

Date:1/23/2025

Username:

Division: BRIDGE

Filename:\OCL\Title.dgn

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION



LIST OF DRAWINGS

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SPECIFICATIONS

Design: Load and Resistance Factor Design per AASHTO LRFD Bridge Design Specifications, Ninth Edition 2020.

DESIGN LOADING

Live Load HL - 93 Maine Modified for Strength I

OLD TOWN
PENOBSCOT COUNTY
LLEWELLYN ESTES BRIDGES
OVER
STILLWATER RIVER
STILLWATER AVENUE
FED. PROJ. NO. 2189401
PROJECT LENGTH 0.223 mi.
BRIDGE NO. 1472 & 2806

HYDROLOGIC DATA

Drainage Area	326 sq mi
Design Discharge (Q50)	43,050 cfs
Check Discharge (Q100)	52,540 cfs
Headwater Elevation (Q1.1)	93.7 ft
Headwater Elevation (Q25)	98.4-98.3 ft
Headwater Elevation (Q50)	99.0-98.8 ft
Headwater Elevation (Q100)	100.2-100.1 ft
Discharge Velocity (Q1.1)	5.8-6.1 fps
Discharge Velocity (Q50)	14.1-14.2 fps
Discharge Velocity (Q100)	16.3-15.9 fps

MATERIALS

Concrete:	
Drilled Shafts & Pier Caps	Class "A"
Reinforcing:	
Low-Carbon Chromium Steel	ASTM A1035, Type CS, Grade 100
Stuctural Steel:	
H-Piles	ASTM A572, Grade 50

BASIC DESIGN STRESSES

Concrete:	
Class "A"	f 'c = 5,000 psi
Reinforcing:	
Low-Carbon Chromium Steel	f y = 100,000 psi
Structural Steel:	
ASTM A572, Grade 50	f y = 50,000 psi

UTILITIES

Emera Maine	Spectrum
Fairpoint Communications	Maine Fiber
Old Town Water and Sewer District	First Light

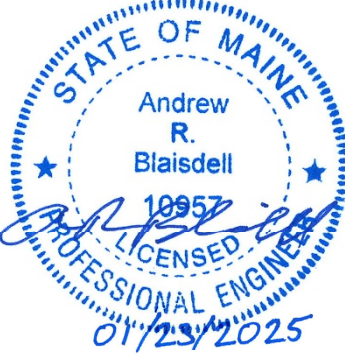
TRAFFIC DATA

Current (2023) AADT	16360(2023)
Future (2043) AADT	18000(2043)
DHV - % of AADT	11%
Design Hour Volume	1980
Heavy Trucks (% of AADT)	5%
Heavy Trucks (% of DHV)	3%
Directional Distribution (% of DHV)	51%
18 kip Equivalent P 2.0	362
18 kip Equivalent P 2.5	346
Design Speed (mph)	25

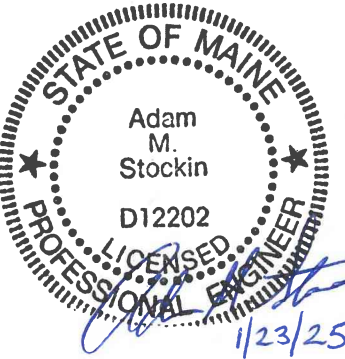
MAINTENANCE OF TRAFFIC

Temporary two-lane bridge with a minimum curb to curb width of 26'-0" on the upstream side of the proposed bridges, with separated 5'-0" sidewalk on the upstream side of the temporary bridge.

PROJECT LOCATION	Along Stillwater Avenue starting 0.18 miles north of Bennoch Road, ending 0.11 miles south of College Avenue. Bridges are located 0.69 miles northeast of I-95 Exit 193N Bridge No. 1: Latitude 44°54'41.50" N 68°41'5.70" W Bridge No. 2: Latitude 44°54'45" N 68°41'4.0" W
OUTLINE OF WORK	Construction Rock-Socketed H-Piles and Lower Abutment Stems.



Sheet C8



Sheets C1-C7
Sheets C9-C16

WIN 022511.01 022512.01

OLD TOWN
STILLWATER AVENUE

TITLE SHEET

SHEET NUMBER

C1

OF C16

STATE OF MAINE

DEPARTMENT OF TRANSPORTATION

APPROVED

DATE

COMMISSIONER:

CHIEF ENGINEER:

SIGNATURE

P.E. NUMBER

DATE

PROJECT INFORMATION

PROGRAM

BRIDGE

PROJECT MANAGER

DESIGNER

CONSULTANT

PROJECT RESIDENT

CONTRACTOR

PROJECT COMPLETION DATE

ANDREW R. BLAISDELL

ADAM M. STOCKIN

WSP USA

WSP USA

CONTRACTOR

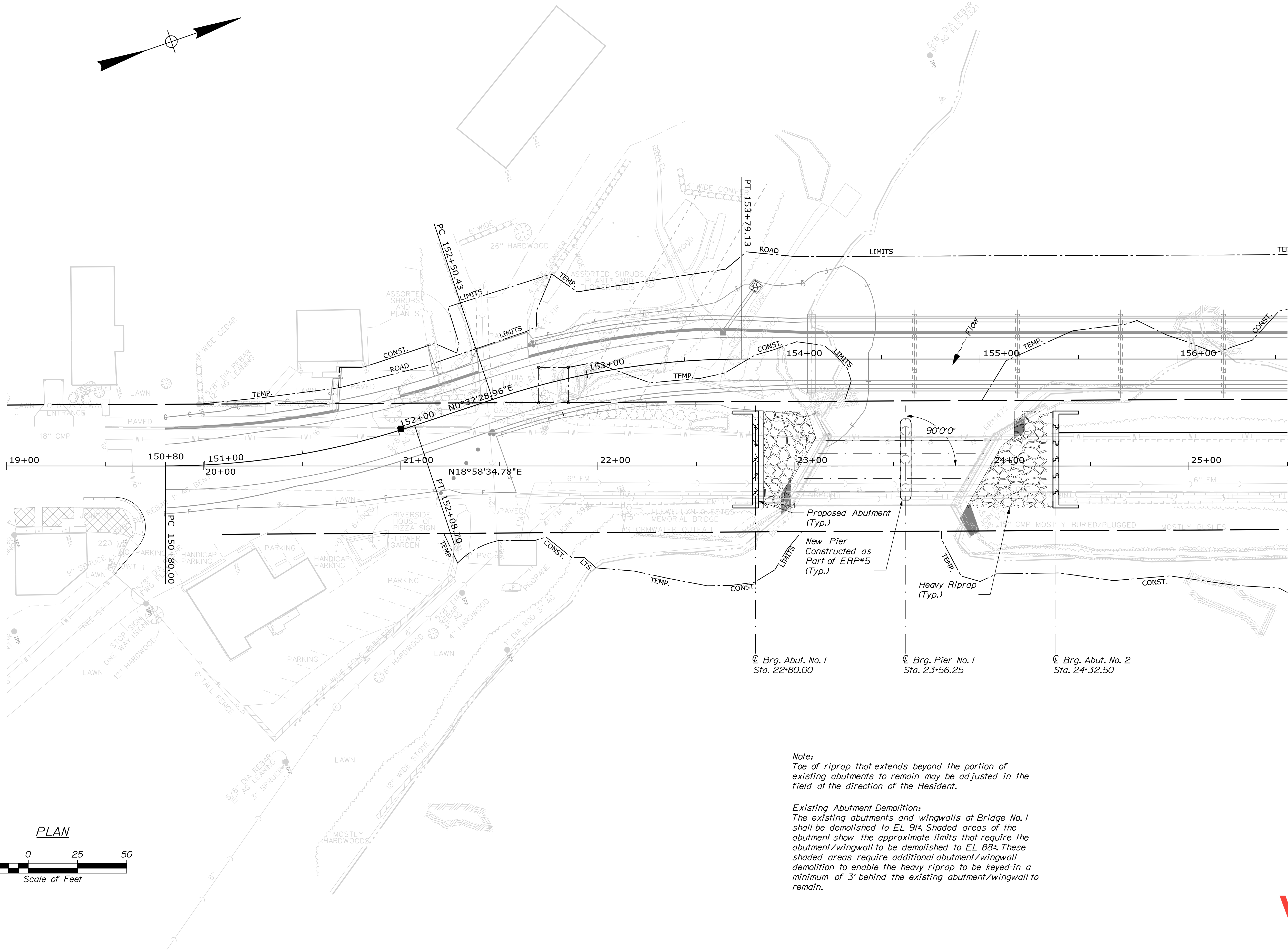
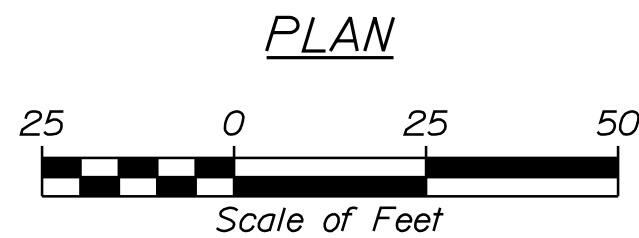
PROJECT COMPLETION DATE

