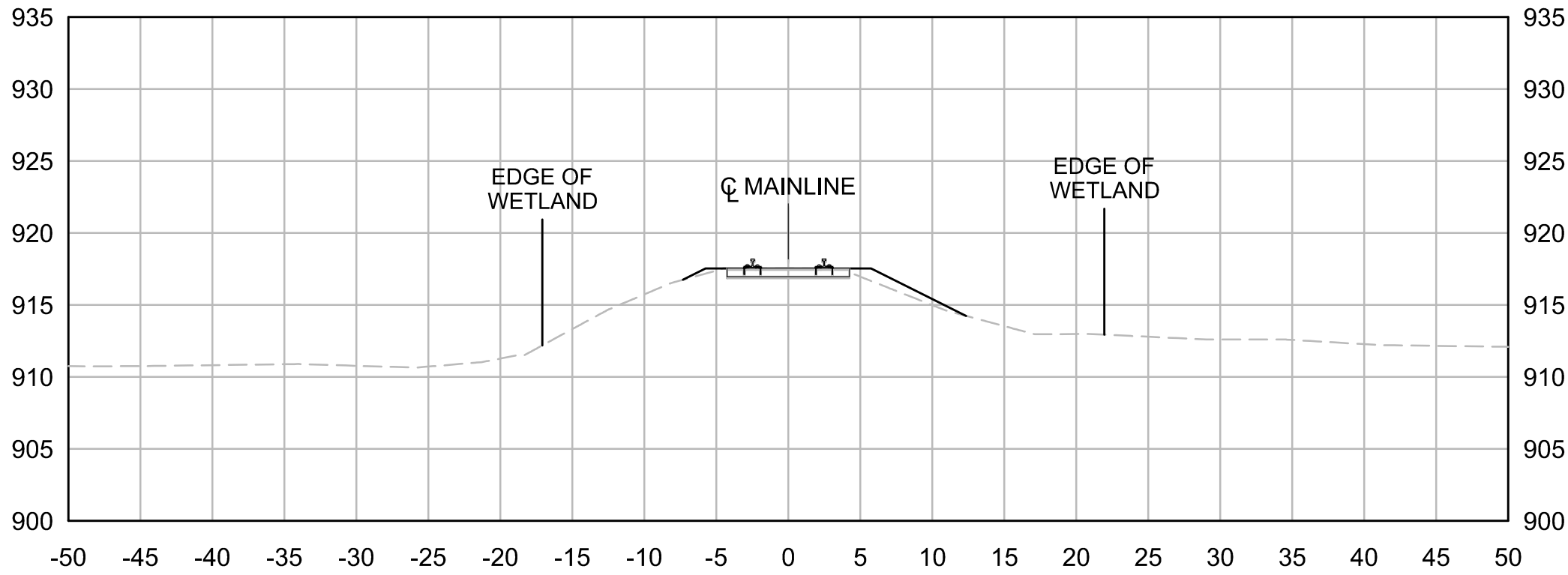
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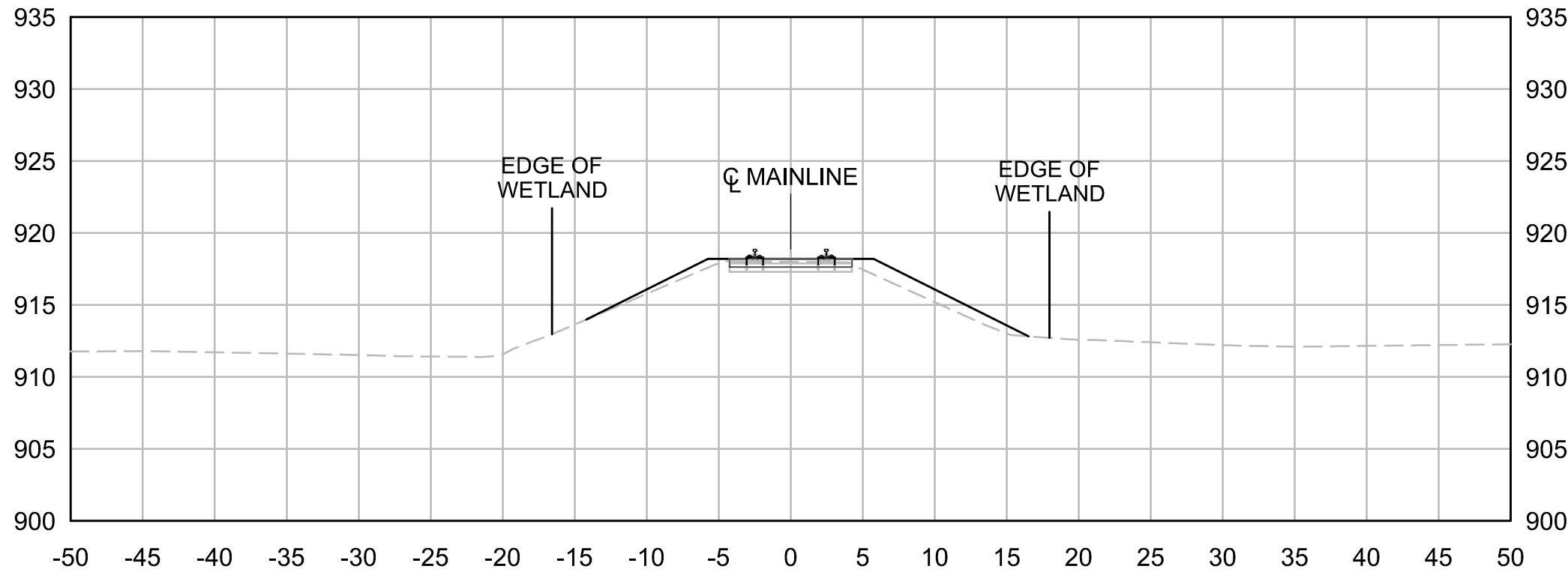
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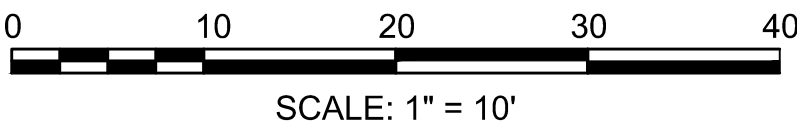
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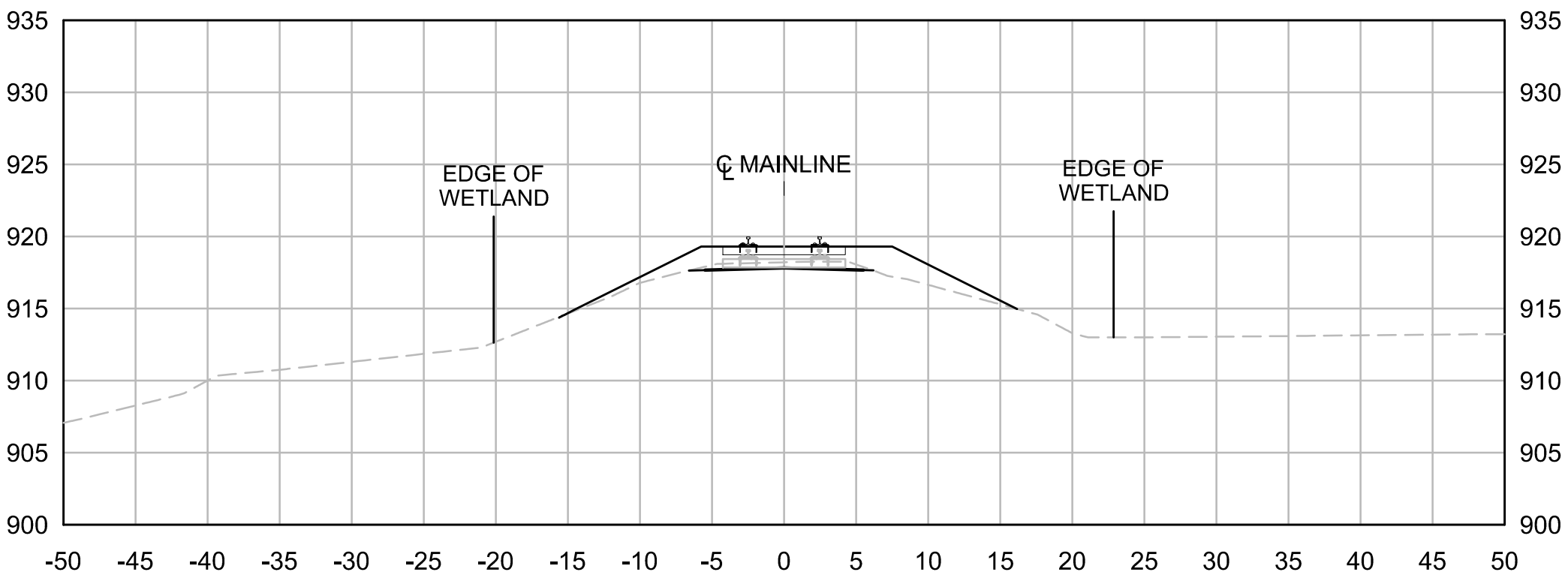
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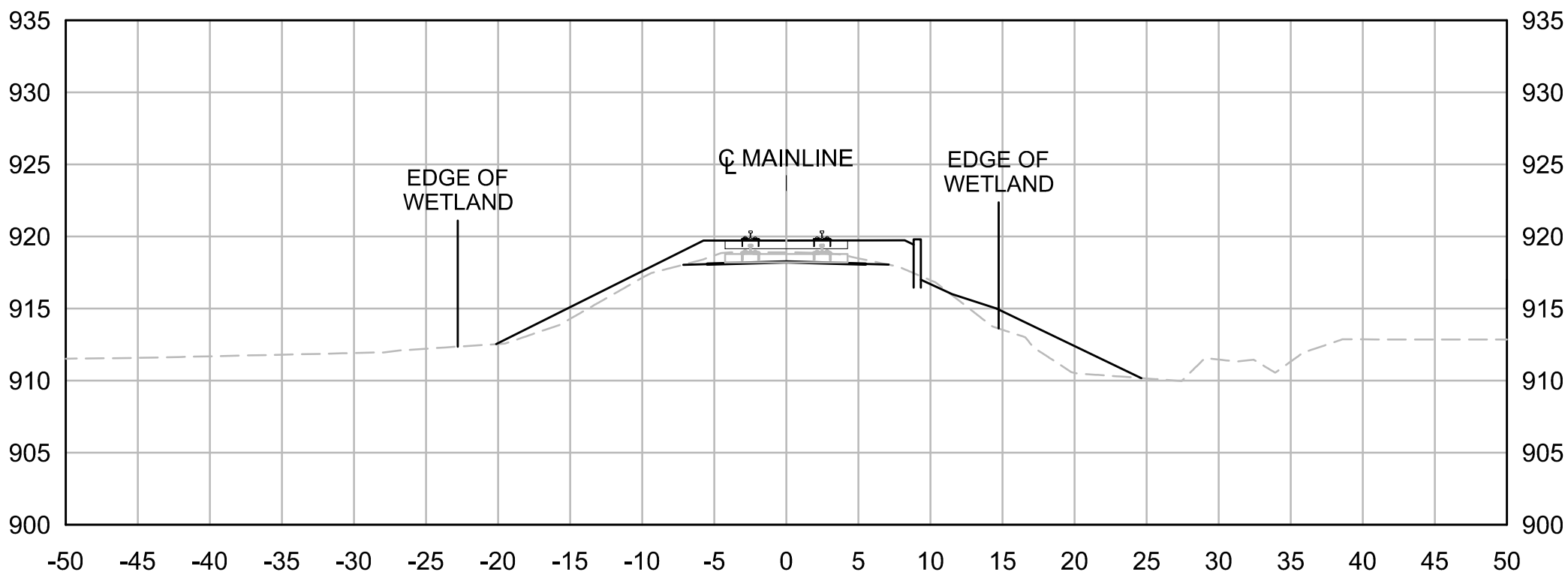
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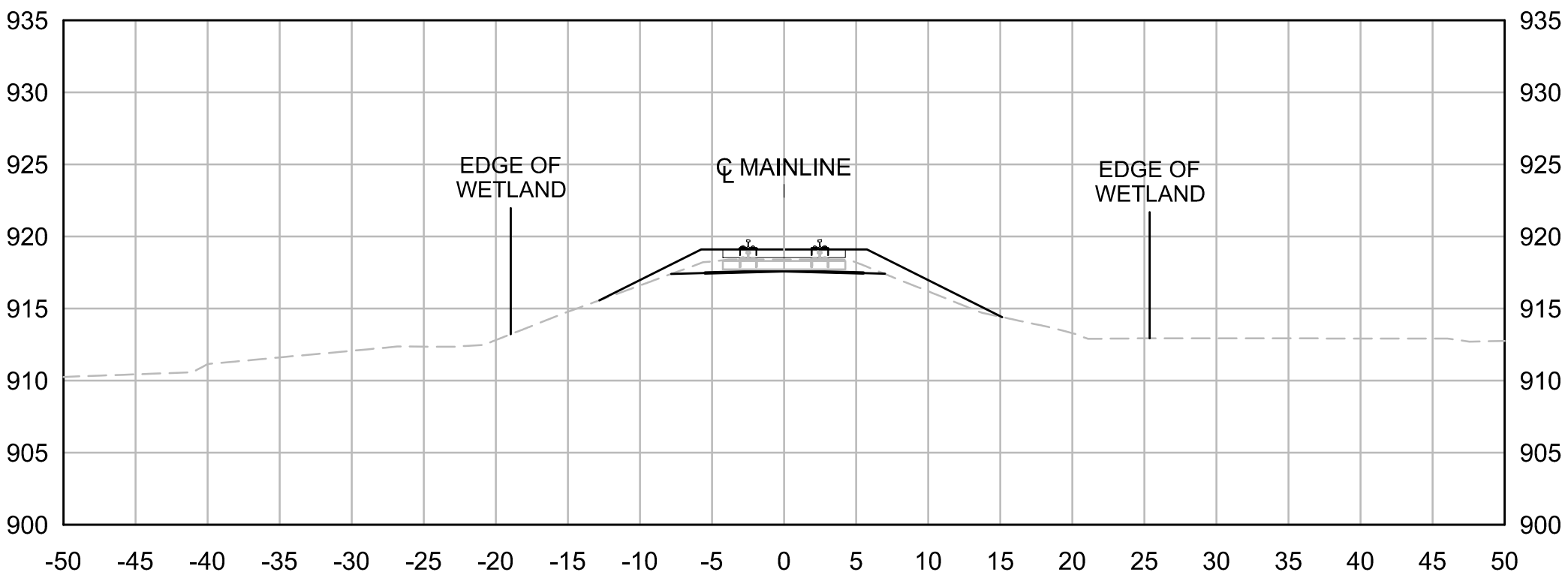
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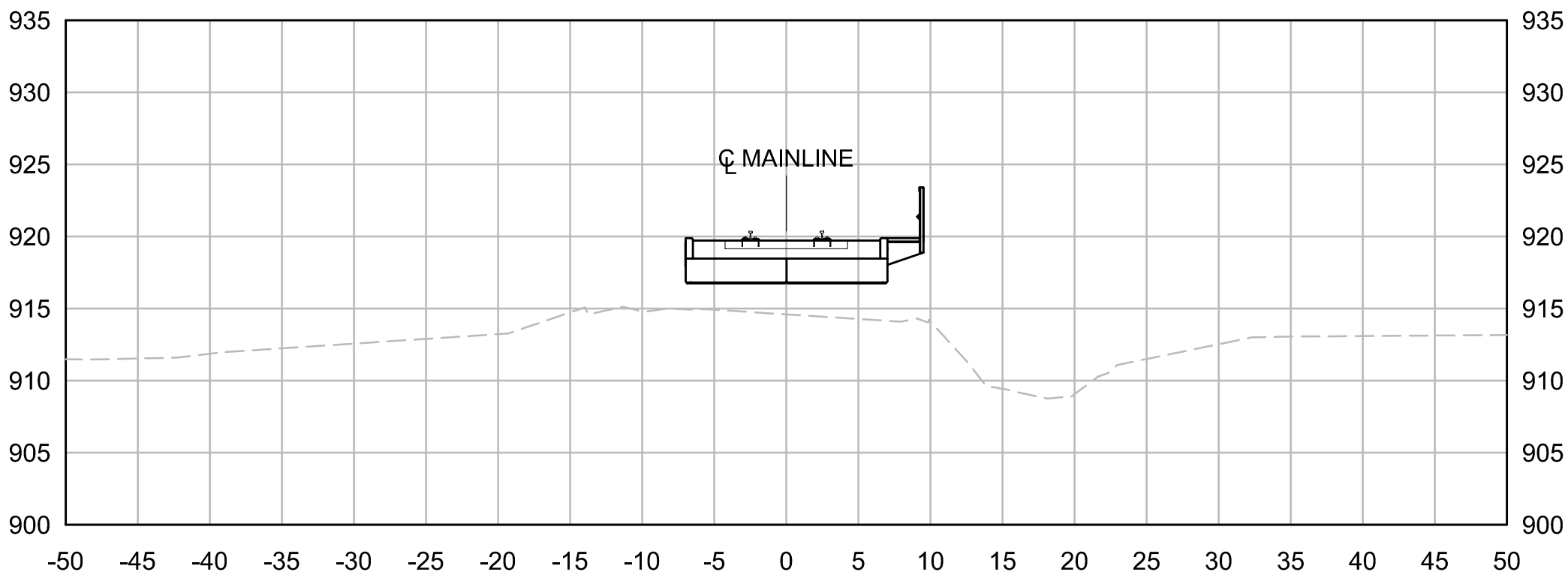
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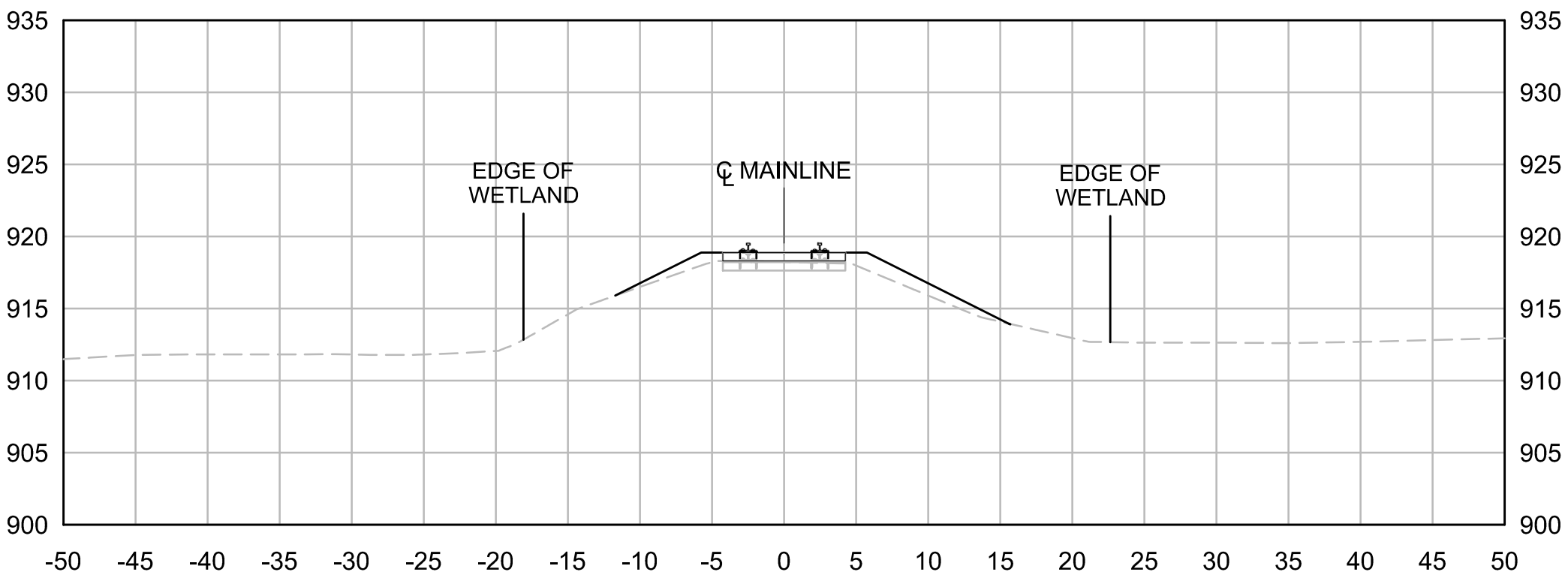
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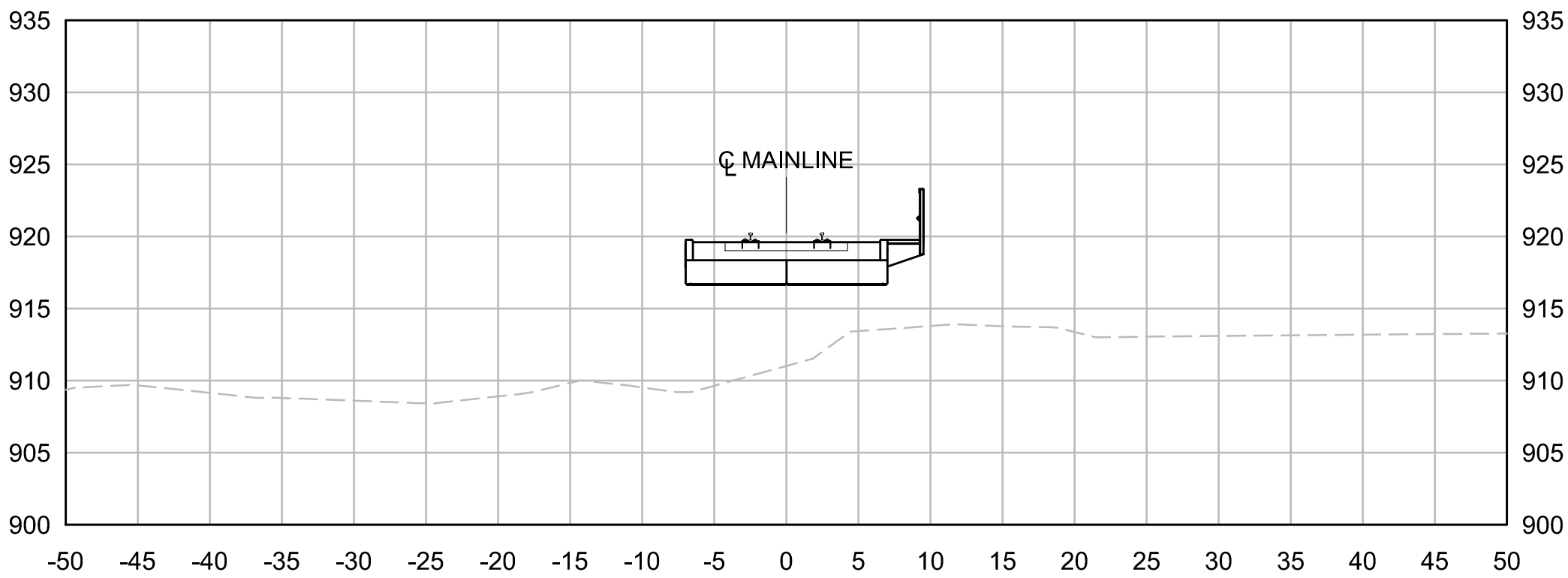
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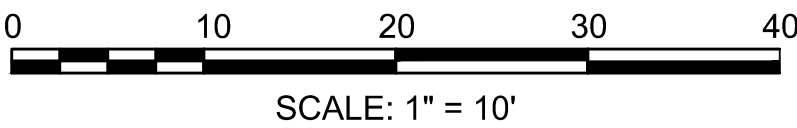


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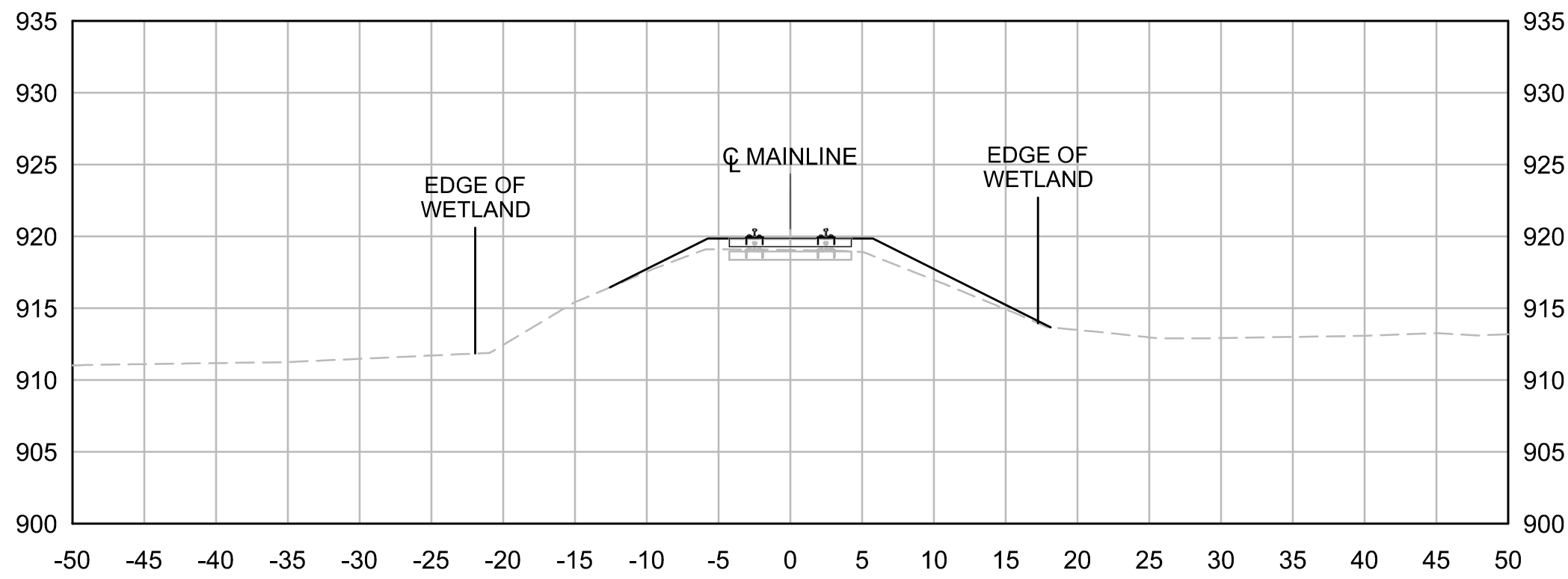


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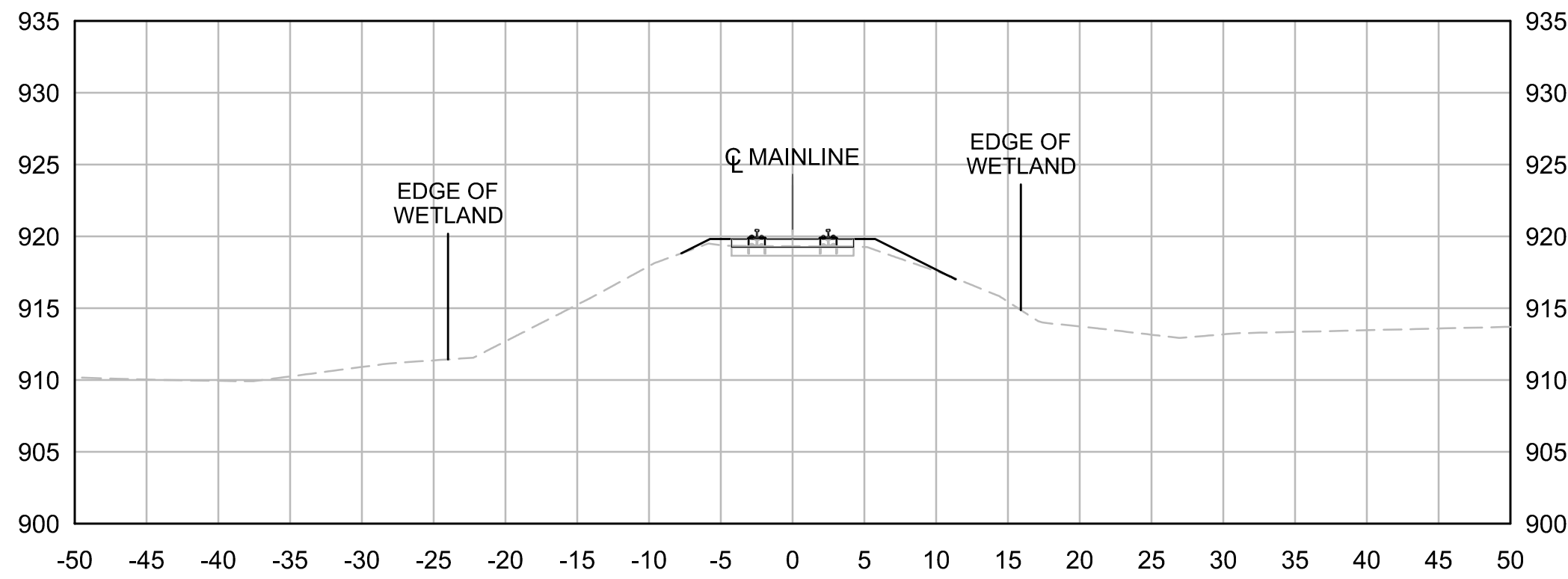
NOTE:
1) SEE STRUCTURAL PLANS FOR PROPOSED BRIDGE DETAILS.



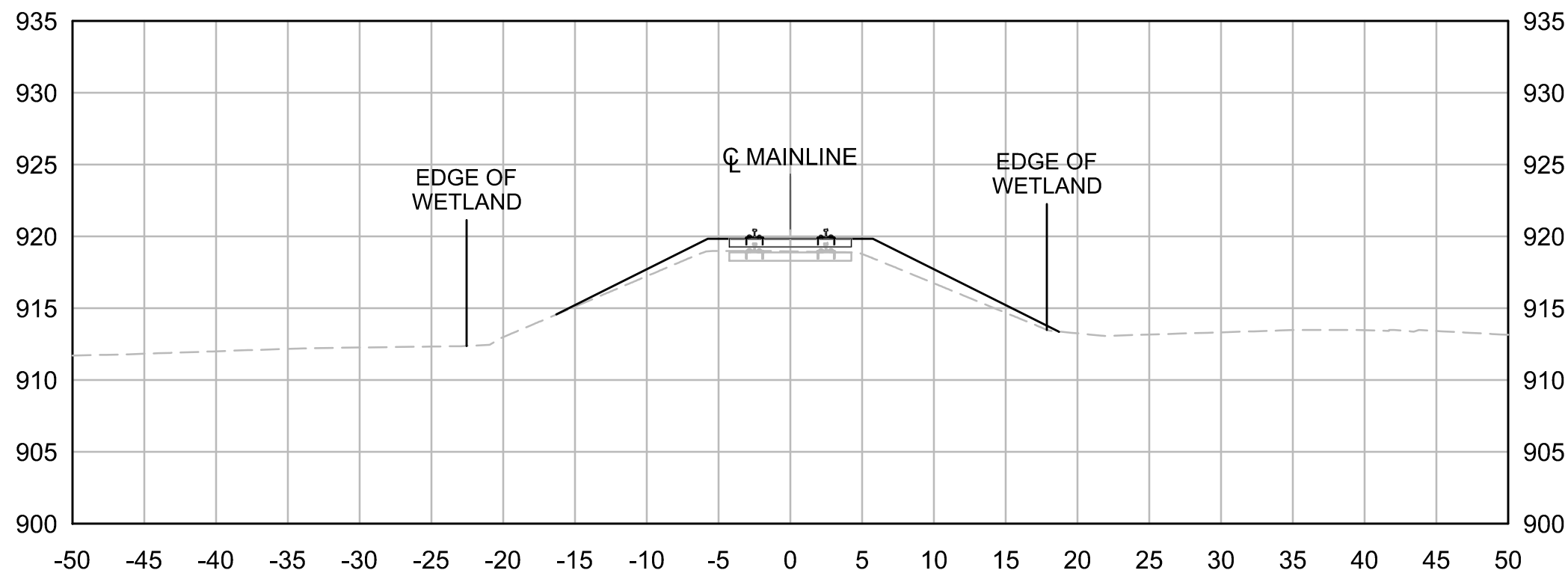
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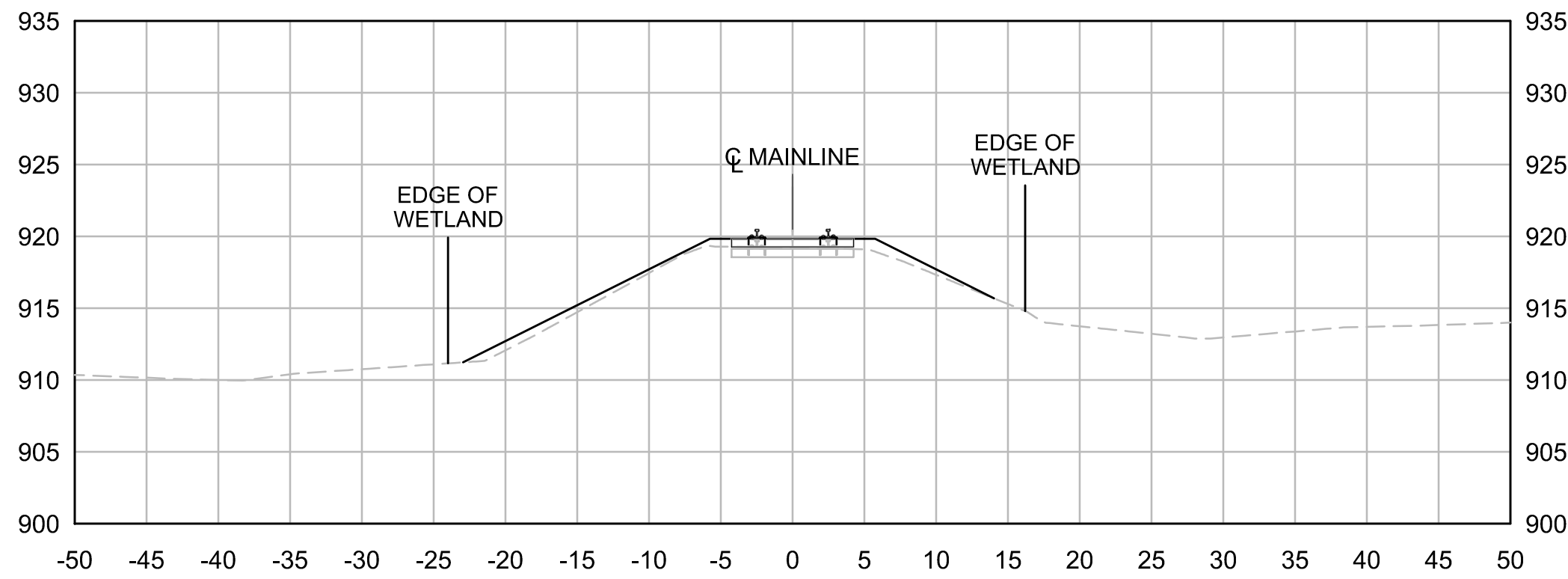
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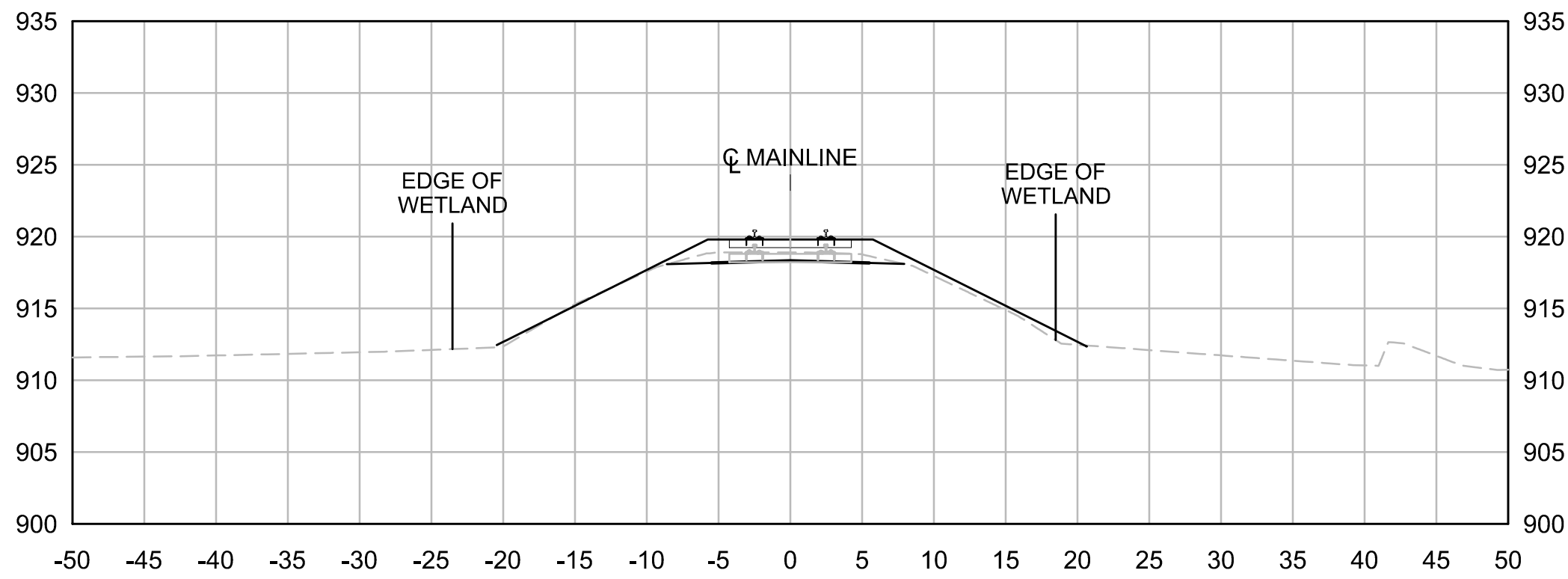
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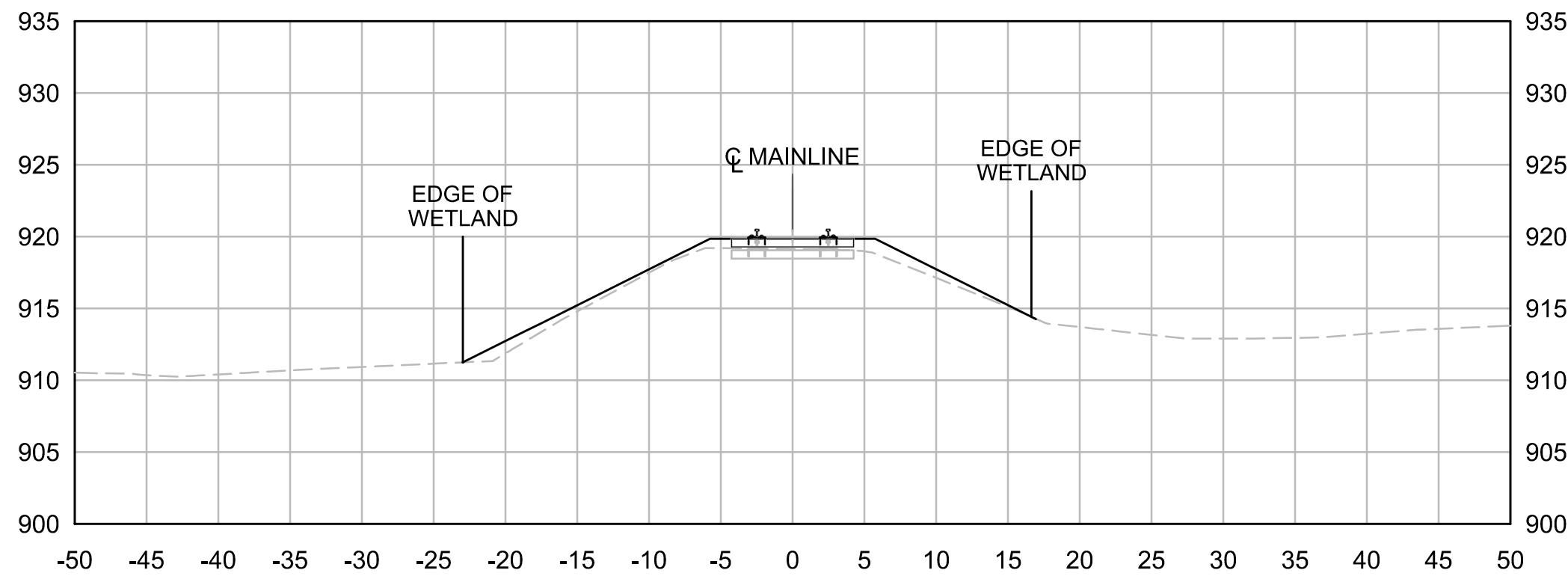
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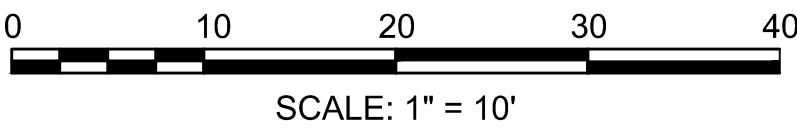
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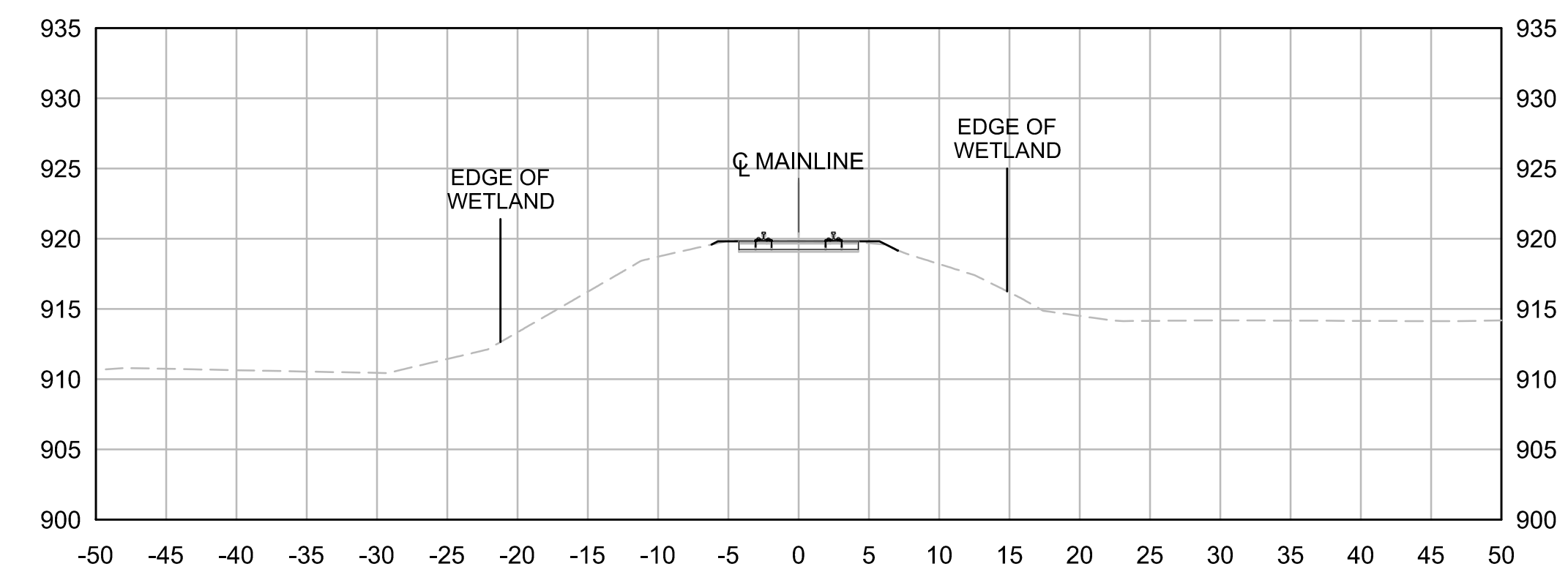
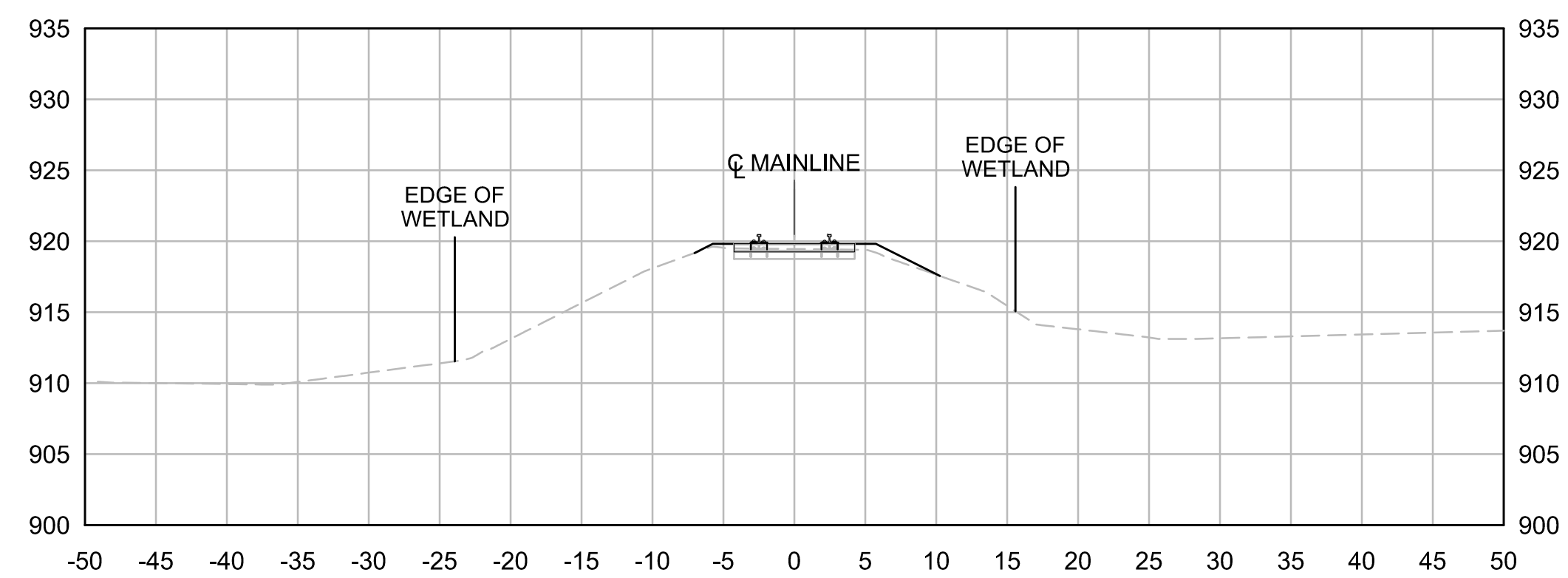
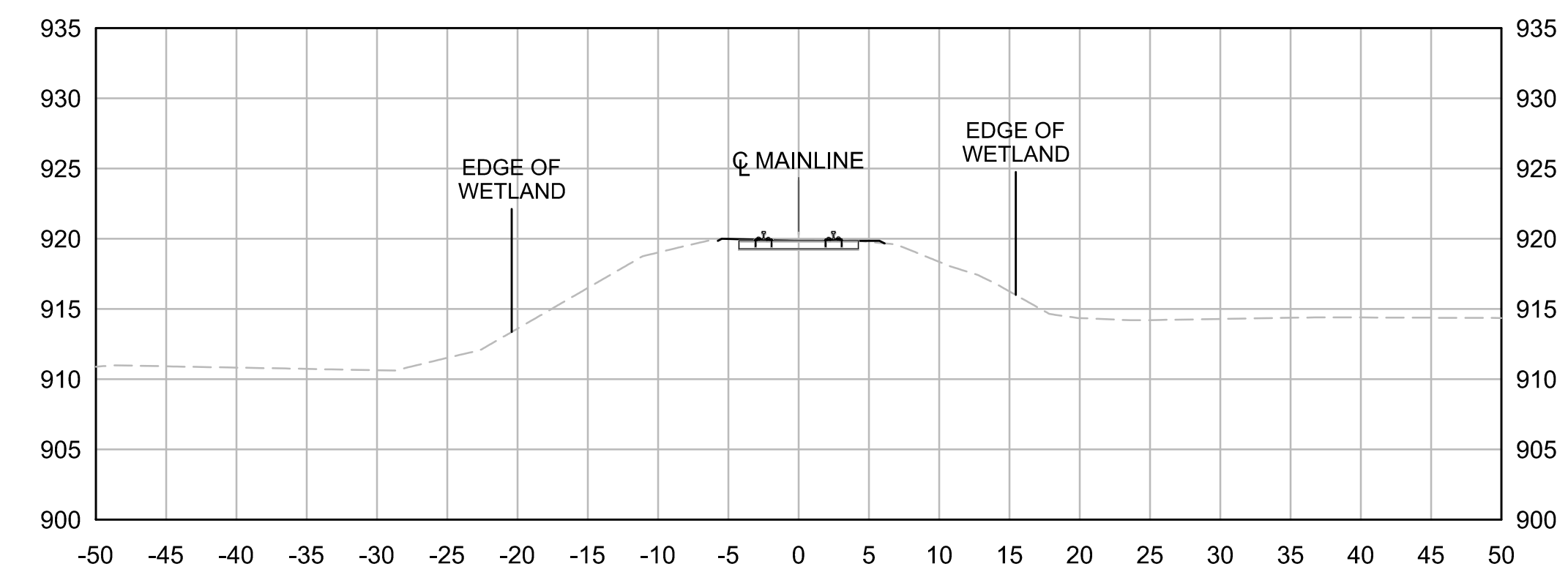
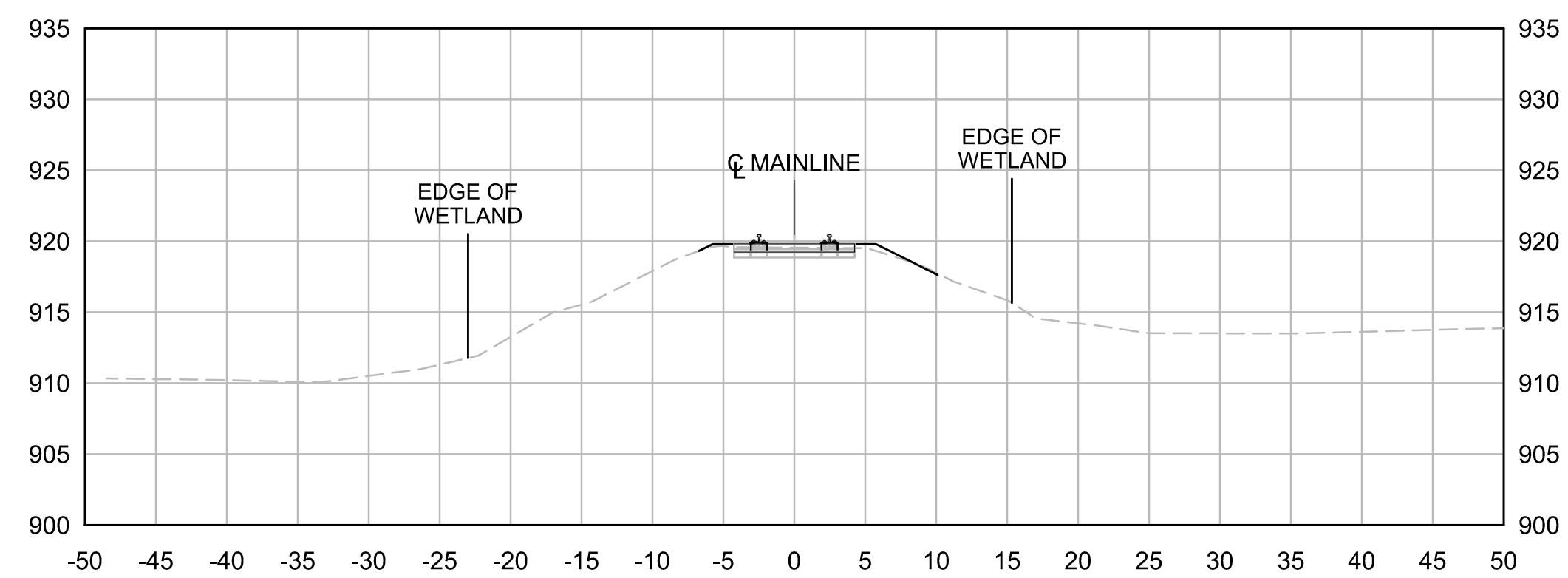
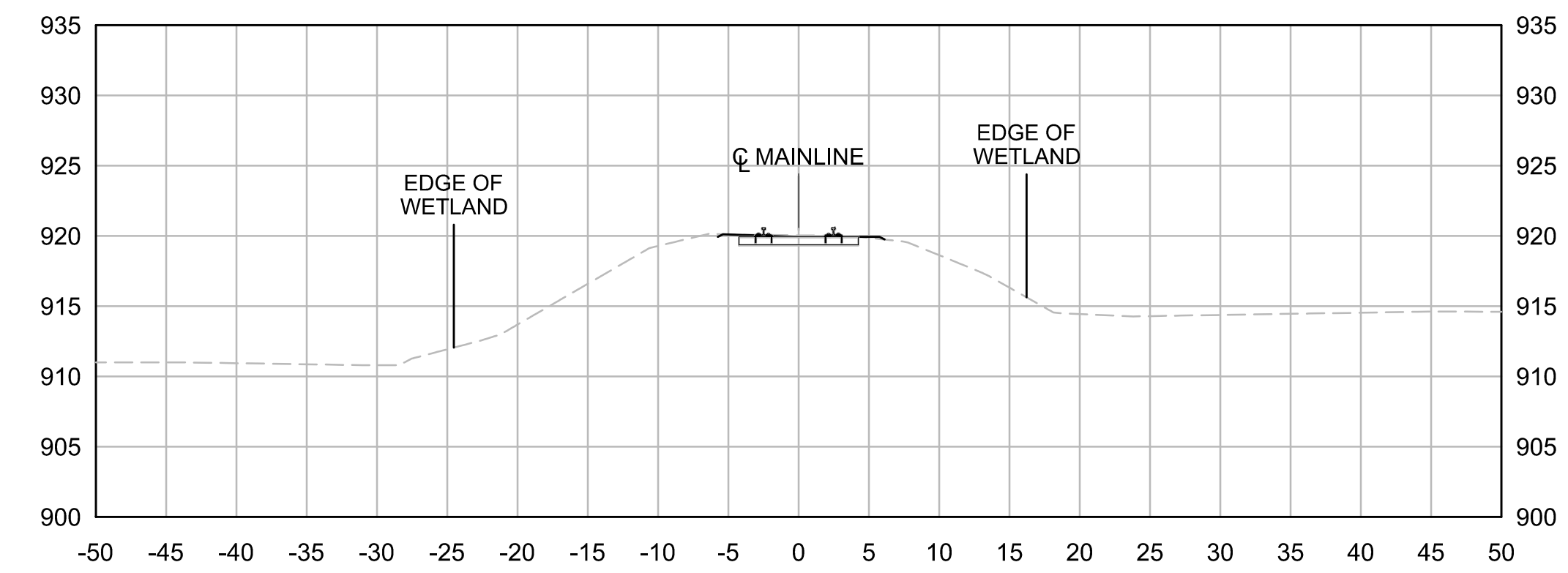
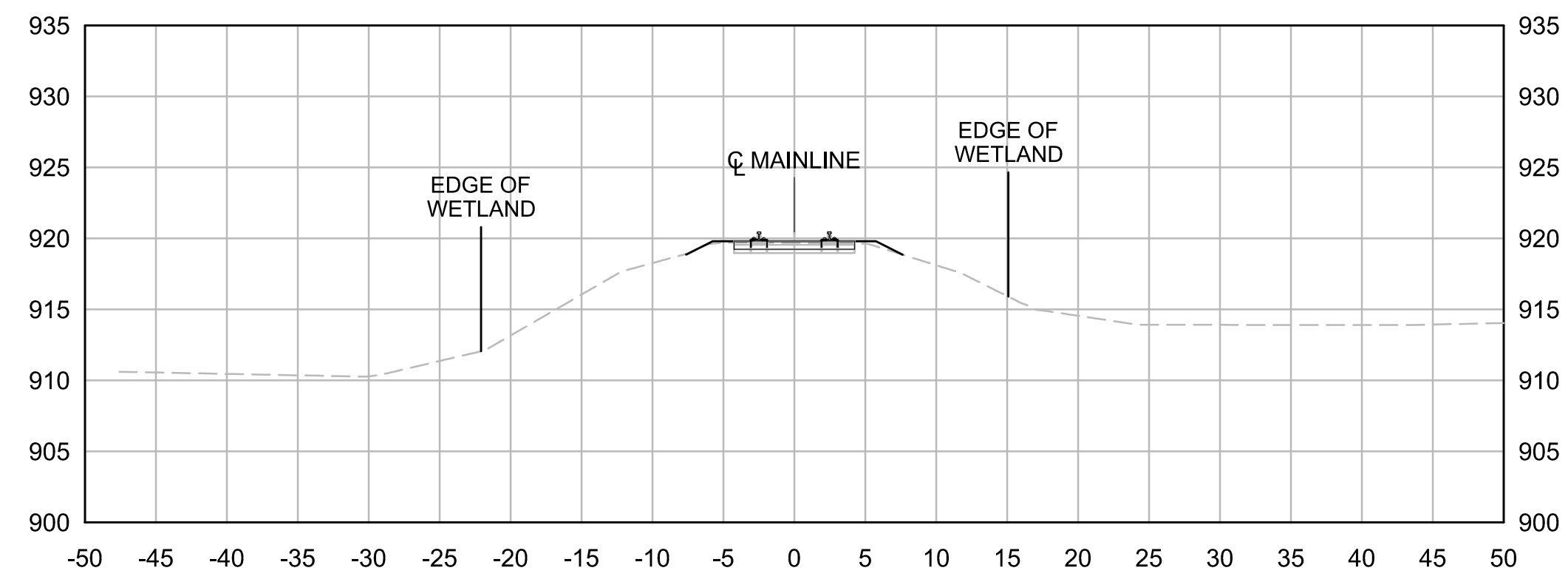
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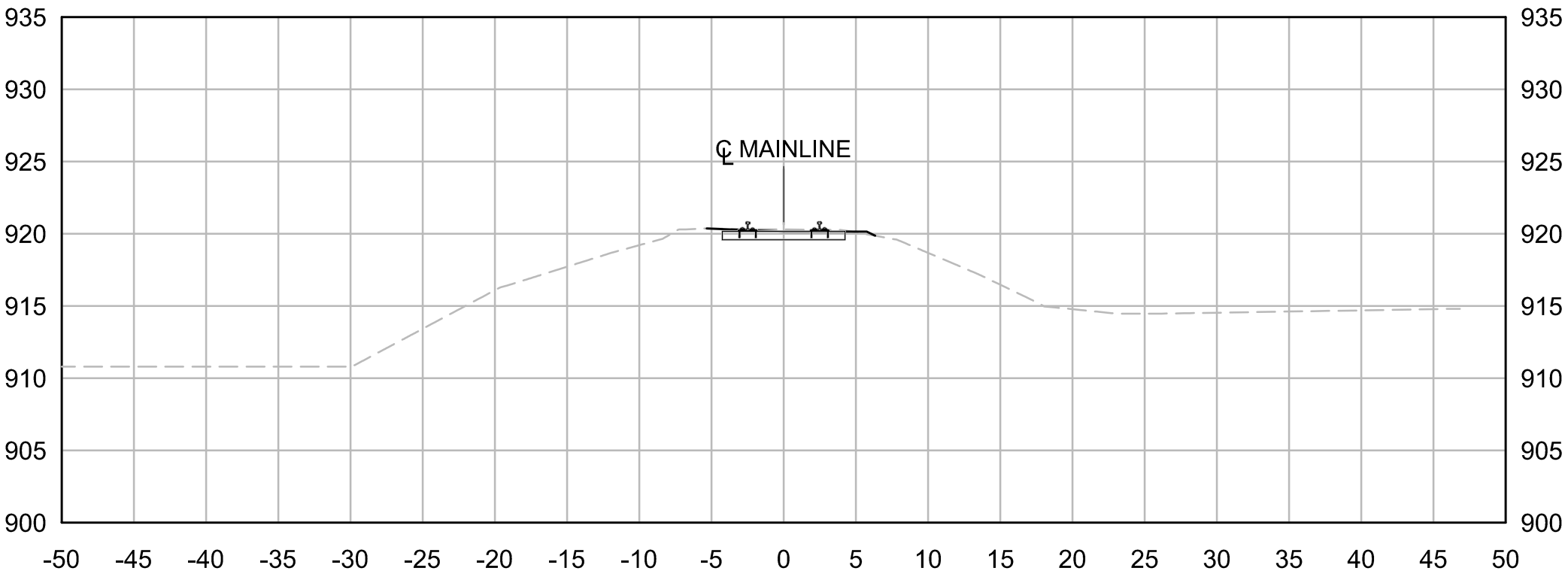
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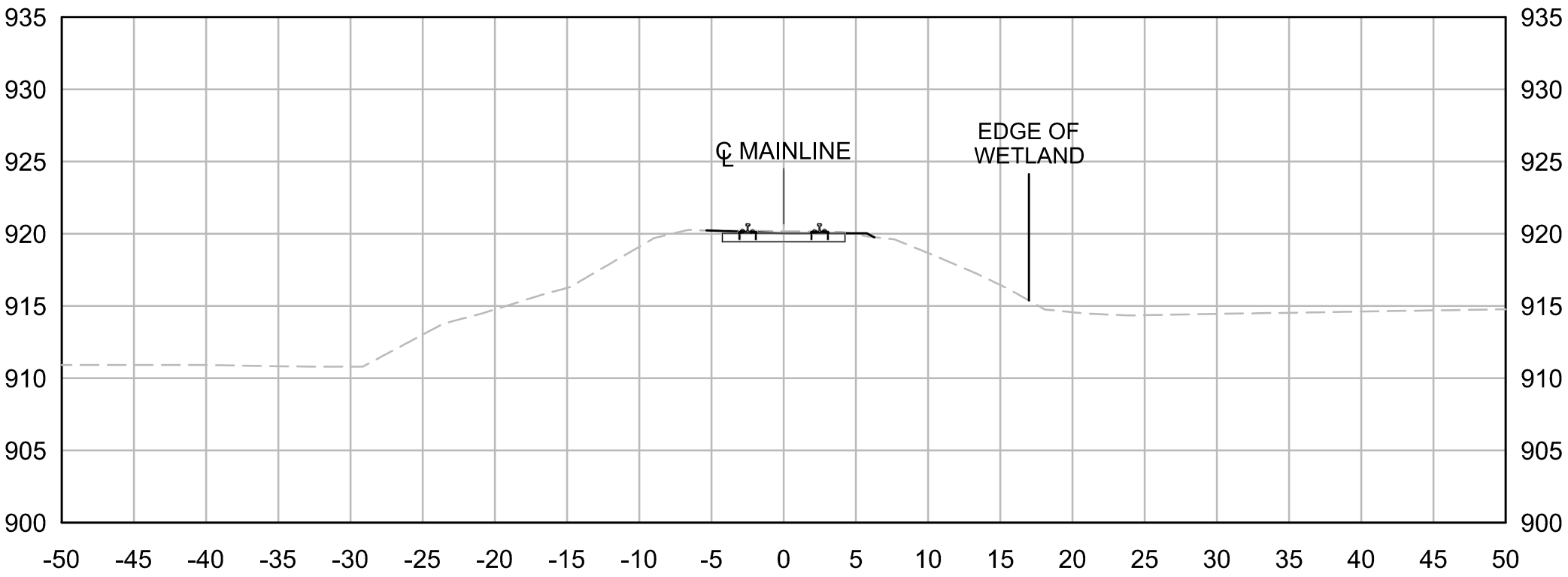
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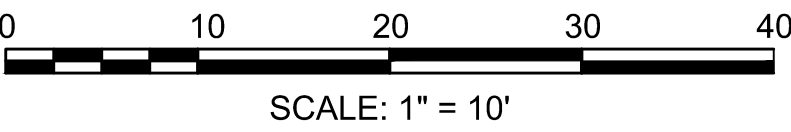
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ISSUE	DATE	DESCRIPTION			BY	CHK'D	APP.	DATE: 12/12/2022	CNL	CNL	NLK	SHEET: XS-05 		



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STRUCTURAL GENERAL NOTES

DESIGN, CONSTRUCTION AND FABRICATION

ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2022 MASSDOT STANDARD SPECIFICATIONS AND SUPPLEMENTAL SPECIFICATIONS DATED JUNE 30, 2022, SPECIAL PROVISIONS PROVIDED IN THE CONTRACT DOCUMENTS, AND THE LATEST EDITION OF AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION (AREMA) "MANUAL FOR RAILWAY ENGINEERING". IN THE EVENT OF DISCREPANCIES BETWEEN THE AREMA SPECIFICATIONS AND THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, THE MORE STRINGENT SPECIFICATION SHALL APPLY AS DETERMINED BY THE ENGINEER.

LIVE LOAD

THE DESIGN LIVE LOAD FOR THE BRIDGE IS AREMA COOPER E80 LOADING.

EXISTING CONDITIONS

ALL DIMENSIONS AND ELEVATIONS SHOWN ON EXISTING STRUCTURE ARE FROM LIMITED FIELD INVESTIGATION. ALL DIMENSIONS AND EXISTING DETAILS NECESSARY FOR THE COMPLETION OF WORK SHALL BE DETERMINED BY THE CONTRACTOR BY FIELD MEASUREMENT AND PRE-CONSTRUCTION SURVEY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE FIELD MEASUREMENTS AND PRE-CONSTRUCTION SURVEY, AND SHALL NOT ORDER ANY MATERIAL OR BEGIN FABRICATION OR CONSTRUCTION UNTIL THE FIELD MEASUREMENTS AND PRE-CONSTRUCTION SURVEY ARE COMPLETED AND THE EXTENT OF THE PROPOSED WORK IS APPROVED BY THE ENGINEER.

DATUM

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

MATERIALS

CONCRETE

1. THE COMPRESSIVE STRENGTH OF THE CONCRETE SHALL BE:

PRESTRESSED CONCRETE:
 $f'_{ci} = 5,000$ PSI (AT TRANSFER)
 $f'_c = 7,000$ PSI (28 - DAY)

REMAINING:
 $f'_c = 5,000 \text{ PSI (28 - DAY)}$

2. CONCRETE AGGREGATE SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED IN THE CURRENT EDITION OF ASTM C33. COARSE AGGREGATE SHALL BE SIZE NO. 67.

PRESTRESSING STRANDS

1. PRESTRESSING STRAND SHALL BE 0.6-INCH DIAMETER, SEVEN-WIRE, UNCOATED, LOW-RELAXATION STRAND WHICH IS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED IN ASTM A416. THE STRAND SHALL HAVE AN ULTIMATE TENSILE STRENGTH OF 270 KSI. THE INITIAL PRESTRESS SHALL BE 43,400 LBS. PER STRAND UNLESS NOTED OTHERWISE.
2. STRAND SHALL BE TESTED IN ACCORDANCE WITH PCI RECOMMENDATIONS (MOUSTAFA METHOD) AND CERTIFIED BY THE FABRICATOR AS HAVING ADEQUATE BOND CHARACTERISTICS TO SATISFY THE PREDICTION EQUATIONS FOR TRANSFER AND DEVELOPMENT LENGTH GIVEN IN THE AREMA MANUAL FOR RAILWAY ENGINEERING.
3. AN ALTERNATE STRAND PATTERN WHICH HAS THE SAME ECCENTRICITY AS THE PATTERN SHOWN ON THIS PLAN AND IS BETTER SUITED TO THE MANUFACTURE'S FACILITIES WILL BE CONSIDERED. MANUFACTURER MUST SUBMIT PLAN AND COMPUTATIONS FOR RAILROAD APPROVAL PRIOR TO CASTING.

REINFORCING STEEL

1. REINFORCING STEEL SHALL BE DEFORMED AND EPOXY COATED, PER CURRENT ASTM A615 SPECIFICATIONS AND MUST MEET GRADE 60 REQUIREMENT. EPOXY COATING SHALL BE IN ACCORDANCE WITH ASTM A775.
2. FABRICATION OF REINFORCING STEEL SHALL BE PER CHAPTER 7 OF THE CRSI MANUAL OF STANDARD PRACTICE. DIMENSIONS OF BENDING DETAILS ARE OUT-TO-OUT OF BAR.
3. REINFORCING STEEL IS TO BE BLOCKED TO PROPER LOCATION AND SECURELY WIRED AGAINST DISPLACEMENT. USE PLASTIC PROTECTED REINFORCING SUPPORTS MEETING CRSI SPECIFICATIONS CHAPTER 3, CLASS 1. TACK WELDING OF REINFORCING IS PROHIBITED. MINIMUM CONCRETE ON REINFORCEMENT SHALL MEET CURRENT AREMA REQUIREMENTS.

MINIMUM CONCRETE COVER
DECK SLAB : 1 1/2 INCHES.
REMAINDER : 2 INCHES, UNLESS OTHERWISE NOTED.

STEEL

1. STRUCTURAL STEEL PLATES AND BARS SHALL MEET THE REQUIREMENTS OF THE CURRENT ASTM DESIGNATION: A709, GR. 36. UNLESS OTHERWISE NOTED.
2. PILING SHALL BE STEEL H-PILES, ASTM A572, GRADE 50.
3. ALL WELDING AND THE PREPARATION AND ASSEMBLY OF MATERIAL FOR WELDING SHALL BE IN ACCORDANCE WITH THE BRIDGE WELDING CODE, ANSI/AASHTO/AWS D1.5. ELECTRODES SHALL BE E70XX.

GALVANIZING

1. ALL STEEL PIPES, ANGLES AND DECK PLATES SHALL BE HOT-DIPPED GALVANIZED PER ASTM A123.
2. BOLTS, NUTS, INSERTS NUTS AND WASHERS SHALL BE GALVANIZED ACCORDING TO ASTM A153 (HOT DIP PROCESS) OR ACCORDING TO ASTM B695, CLASS 50. TYPE 1 (MECHANICAL PROCESS).

PAINTING

1. THE EXPOSED PORTION OF ANY STEEL (PILE PLATES, BRACKETS, LONGITUDINAL RESTRAINT BRACKETS, EMBEDDED PLATES, ETC.) SHALL BE PAINTED WITH ONE FIELD COAT OF CHEMICAL MASTIC CM-15 (OR APPROVED EQUAL), METALLIC ALUMINUM COLOR, APPLIED TO A DRY FILM THICKNESS OF 8 MILS. CORRESPONDING TO A WET FILM THICKNESS OF 10 MILS. PAINT APPLICATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTION.
2. INFORMATION PERTAINING TO CHEMICAL MASTIC CM-15 (OR APPROVED EQUAL) CAN BE OBTAINED FROM THE MANUFACTURER.

FABRICATION

CONCRETE

1. PRODUCTION PROCEDURES AND DIMENSIONAL TOLERANCES FOR THE MANUFACTURE OF PRECAST. PRESTRESSED GIRDERS SHALL BE IN ACCORDANCE WITH THE AREMA MANUAL FOR RAILWAY ENGINEERING AND THE PRESTRESSED CONCRETE INSTITUTES CURRENT MANUAL MNL -116 FOR QUALITY CONTROL.
2. TOLERANCE FOR LOCATION OF LIFTING LOOPS SHALL BE $\pm 1/2"$.
3. THE ENDS OF THE STRANDS SHALL BE CUT OFF FLUSH WITH THE END OF THE BEAM AND PAINTED. RECESSES AND MINOR SPALLS MUST BE FILLED AND FINISHED TO THE PLAN DIMENSIONS USING AN EPOXY BONDING COMPOUND AND GROUT.
4. CONCRETE CURB SHALL BE CAST AFTER THE GIRDER IS REMOVED FROM THE FORM.
5. CONCRETE BONDING AGENT: REFER TO SPECIFICATIONS.
6. SURFACES SHALL BE FORMED IN A MANNER WHICH WILL PRODUCE A SMOOTH AND UNIFORM APPEARANCE WITHOUT RUBBING OR PLASTERING. UNLESS OTHERWISE NOTED, EXPOSED EDGES OF 90-DEGREES OR LESS ARE TO BE CHAFFERED $3/4" \times 3/4"$. UNFORMED SURFACES SHALL HAVE A SMOOTH FINISH FREE OF ALL FLOAT AND TROWEL MARKS.
7. THE FABRICATOR SHALL STENCIL THE FABRICATOR'S NAME, DATE OF FABRICATION PLACE MARK AND LIFTING WEIGHT ON EACH PIECE.
8. FABRICATOR IS RESPONSIBLE FOR ADEQUACY OF LIFTING DEVICES.
9. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED $3/4"$ UNLESS OTHERWISE NOTED.
10. ALL BAR-BENDING AND STANDARD HOOK DIMENSIONS SHALL BE IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE" AS PUBLISHED BY THE CONCRETE REINFORCING STEEL INSTITUTE UNLESS OTHERWISE SHOWN OR NOTED.

CONSTRUCTION

GENERAL

1. THERE IS NO CONSTRUCTION STAGING AREA AT THE JOB SITE DESIGNATED. AS REQUIRED, THE CONTRACTOR SHALL PROVIDE HIS/HER OWN OFF-SITE STAGING AREA.
2. THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT CONTINUOUS COORDINATION WITH THE OPERATOR, HOUSATONIC RAILROAD COMPANY (HRRRC), WILL BE REQUIRED THROUGHOUT CONSTRUCTION. HRRRC WILL PROVIDE THE CONTRACTOR WITH FLAGGERS FOR PROTECTION FROM RAILROAD TRAFFIC WHILE WORK IS BEING PERFORMED ON THE RAILROAD RIGHT-OF-WAY (R.O.W.). THE CONTRACTOR SHALL NOT ENTER THE R.O.W. AT ANYTIME WITHOUT HRRRC AUTHORIZATION. THE CONTRACTOR WILL ALSO BE REQUIRED TO OBTAIN R.O.W. TRAINING PRIOR TO WORKING IN THE R.O.W.
3. ALL WORK SHALL BE PERFORMED DURING A SERIES OF SHUTDOWNS OF RAILROAD TRAFFIC. THE CONTRACTOR SHALL COORDINATE ALL SHUTDOWNS WITH HRRRC. SEE THE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION REGARDING SPECIFIC DATES, LENGTH OF SHUTDOWNS, AND LIQUIDATED DAMAGE PENALTIES FOR EXCEEDING AUTHORIZED TIME LIMITS.
4. ALL CONSTRUCTION AND ACCESS SHALL BE WITHIN THE R.O.W. UNLESS OTHERWISE APPROVED BY THE PROPERTY OWNER(S) AND MASSDOT. THE CONTRACTOR SHALL COORDINATE DIRECTLY WITH THE PROPERTY OWNER(S) TO OBTAIN WRITTEN APPROVAL OF LAND USE OUTSIDE THE R.O.W. THE CONTRACTOR SHALL SUBMIT COPIES OF WRITTEN PROPERTY AGREEMENTS TO THE RESIDENT ENGINEER.
5. ANY DAMAGE TO REMAINING EXISTING COMPONENTS THAT IS CAUSED BY THE CONTRACTOR'S ACTIVITY SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AS DIRECTED AND APPROVED BY THE ENGINEER, AT NO ADDITIONAL EXPENSE TO THE BRIDGE OWNER OR RAILROAD OPERATOR.
6. THE CONTRACTOR SHALL PROVIDE SAFE ACCESS TO ALL AREAS OF WORK ON THE BRIDGE FOR THE ENGINEER'S INSPECTIONS. COSTS SHALL BE INCLUDED IN MOBILIZATION.
7. ALL EXISTING MATERIALS NOT REUSED OR RESET AS PART OF THIS PROJECT SHALL BE CONSIDERED WASTE MATERIAL. ALL WASTE MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE AND PROPERLY DISPOSED OF. ALL TREATED TIMBER SHALL BE DISPOSED OF ONLY AT AN APPROVED FACILITY.
8. COORDINATE RAIL TRAFFIC SHUTDOWNS AND THE USE OF TEMPORARY STAGING AREA DURING THE SHUTDOWN WITH THE RAILROAD.