Date:1/24/2025

Username:

Division: BRIDGE

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Note:
Toe of riprap that extends beyond the portion of existing abutments to remain may be adjusted in the field at the direction of the Resident.

Existing Abutment Demolition:
The existing abutments and wingwalls at Bridge No. 1 shall be demolished to EL 91'. Shaded areas of the abutment show the approximate limits that require the abutment/wingwall to be demolished to EL 88'. These shaded areas require additional abutment/wingwall demolition to enable the heavy riprap to be keyed-in a minimum of 3' behind the existing abutment/wingwall to remain.



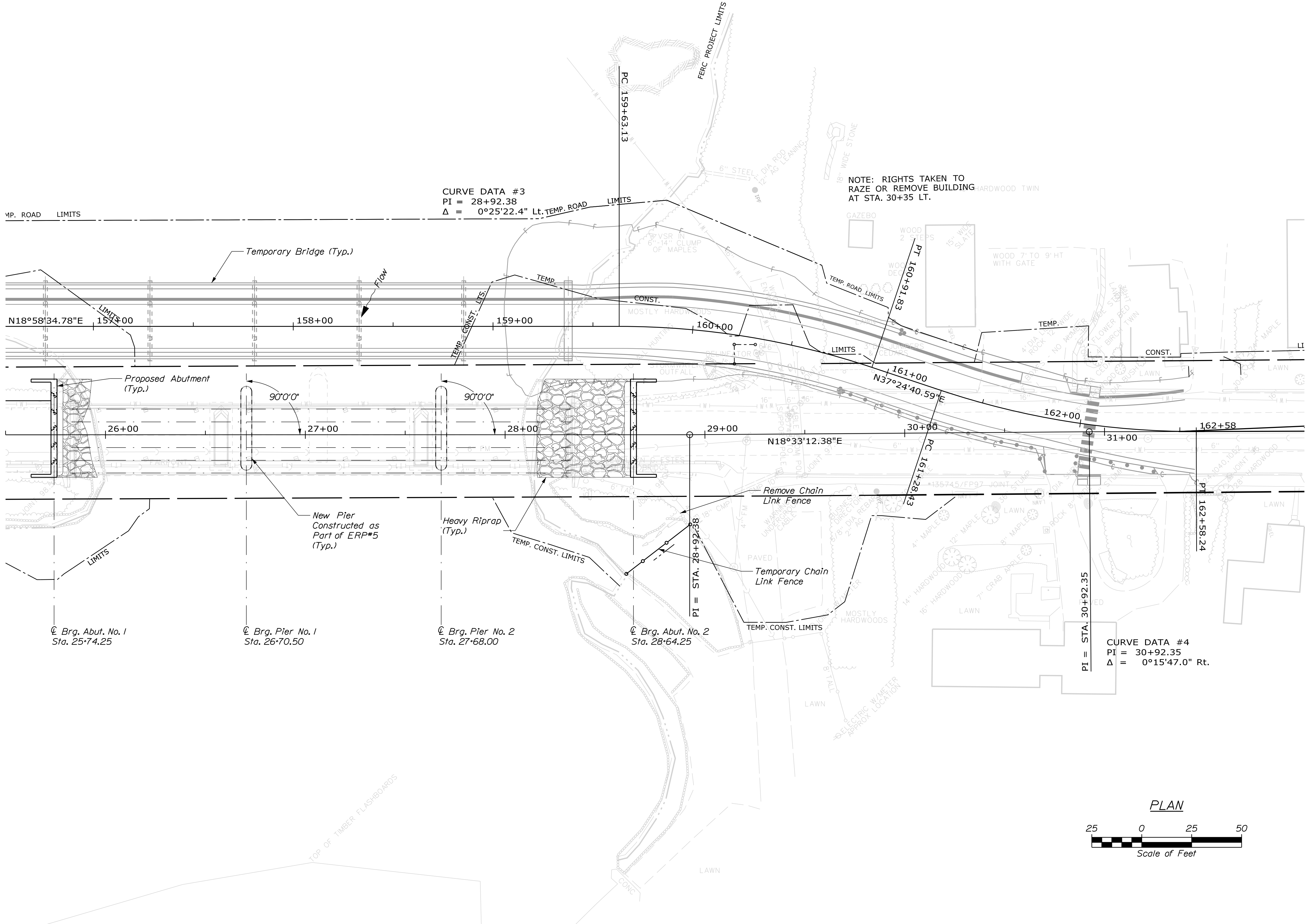
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GENERAL PLAN			DESIGN-DETAILED		J. KHERA	12/2024
			CHECKED-REVIEWED		T. HIGGINS	12/2024
			DESIGN2-DETAILED2			
			DESIGN3-DETAILED3			
			REVISIONS 1			
			REVISIONS 2			
			REVISIONS 3			
			REVISIONS 4			
			FIELD CHANGES			
SHEET NUMBER						
C3						
OF C16						
STATE OF MAINE DEPARTMENT OF TRANSPORTATION			SIGNATURE			
2189401			P.E. NUMBER			
BRIDGE NO. 1472 BRIDGE NO. 2806			DATE			
WIN 022512.01			WIN 022512.01			
WIN 022511.01			WIN 022511.01			
BRIDGE PLANS						

Date:1/24/2025

Username:

Division: BRIDGE

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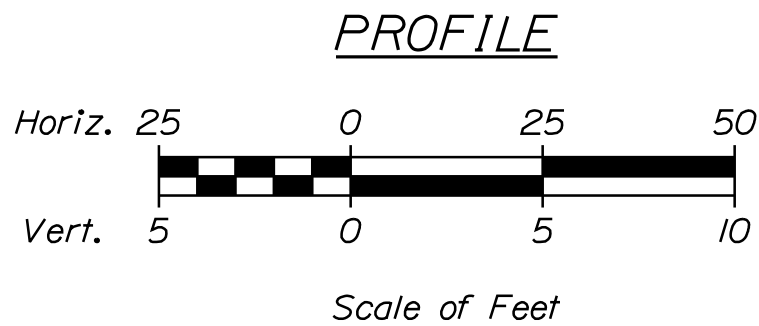
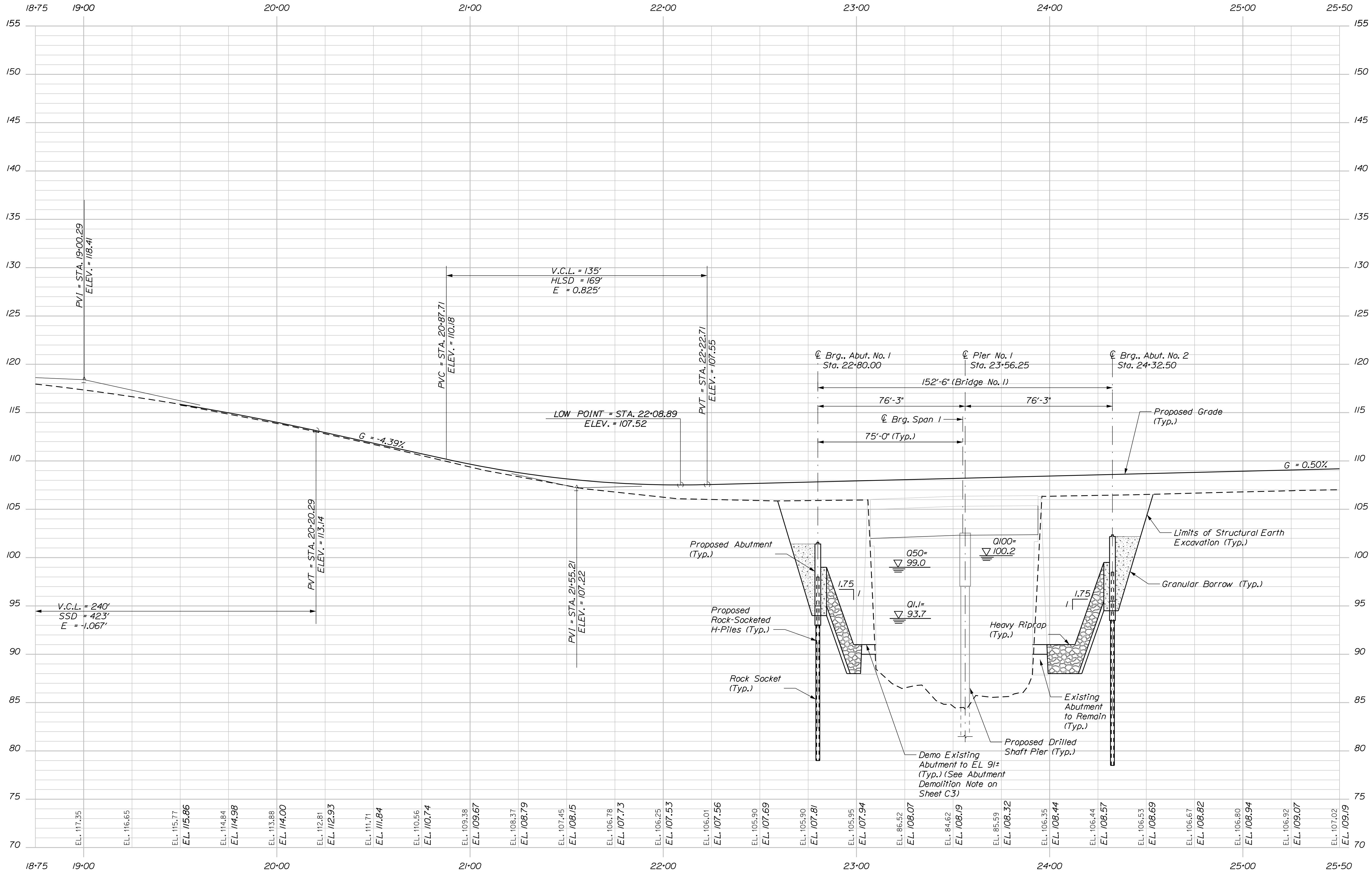
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PROJ. MANAGER	ANDREW LATHE	BY	J. KHERA	DATE	12/2024	SIGNATURE		P.E. NUMBER	
CHECKED	REVIEWED	T. HIGGINS	T. HIGGINS	12/2024					
DESIGN	DETAILED								
DESIGN	DETAILED								
REVISIONS	1								
REVISIONS	2								
REVISIONS	3								
REVISIONS	4								
				FIELD CHANGES					

Date:1/24/2025

Username:

Division: BRIDGE

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Note: Profile provided for information only.



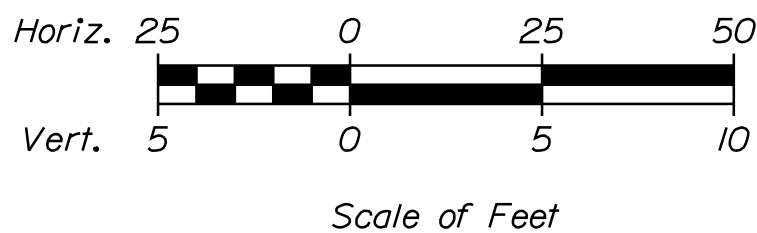
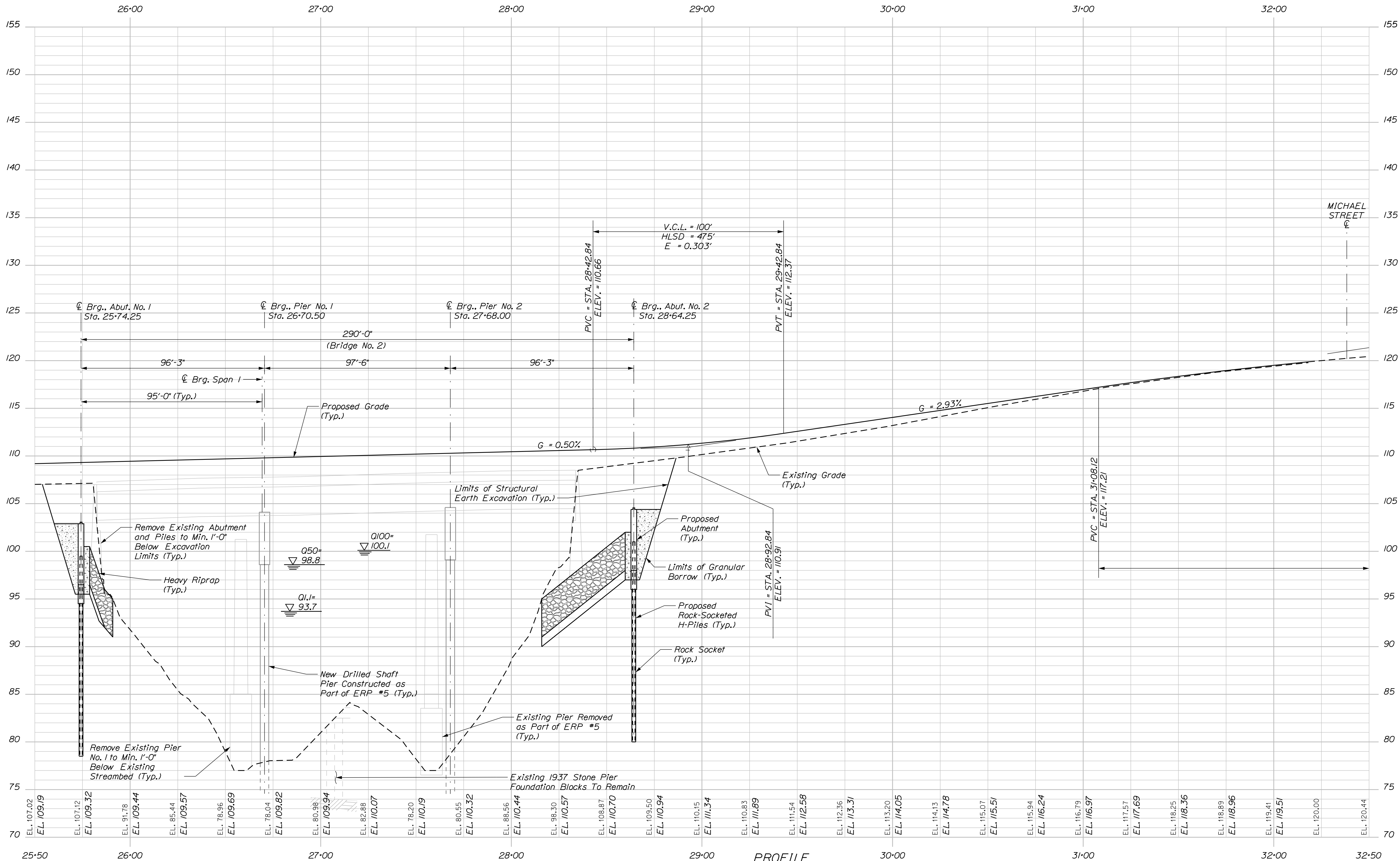
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SHEET NUMBER		C5		OF C16	
PROJ. MANAGER ANDREW LATHE		BY J. KHERA		DATE 12/2024	
DESIGN-DETAILED		CHECKED-REVIEWED T. HIGGINSON		SIGNATURE	
DESIGN-DETAILED		DESIGN-DETAILED		P.E. NUMBER	
REVISIONS 1		REVISIONS 2		DATE	
REVISIONS 3		REVISIONS 4		FIELD CHANGES	