MORTAR FOR SETTING BEAM

1. BEAMS SHALL HAVE FULL AND EVEN BEARING UPON THE BRIDGE SEAT AREAS. IF NEEDED, MORTAR CONSISTING OF EQUAL PARTS BY VOLUME OF CLASS B EPOXY AND DRY SILICA SAND, FIXED IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS, SHALL BE SPREAD ON THE TOP OF BEARING PADS TO OBTAIN UNIFORM BEARING. SCRAPE EXCESS MORTAR FROM AROUND BEARING PADS AFTER THE BEAMS ARE SET.
2. AFTER PRECAST CONCRETE MEMBERS ARE SET, THE ENDS OF THE LIFTING LOOP STRANDS SHALL BE BURNED OFF AND RECESSED TO A DEPTH OF 1 INCH. FILL RECESSES AT LIFT ANCHORS WITH CEMENT GROUT TO TOP OF SURROUNDING CONCRETE.

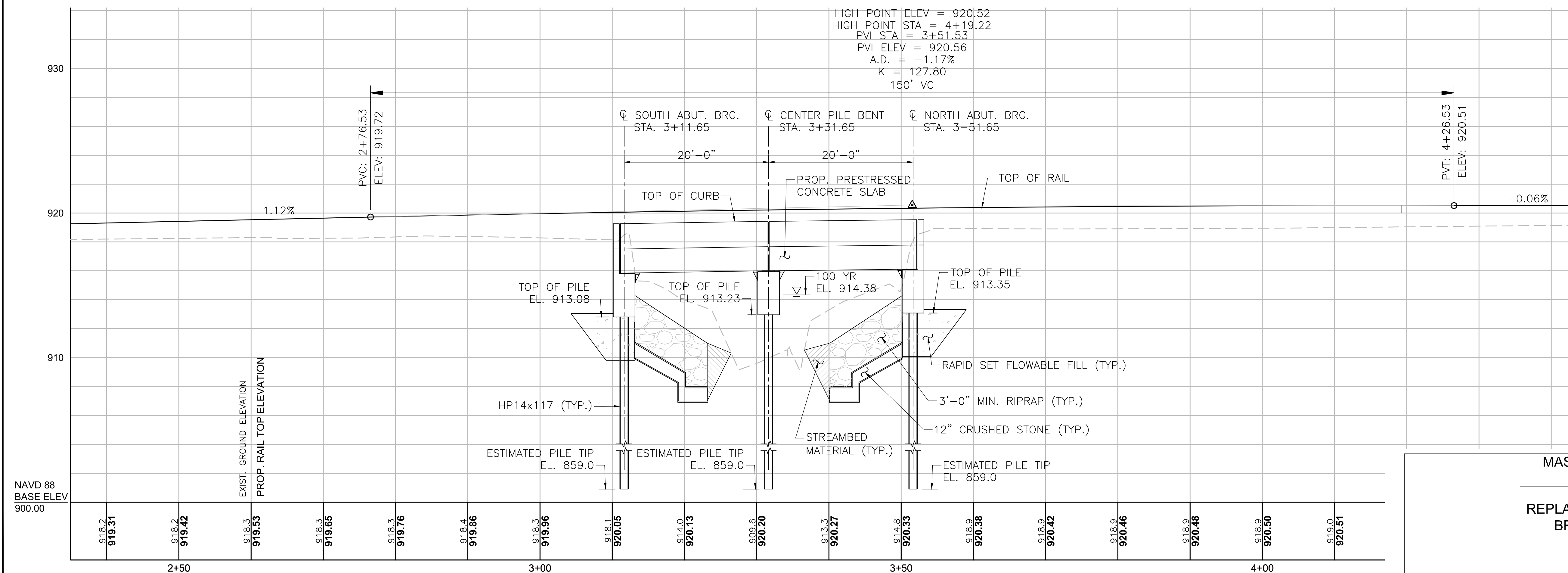
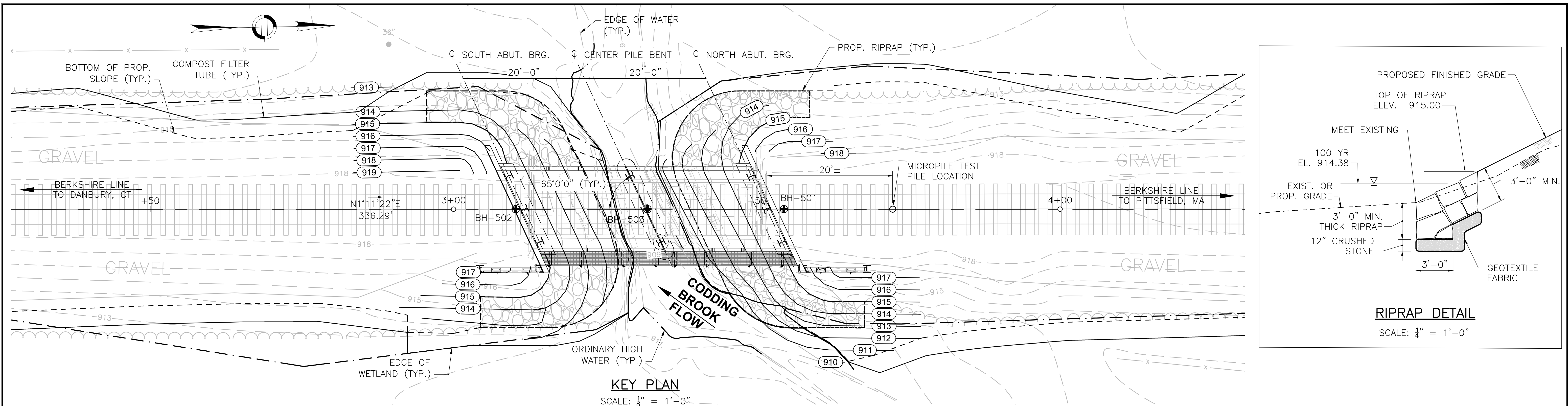
ENVIRONMENTAL:

- | | | |
|--|--|---|
| 1. THE CONTRACTOR SHALL PREVENT ANY CONSTRUCTION DEBRIS FROM ENTERING THE WATERWAYS, PUBLIC OR PRIVATE PROPERTY, OR TRAVELED WAYS DURING CONSTRUCTION. ALL WASTE MATERIAL GENERATED AS PART OF THIS PROJECT SHALL BE DISPOSED OF OFF SITE. | | |
| 2. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE STATUTES AND REGULATIONS RELATING TO THE PREVENTION AND ABATEMENT OF ALL POLLUTION. | | MASSDOT BERKSHIRE LINE IMP
CONTRACT NO. 1205 |
| 3. SEE SPECIFICATIONS FOR REQUIREMENTS FOR WORKING AT PROJECT SITE. | | |

ABBREVIATIONS:

B.F.	BACK FACE
BOT.	BOTTOM
E.F.	EACH FACE
EL. OR ELEV.	ELEVATION
EQ. SP.	EQUALLY SPACED
F.F.	FRONT FACE
R/F	REINFORCEMENT
TYP.	TYPICAL
W.P.	WORKING POINT

[illegible]



NOTES:
MICROPILE OPTION NOT SHOWN FOR CLARITY SEE SHEET S-9A FOR DETAILS.

PROFILE
HORIZONTAL SCALE: 1/8" = 1'-0"
VERTICAL SCALE: 1/4" = 1'-0"

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDINGTON BROOK BRIDGE
KEY PLAN AND PROFILE

HDR, INC. 80 HIGH STREET, SUITE 2300 BOSTON, MA 02110 (617) 357-7700				massDOT Massachusetts Department of Transportation Rail & Transit Division			
SCALE: AS NOTED	DRAWN BY: SSL	DESIGN BY: SSL	CHECK BY: JQW	PLAN NO.	ISSUE		
DATE: 12/12/2022				SHEET: S-2			
ISSUE	DATE	DESCRIPTION	BY	CHKD	APP.		

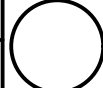
BORING B501 (CONTINUED)

BORING
B501
PAGE 1 of 3

ELEV. 876.0

ESTIMATED PILE TIP
ELEV. 847.0 FOR
MICROPILE 7

1. LOCATION OF BRIDGE BORINGS SHOWN ON THE PLAN THUS: B#
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 LOG WERE OBSERVED AT THE TIME OF TAKING BORINGS AND DO NOT NECESSARILY SHOW THE TRUE GROUND WATER LEVEL.
4. FIGURES IN BLOW COUNT COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 2" O.D. SPLIT SPOON SAMPLER 6" USING A 140 POUND WEIGHT FALLING 30".
5. ALL BORINGS WERE MADE IN OCTOBER, 2018.
6. THE BORINGS WERE MADE BY AQUIFER DRILLING AND TESTING, INC., MINEOLA, NEW YORK.
7. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.

								MASSDOT BERKSHIRE LINE IMPROVEMENTS CONTRACT NO. 120593							
								REPLACEMENT OF BRIDGES ON BERKSHIRE LINE BRIDGE 77.04 - CODDING BROOK BRIDGE BORING SHEET 1 OF 3							
								 HDR, INC. 99 HIGH STREET, SUITE 2300 BOSTON, MA 02110 (617) 267-7700							
								SCALE: NTS	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE		
								DATE: 12/12/2022	A.T.	E.Y.	SSL	SHEET: S-3			
ISSUE	DATE	DESCRIPTION		BY	CHKD	APP.									

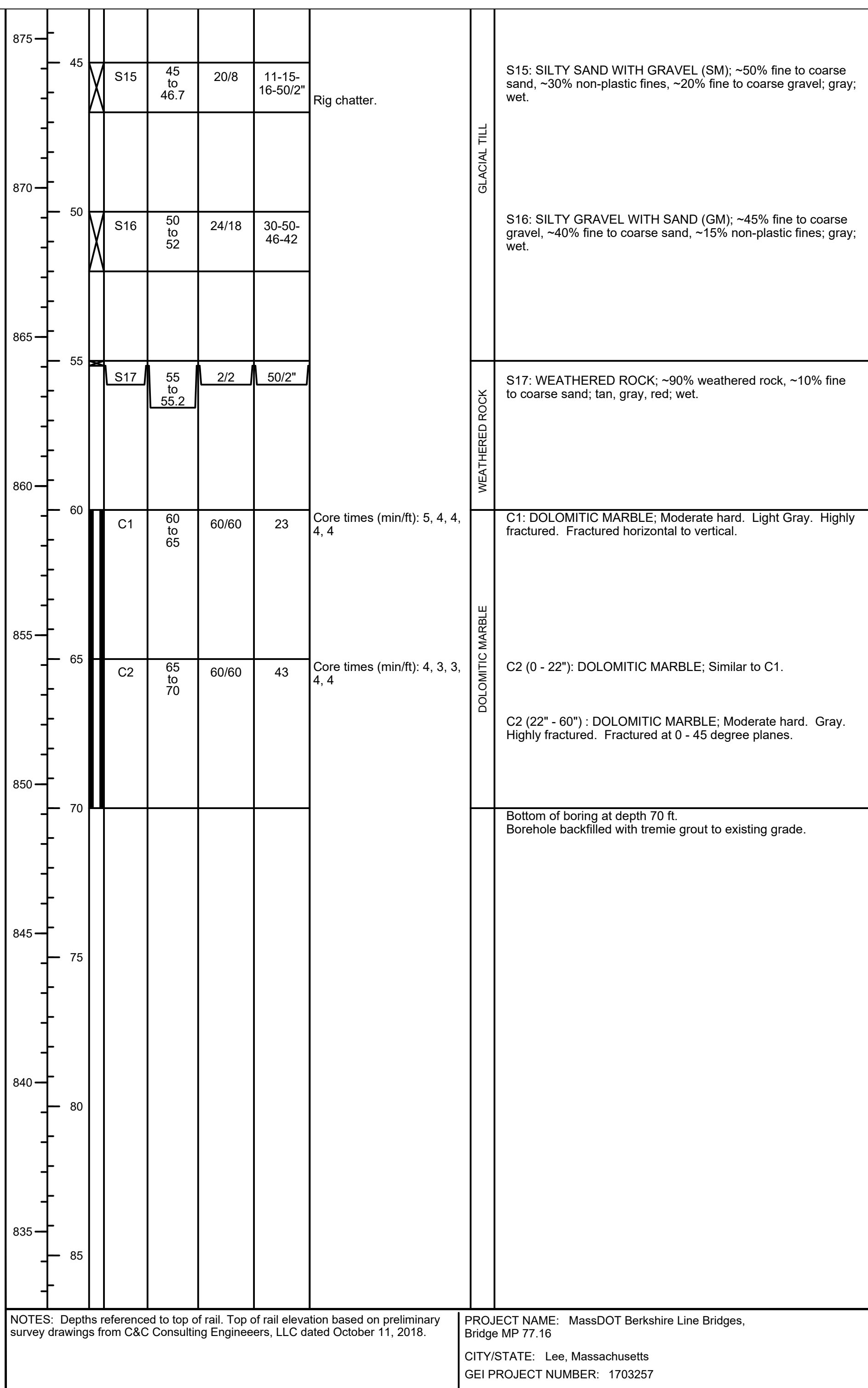
BORING
B502
PAGE 1 of 3

BORING INFORMATION LOCATION: <u>Bridge 77-16, South Abutment</u> GROUND SURFACE EL. (ft): <u>919.2</u> VERTICAL DATUM: <u>NAVD 88</u> TOTAL DEPTH (ft): <u>70.0</u> LOGGED BY: <u>D. Litton</u>				BORING B502 PAGE 1 of 3			
DRILLING INFORMATION HAMMER TYPE: <u>Automatic</u> AUGER I.D./O.D.: <u>NA / NA</u> DRILLING METHOD: <u>Driven casing and washed with rotary tooling.</u> WATER LEVEL DEPTHS (ft): <u>Not measured</u>				CASING I.D./O.D.: <u>4 inch / 4.5 inch</u> DRILL ROD O.D.: <u>2.675 inch</u> CORE BARREL TYPE: <u>NX</u> CORE BARREL I.D./O.D.: <u>2 inch / 3 inch</u>			
ABBREVIATIONS: Pen. = Penetration Length Rec. = Recovery Length RQD = Rock Quality Designation = Length of Sound Core-4 in. / Pen. % WOR = Weight of Rods WOH = Weight of Hammer				S = Split Spoon Sample C = Core Sample U = Undisturbed Sample SC = Sonic Core DP = Direct Push Sample HSA = Hollow-Stem Auger Qp = Pocket Penetrometer Strength Sv = Pocket Torque Shear Strength LL = Liquid Limit PI = Plasticity Index PID = Photolization Detector I.D./O.D. = Inside Diameter/Outside Diameter NA, NM = Not Applicable, Not Measured Blows per 6 in.; 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.			

Elev. (ft)	Depth (ft)	Sample Information				Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description	
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD				
	915	5	S1	1 to 3	24/4	3-5-6-6	SAND AND GRAVEL	(0 - 4"): 4"RAIL. (4" - 12"): BALLAST. S1: SILTY GRAVEL WITH SAND (GM); ~50% fine to coarse gravel, ~35% fine to coarse sand, ~15% non-plastic fines; black; moist. <FILL>	
		S2	3 to 5	24/14	3-3-4-4	S2: SILTY SAND (SM); ~60% fine to coarse sand, ~30% non-plastic fines, ~10% fine gravel; brown; moist. <FILL>			
		S3	5 to 7	24/16	4-4-4-4	S3: SILTY SAND (SM); Similar to S2. Trace organics. <FILL>			
		S4	7 to 9	24/16	4-4-4-3	S4: SILTY SAND (SM); Similar to S2. Wet. <FILL>			
	910	10	S5	9 to 11	24/11	20-29-23-9	Rollerbit grinding ~9.5 ft.	GLACIAL TILL	S5: SILTY GRAVEL WITH SAND (GM); ~55% fine to coarse gravel, 30% fine to coarse sand, ~15% non-plastic fines; brown to dark gray; wet.
		S6	11 to 13	24/12	7-15-11-6	S6: SILTY GRAVEL WITH SAND (GM); Similar to S5.			
		S7	13 to 15	24/10	5-3-12-18	S7: WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); ~50% fine to coarse sand, ~40% fine to coarse gravel, ~10% non-plastic fines; brown; wet.			
		S8	15 to 17	24/10	18-19-3-7	S8: WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); Similar to S7.			
	905	15	S9	17 to 19	24/8	8-8-14-22	S9: WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); Similar to S7.		
							Drive 4 inch casing to 20 ft.		
			S10	20 to 22	24/11	20-15-20-16	Rig chatter.		
	895	25	S11	24 to 26	24/9	10-9-10-7	S11: WIDELY GRADED GRAVEL WITH SILT AND SAND (GW-GM); ~55% fine to coarse gravel, ~35% fine to coarse sand, ~10% non-plastic fines; tan; wet.		
							Rig chatter.		
S12			29 to 31	24/2	11-22-16-16	S12: WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); ~55% fine to coarse sand, ~35% fine to coarse gravel, ~10% non-plastic fines; tan; wet.			
890	30					Rig chatter.			
		S13	34 to 36	24/16	14-23-25-26	S13: SILTY SAND (SM); ~70% fine to coarse sand, ~25% non-plastic fines, ~5% fine gravel; tan; wet.			
885	35								
		S14	39 to 41	24/14	10-14-19-22	S14: SILTY SAND (SM); ~60% fine to coarse sand, ~30% non-plastic fines, ~10% fine gravel; tan; wet.			
880	40								

ELEV. 876.0

ELEV. 876.0



ESTIMATED PILE TIP
ELEV. 847.0 FOR
MICROPILE

FOR BORING NOTES, SEE SHEET S-3.

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
BORING SHEET 2 OF 3

[illegible]

BORING B503

BORING INFORMATION LOCATION: Bridge 77.16, Mid-span GROUND SURFACE EL. (ft): 919.3 VERTICAL DATUM: NAVD 88 TOTAL DEPTH (ft): 37.0 LOGGED BY: D. Litton						BORING B503 PAGE 1 of 2	
DRILLING INFORMATION HAMMER TYPE: Automatic AUGER I.D./O.D.: NA / NA DRILLING METHOD: Spun and driven casing and washed with rotary tooling. WATER LEVEL DEPTHS (ft): 8.1 10/17/2018 10:24 am							
ABBREVIATIONS: Pen. = Penetration Length Rec. = Recovery Length RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen., % WOR = Weight of Rods WOH = Weight of Hammer S = Split Spoon Sample C = Core Sample U = Undisturbed Sample SC = Sonic Core DP = Direct Push Sample HSA = Hollow-Stem Auger Qp = Pocket Penetrometer Strength Sv = Pocket Torvane Shear Strength LL = Liquid Limit PI = Plasticity Index PID = Photolionization Detector I.D./O.D. = Inside Diameter/Outside Diameter NA, NM = Not Applicable, Not Measured Blows per 6 in., 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.							
Elev. (ft)	Depth (ft)	Sample Information			Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)			
915	5						
910	10						
905	15	S1	10.4 to 12.4	24/4	15-13-15-20	Rig chatter.	
		S2	12.4 to 14.4	24/8	10-9-38-68		
		S3	14.4 to 15.2	9/9	74-100/3"		
		S4	16 to 18	24/18	38-38-36-38		
900	20	S5	18 to 20	24/10	19-52-51-40	Rollerbit through timber.	
		S6	20 to 22	24/11	19-30-21-14	Open hole after ~20 ft.	
		S7	22 to 24	24/19	12-16-18-21		
NOTES: S1 - S4 taken with 3" O.D. Split Spoon sampler. Depths referenced to top of rail. Top of rail elevation based on preliminary survey drawings from C&C Consulting Engineers, LLC dated October 11, 2018.						PROJECT NAME: MassDOT Berkshire Line Bridges, Bridge MP 77.16 CITY/STATE: Lee, Massachusetts GEI PROJECT NUMBER: 1703257	

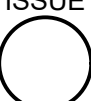
TOP OF PIER PILE
ELEV. 913.23

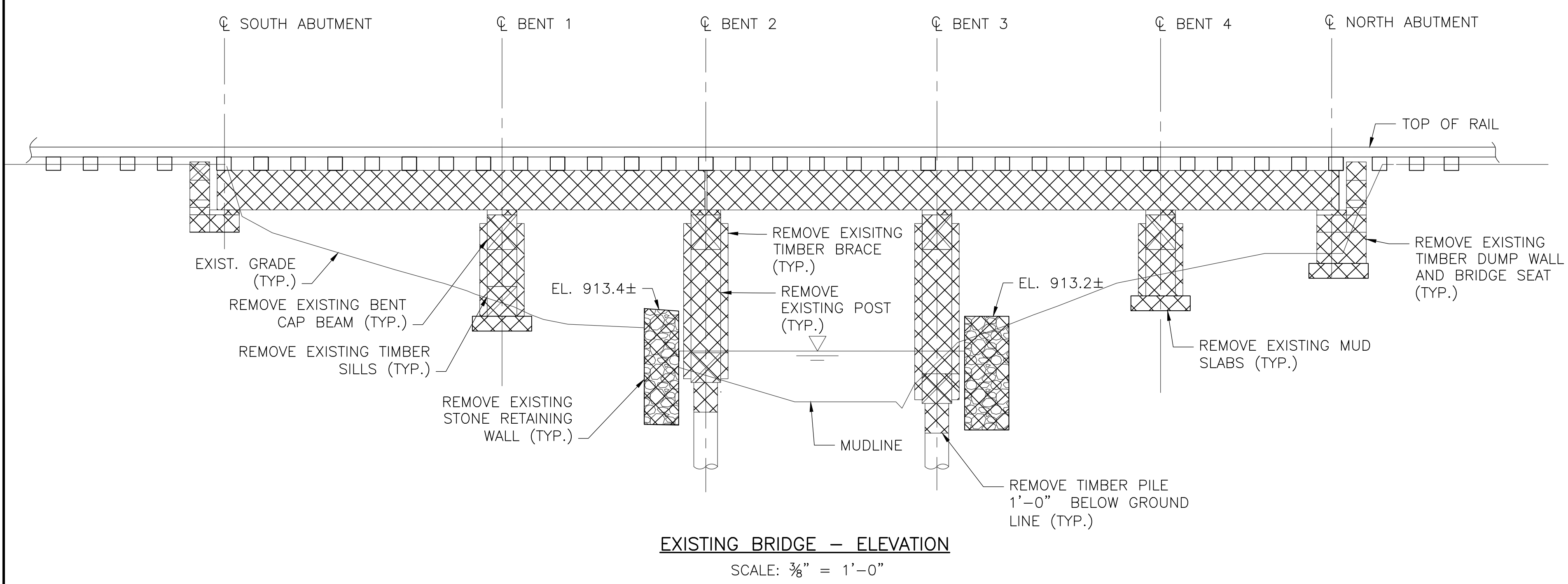
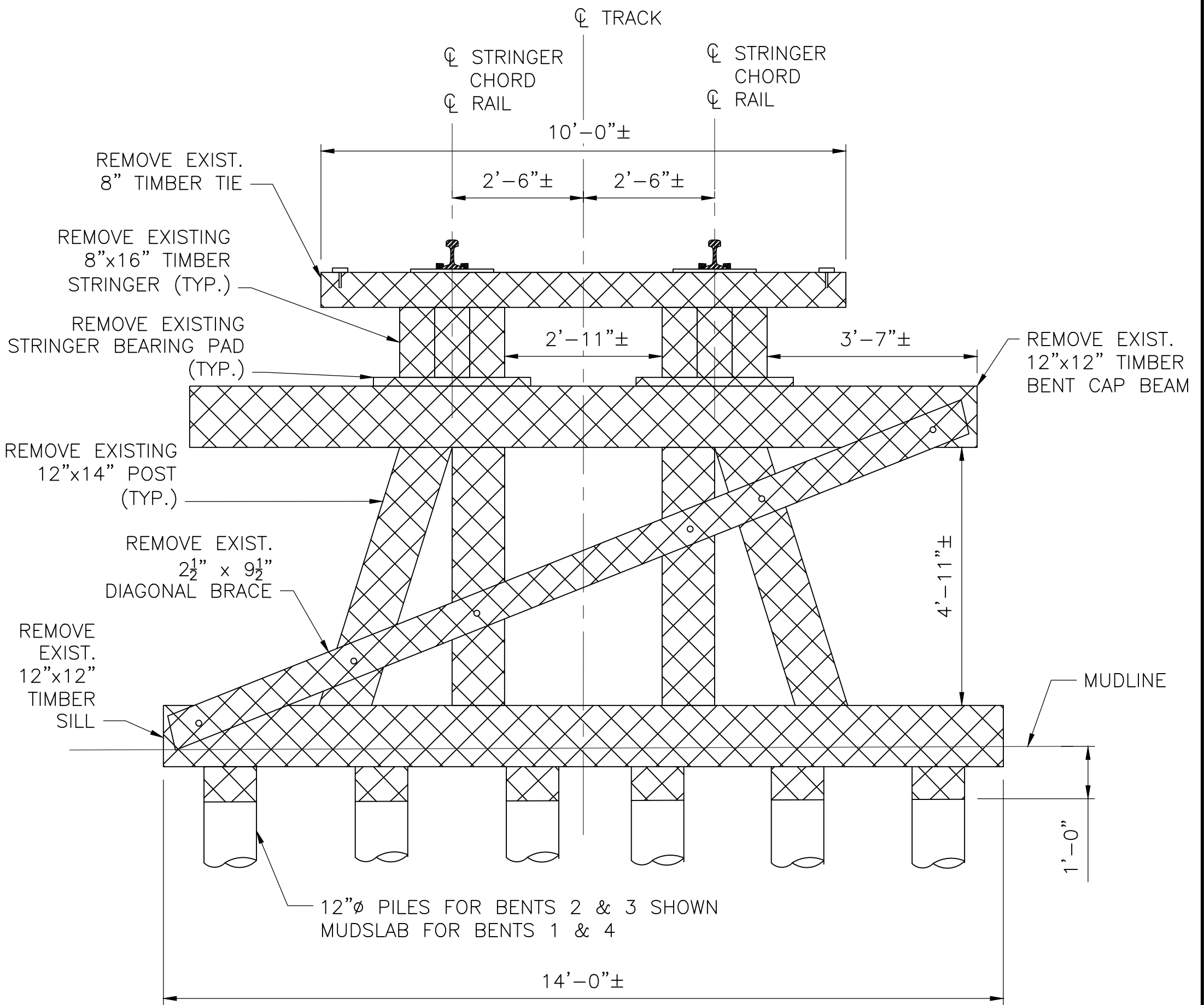
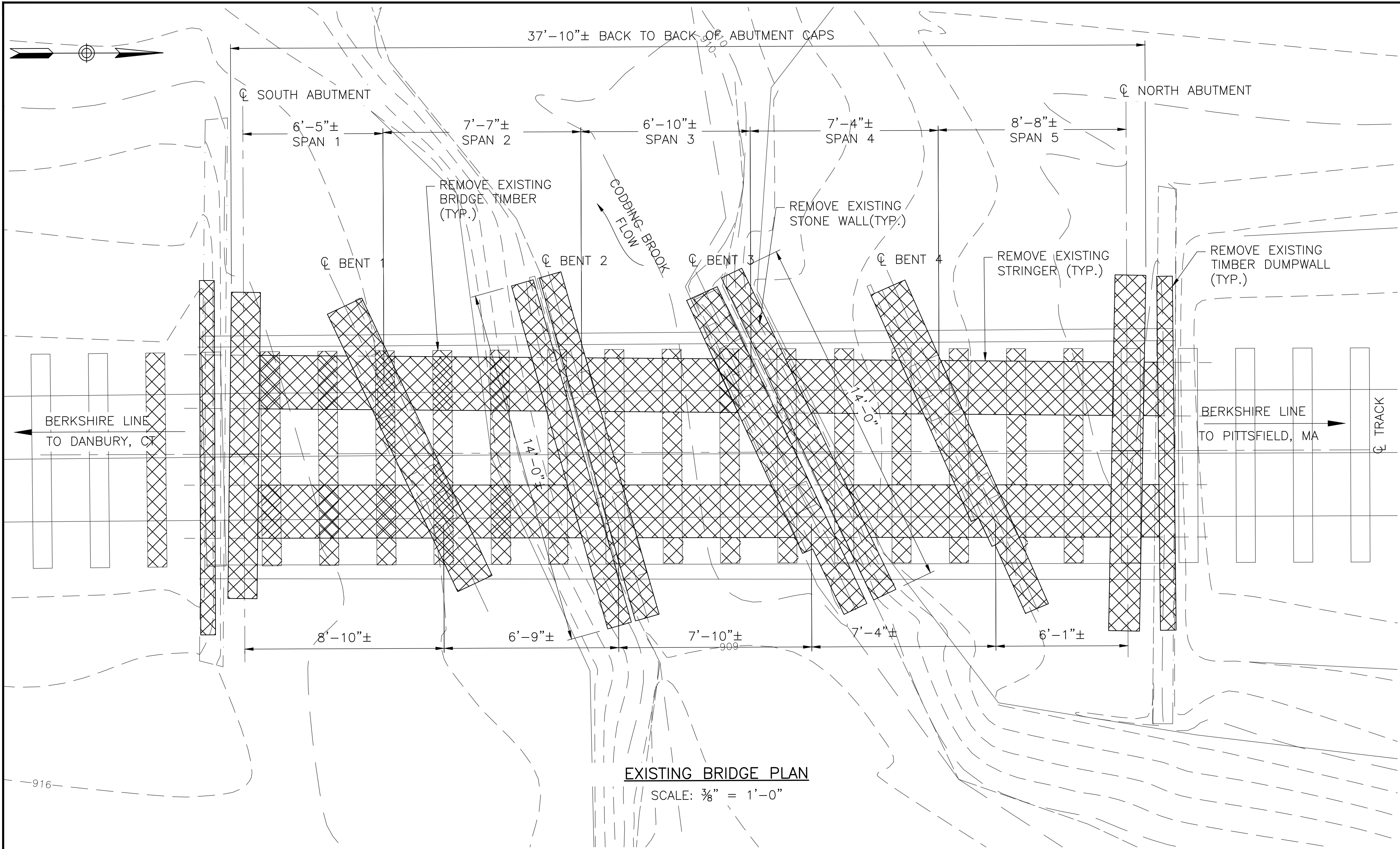
BORING B503 (CONTINUED)

BORING INFORMATION LOCATION: Bridge 77.16, Mid-span GROUND SURFACE EL. (ft): 919.3 VERTICAL DATUM: NAVD 88						BORING B503 PAGE 2 of 2	
DRILLING INFORMATION HAMMER TYPE: Automatic AUGER I.D./O.D.: NA / NA DRILLING METHOD: Spun and driven casing and washed with rotary tooling. WATER LEVEL DEPTHS (ft): 8.1 10/17/2018 10:24 am							
ABBREVIATIONS: Pen. = Penetration Length Rec. = Recovery Length RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen., % WOR = Weight of Rods WOH = Weight of Hammer S = Split Spoon Sample C = Core Sample U = Undisturbed Sample SC = Sonic Core DP = Direct Push Sample HSA = Hollow-Stem Auger Qp = Pocket Penetrometer Strength Sv = Pocket Torvane Shear Strength LL = Liquid Limit PI = Plasticity Index PID = Photolionization Detector I.D./O.D. = Inside Diameter/Outside Diameter NA, NM = Not Applicable, Not Measured Blows per 6 in., 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.							
Elev. (ft)	Depth (ft)	Sample Information			Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)			
895	25	S8	25 to 27	24/10	16-41-35-43		S8: WIDELY GRADED SAND WITH GRAVEL (SW); ~70% fine to coarse sand, ~25% fine to coarse gravel, ~5% non-plastic fines; tan to gray at 6 inches into spoon. Wet.
890	30	S9	30 to 32	24/11	15-14-14-19	Lost mud at ~30 ft. Remix and continue. Roller bit grinding.	S9: SILTY SAND WITH GRAVEL (SM); ~65% fine to coarse sand, ~25% fine gravel, ~20% non-plastic fines; tan; wet.
885	35	S10	35 to 37	24/3	30-37-44-45		S10: WIDELY GRADED GRAVEL WITH SAND (GW); ~80% fine to coarse gravel, ~15% fine to coarse sand, ~5% non-plastic fines; tan; wet.
880	40						Bottom of boring at depth 37 ft. Borehole backfilled with tremie grout to existing grade.
875	45						
870	50						
865	55						
NOTES: S1 - S4 taken with 3" O.D. Split Spoon sampler. Depths referenced to top of rail. Top of rail elevation based on preliminary survey drawings from C&C Consulting Engineers, LLC dated October 11, 2018.						PROJECT NAME: MassDOT Berkshire Line Bridges, Bridge MP 77.16 CITY/STATE: Lee, Massachusetts GEI PROJECT NUMBER: 1703257	

NOTE:

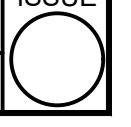
FOR BORING NOTES, SEE SHEET S-3.