Date:1/24/2025

Username:

Division: BRIDGE

Filename: ... \OC6_Profile_02.dgn



Note: Profile provided for information only.



PROJ. MANAGER	ANDREW LATHE	BY	DATE
CHECKED-REVIEWED	J. KHERA	J. KHERA	12/2024
DESIGNED-DETAILED	T. HIGGINSON	T. HIGGINSON	12/2024
DESIGNED-DETAILED			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

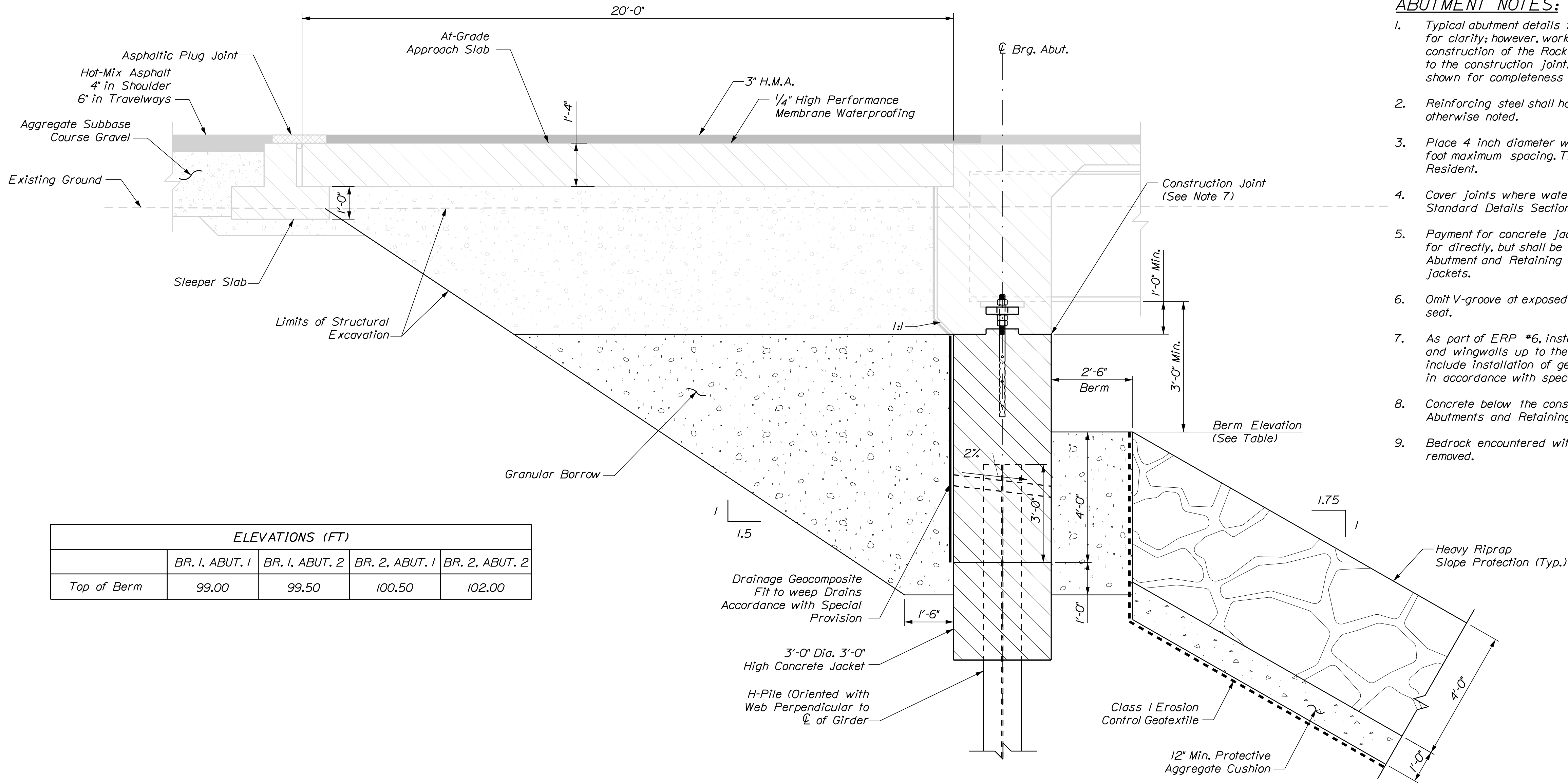
LLEWELLYN ESTES BRIDGES
STILLWATER RIVER
PENOBSCOT COUNTY
OLD TOWN
PROFILE

Date:1/24/2025

Username:

Division: BRIDGE

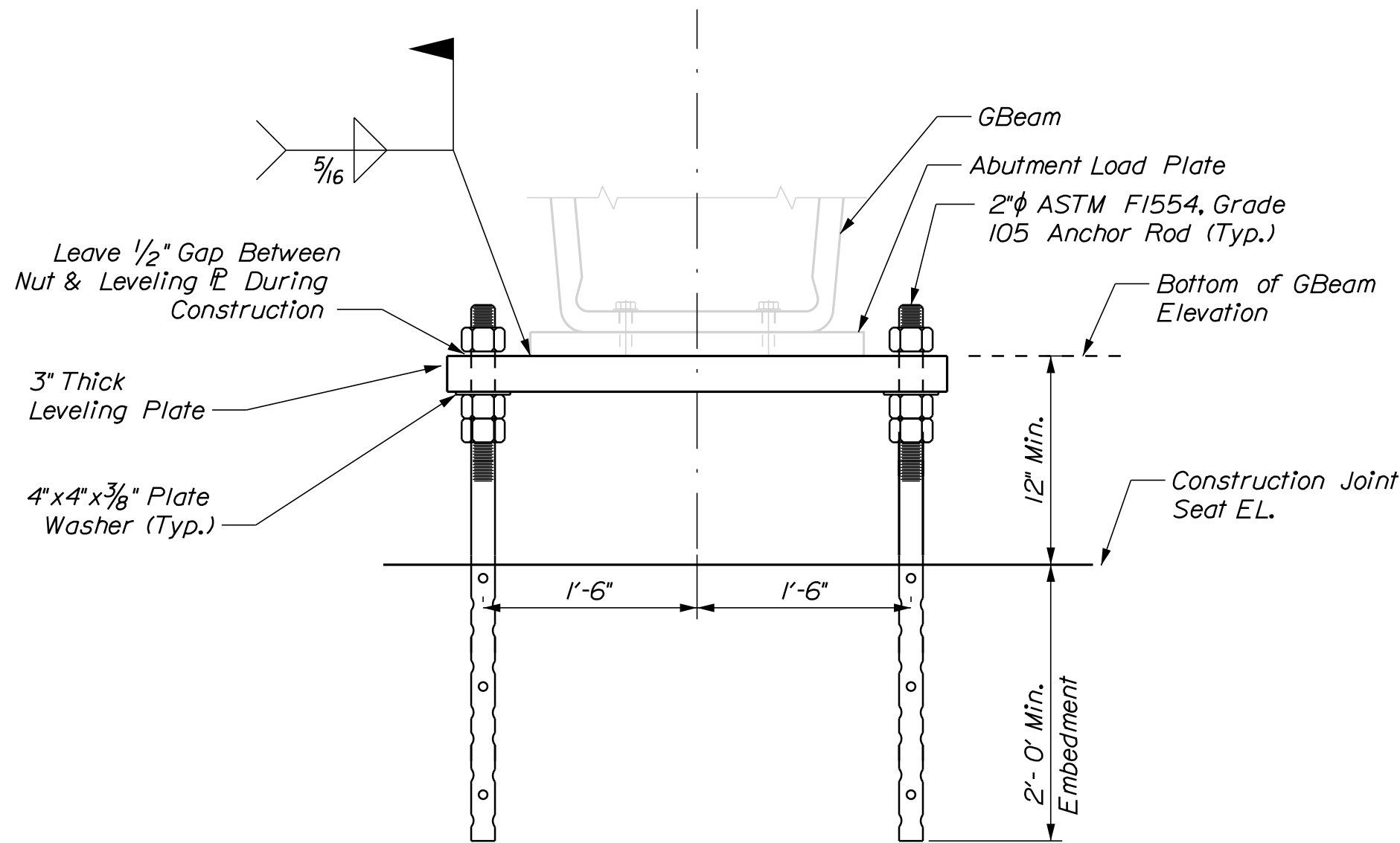
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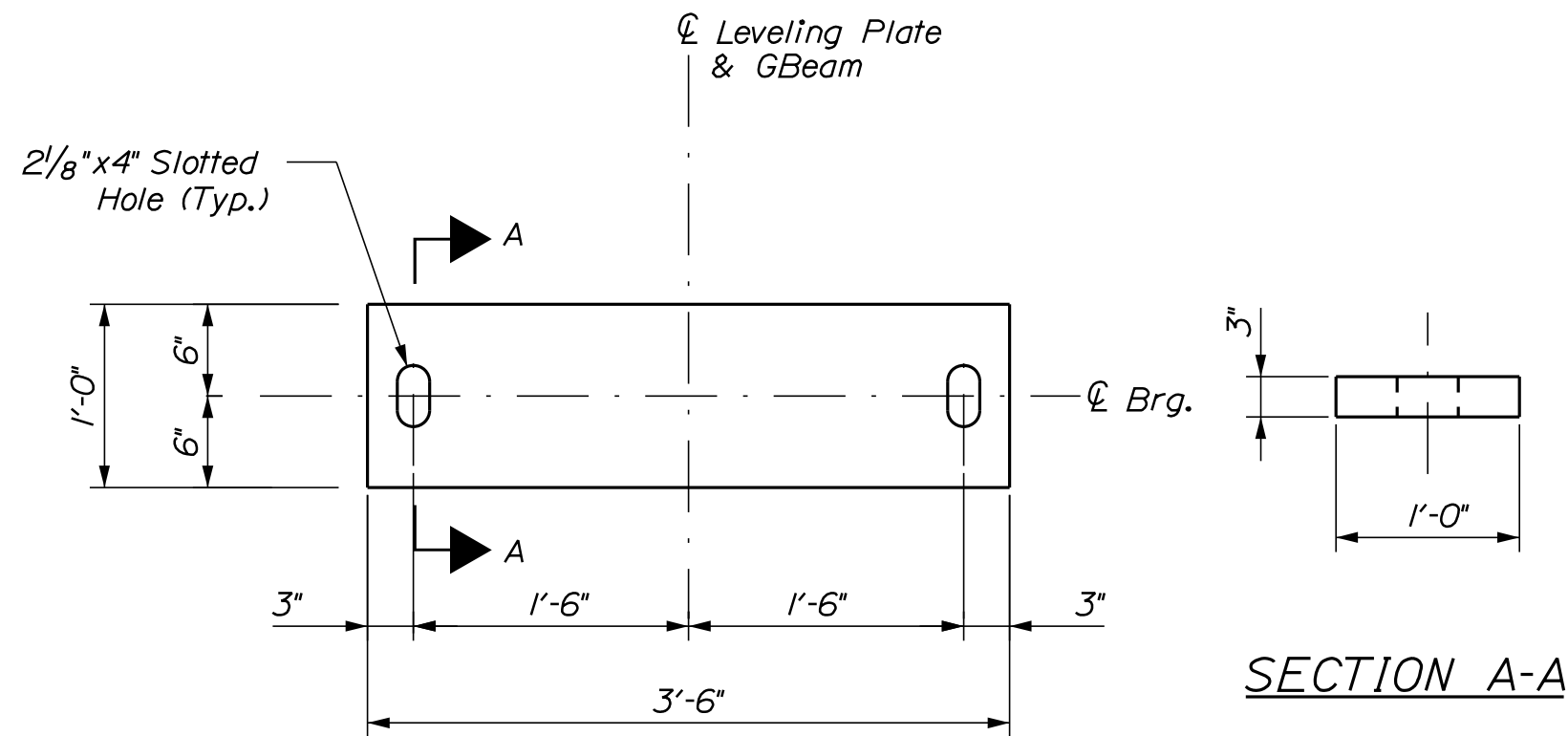
- ABUTMENT NOTES:**
1. Typical abutment details for the anticipated completed abutment are shown for clarity; however, work associated with this ERP #6 includes construction of the Rock-Socketed H-Piles and the abutment/wingwalls up to the construction joint. Future work that is not part of this ERP #6 is shown for completeness in gray.
 2. Reinforcing steel shall have a minimum concrete cover of 3 inches unless otherwise noted.
 3. Place 4 inch diameter weep drains in the breast wall and wingwalls at 10 foot maximum spacing. The exact location will be determined by the Resident.
 4. Cover joints where waterstops are not required in accordance with Standard Details Section 502.
 5. Payment for concrete jacket around the tops of the H-Piles will not be paid for directly, but shall be incidental to item 502.219, Structural Concrete, Abutment and Retaining Walls. Fill concrete may be used for the concrete jackets.
 6. Omit V-groove at exposed face of horizontal construction joint at bridge seat.
 7. As part of ERP #6, install drainage geocomposite behind the abutments and wingwalls up to the construction joint elevation. Future work will include installation of geocomposite up to the approach slab seat elevation in accordance with special provision section 620, Drainage Geocomposite.
 8. Concrete below the construction joint shall be paid as Structural Concrete, Abutments and Retaining Walls unless otherwise noted.
 9. Bedrock encountered within 1'-0" of the bottom of the abutment shall be removed.