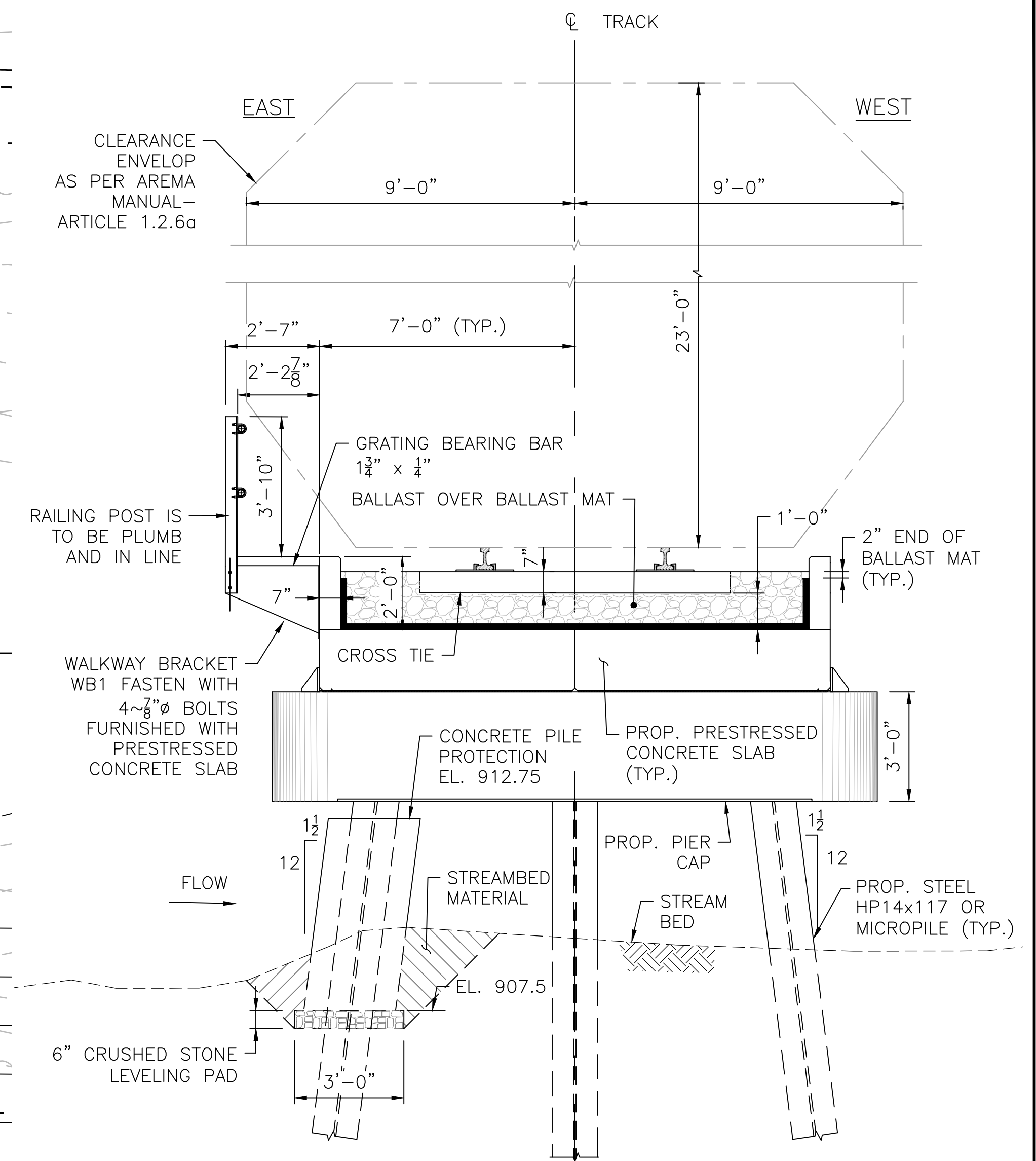
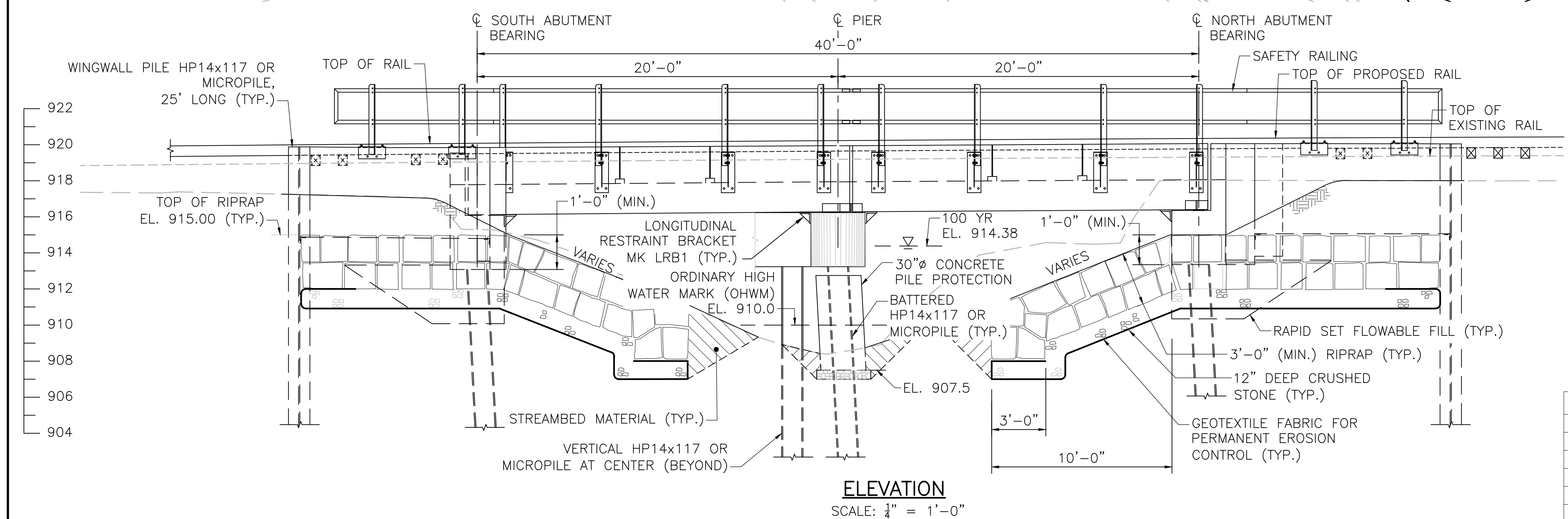
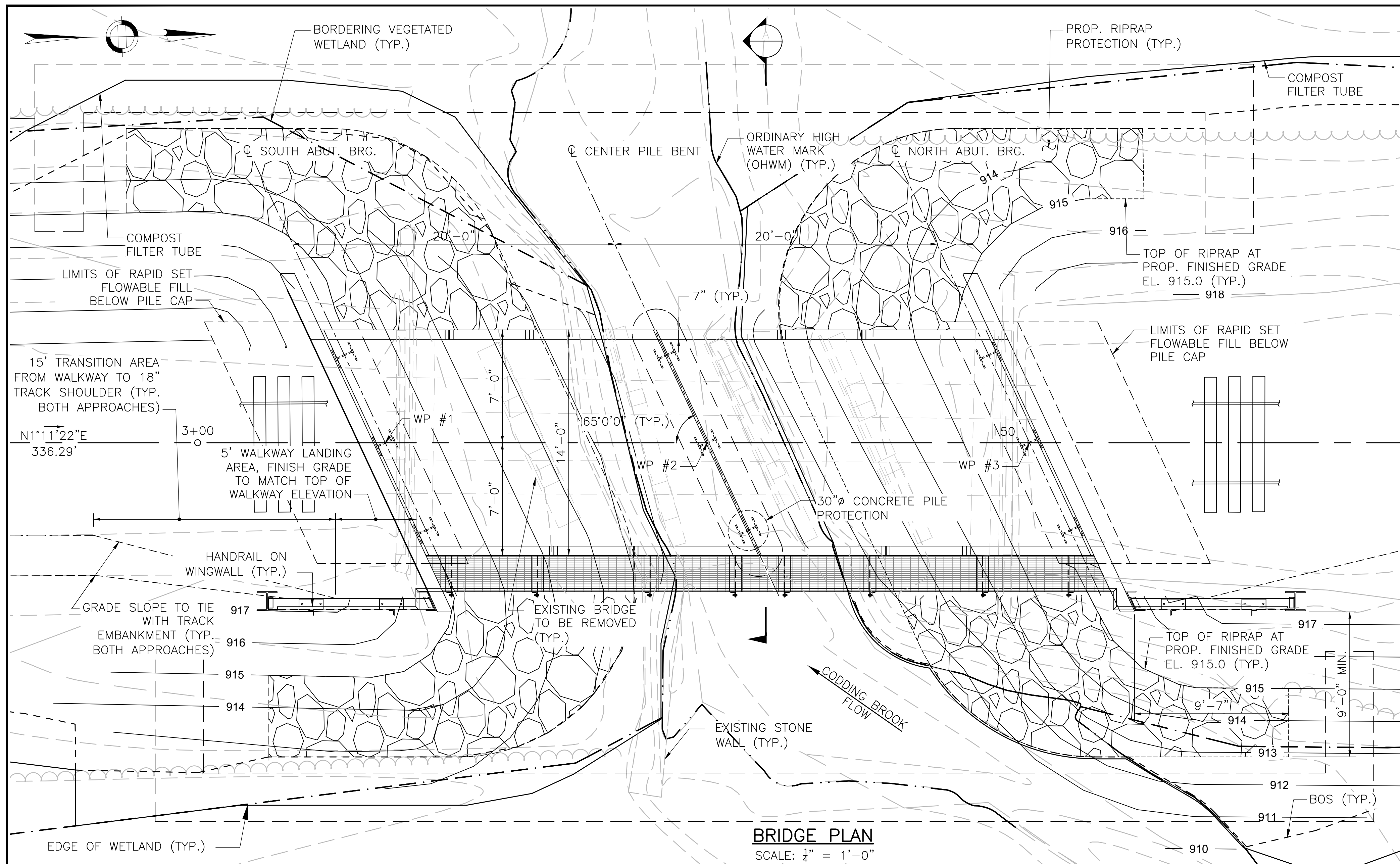
		MASSDOT BERKSHIRE LINE IMPROVEMENTS CONTRACT NO. 120593			
		REPLACEMENT OF BRIDGES ON BERKSHIRE LINE BRIDGE 77.04 - CODDING BROOK BRIDGE BORING SHEET 3 OF 3			
		 HDR, INC. 90 HIGH STREET, SUITE 2300 BOSTON, MA 02110 (617) 357-7700		 Massachusetts Department of Transportation Rail & Transit Division	
SCALE: NTS	DRAWN BY: A.T.	DESIGN BY: E.Y.	CHECK BY: SSL	PLAN NO.	ISSUE
DATE: 12/12/2022				SHEET: S-5	



LEGEND

 EXISTING TIMBER STRUCTURE REMOVAL

		MASSDOT BERKSHIRE LINE IMPROVEMENTS CONTRACT NO. 120593				
		REPLACEMENT OF BRIDGES ON BERKSHIRE LINE BRIDGE 77.04 - CODDING BROOK BRIDGE DEMOLITION LIMITS PLAN AND ELEVATION				
 HDR, INC. 90 HIGH STREET, SUITE 2300 BOSTON, MA 02110 (617) 357-7700		 Massachusetts Department of Transportation Rail & Transit Division				
SCALE: AS NOTED		DRAWN BY: A.T.	DESIGN BY: E.Y.	CHECK BY: SSL	PLAN NO.	ISSUE
DATE: 12/12/2022		SHEET: S-6				



WP#	STATION	NORTHING	EASTING	ELEVATION (TOP OF RAIL)
1	3+11.65	2947956.4076	185237.1596	920.06'
2	3+31.65	2947976.4032	185237.5748	920.22'
3	3+51.65	2947996.3989	185237.9899	920.34'

NOTES:

1. GENERAL NOTES REFER TO DWG NO. S-1.
2. W.P ELEVATIONS CORRESPOND TO THE ELEVATION OF THE TOP OF THE RAIL AT STATION INDICATED.
3. FILL GAP BETWEEN ENDS OF BEAMS AND FACE OF BACKWALL WITH PILES OF PREFORMED JOINT FILLER.
4. MICROPILE OPTION NOT SHOWN FOR CLARITY. SEE SHEET S-9A FOR DETAILS.

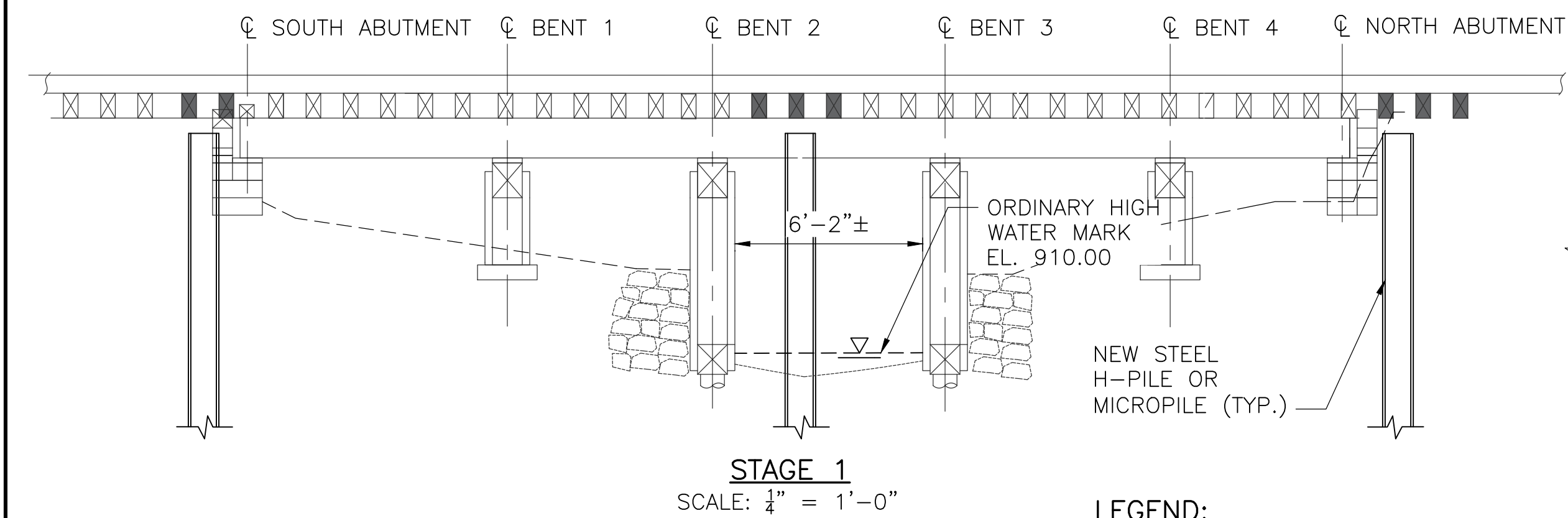
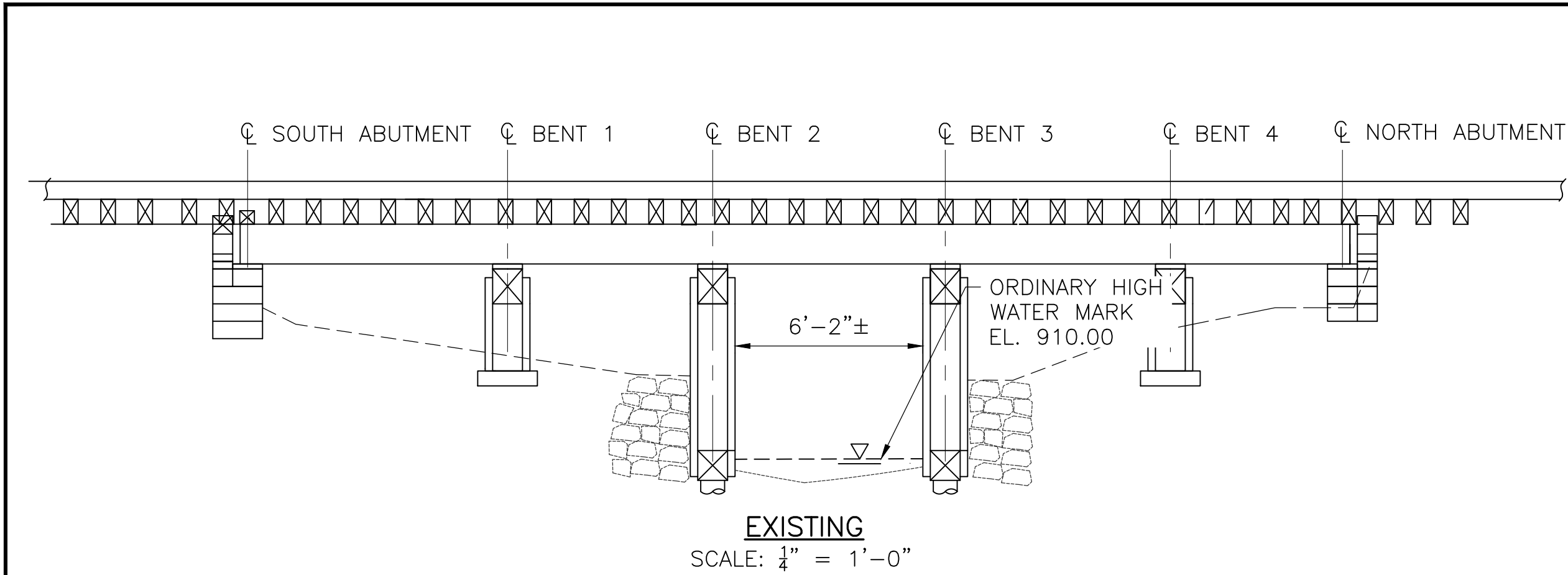
MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
PROPOSED BRIDGE PLAN & ELEVATION

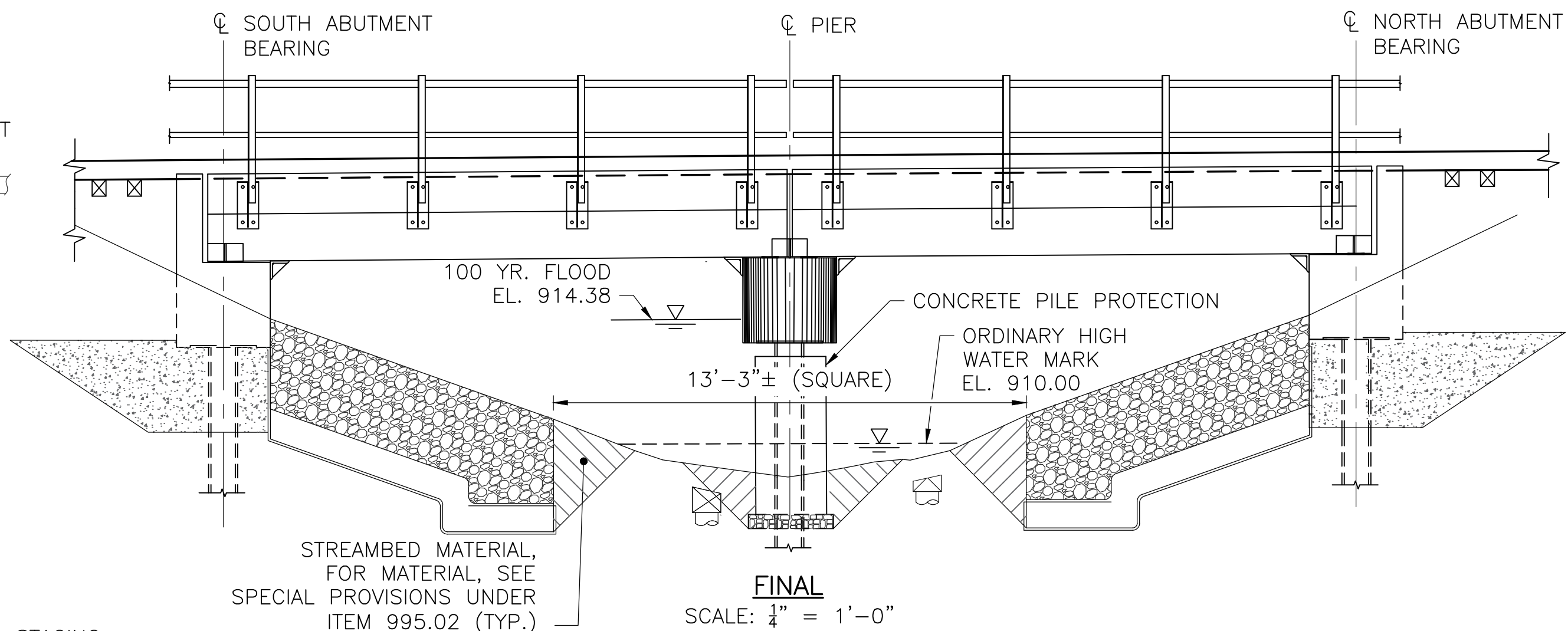
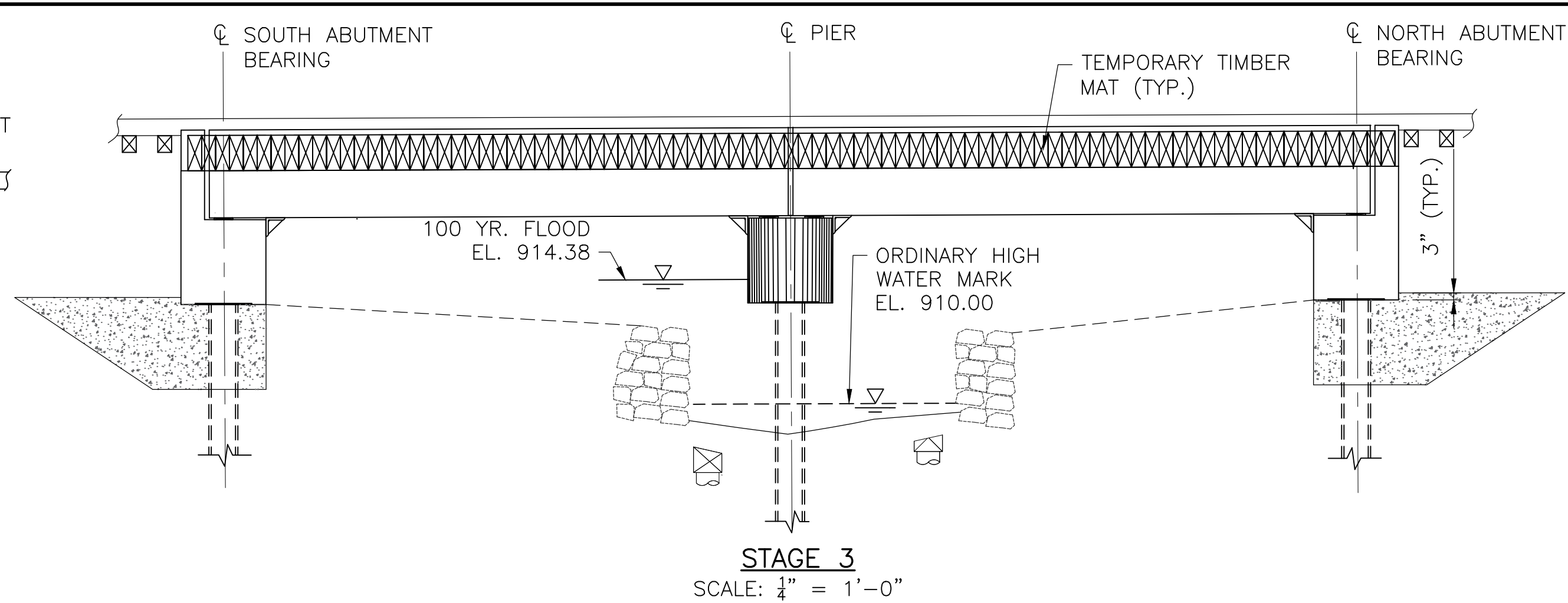


HDR, INC.
99 HIGH STREET, SUITE 2300
BOSTON, MA 02110
(617) 357-7700

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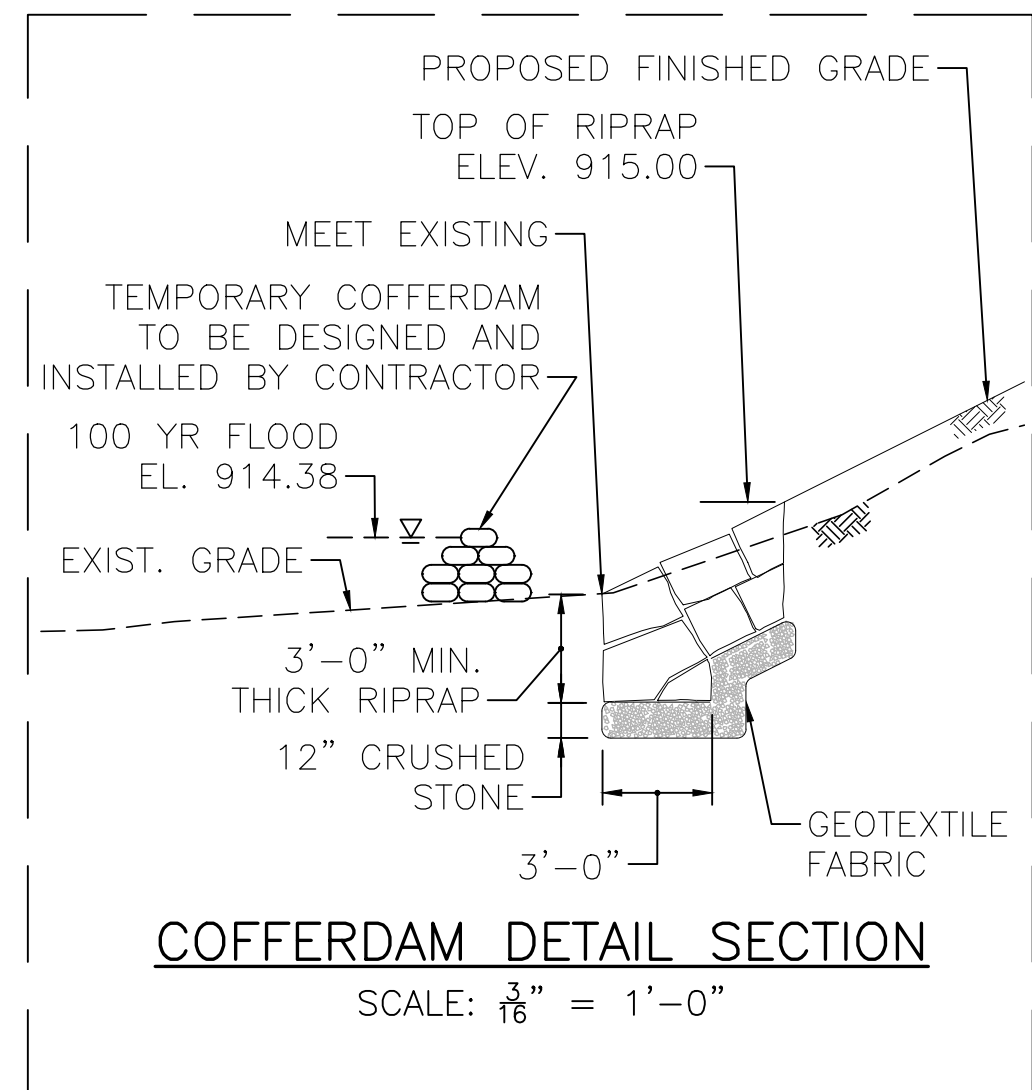


LEGEND:
[Symbol] TEMPORARY REMOVAL DURING STAGING



TEMPORARY SUPPORT NOTES:

1. TEMPORARY TRACK SUPPORT AT ABUTMENTS SHALL BE DESIGNED AND FABRICATED BY THE CONTRACTOR PRIOR TO CONSTRUCTION IN CASE EXISTING ABUTMENTS ARE DAMAGED DURING INSTALLATION OF PILES. DESIGN OF TEMPORARY SUPPORT SHALL BE STAMPED BY A PROFESSIONAL STRUCTURAL ENGINEER REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS AND SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL BEFORE FABRICATION. COST OF TEMPORARY SUPPORT SHALL BE INCIDENTAL TO PILE INSTALLATION.
2. THE CONTRACTOR SHALL PROVIDE SUPPORTS FOR THE EXISTING SUBSTRUCTURES AND RETAINING WALLS DURING INSTALLATION OF PILES.



SUGGESTED CONSTRUCTION STAGING:

STAGE 1 – WORK WILL BE PERFORMED DURING WEEKEND CLOSURES

1. REMOVE EXISTING TIES TEMPORALLY TO FACILITATE INSTALLATION OF PILES.
2. INSTALL PILES FOR NEW STRUCTURE ONE PIER/ABUTMENT LOCATION AT A TIME.
3. REINSTALL TIES.

STAGE 2 – WORK WILL BE PERFORMED DURING NON-OPERATION HOURS

1. INSTALL COFFERDAM.

STAGE 3 – WORK WILL BE PERFORMED IN THREE CONSECUTIVE WEEKEND CLOSURES

STAGE 3A – WORK WILL BE PERFORMED DURING 1st WEEKEND CLOSURE

1. REMOVE EXISTING BRIDGE SUPERSTRUCTURE, TIMBER PIERS AND ABUTMENTS INCLUDING TIES AND RAILS.
2. EXCAVATE AT PROPOSED ABUTMENT CAPS TO PROVIDE ACCESS FOR FIELD WELDING.
3. INSTALL AND WELD NEW PRECAST ABUTMENT AND PIER CAPS TO PRE-INSTALLED PILES.
4. BACKFILL EXCAVATED AREAS AT ABUTMENT CAPS.
5. INSTALL BEARINGS AND BRIDGE SUPERSTRUCTURE AND WELD RESTRAINT BRACKETS MK LRB1.
6. INSTALL TEMPORARY TIMBER MAT AND RAILS ON BRIDGE.
7. INSTALL AND COMPACT TEMPORARY BACKFILL.
8. OPEN BRIDGE TO TRAIN SERVICE.

STAGE 3B – WORK WILL BE PERFORMED DURING 2nd WEEKEND CLOSURE

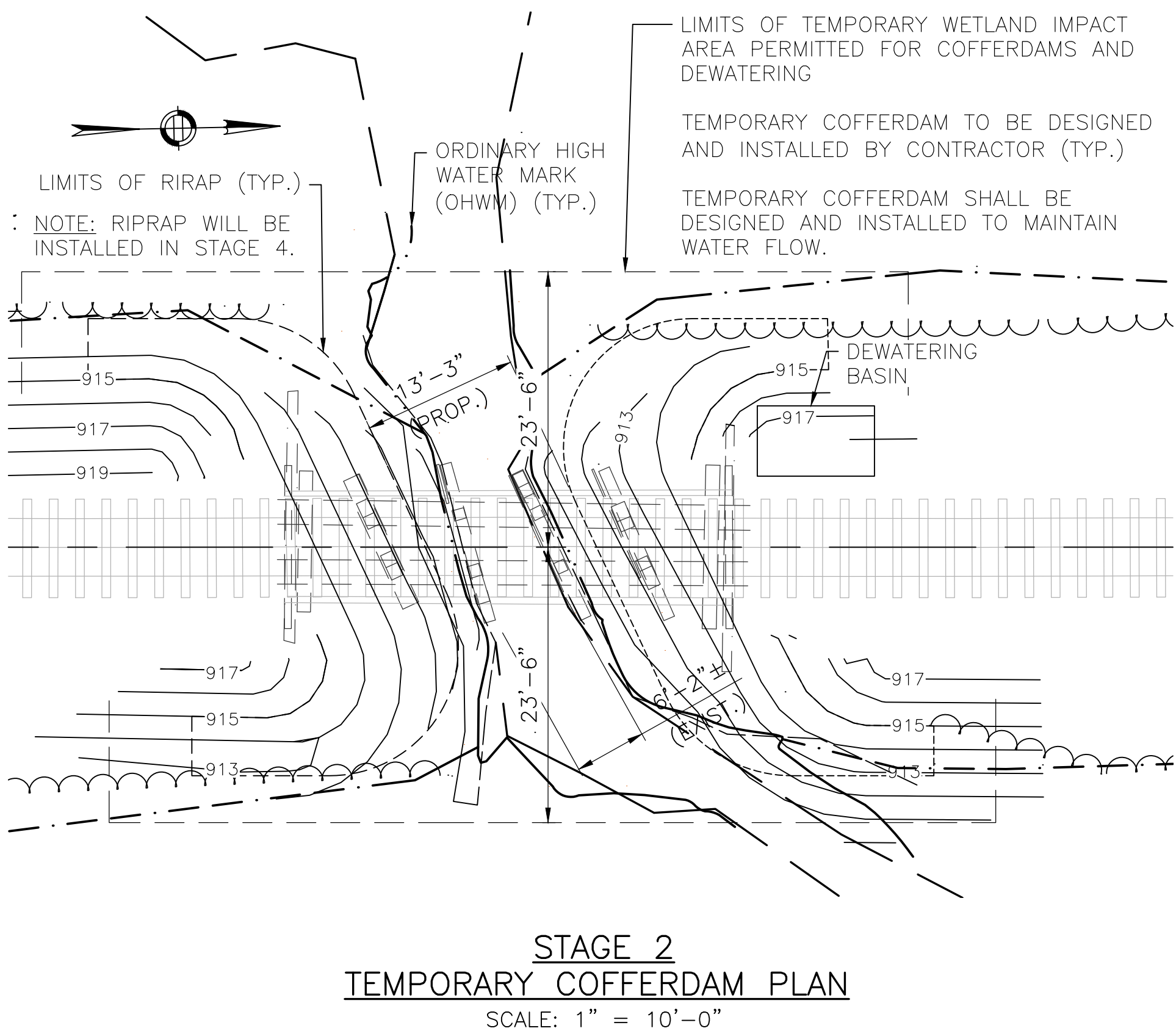
1. REMOVE EXISTING RAIL AND TIES AT BRIDGE AND APPROACHES.
2. EXCAVATE AT ABUTMENT CAPS FOR PLACEMENT OF RAPID SET FLOWABLE FILL.
3. INSTALL PRECAST WINGWALLS AND POUR RAPID SET FLOWABLE FILL
4. BACKFILL AFTER FLOWABLE FILL HARDENS
5. REINSTALL TRACK AND OPEN BRIDGE TO TRAIN SERVICE.

STAGE 3C – WORK WILL BE PERFORMED DURING 3rd WEEKEND CLOSURE

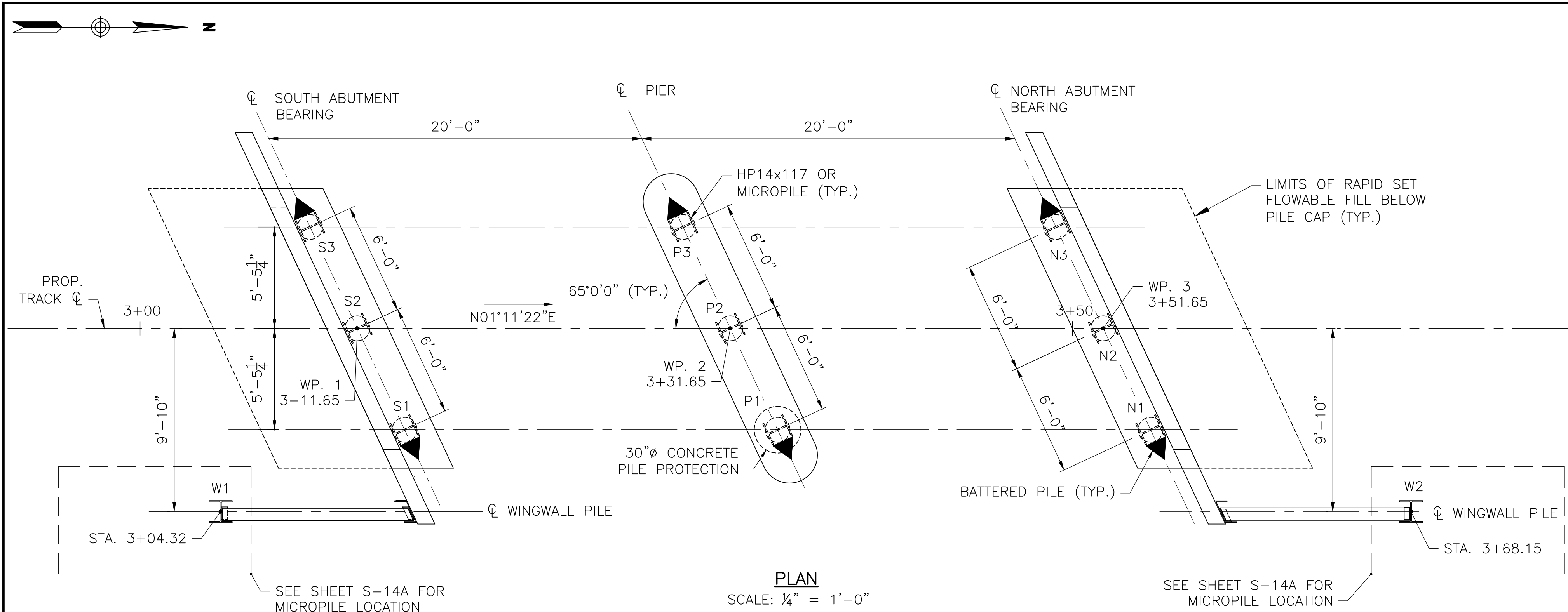
1. REMOVE TEMPORARY TIMBER MAT AND RAILS ON BRIDGE
2. PERFORM TRACK WORK AT BRIDGE APPROACHES.
3. INSTALL BALLAST MAT, BALLAST, CROSS TIES AND RAILS
4. OPEN BRIDGE TO TRAIN SERVICE.

STAGE 4 – WORK WILL BE PERFORMED DURING NON-OPERATION HOURS

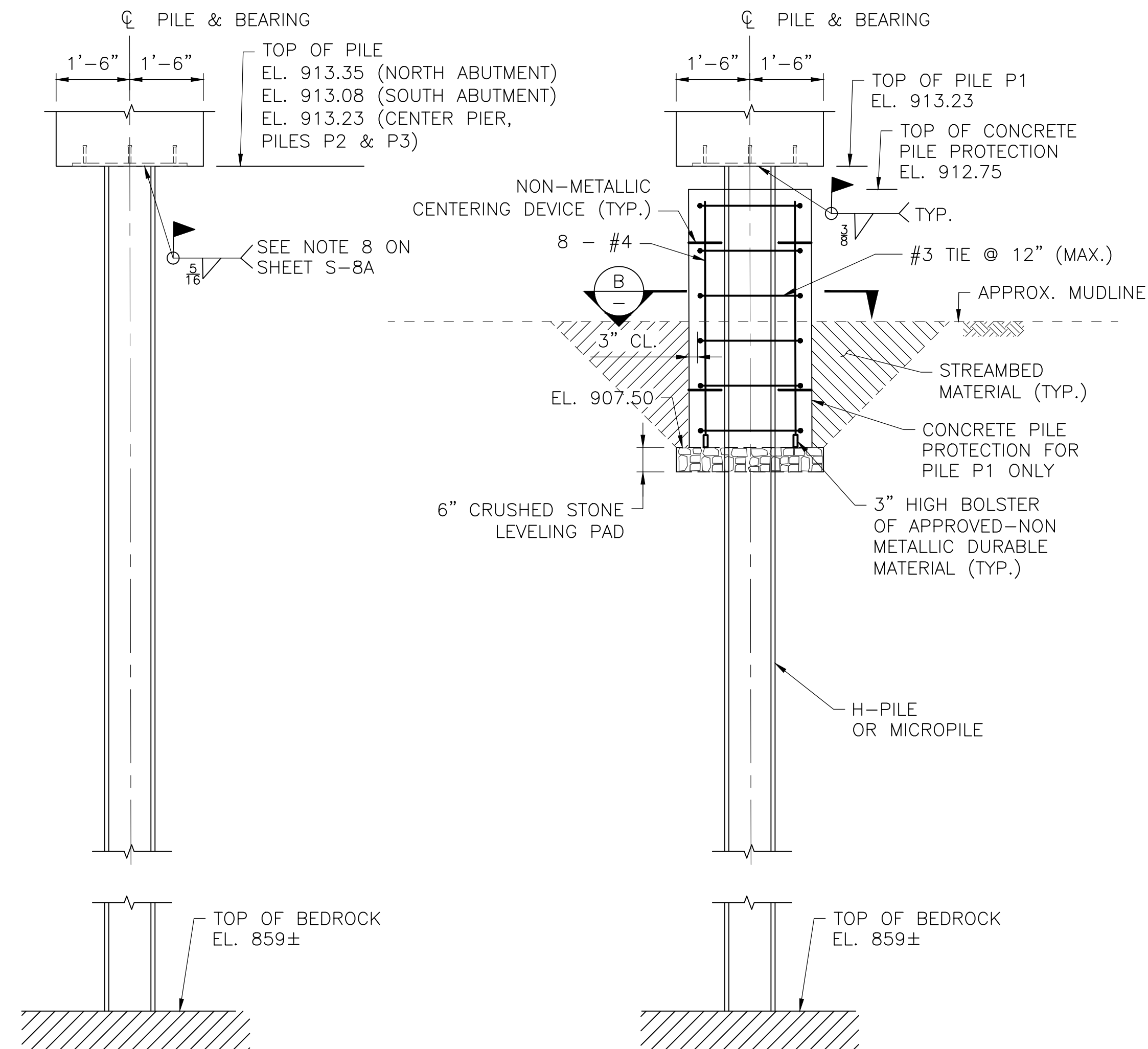
1. REMOVE EXISTING RETAINING WALLS AND CUT TIMBER PILES AT 1 FOOT BELOW FINISH GRADE.
2. INSTALL CONCRETE PILE PROTECTION.
3. INSTALL RIPRAP.
4. INSTALL BRIDGE WALKWAY AND RAILING.
5. REMOVE COFFERDAM



				MASSDOT BERKSHIRE LINE IMPROVEMENTS CONTRACT NO. 120593			
				REPLACEMENT OF BRIDGES ON BERKSHIRE LINE BRIDGE 77.04 - CODDING BROOK BRIDGE CONSTRUCTION STAGING			
				 HDR, INC. 90 HIGH STREET, SUITE 2300 BOSTON, MA 02110 (617) 367-7700		 Massachusetts Department of Transportation Rail & Transit Division	
				SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY
				DATE: 12/12/2022	A.T.	E.Y.	SSL
				PLAN NO.			ISSUE
				SHEET: S-8			
ISSUE	DATE	DESCRIPTION	BY	CHKD	APP.		