ELEVATIONS (FT)				
	BR. 1, ABUT. 1	BR. 1, ABUT. 2	BR. 2, ABUT. 1	BR. 2, ABUT. 2
Top of Berm	99.00	99.50	100.50	102.00

TYPICAL ABUTMENT SECTION



ELEVATION



PLAN

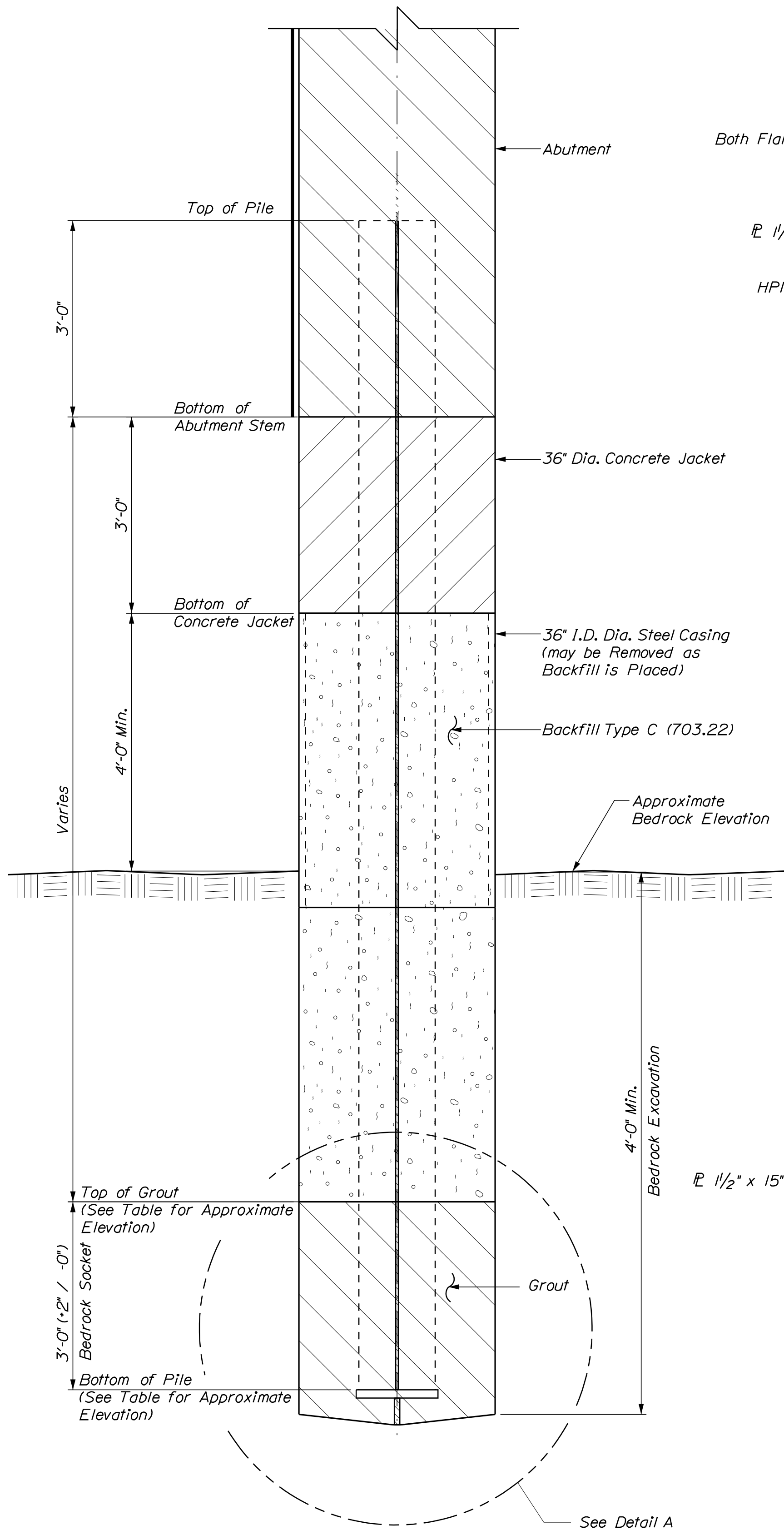
SECTION A-A

- LEVELING PLATE NOTES:**
1. Leveling plate and associated hardware shall be hot-dipped galvanized. Costs associated with the leveling plate and associated hardware shall be incidental to the abutment concrete pay item.
 2. Anchor rod shall be swedged or threaded on the embedded portion of the rod.

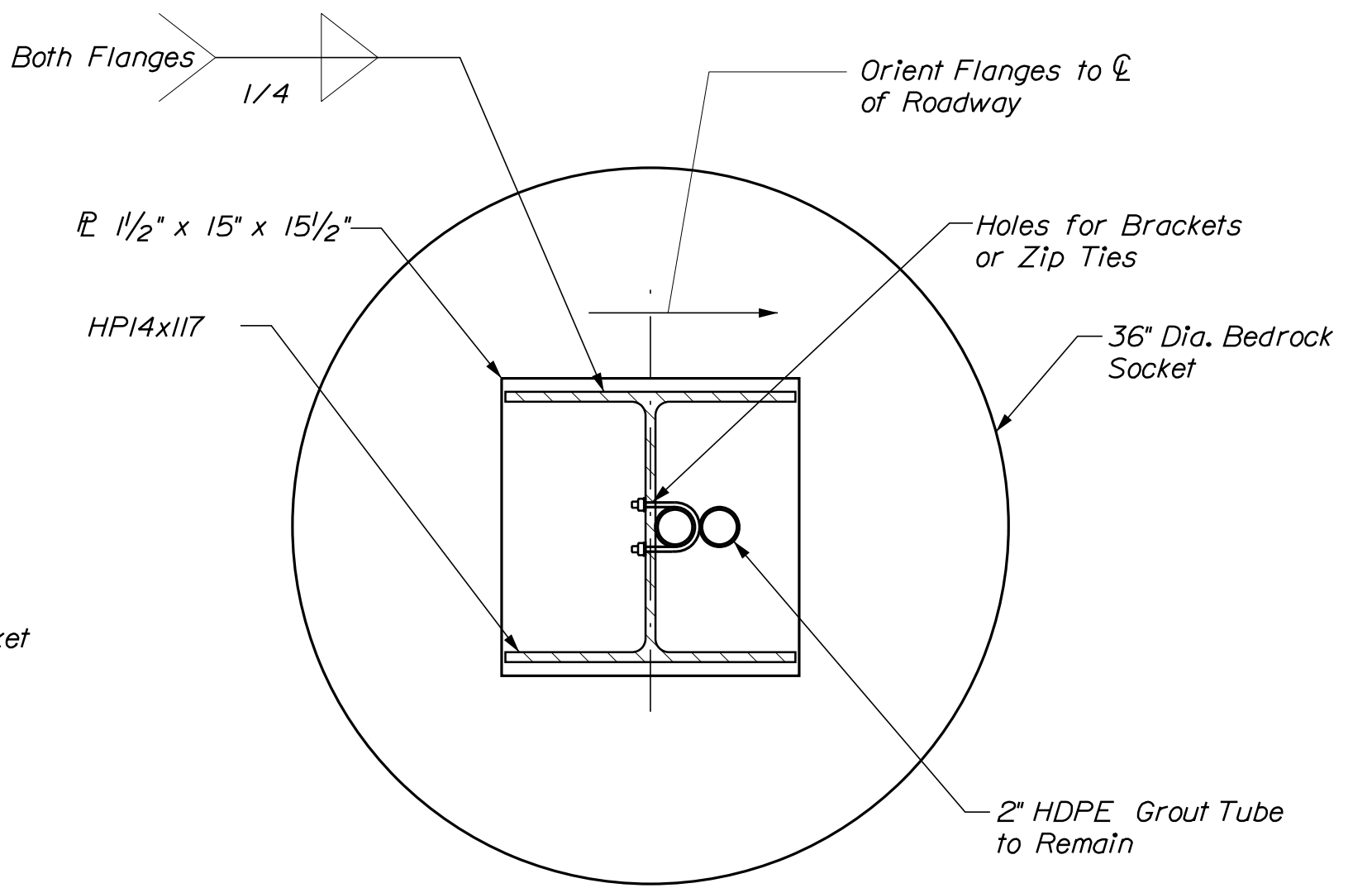
LEVELING PLATE DETAIL



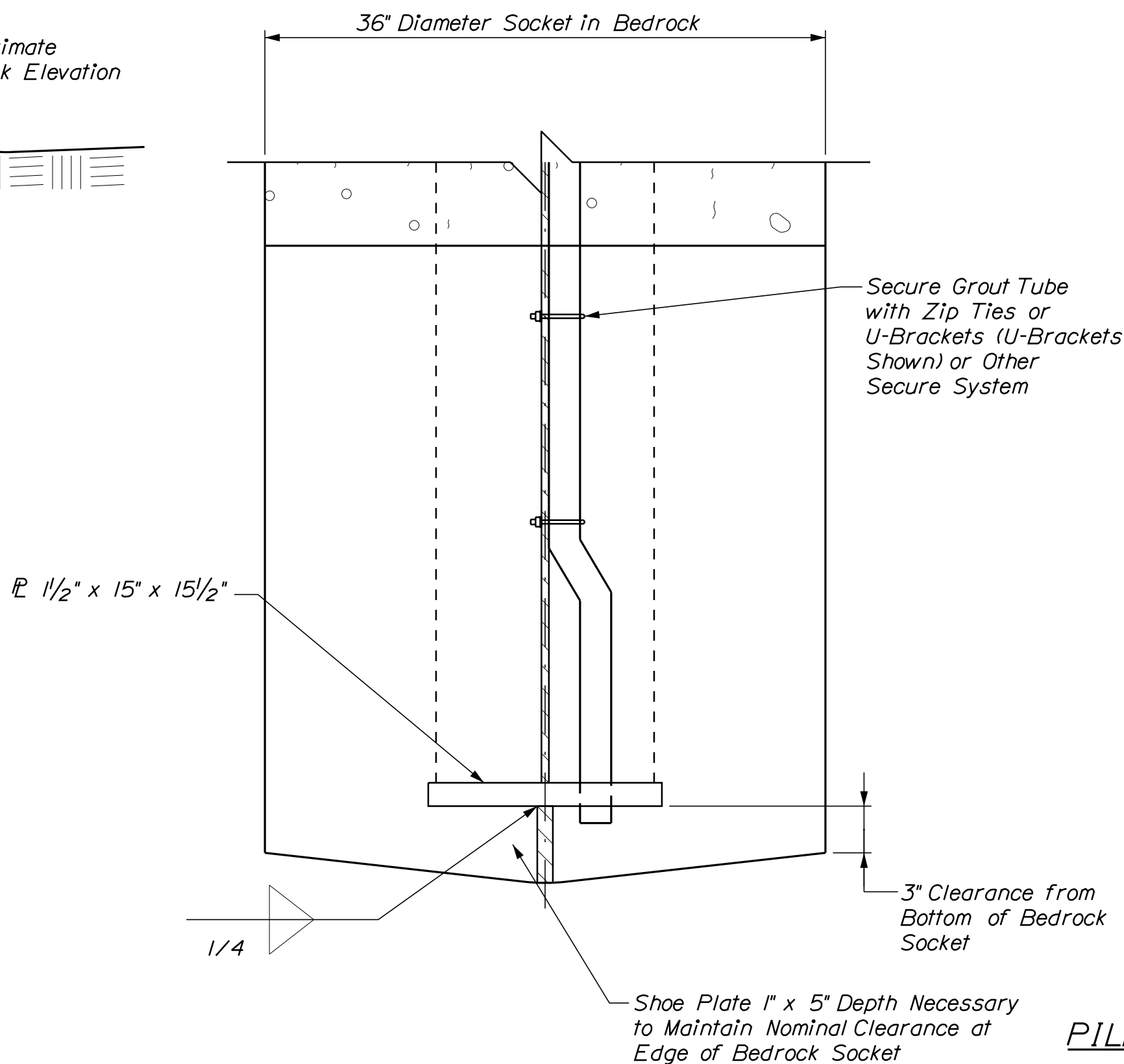
STATE OF MAINE DEPARTMENT OF TRANSPORTATION	2189401		BRIDGE NO. 1472		WIN 022512.01		BRIDGE PLANS		
	SIGNATURE		P.E. NUMBER		DATE				
LLEWELLYN ESTES BRIDGES STILLWATER RIVER OLD TOWN		PENOBSCOT COUNTY		SHEET NUMBER		C7		OF C16	
ABUTMENT TYPICAL SECTION & NOTES									