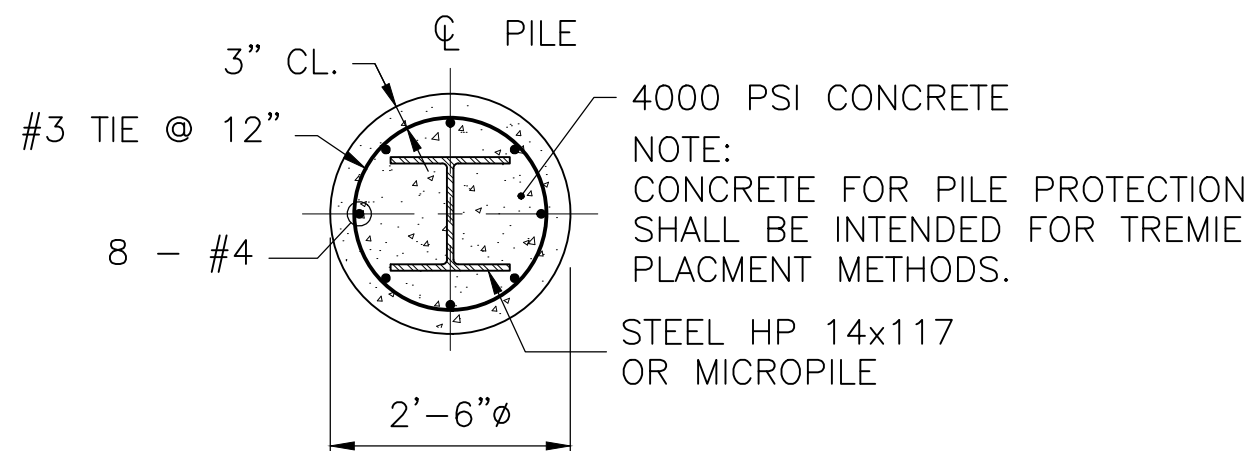
PLAN
SCALE: 1/4" = 1'-0"



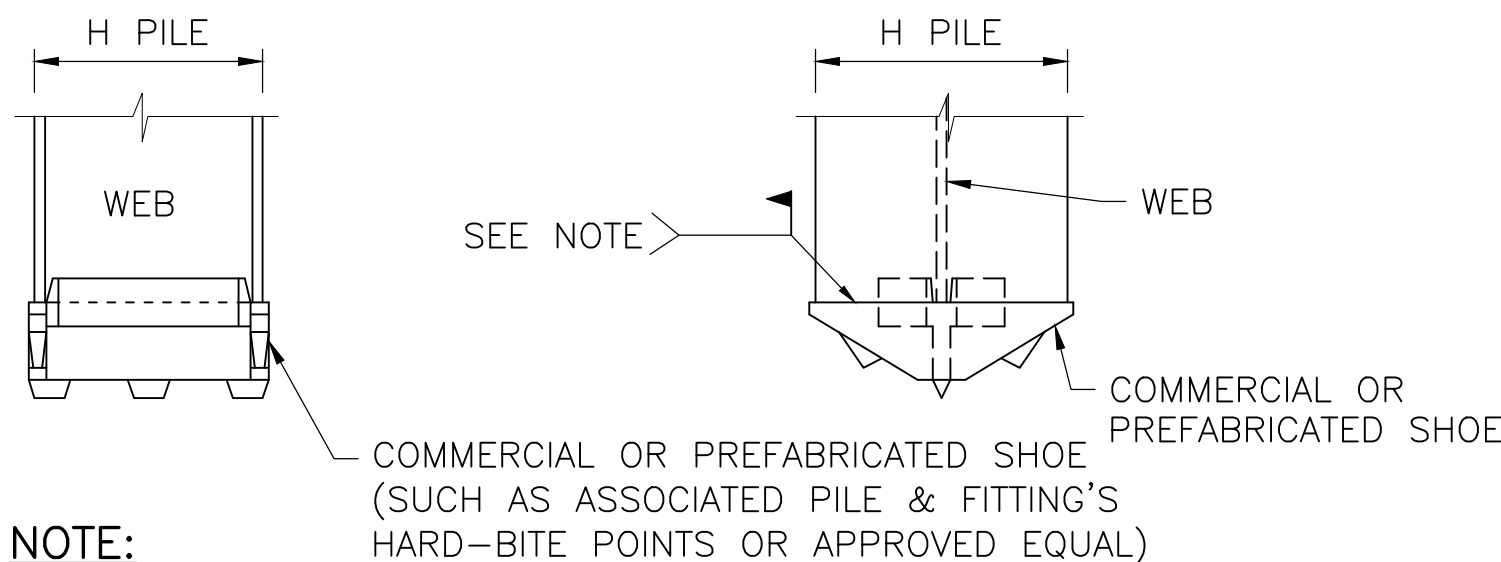
STEEL H PILE DETAIL
SCALE: 1/2" = 1'-0"

STEEL PILE P1 DETAIL
SCALE: 1/2" = 1'-0"

NOTE:
MICROPILE OPTION NOT SHOWN FOR CLARITY.



SECTION B
SCALE: 1/2" = 1'-0"



NOTE:
THE SHOE WELD JOINT DESIGN SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION AND AS SHOWN ON THE APPROVED WELDING PROCEDURE SPECIFICATIONS.

STEEL H-PILE SHOE
NOT TO SCALE

LIST OF PILES			
LOCATION	NO.	SIZE	ESTIMATED LENGTH (FT)
SOUTH ABUTMENT	S2	HP 14 X 117	55±
	S1 & S3	HP 14 X 117	
CENTER PIER BENT	P2	HP 14 X 117	
	P1 & P3	HP 14 X 117	
NORTH ABUTMENT	N2	HP 14 X 117	
	N1 & N3	HP 14 X 117	55±
WINGWALLS	W1 & W2	HP 14 X 117	25

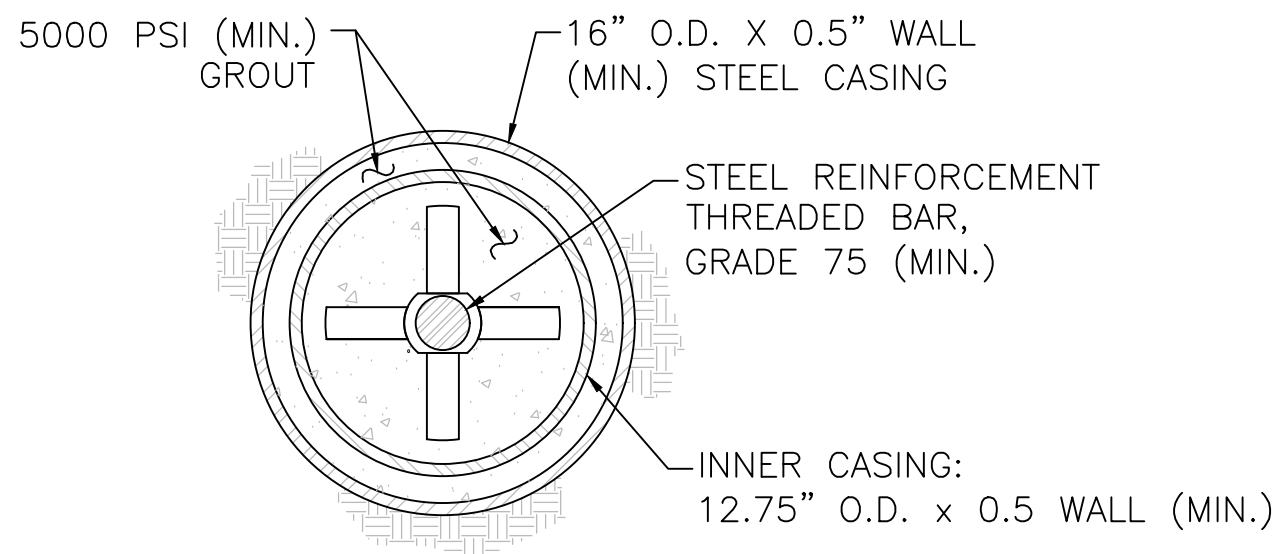
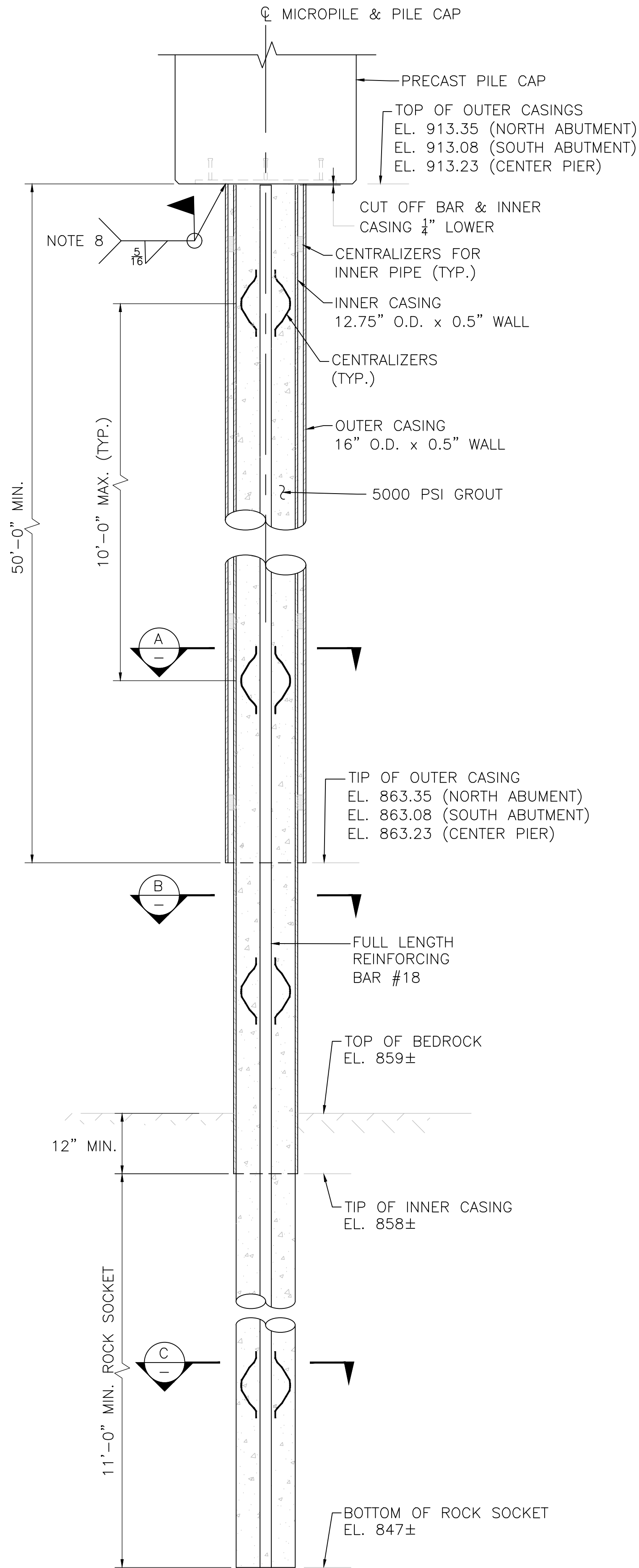
NOTES:

- ESTIMATED PILE LENGTHS SHOWN IN THE TABLE ABOVE ARE BASED ON INFORMATION FROM BORINGS. FINAL PILE LENGTHS ARE EXPECTED TO VARY BASED ON DRIVING CONDITIONS AND THE RESULTS OF DYNAMIC PILE TESTING.
- HIGHEST ALLOWABLE TIP ELEVATION FOR DRIVEN ABUTMENT AND PIER PILES IS 16 FEET BELOW THE TOP OF GLACIAL TILL OR THE ELEVATIONS LISTED BELOW, WHICHEVER IS DEEPER:
 - SOUTH ABUTMENT: EL. 894
 - CENTER PIER: EL. 878
 - NORTH ABUTMENT: EL. 888DRIVEN PILES ARE ANTICIPATED TO BE DRIVEN DEEPER INTO THE GLACIAL TILL OR TO THE TOP OF BEDROCK TO DEVELOP THE REQUIRED ULTIMATE RESISTANCE.
- HIGHEST ALLOWABLE TIP ELEVATION FOR DRIVEN WINGWALL PILES IS 25 FEET BELOW THE TOP OF WINGWALL:
 - SOUTHEAST WINGWALL: EL. 894.6
 - NORTHEAST WINGWALL: EL. 894.8DRIVEN WINGWALL PILES DO NOT HAVE A REQUIRED ULTIMATE RESISTANCE.
- THE AXIAL DESIGN LOAD PER PILE FOR ABUTMENT AND PIER PILES IS 340.0 KIPS AS PER AREMA SERVICE LOAD DESIGN GROUP I LOAD COMBINATION.
- THE ALLOWABLE STRUCTURAL PILE RESISTANCE IS 509.8 KIPS.
- HEAVY DUTY PILE SHOES SHALL BE INSTALLED ON THE TIPS OF ALL PILES. PREFABRICATED PILE SHOES MAY BE USED IF APPROVED BY THE ENGINEER.
- DETERMINATION OF THE DRIVEN PILE RESISTANCE, PILE DRIVING CRITERIA, AND PILE INTEGRITY SHALL BE PERFORMED USING THE PILE DRIVING ANALYZER (PDA) WITH SIGNAL MATCHING. PILES SHALL BE INSTALLED TO ACHIEVE AN ULTIMATE DRIVEN RESISTANCE EQUAL TO OR GREATER THAN 2.25 TIMES THE MAXIMUM SERVICE AXIAL DESIGN LOAD. A MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER ENGAGED BY THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING THE PDA TESTING IN ACCORDANCE WITH SECTION 940 OF THE MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGES, 2022 EDITION.
- THE CONTRACTOR SHALL SUBMIT A PILE SCHEDULE, PILE INSTALLATION, AND PILE DRIVING/TESTING PLAN FOR REVIEW AND APPROVAL OF THE ENGINEER.
- PILE DRIVING TESTING SHALL BE PERFORMED BY CONTRACTOR ON A LEAST ONE ABUTMENT PILE ON EACH SIDE, ONE BATTERED PIER PILE, AND ONE VERTICAL PIER PILE FOR A TOTAL OF AT LEAST 4 PILES.
- PILES SHALL BE DRIVEN IN ACCORDANCE WITH SECTION 940 OF THE MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, 2022 EDITION, AND THE REQUIREMENTS SHOWN ON THE DRAWINGS. IN THE EVENT OF A CONFLICT, THE NOTES ON THE DRAWING GOVERN.
- PILES SHALL CONFORM TO ASTM A572, GRADE 50.
- PILES SHALL BE COATED WITH COAL TAR EPOXY COATING BEFORE DRIVING. THE COAL TAR EPOXY COATING SHALL EXTEND AT LEAST 15 FEET BELOW THE FINAL GRADE. TOUCH UP COAL TAR EPOXY AT TOP OF PILE AFTER WELDING.
- SEE SHEET S-9A FOR DETAILS FOR MICROPILE OPTION.

REQUIRED PILE LOCATION TOLERANCES:

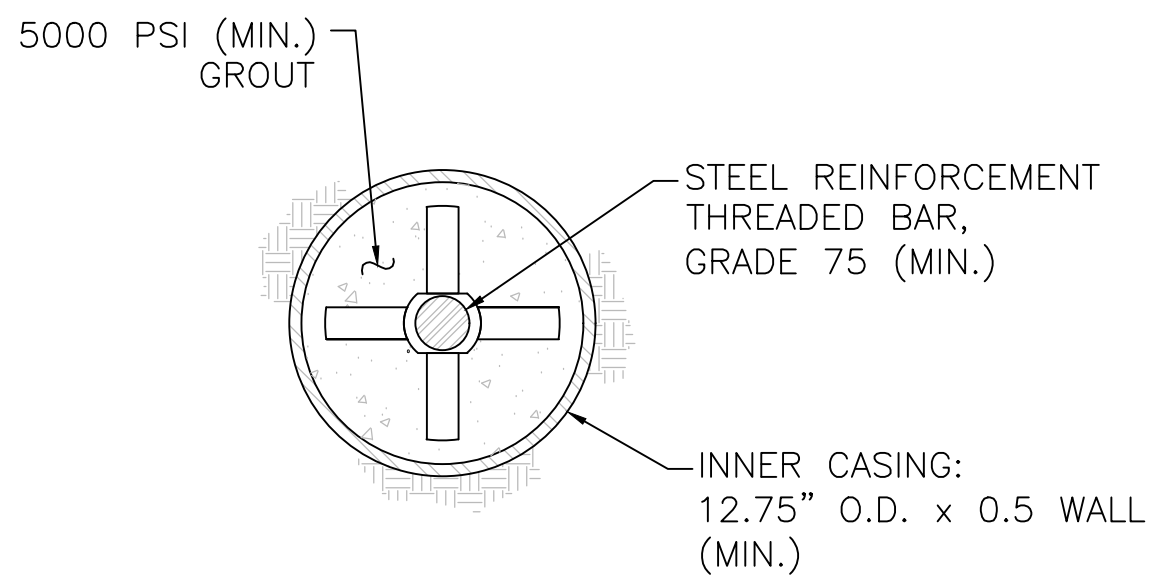
- CONFORMANCE TO THE FOLLOWING TOLERANCES IS OF EXTREME IMPORTANCE TO FOUNDATIONS OF THIS TYPE.
- PRIOR TO DRIVING, EACH PILE SHALL BE HELD BY TEMPLATE TO WITHIN 1" OF PLAN LOCATION.
- AFTER EACH PILE IS DRIVEN, THE TOP OF THE PILE SHALL BE WITHIN 3" OF PLAN LOCATION.

MASSDOT BERKSHIRE LINE IMPROVEMENTS CONTRACT NO. 120593									
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE BRIDGE 77.04 - CODDING BROOK BRIDGE FOUNDATION LAYOUT DETAILS									
HDR, INC.				80 HIGH STREET, SUITE 2300 BOSTON, MA 02110 (617) 357-7700					
SCALE: AS NOTED				DATE: 12/12/2022	DRAWN BY: A.T.	DESIGN BY: E.Y.	CHECK BY: SSL	PLAN NO.	ISSUE
DATE: 12/12/2022				SHEET: S-9				ISSUE	

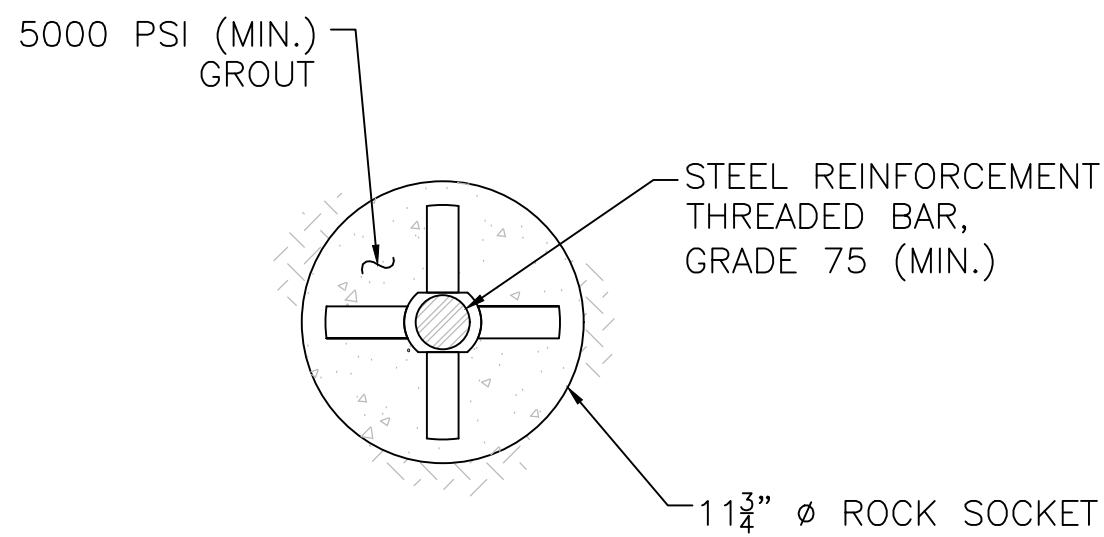


CENTRALIZER BETWEEN CASINGS NOT SHOWN FOR CLARITY.

SECTION A
SCALE: 1 1/2" = 1'-0"



SECTION B
SCALE: 1 1/2" = 1'-0"



SECTION C
SCALE: 1 1/2" = 1'-0"

LIST OF MICROPILES			
LOCATION	NO.	INNER CASING SIZE	* ESTIMATED LENGTH (FT)
SOUTH ABUTMENT	S2	12.75"ø x 1/2"	66±
	S1 & S3	12.75"ø x 1/2"	
CENTER PIER BENT	P2	12.75"ø x 1/2"	
	P1 & P3	12.75"ø x 1/2"	
NORTH ABUTMENT	N2	12.75"ø x 1/2"	
	N1 & N3	12.75"ø x 1/2"	66±

* INCLUDING 11' ROCK SOCKET

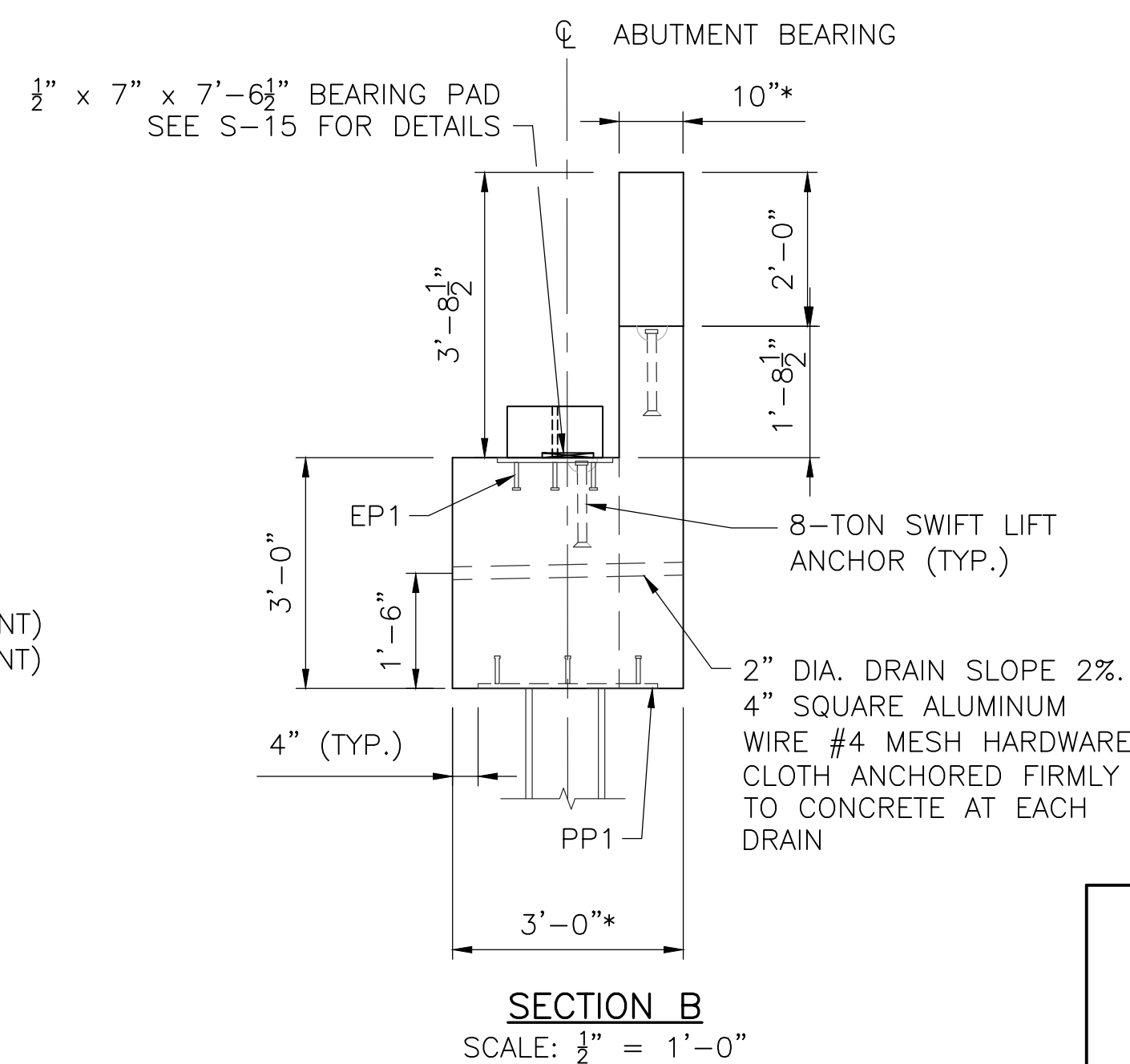
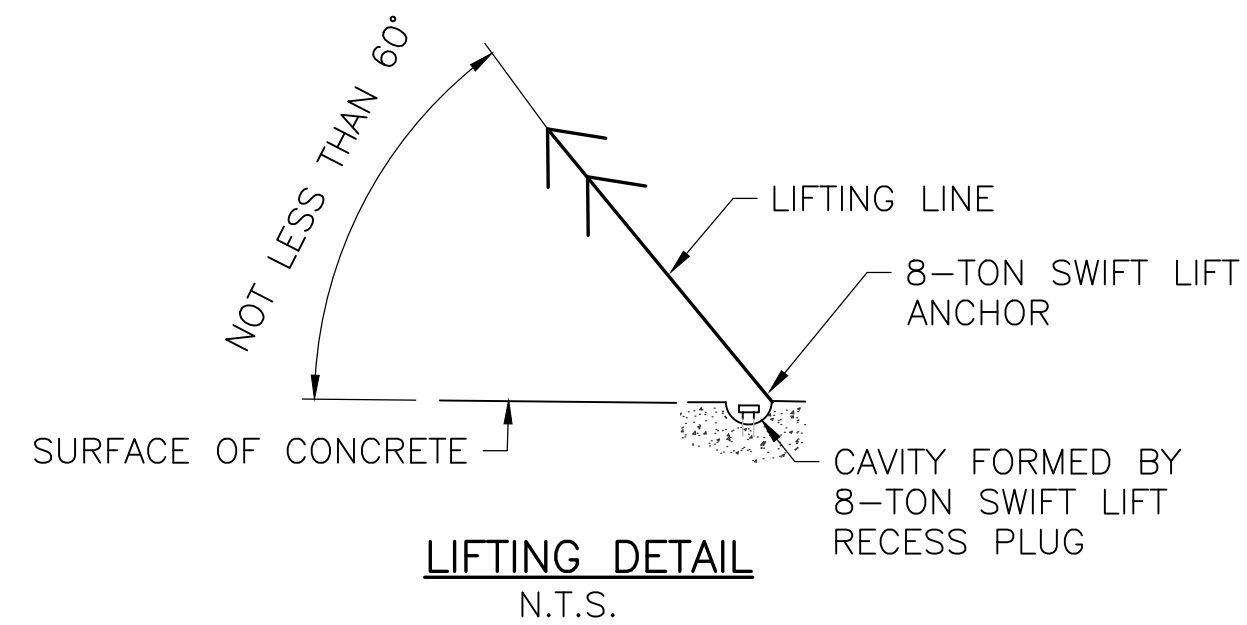
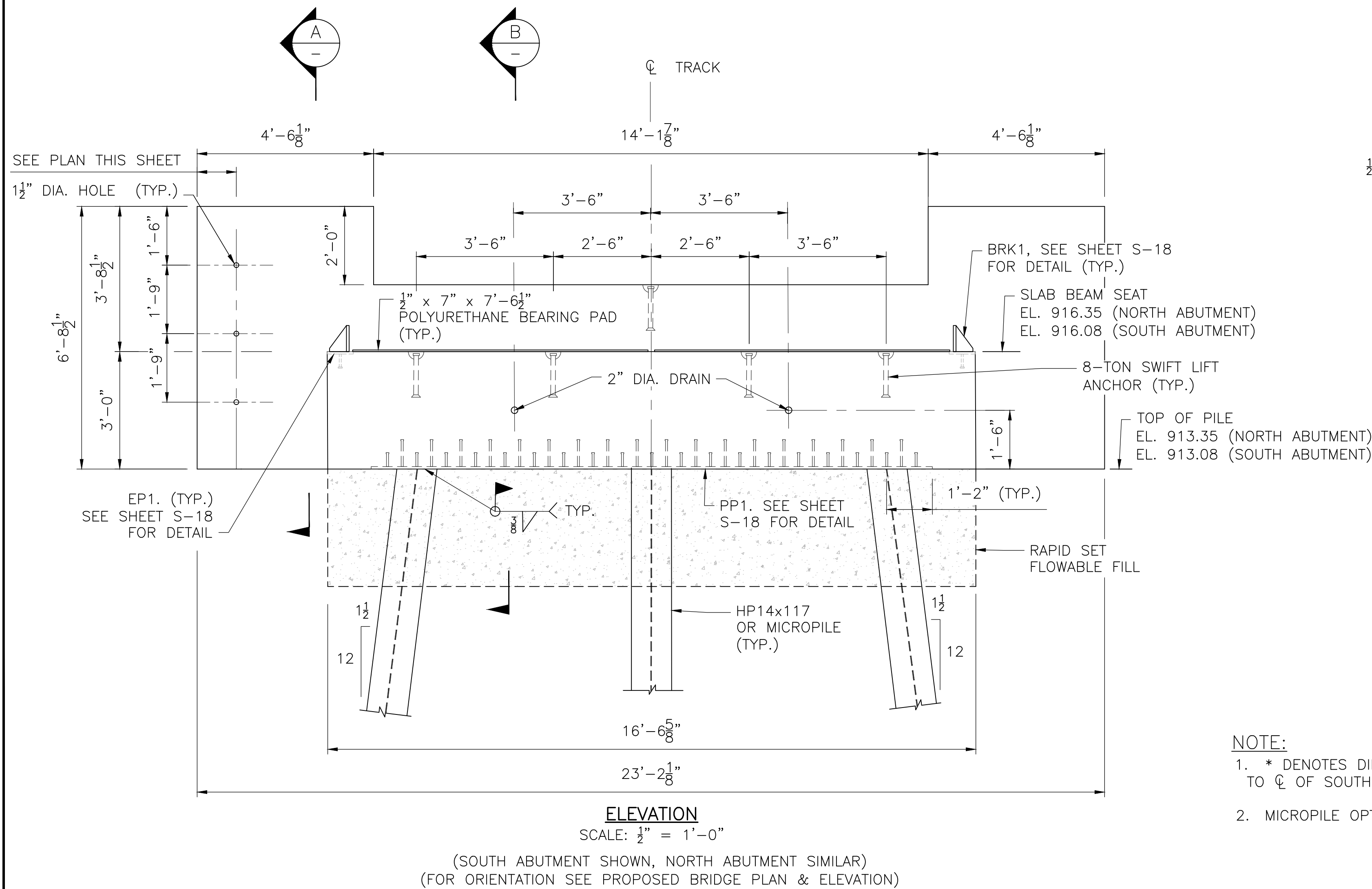
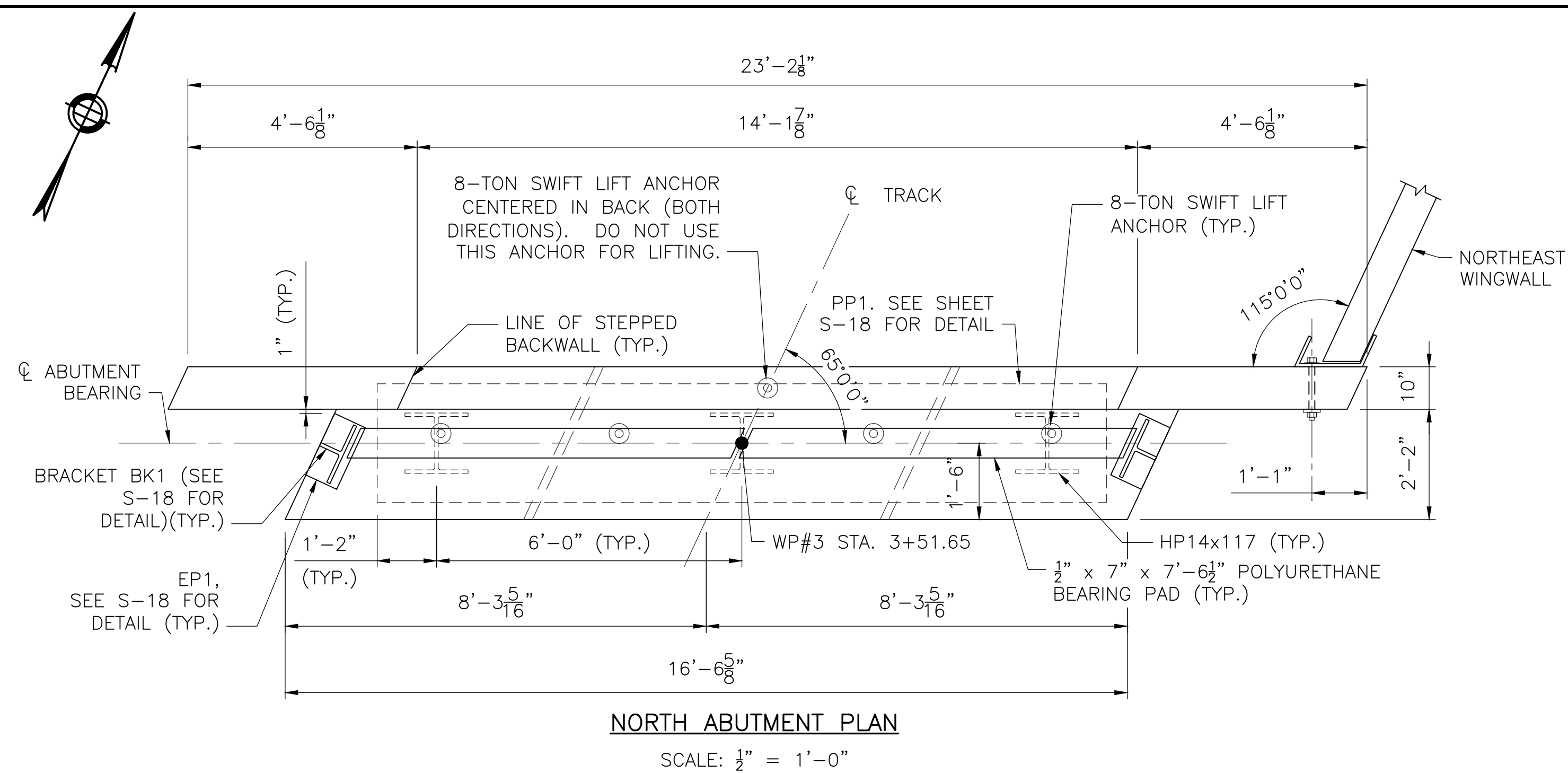
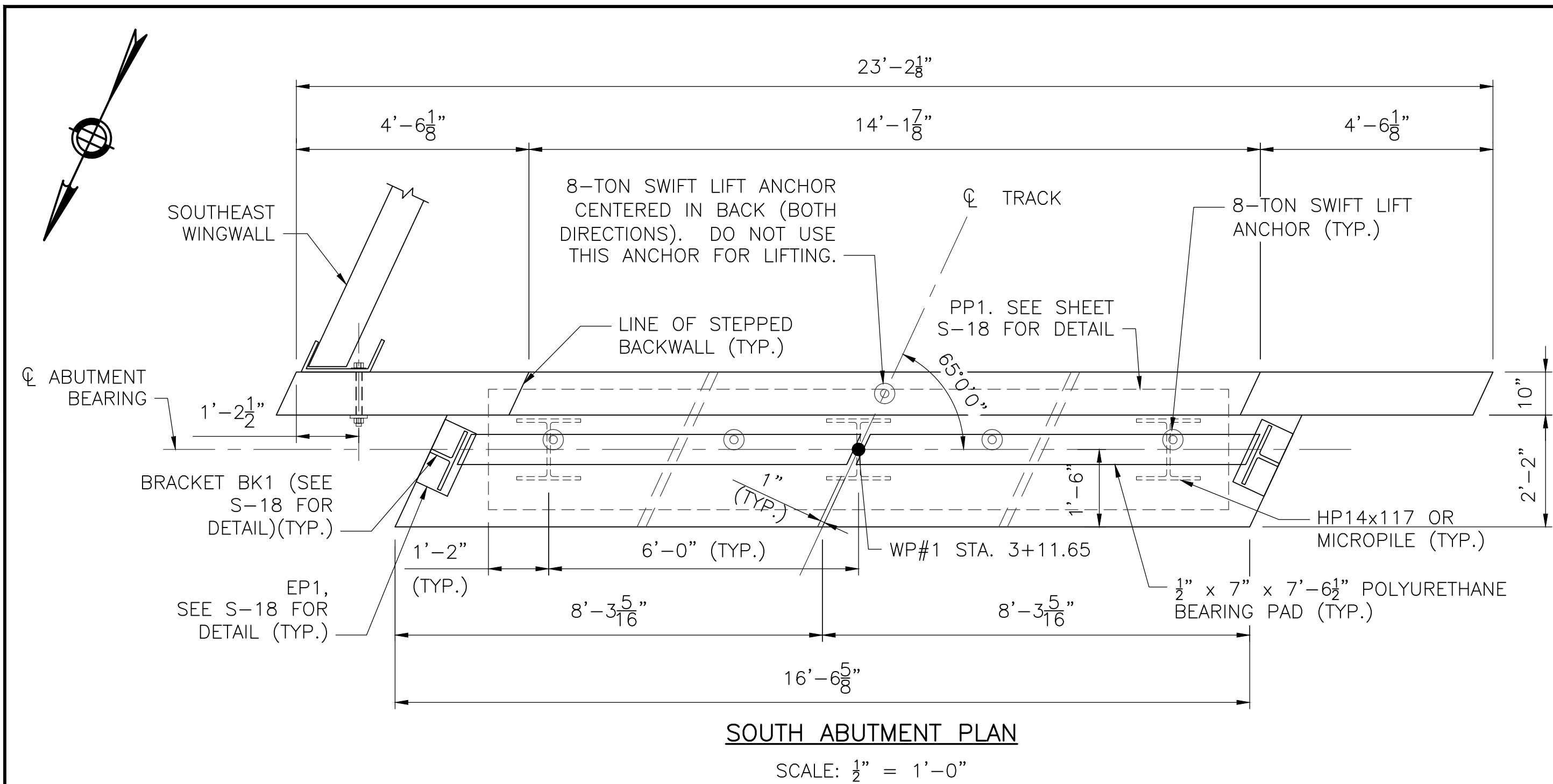
MICROPILE NOTES:

1. GROUT SHALL BE A NEAT CEMENT GROUT WITH A MINIMUM 3-DAY UNCONFINED COMPRESSIVE STRENGTH OF 2,500 PSI AND A MINIMUM 28-DAY UNCONFINED COMPRESSIVE STRENGTH OF 5,000 PSI. THE GROUT SHALL CONFORM TO AASHTO T106/ASTM C109.
2. ALL PERMANENT STEEL OUTER PIPE CASINGS SHALL BE NEW PRIME STEEL MEETING THE REQUIREMENTS OF ASTM A252, GRADE 3. FOR INNER PIPE, CASINGS SHALL BE NEW PRIME STEEL MEETING THE REQUIREMENTS OF ASTM A252, GRADE 3, OR API 5L PSL1, GRADE 52 WITH SR15 SUPPLEMENTAL REQUIREMENTS.
3. NO THREADED OUTER CASING JOINTS SHALL BE LOCATED WITHIN 8 FEET OF THE PILE CAP. JOINTS IN INNER CASING SHALL BE STAGGERED AT 5'-0"±6" FROM JOINTS IN OUTER CASING.
4. THREADED BARS SHALL BE ASTM A615, GRADE 75, AND SHALL BE JOINED WITH COUPLERS SUPPLIED BY THE MANUFACTURER. THE COUPLERS SHALL BE CAPABLE OF DEVELOPING OR EXCEEDING THE STRENGTH OF THE THREAD BAR.
5. THE CONTRACTOR SHALL SUBMIT A PILE SCHEDULE, PILE INSTALLATION, AND PILE TESTING PLAN FOR REVIEW AND APPROVAL BY THE ENGINEER.
6. MICROPILES SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH SPECIAL PROVISIONS ITEM 945.10 DRILLED MICROPILES.
7. THE AXIAL DESIGN LOAD PER PILE FOR ABUTMENT AND PIER PILES IS 340.0 KIPS AS PER AREMA SERVICE LOAD DESIGN GROUP I LOAD COMBINATION.
8. THE CONTRACTOR SHALL SUBMIT WELDING PROCEDURE AS A PART OF SUPERSTRUCTURE ERECTION PROCEDURE FOR ENGINEER'S REVIEW. THE WELDING PROCEDURE SHOULD COVER POSSIBLE FIELD CONDITIONS SUCH AS THE TOP OF PILES MAY BE CUT OFF LOWER THAN ELEVATIONS INDICATED ON PLANS. MEASUREMENTS FOR CONTROL OF HEAT GENERATED DURING WELDING TO AVOID DAMAGING SURROUNDING PRECAST CONCRETE DUE TO THERMAL EXPANSION IN EMBEDDED STEEL PLATES SHALL BE INCLUDED IN THE PROCEDURE.
9. CONCRETE PILE PROTECTION FOR PILE P1, SEE SHEET S-9.

REQUIRED PILE LOCATION TORERANCES:

1. CONFORMANCE TO THE FOLLOWING TOLERANCES IS OF EXTREME IMPORTANCE TO FOUNDATIONS OF THIS TYPE.
2. PRIOR TO DRILLING, EACH PILE SHALL BE HELD BY TEMPLATE TO WITHIN 1" OF PLAN LOCATION.
3. AFTER EACH PILE IS INSTALLED, THE TOP OF THE PILE SHALL BE WITHIN 2" OF PLAN LOCATION.

				MASSDOT BERKSHIRE LINE IMPROVEMENTS CONTRACT NO. 120593			
				REPLACEMENT OF BRIDGES ON BERKSHIRE LINE BRIDGE 77.04 - CODDING BROOK BRIDGE DETAILS FOR MICROPILE OPTION			
				 HDR, INC. 50 HIGH STREET, SUITE 2300 BOSTON, MA 02110 (617) 357-4700		 Massachusetts Department of Transportation Rail & Transit Division	
SCALE: AS NOTED				DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.
DATE: 12/12/2022				SSL	SSL	JQW	SHEET: S-9A
ISSUE	DATE	DESCRIPTION	BY	CHKD	APP.		



- NOTE:
- * DENOTES DIMENSIONS MEASURED PERPENDICULAR TO ϕ OF SOUTH ABUTMENT BEARING
 - MICROPILE OPTION NOT SHOWN FOR CLARITY.

MASSDOT BERKSHIRE LINE IMPROVEMENTS CONTRACT NO. 120593									
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE BRIDGE 77.04 - CODDING BROOK BRIDGE ABUTMENT LAYOUT DETAILS									
ISSUE		DATE		DESCRIPTION		BY		CHKD APP.	
SCALE: AS NOTED		DRAWN BY		DESIGN BY		CHECK BY		PLAN NO.	
DATE: 12/12/2022		A.T.		E.Y.		SSL		SHEET: S-10	
ISSUE		DATE		DESCRIPTION		BY		CHKD APP.	

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90 HIGH STREET, SUITE 2300
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Massachusetts Department of Transportation
Rail & Transit Division

SCALE: AS NOTED

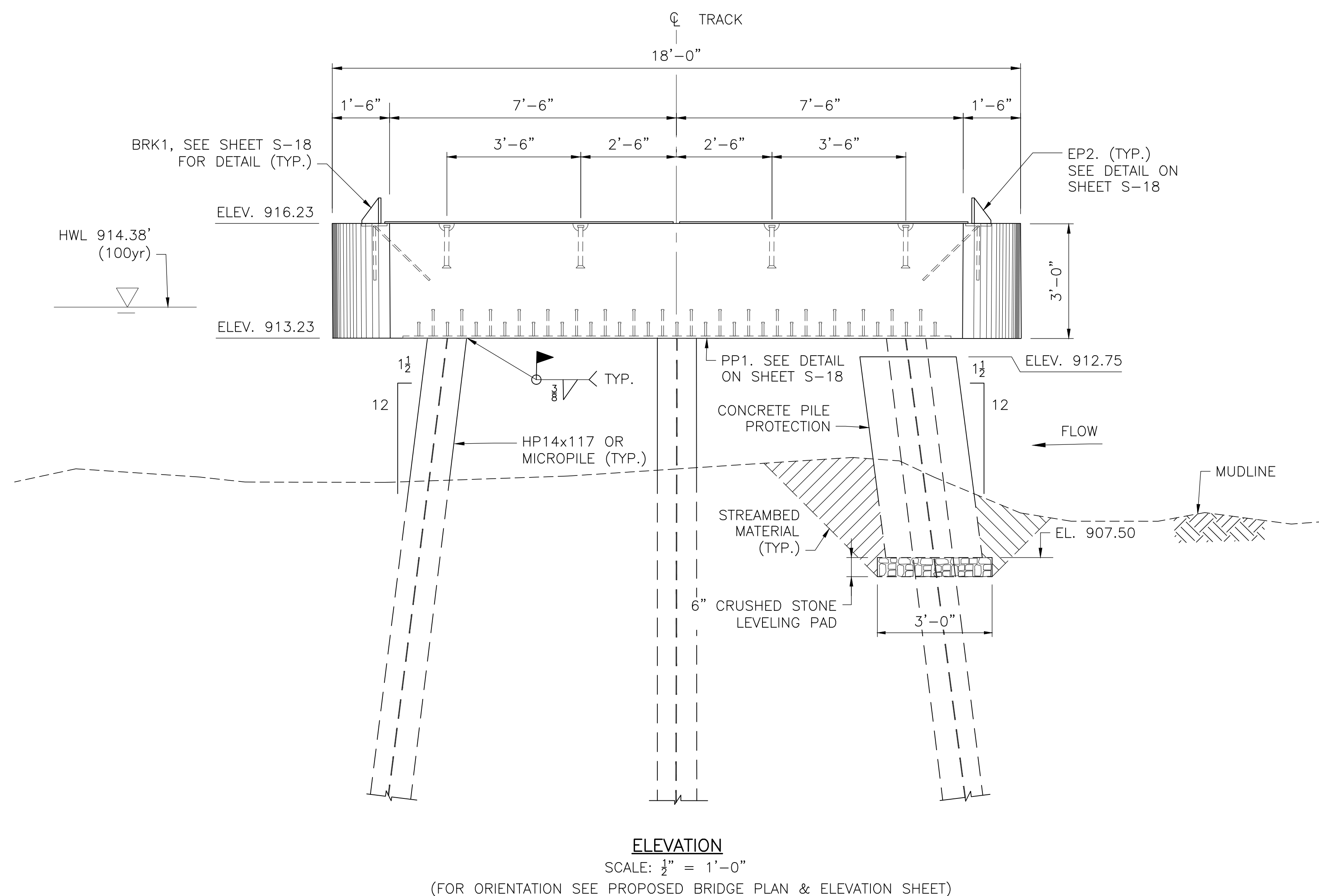
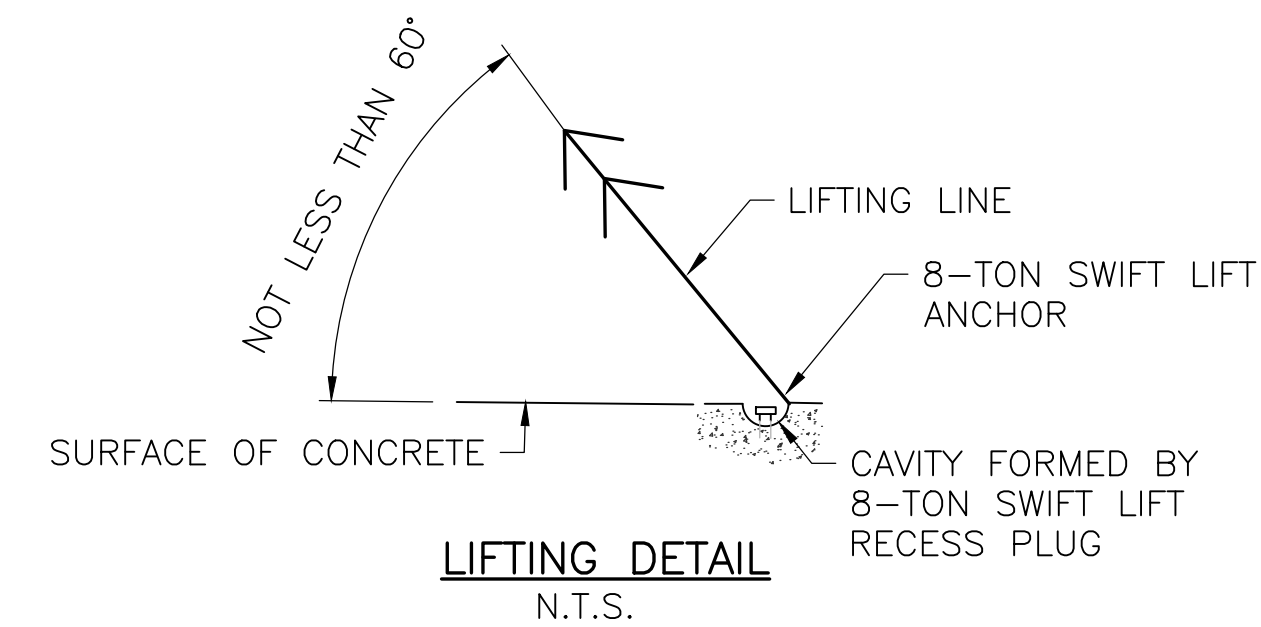
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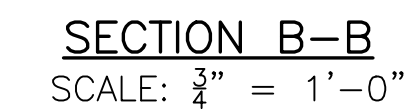
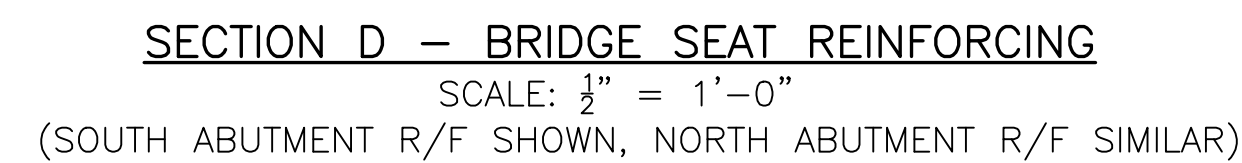
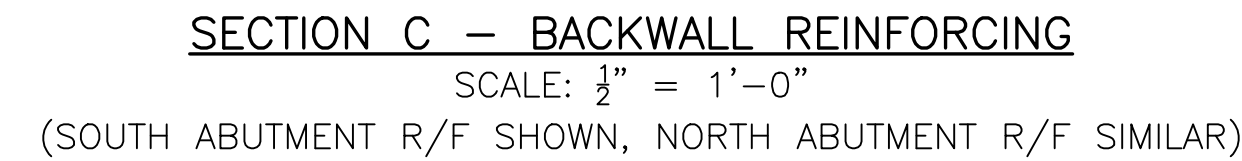
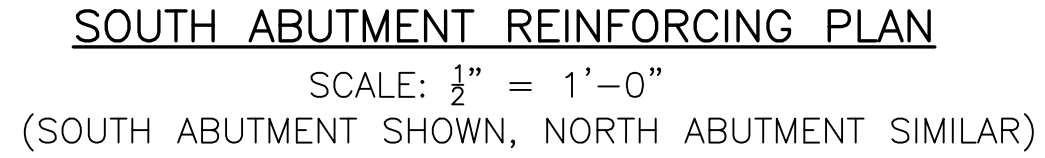
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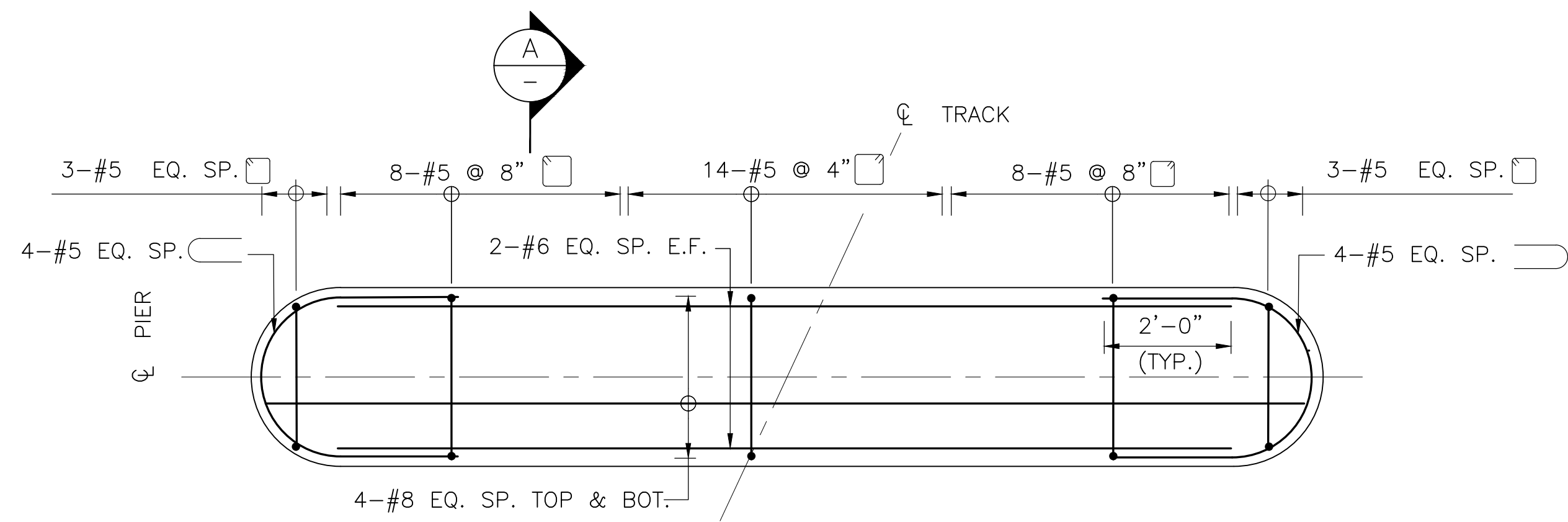
PLAN NO.

ISSUE

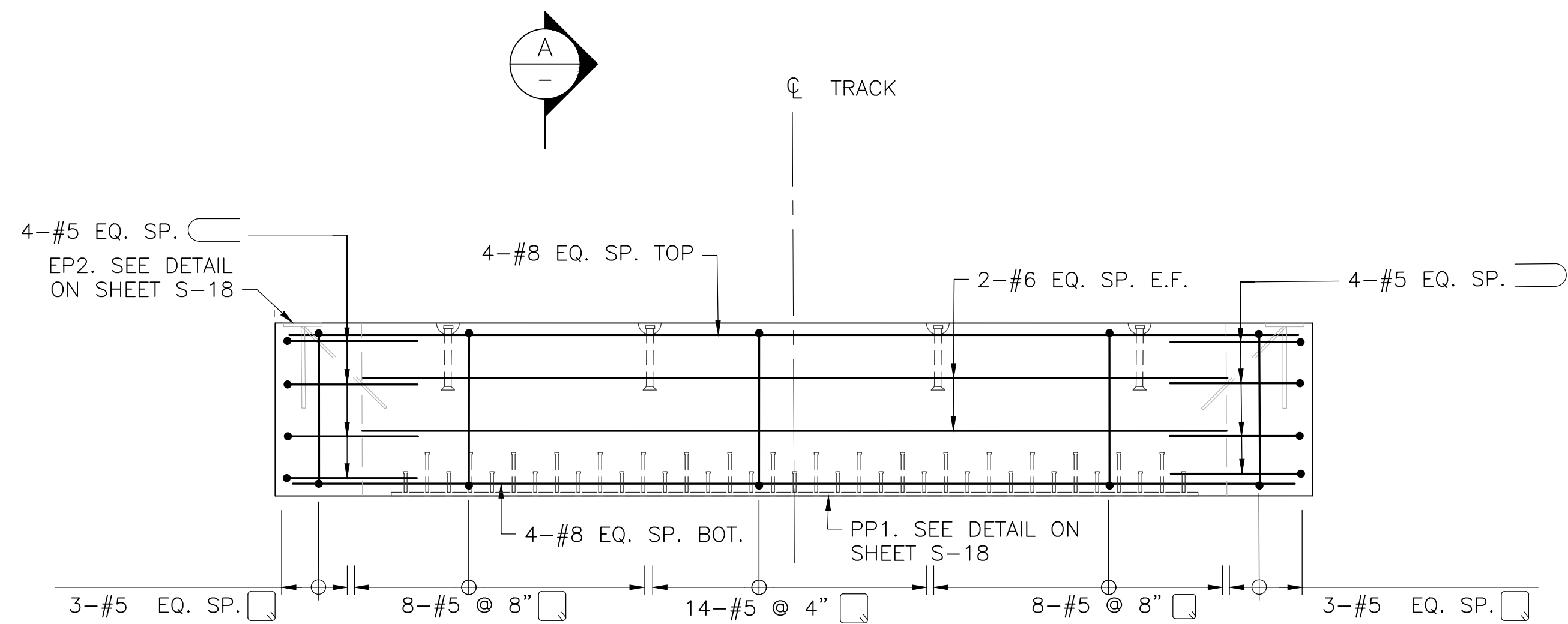


								MASSDOT BERKSHIRE LINE IMPROVEMENTS CONTRACT NO. 120593					
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								 HDR, INC. 99 HIGH STREET, SUITE 2300 BOSTON, MA 02110 (617) 357-7700		 Massachusetts Department of Transportation Rail & Transit Division			
								SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
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ISSUE	DATE	DESCRIPTION			BY	CHKD	APP.						

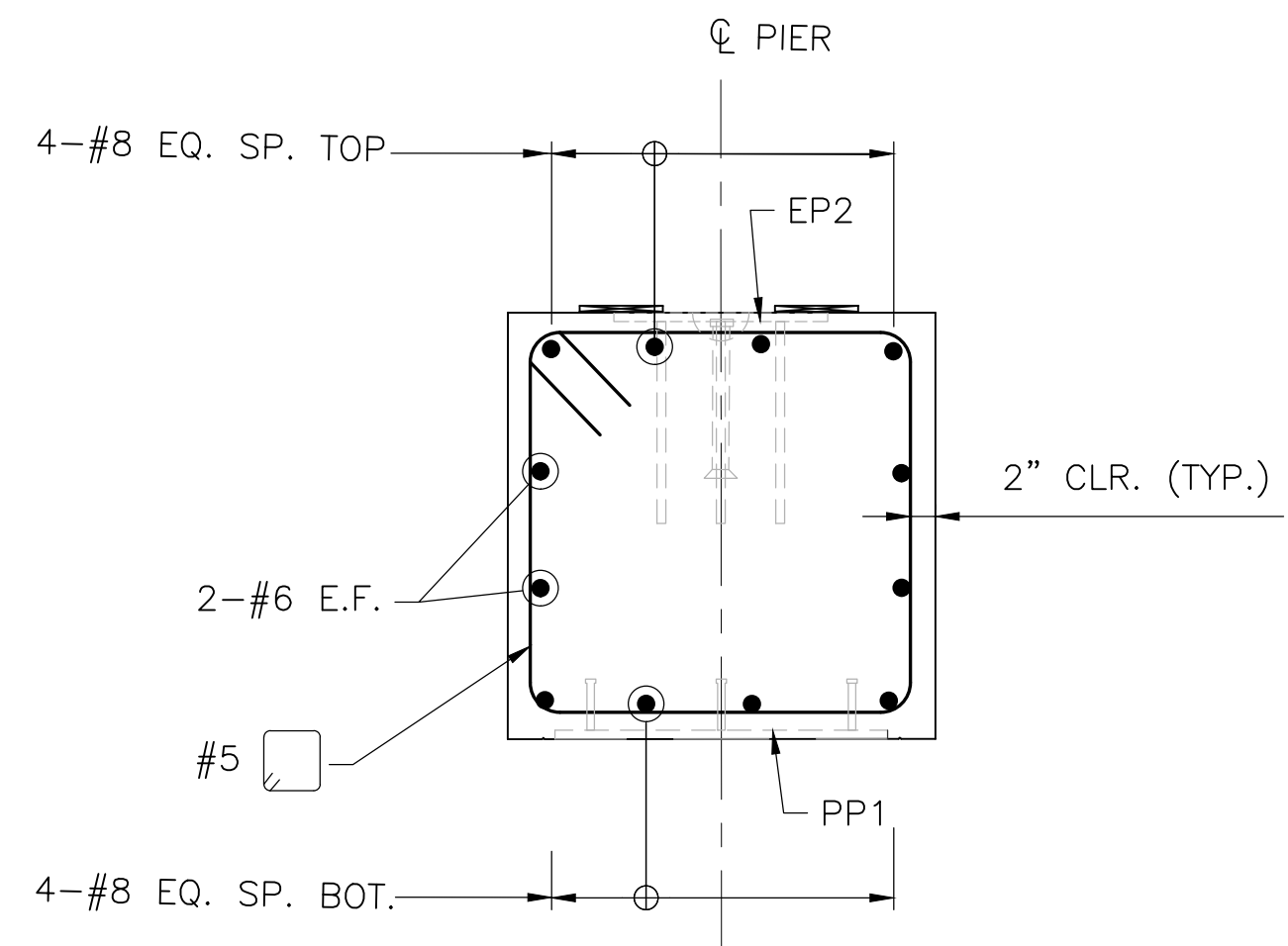
[illegible]



PRECAST CAP PLAN
SCALE: $\frac{1}{2}$ " = 1'-0"



PRECAST CAP ELEVATION
SCALE: $\frac{1}{2}$ " = 1'-0"



SECTION A-A
SCALE: $\frac{3}{4}$ " = 1'-0"

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

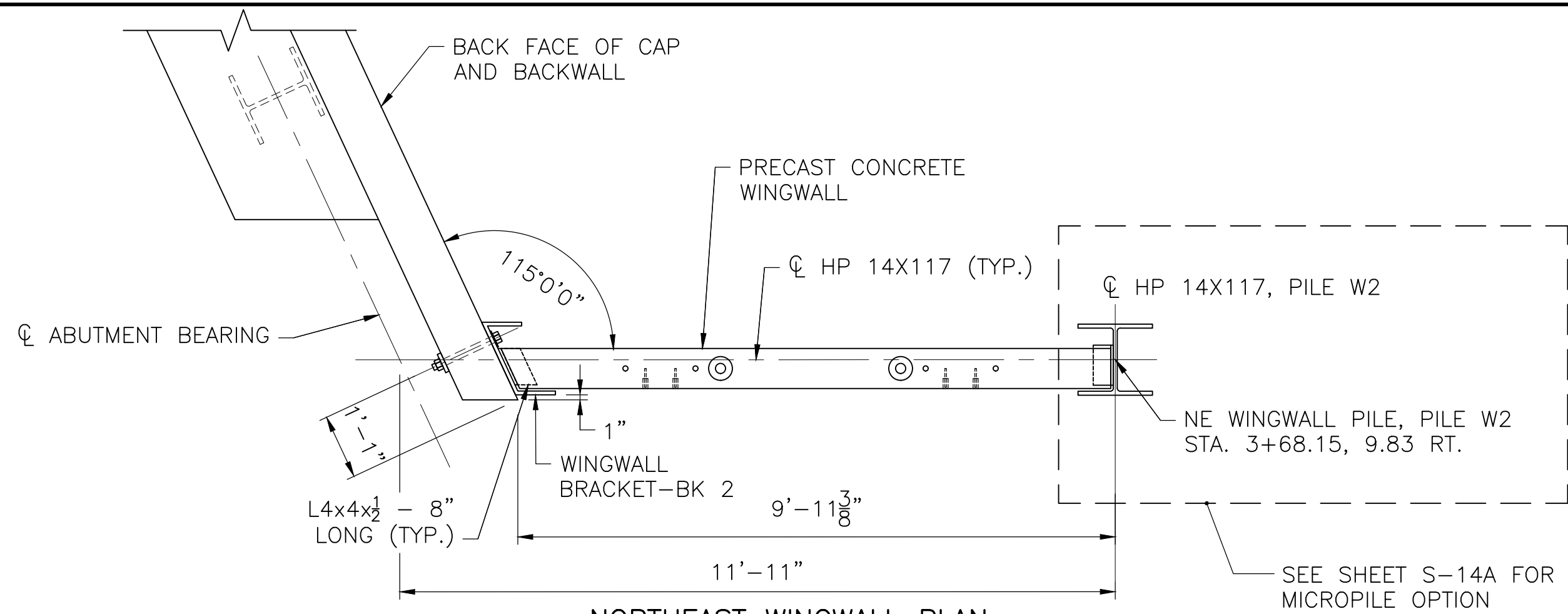
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
PIER CAP REINFORCEMENT DETAILS



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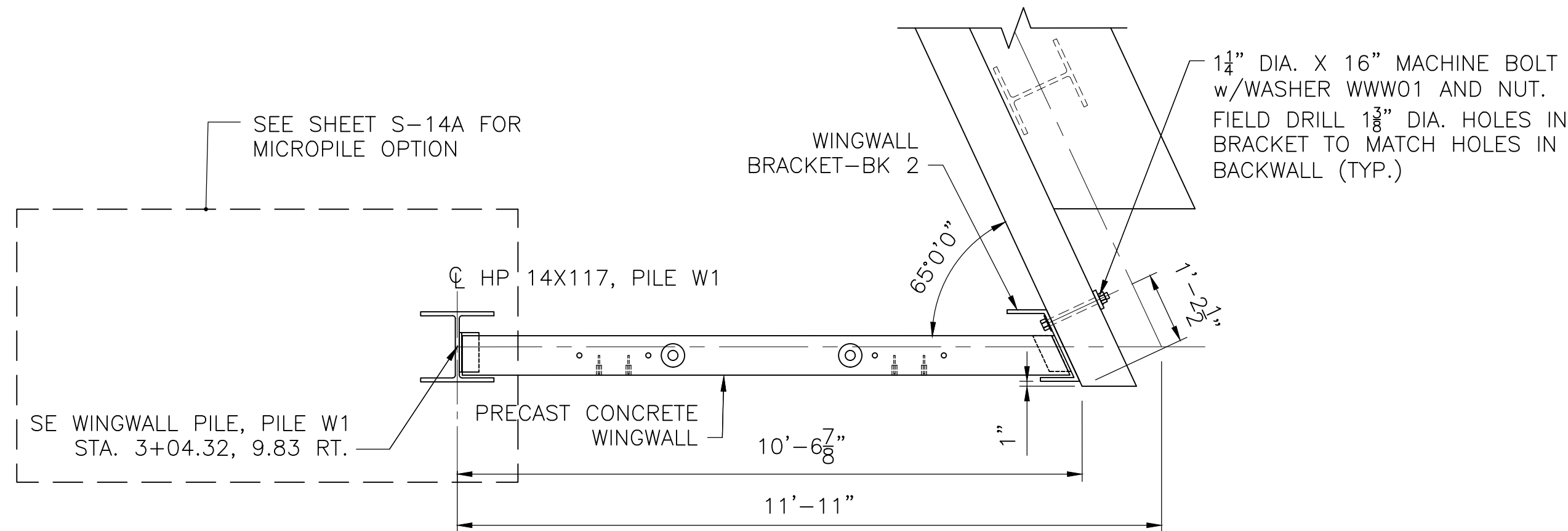


ISSUE	DATE	DESCRIPTION	BY	CHKD	APP.	SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
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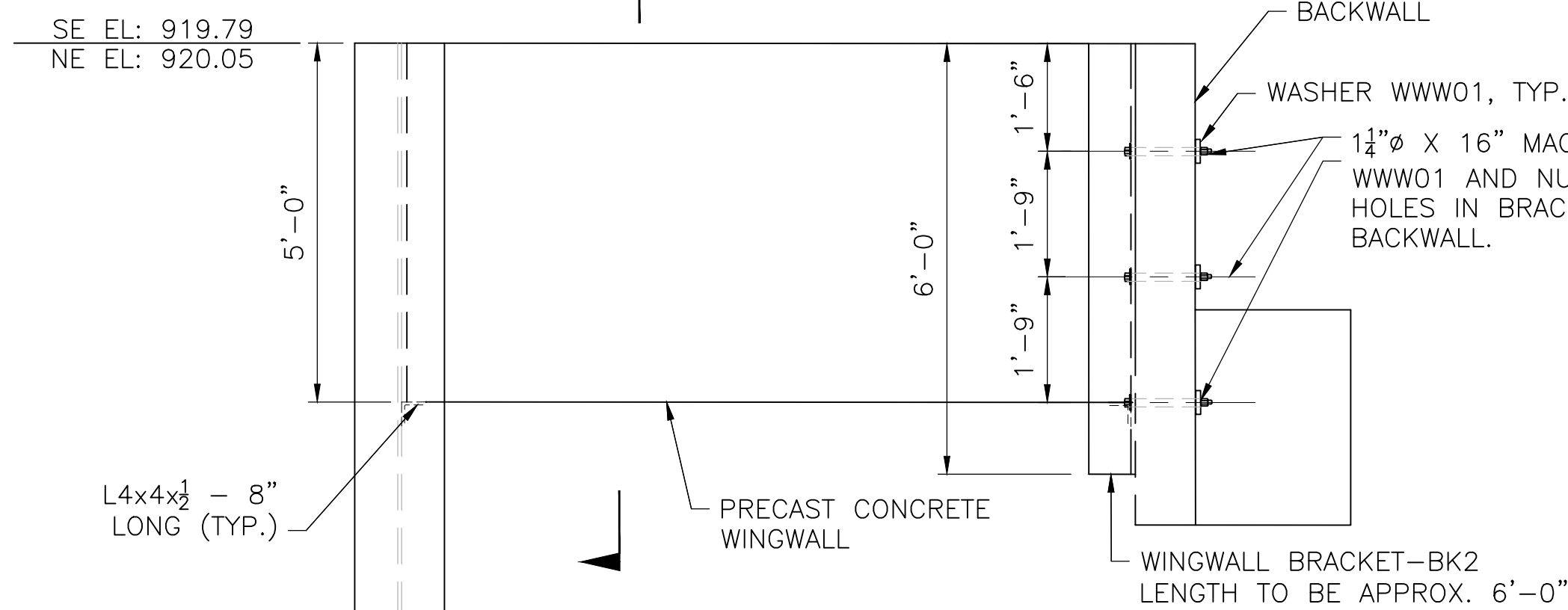
NORTHEAST WINGWALL PLAN

SCALE: 1/2" = 1'-0"



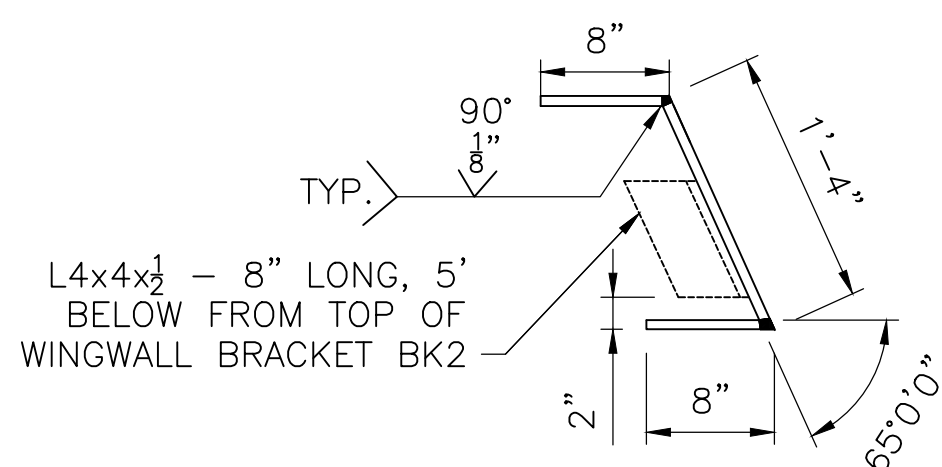
SOUTHEAST WINGWALL PLAN

SCALE: 1/2" = 1'-0"



WINGWALL ELEVATION

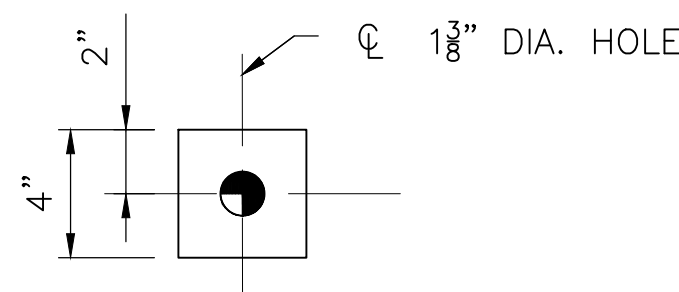
SCALE: 1/2" = 1'-0"



WINGWALL BRACKET BK2

SCALE: 1" = 1'-0"

THICKNESS = 3/4"



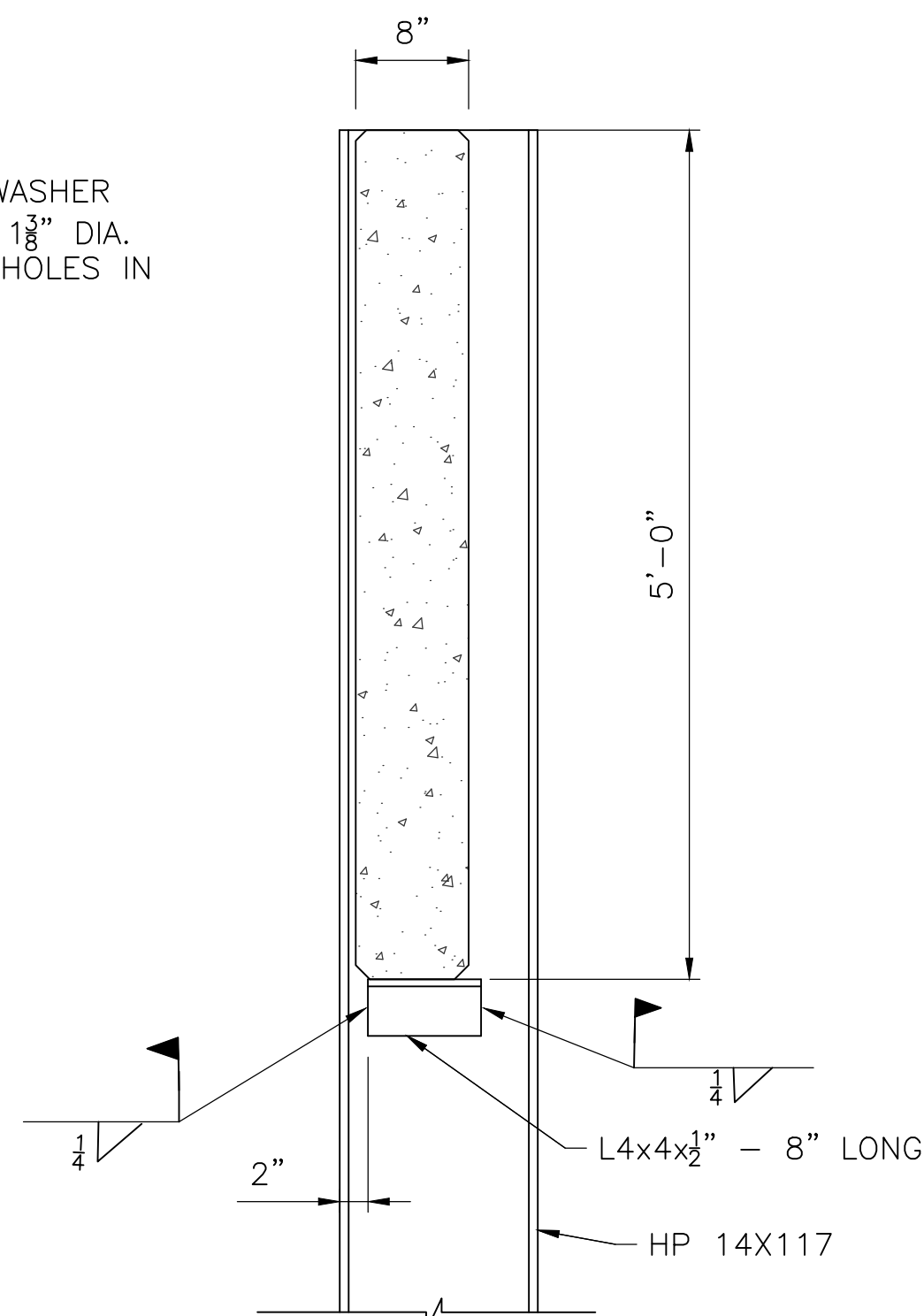
WASHER MK WWW01

N.T.S.

1~BAR 4" X 3/4" X 4"

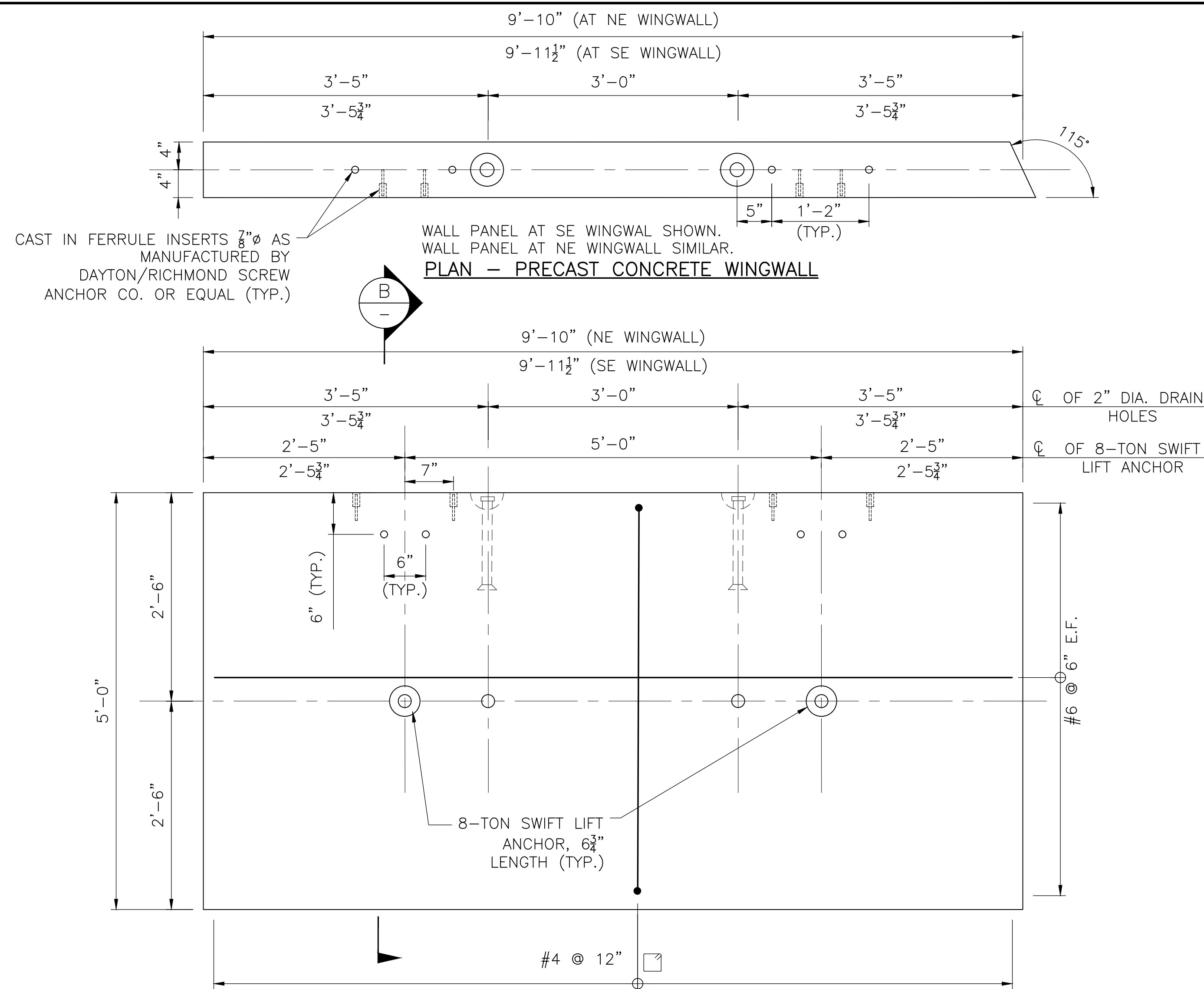
WEIGHT = 3.4 LBS.

GALVANIZE AFTER FABRICATION



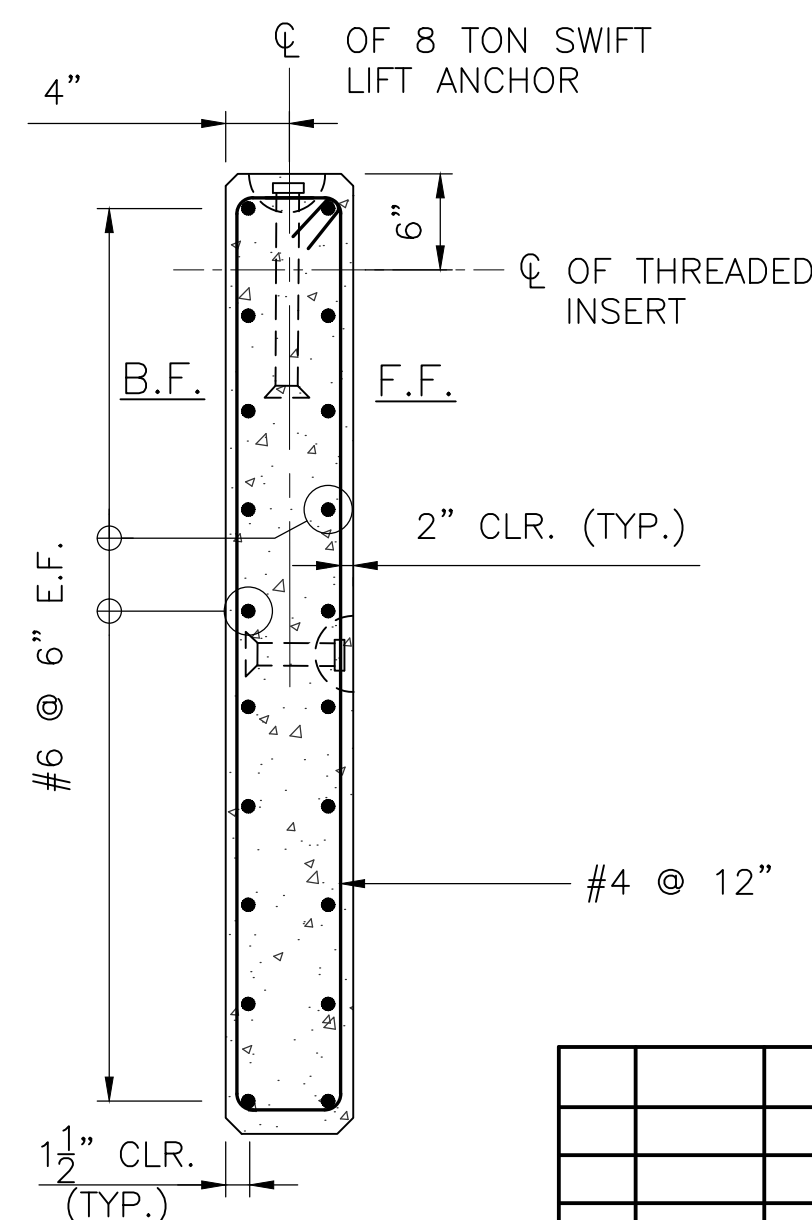
SECTION A

SCALE: 1" = 1'-0"



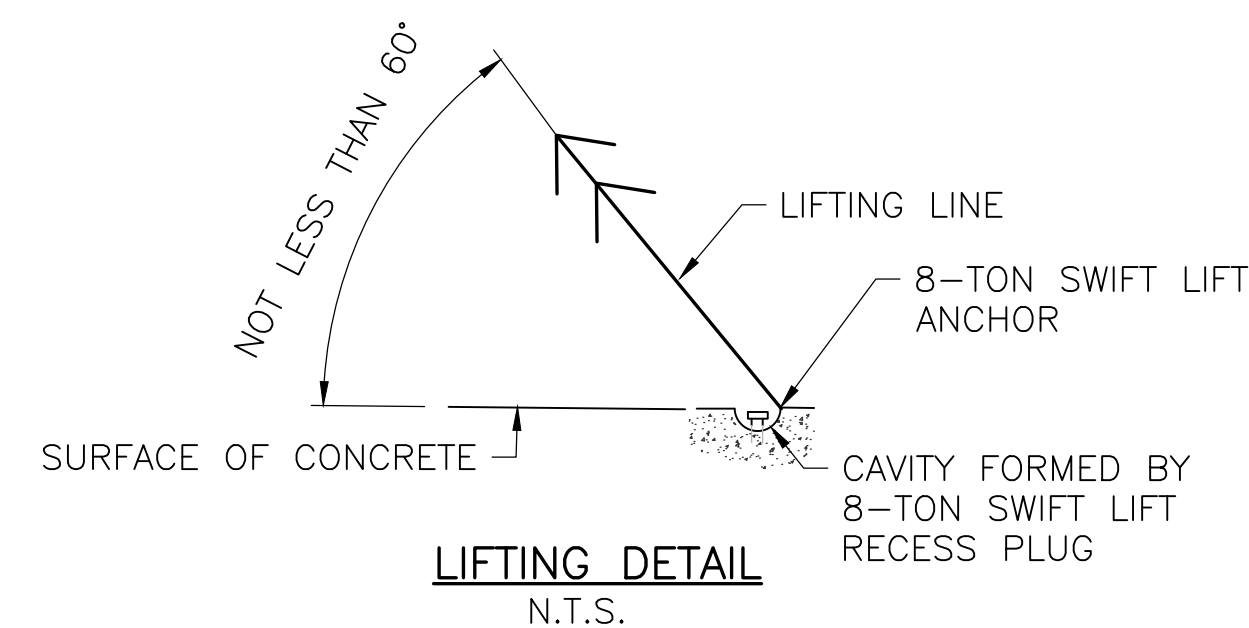
PRECAST CONCRETE WINGWALL

SCALE: 1" = 1'-0"



SECTION B

SCALE: 1" = 1'-0"



LIFTING DETAIL

N.T.S.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
WINGWALL LAYOUT AND
REINFORCEMENT DETAILS



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BOSTON, MA 02110
(617) 357-7700



SCALE: AS NOTED

DRAWN BY

DESIGN BY

CHECK BY

PLAN NO.

ISSUE

DATE: 12/12/2022

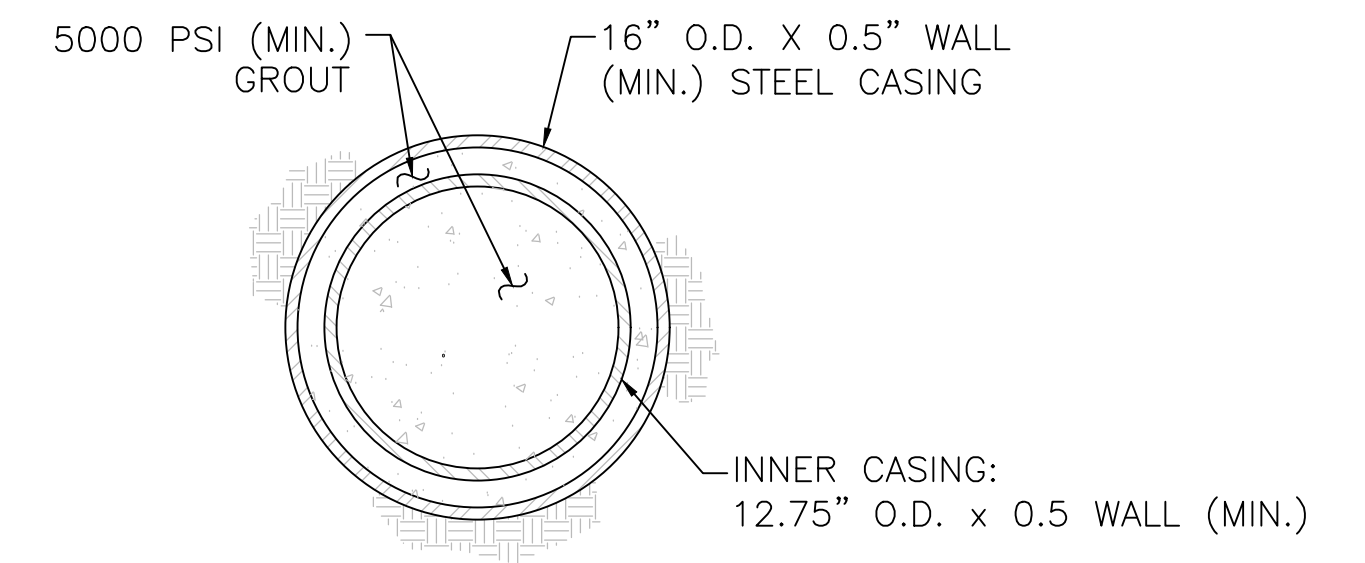
A.T.

E.Y.

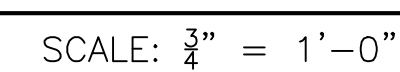
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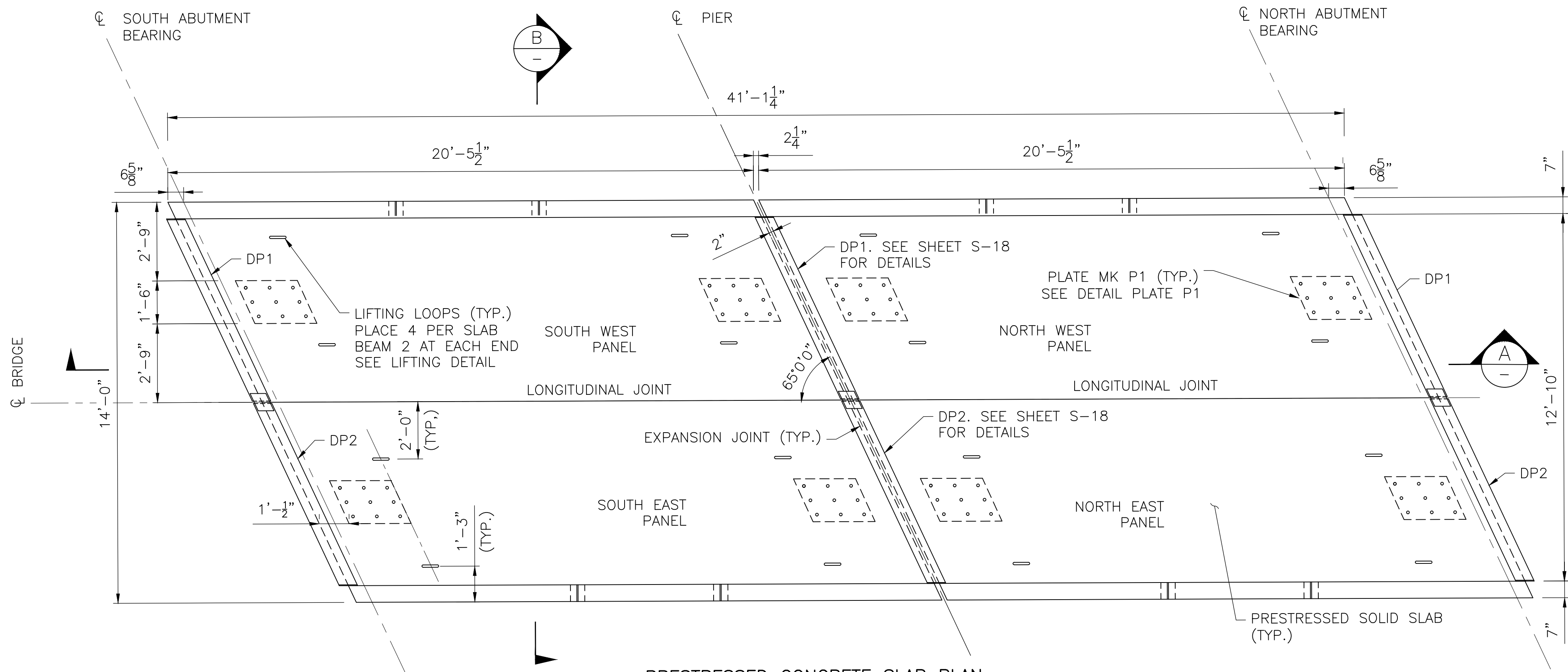
SHEET: S-14

ISSUE



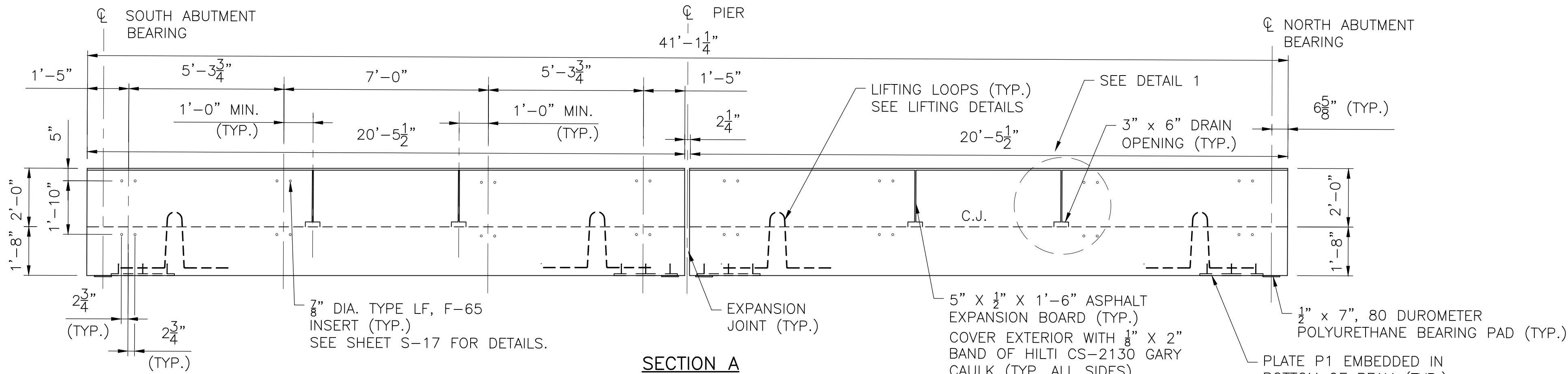
SECTION A
 SCALE: $1\frac{1}{2}" = 1'-0"$

[illegible]



PRESTRESSED CONCRETE SLAB PLAN

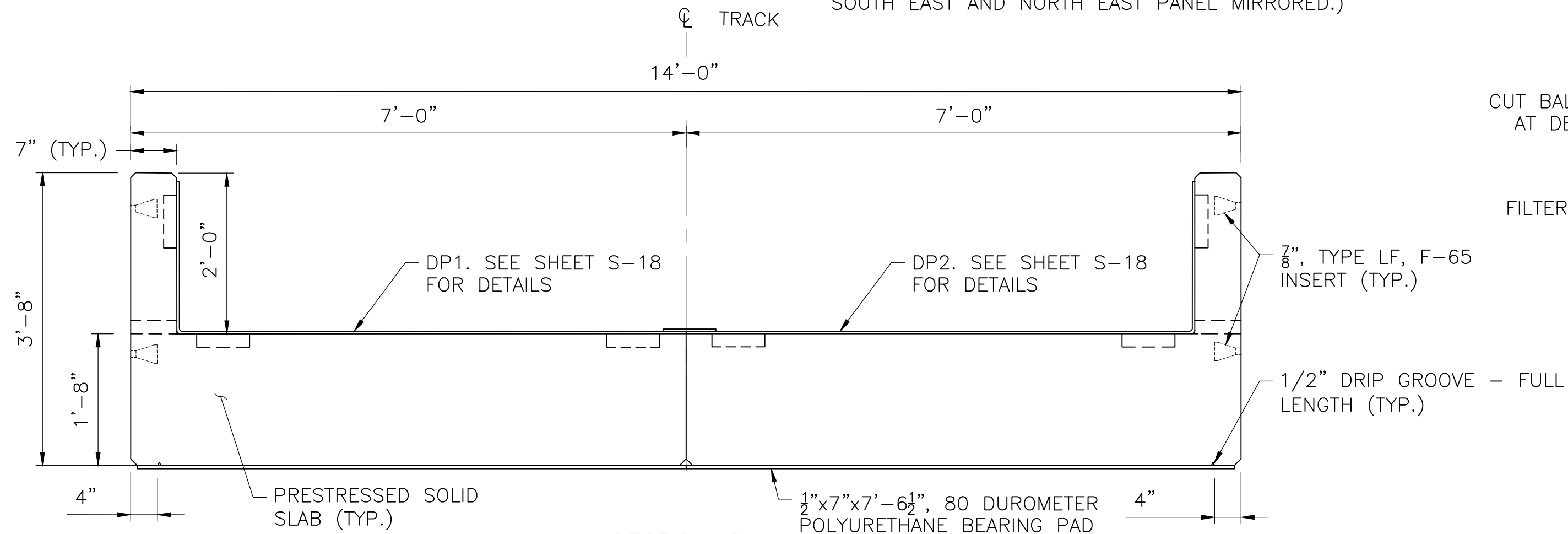
SCALE: 3/8" = 1'-0"



SECTION A

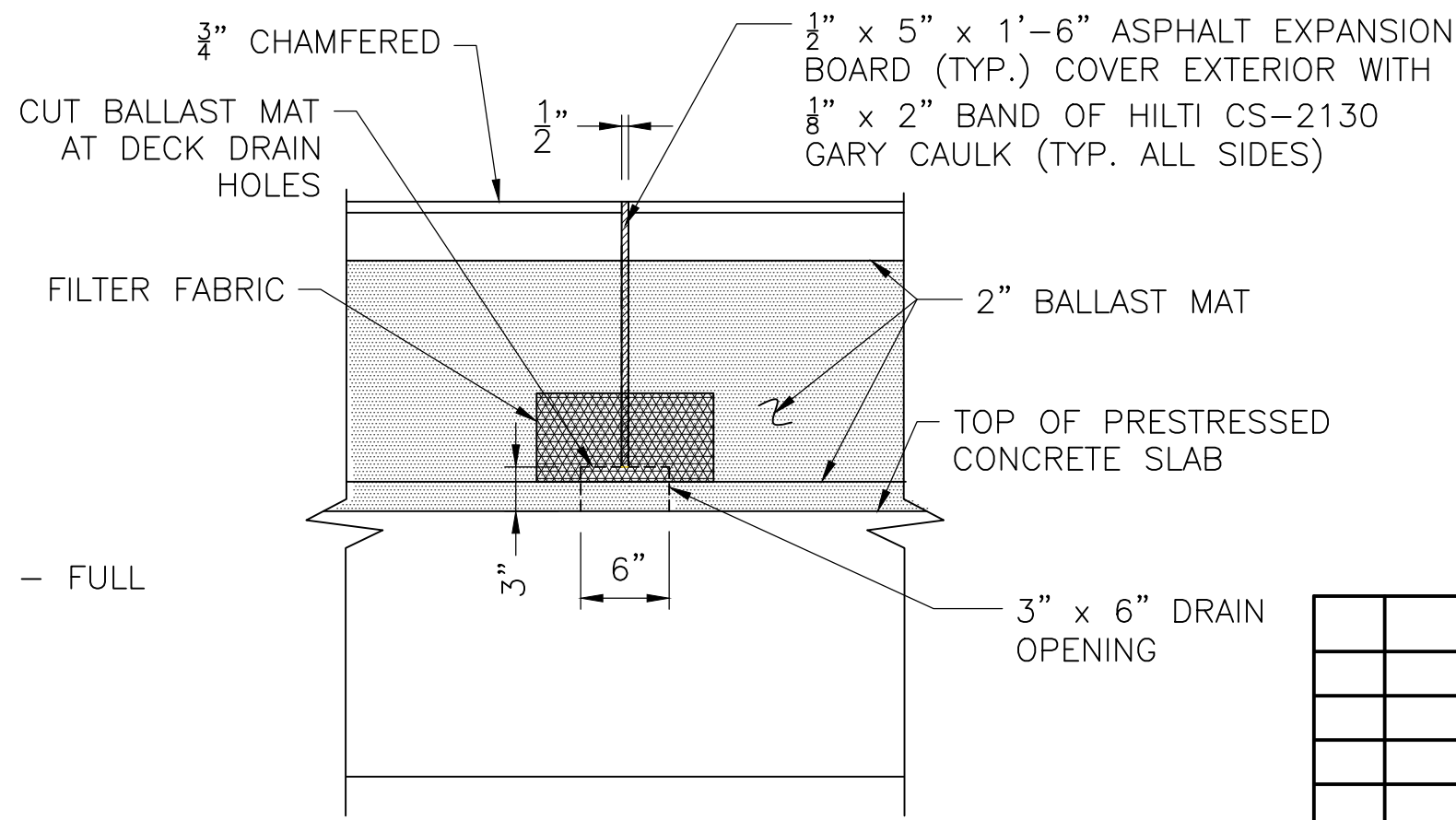
SCALE: 3/8" = 1'-0"

(SOUTH WEST AND NORTH WEST PANEL SHOWN,
SOUTH EAST AND NORTH EAST PANEL MIRRORED.)



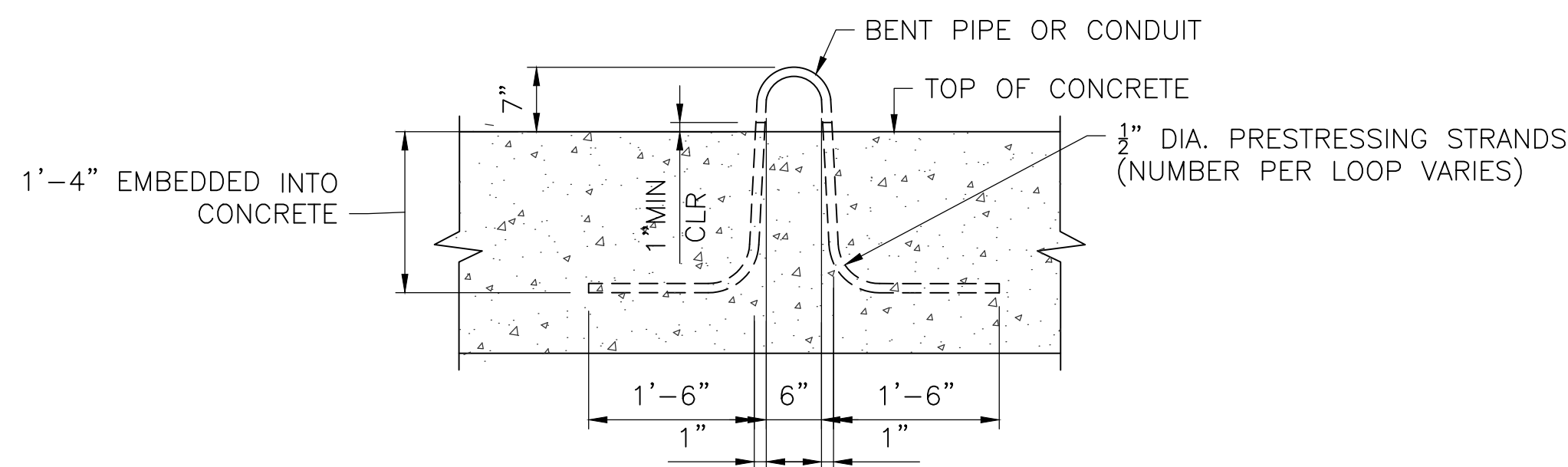
SECTION B

SCALE: 3/4" = 1'-0"



DETAIL 1

SCALE: 1" = 1'-0"



LIFTING DETAIL

SCALE: N.T.S.

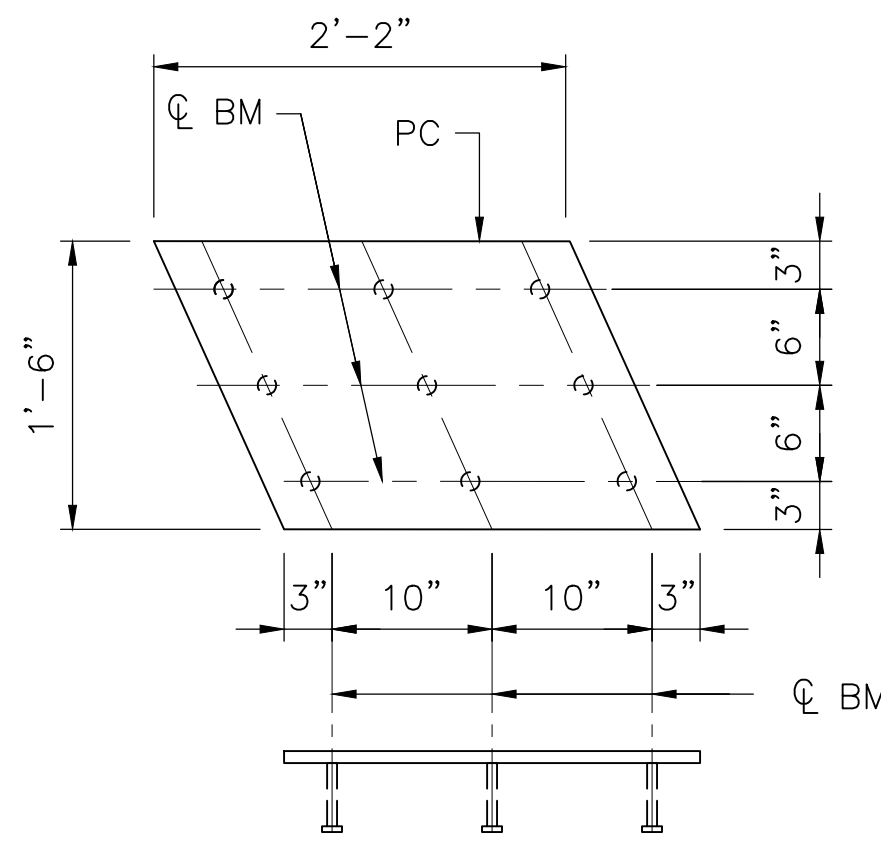
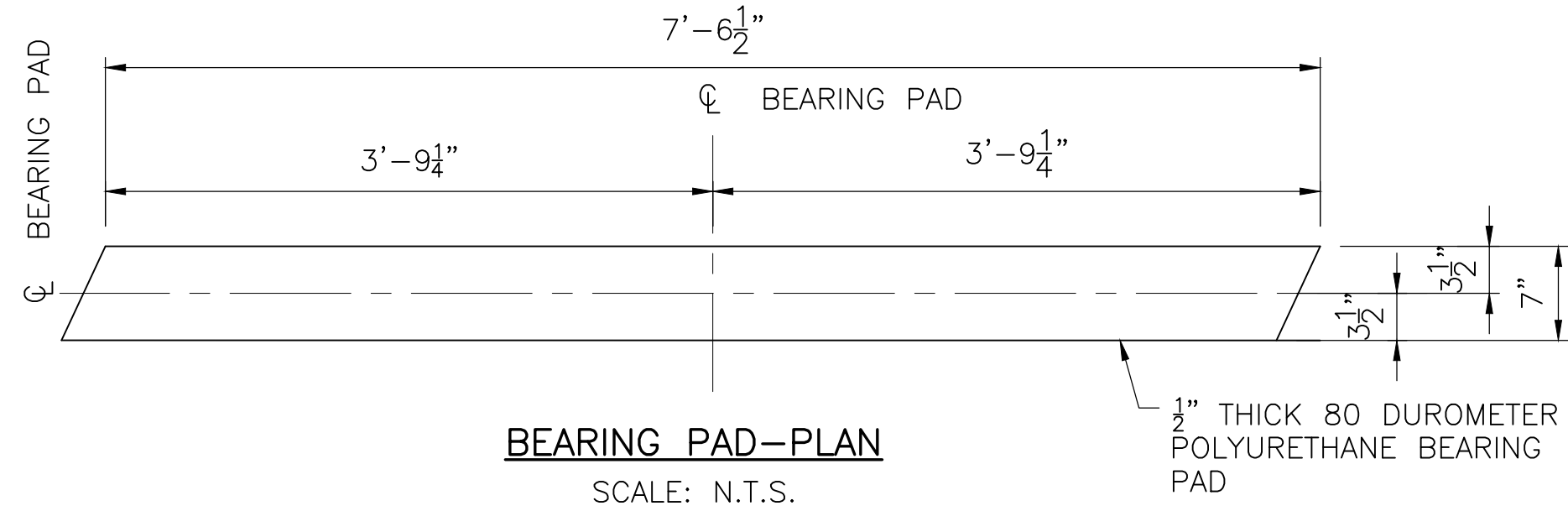


PLATE P1

SCALE: N.T.S.

1 - PLATE 3/4"x18"x2'-2"-PC
9-7/8" DIA X 4" SHEAR STUD- BM



BEARING PAD-PLAN

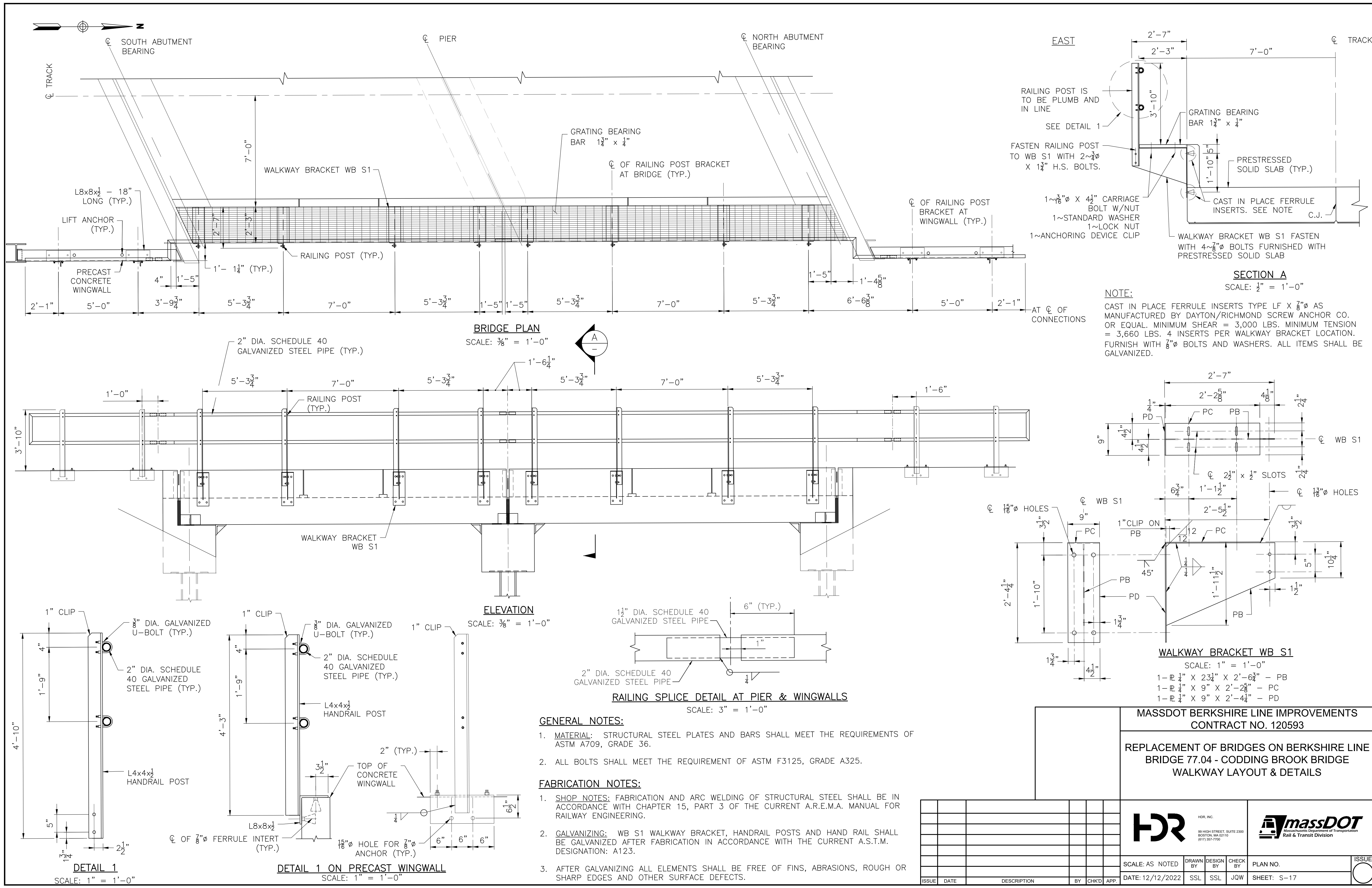
SCALE: N.T.S.

NOTE:

1. THE BEARING PAD SHALL BE IN ACCORDANCE WITH THE LATEST AREMA MANUAL WITH THE FOLLOWING CHARACTERISTICS/CONSTRAINTS:

- 80 DUROMETER POLYURETHANE WITH A MINIMUM SHEAR MODULUS OF 500 PSI AND MAXIMUM SHEAR MODULUS OF 1,450 PSI.
- AVERAGE COMPRESSIVE STRESS OF 1,000 PSI.

MASSDOT BERKSHIRE LINE IMPROVEMENTS CONTRACT NO. 120593									
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE BRIDGE 77.04 - CODDING BROOK BRIDGE PRESTRESSED CONCRETE SLAB LAYOUT DETAILS									
ISSUE					DATE				
DESCRIPTION					BY				
CHKD					APP.				
DATE: 12/12/2022					SCALE: AS NOTED				
DRAWN BY: A.T.					DESIGN BY: E.Y.				
CHECK BY: SSL					PLAN NO.				
SHEET: S-15					ISSUE				



NOTE:
CAST IN PLACE FERRULE INSERTS TYPE LF X 8"Ø AS MANUFACTURED BY DAYTON/RICHMOND SCREW ANCHOR CO. OR EQUAL. MINIMUM SHEAR = 3,000 LBS. MINIMUM TENSION = 3,660 LBS. 4 INSERTS PER WALKWAY BRACKET LOCATION. FURNISH WITH 7/8"Ø BOLTS AND WASHERS. ALL ITEMS SHALL BE GALVANIZED.

WALKWAY BRACKET WB S1

SCALE: 1" = 1'-0"

- 1-PC 4" X 23 1/4" X 2'-6 3/4" - PB
- 1-PC 4" X 9" X 2'-2 5/8" - PC
- 1-PC 4" X 9" X 2'-4 1/4" - PD

**MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593**

**REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDINGTON BROOK BRIDGE
WALKWAY LAYOUT & DETAILS**

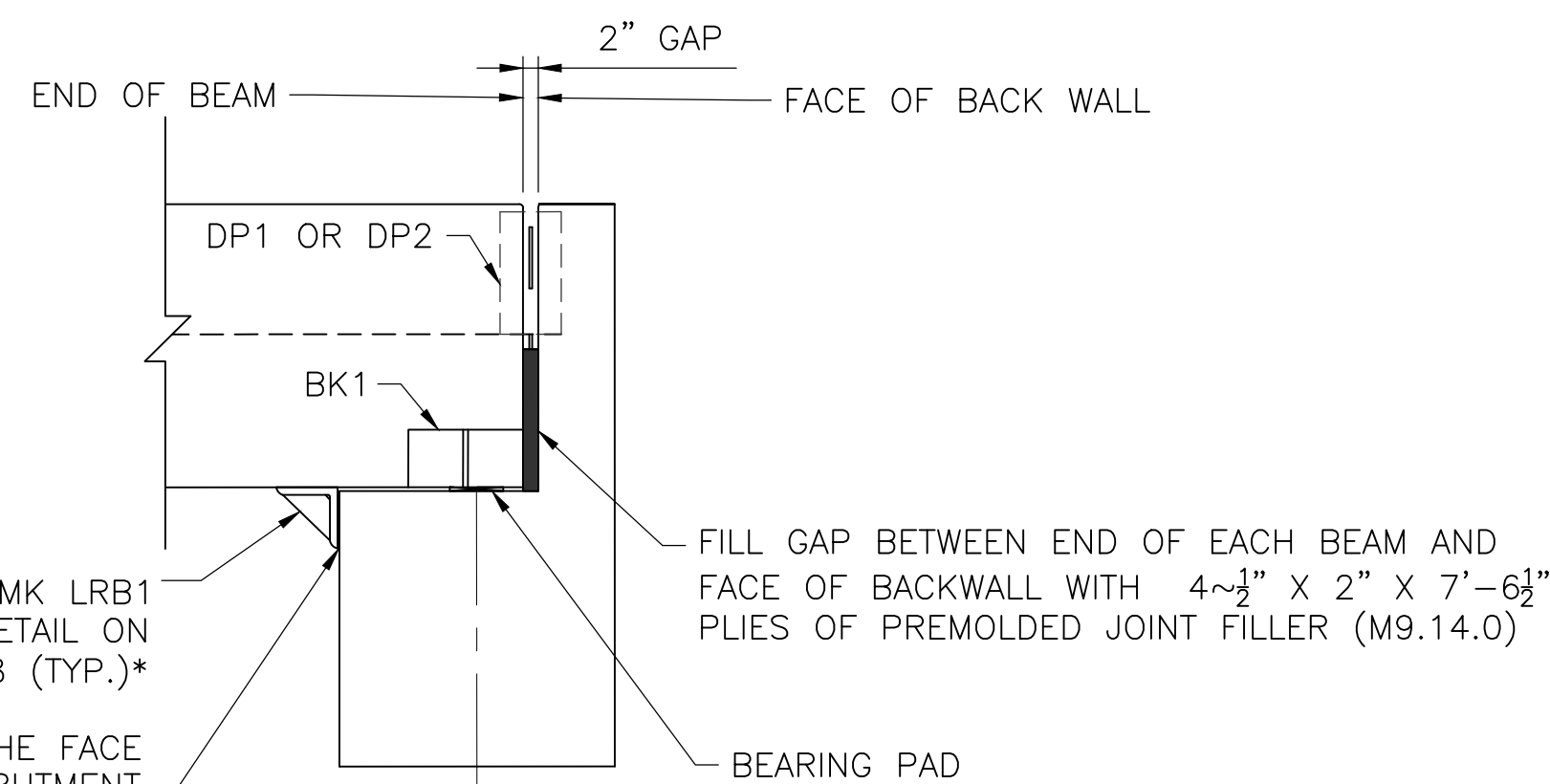
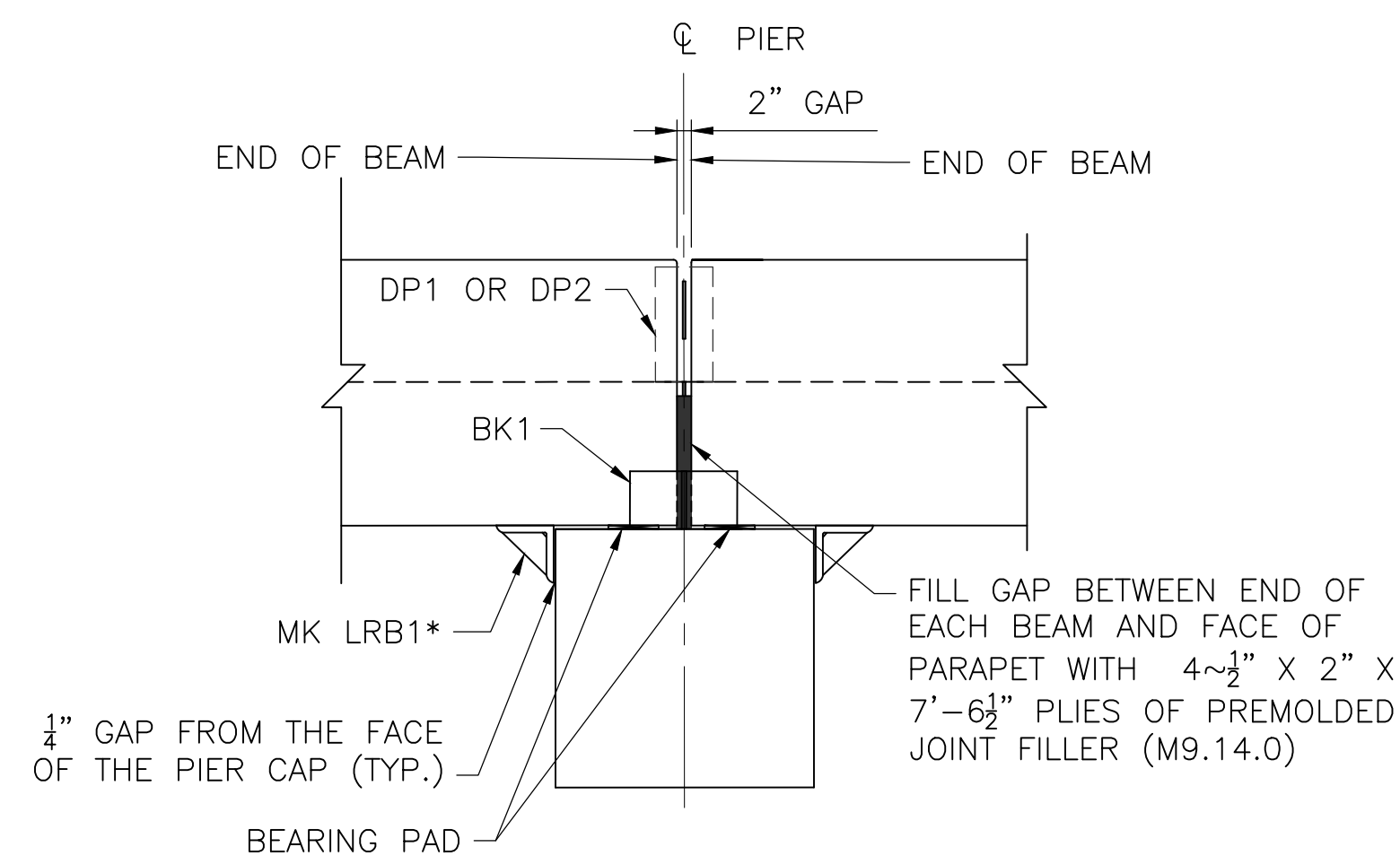
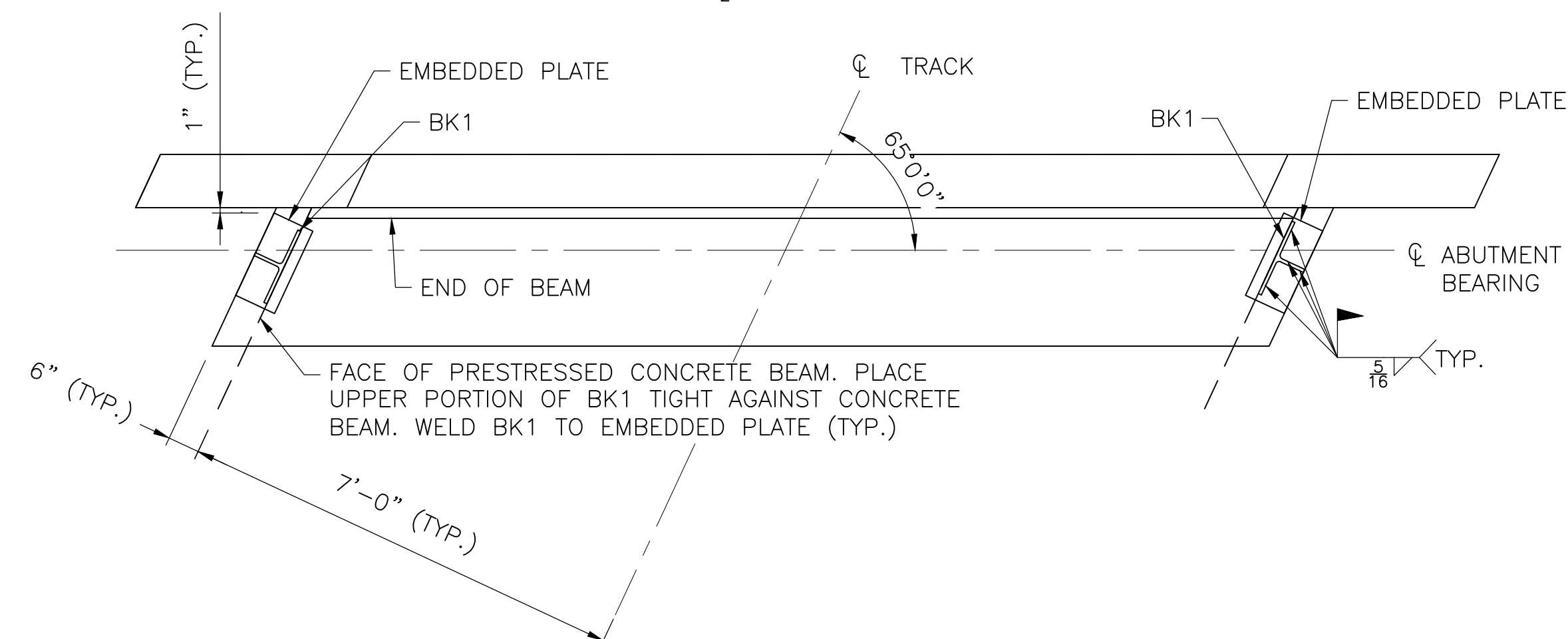
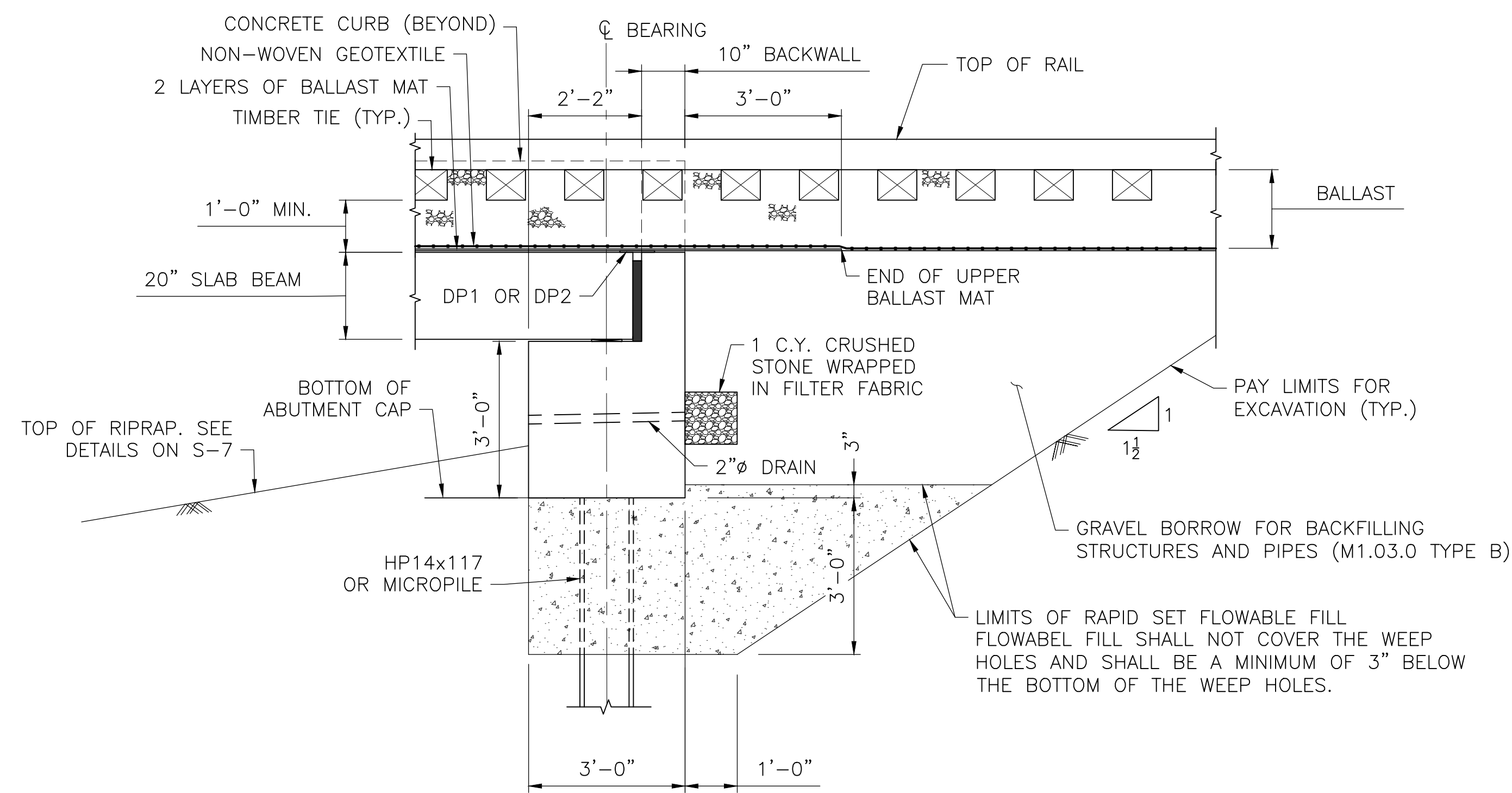


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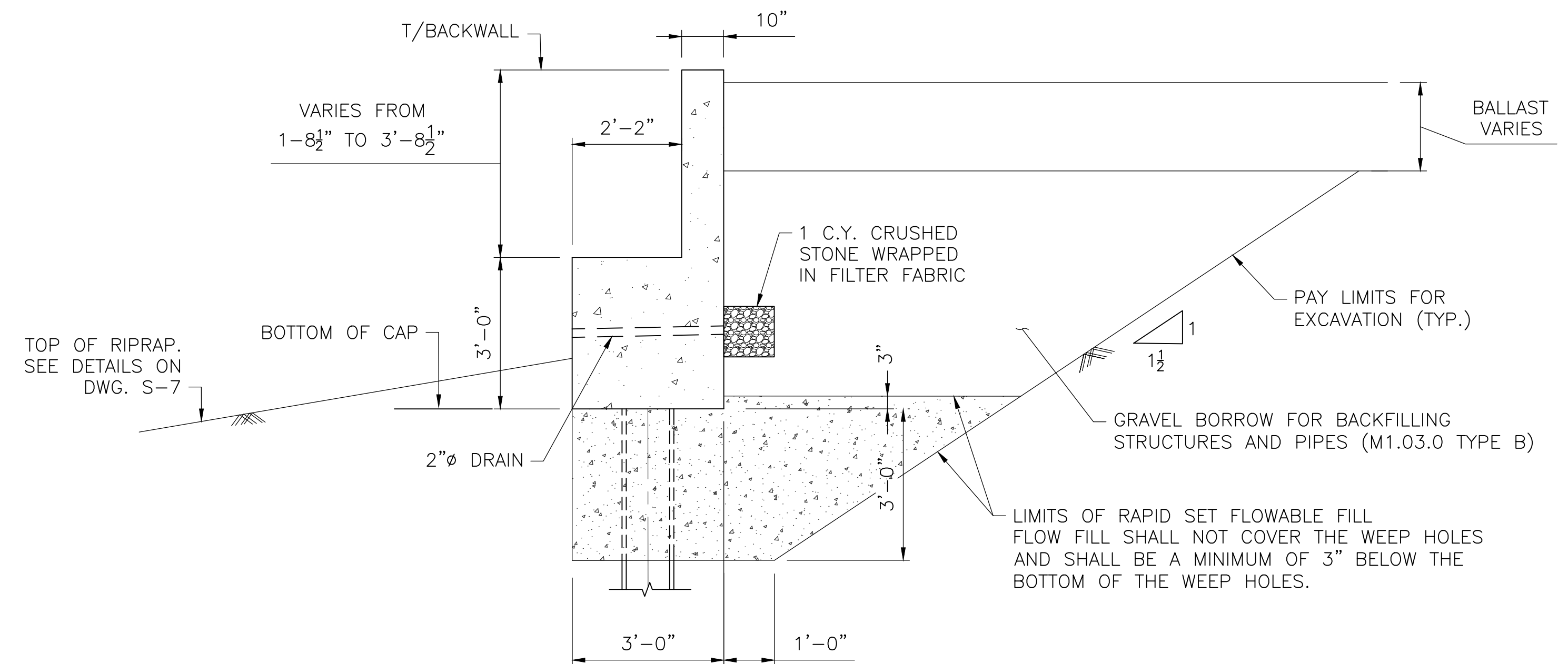


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DATE: 12/12/2022	SSL	SSL	JQW	SHEET: S-17	

								MASSDOT BERKSHIRE LINE IMPROVEMENTS CONTRACT NO. 120593					
								REPLACEMENT OF BRIDGES ON BERKSHIRE LINE BRIDGE 77.04 - CODDING BROOK BRIDGE STEEL DETAILS					
								 HDR, INC. 99 HIGH STREET, SUITE 2300 BOSTON, MA 02110 (617) 357-7700		 massDOT Massachusetts Department of Transportation Rail & Transit Division			
								SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
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ISSUE	DATE		DESCRIPTION	BY	CHK'D	APP.							

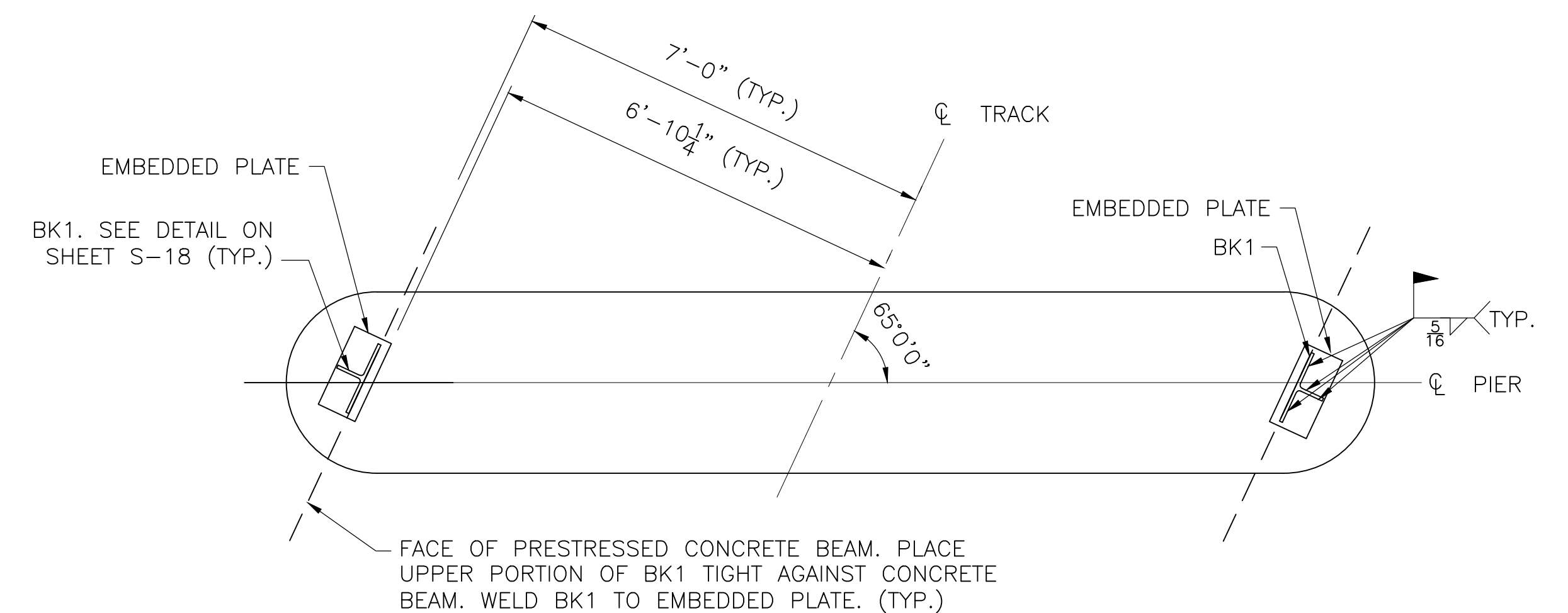


* PLACE LONGITUDINAL RESTRAINT BRACKET MK LRB1 WITH $\frac{1}{4}$ " GAP BETWEEN ABUTMENT BENT CAPS/CENTER BENT CAP AND BRACKET AND $\frac{1}{8}$ " FIELD FILLET WELD TO PLATE IN BOTTOM OF BEAM.



TYPICAL ABUTMENT SECTION OUTSIDE OF TRACK

SCALE: $\frac{1}{2}" = 1'-0"$
BEFORE BACKFILLING END BENTS, APPLY A COATING
OF PETROLATUM TO PILE PLATE PP1, AND TOP ONE
FOOT OF PILES
(DIMENSION PERPENDICULAR TO DECK)



PIER CAP – WELDING OF LATERAL RESTRAINT BK1

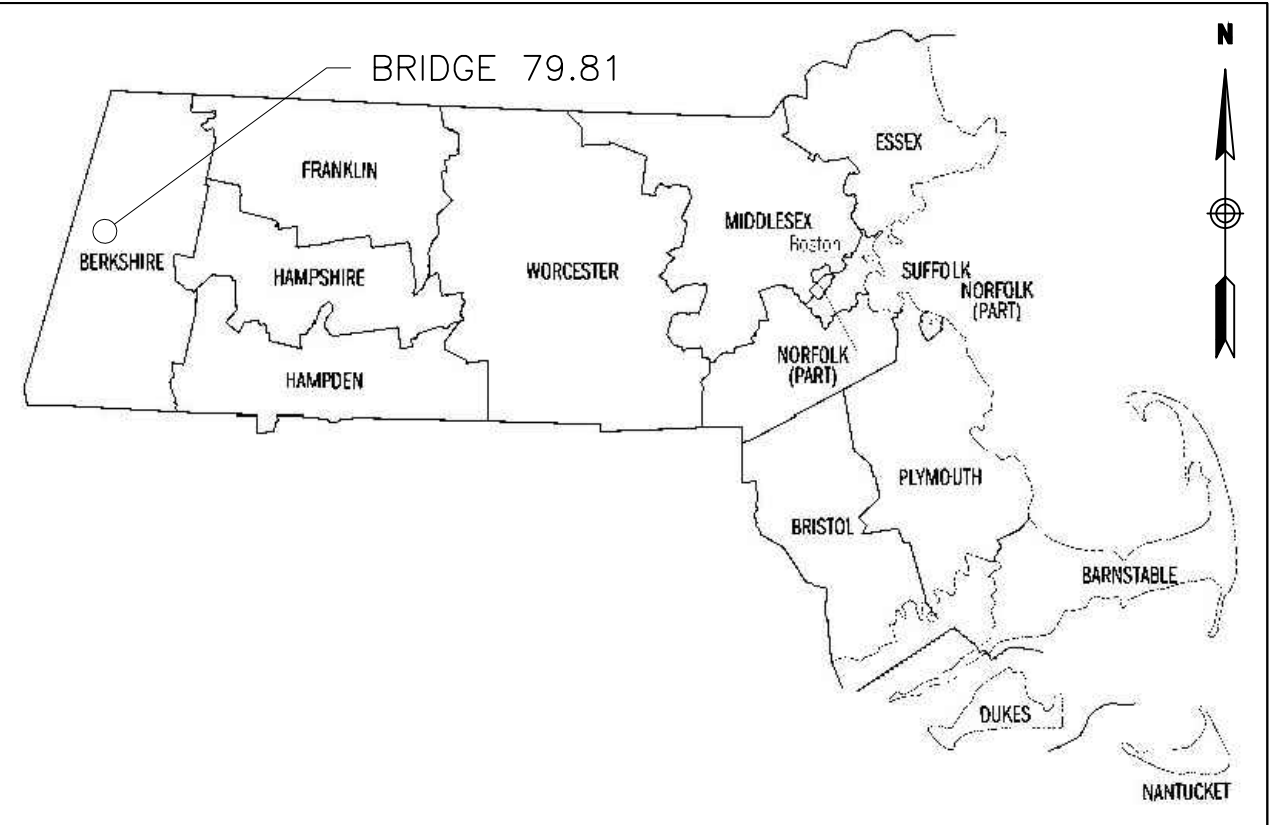
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							MASSDOT BERKSHIRE LINE IMPROVEMENTS CONTRACT NO. 120593							
							REPLACEMENT OF BRIDGES ON BERKSHIRE LINE BRIDGE 77.04 - CODDING BROOK BRIDGE MISCELLANEOUS DETAILS							
							HDR HDR, INC. 99 HIGH STREET, SUITE 2300 BOSTON, MA 02110 (617) 357-7700				 massDOT Massachusetts Department of Transportation Rail & Transit Division			
							SCALE: AS NOTED		DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE	
ISSUE	DATE	DESCRIPTION				BY	CHK'D	APP	DATE: 12/12/2022	A.T.	E.Y.	G.J.	SHEET: S-19	

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION RAIL & TRANSIT DIVISION

REPLACEMENT OF BERKSHIRE LINE BRIDGE NO.79.81

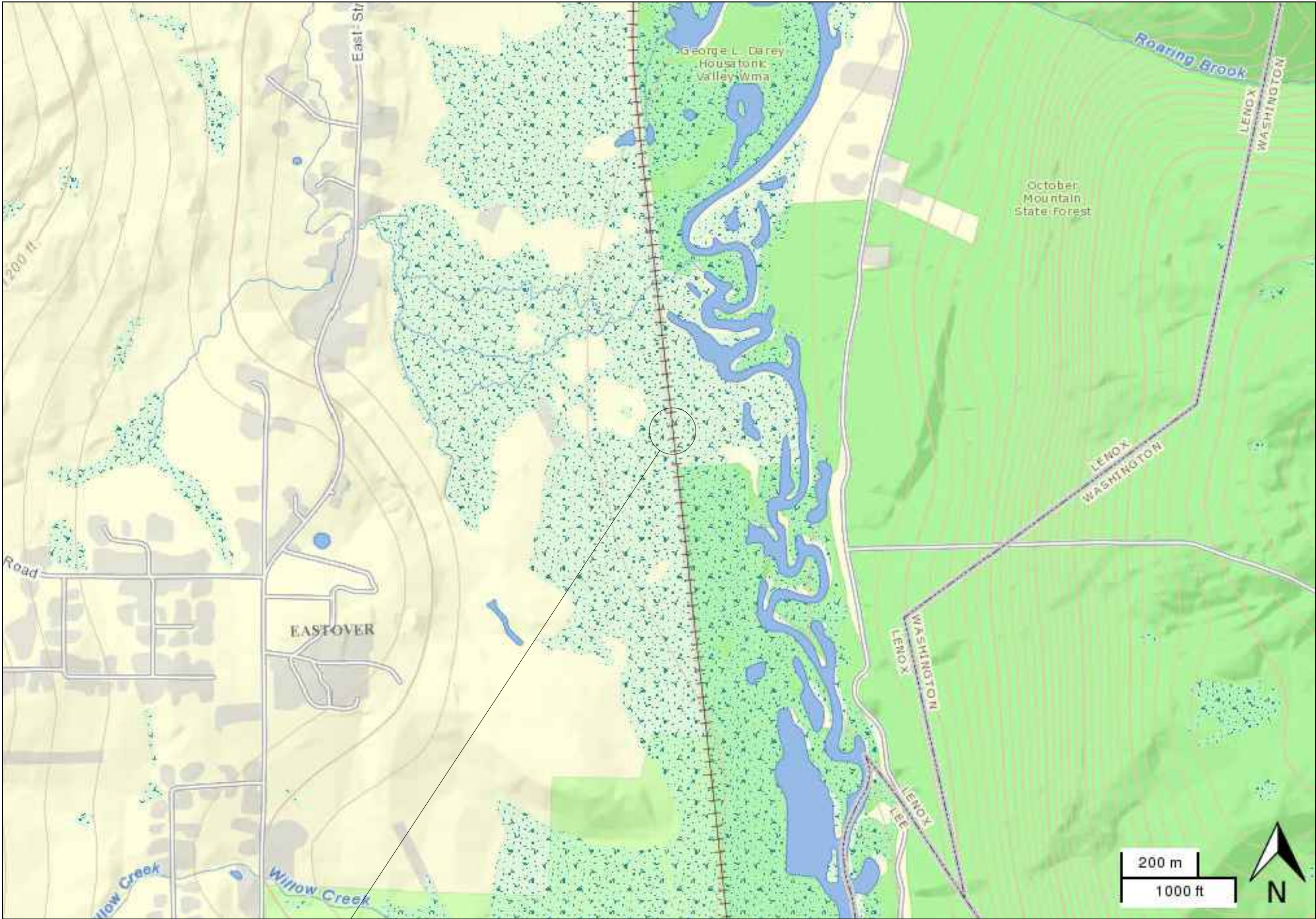
PROJECT LOCATION: LENOX, MA



LOCATION MAP

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
G-1	TITLE SHEET & INDEX
TK-01	MAINLINE TRACK PLAN AND PROFILE STA. 6+40 TO STA. 12+20
TK-02	MAINLINE TRACK PLAN AND PROFILE STA. 12+20 TO STA. 13+40
XS-01	PROPOSED CROSS SECTIONS STA. 6+80 TO STA. 7+80
XS-02	PROPOSED CROSS SECTIONS STA. 8+00 TO STA. 9+00
XS-03	PROPOSED CROSS SECTIONS STA. 9+20 TO STA. 10+20
XS-04	PROPOSED CROSS SECTIONS STA. 10+40 TO STA. 11+40
XS-05	PROPOSED CROSS SECTIONS STA. 11+60 TO STA. 12+60
XS-06	PROPOSED CROSS SECTIONS STA. 12+80 TO STA. 13+00
S-1	STRUCTURAL GENERAL NOTES
S-2	KEY PLAN AND PROFILE
S-3	BORING SHEET 1 OF 2
S-4	BORING SHEET 2 OF 2
S-5	DEMOLITION LIMITS - PLAN AND ELEVATION
S-6	PROPOSED BRIDGE PLAN & ELEVATION
S-7	CONSTRUCTION STAGING
S-8	FOUNDATION LAYOUT DETAILS
S-8A	DETAILS FOR MICROPILE OPTION
S-9	ABUTMENT LAYOUT DETAILS
S-10	PIER LAYOUT DETAILS
S-11	ABUTMENT CAP REINFORCEMENT DETAILS
S-12	PIER CAP REINFORCEMENT DETAILS
S-13	PRESTRESSED CONCRETE SLAB LAYOUT DETAILS
S-14	PRESTRESSED CONCRETE SLAB REINFORCEMENT DETAILS
S-15	WALKWAY LAYOUT & DETAILS
S-16	STEEL DETAILS
S-17	MISCELLANEOUS DETAILS
S-18	PRECAST APPROACH SLAB DETAILS
S-19	STEEL SHEET PILE WALL DETAILS

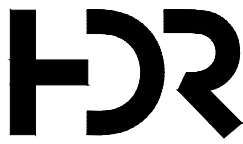


BRIDGE 79.81

PLAN

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
TITLE SHEET & INDEX

							
SCALE: AS NOTED				DRAWN BY: A.T.			
DATE: 12/12/2022				DESIGN BY: E.Y.			
CHECK BY: J.Q.W.				PLAN NO. G-1			
ISSUE				ISSUE			