ROCK SOCKETED
H - PILE DETAIL



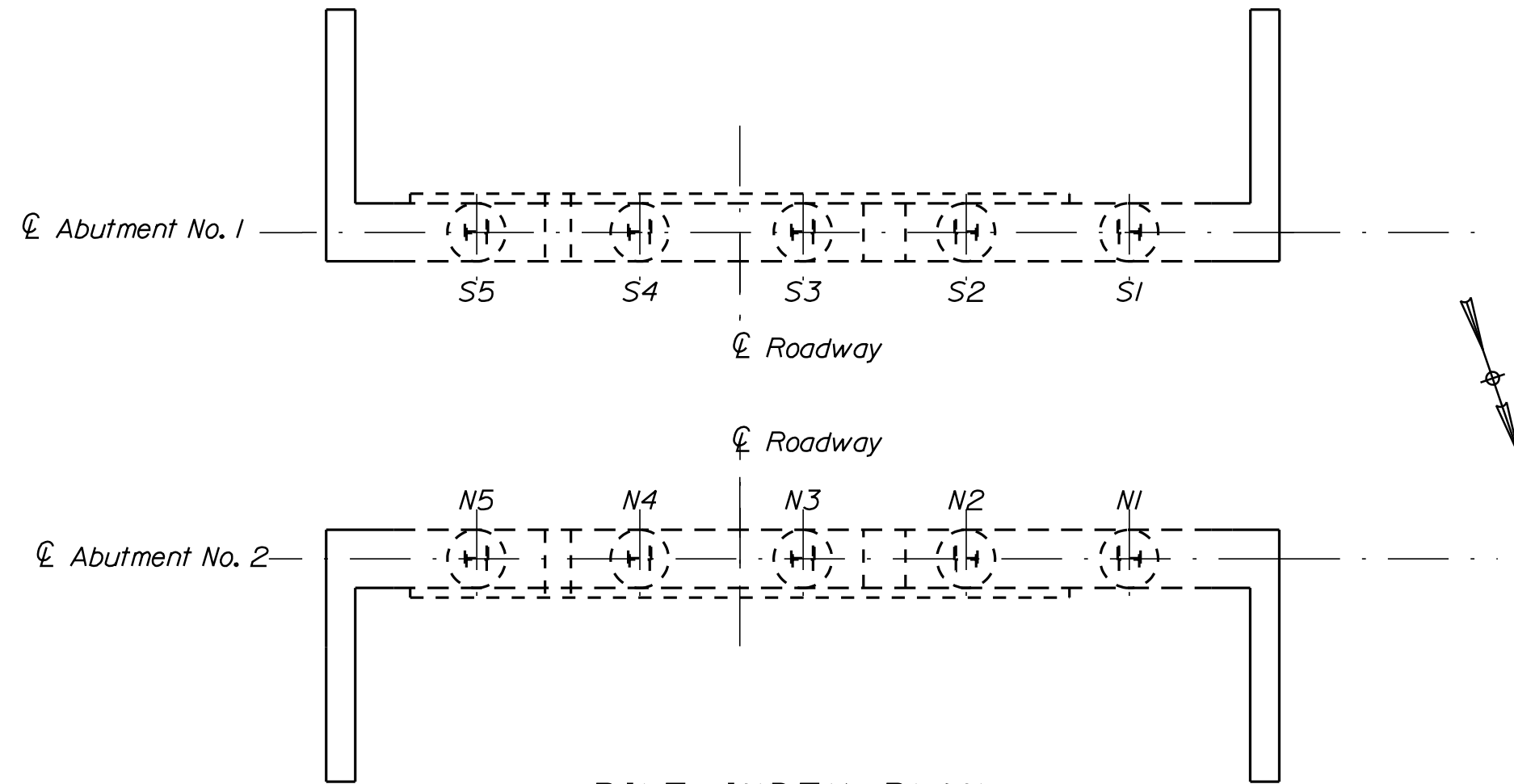
ROCK SOCKETED
H-PILE BASE DETAIL



DETAIL A

PILE NOTES:

- The maximum factored pile load at the Strength Limit State is as follows:
Bridge No. 1: 467 kips
Bridge No. 2: 518 kips
- H-pile material shall be ASTM A572 Grade 50.
- Estimate of required piles:
Bridge No. 1 Abutment No. 1 & 2: 5 - HPI4x117, see chart below for pile length estimates
Bridge No. 2 Abutment No. 1 & 2: 5 - HPI4x117, see chart below for pile length estimates
- Piles shall not be out of position by more than 2 inches in any direction. Piles shall be oriented as shown with the pile webs perpendicular to girder centerlines.



PILE INDEX PLAN
See Abutment Plans For Pile Layout

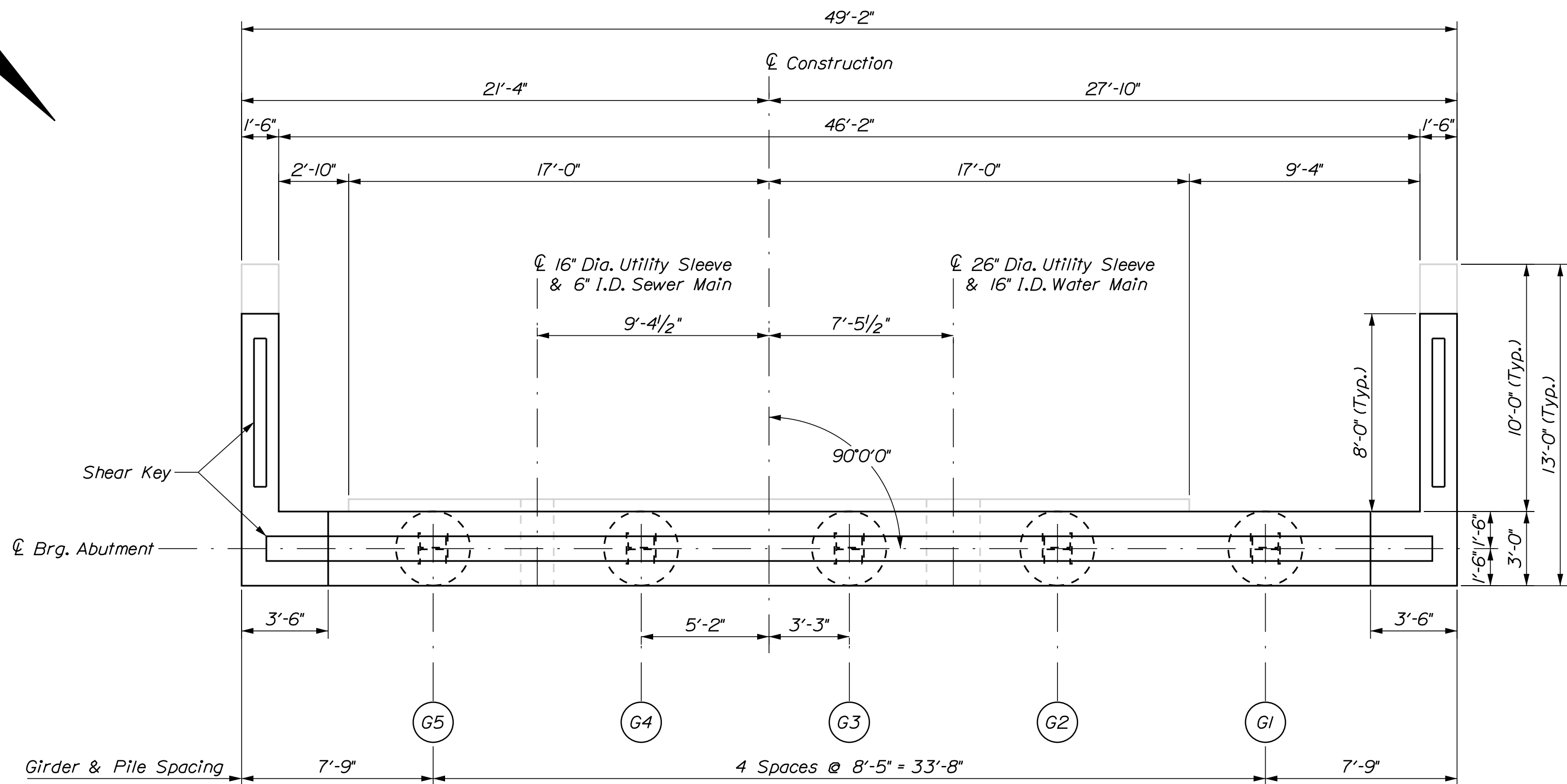
BRIDGE NO. 1 - PILE TABLE (All Dimensions in Feet)						
PILE	BOTTOM OF ABUTMENT STEM ELEVATION	APPROX. TOP OF BEDROCK ELEVATION	ESTIMATED TOP OF GROUT ELEVATION	ESTIMATED BOTTOM OF PILE ELEVATION	ESTIMATED BEDROCK EXCAVATION LENGTH	ESTIMATED PILE LENGTH
S1	95.0	87.5	82.0	79.0	8.9	19.0
S2		84.5	82.0	79.0	5.9	19.0
S3		86.8	82.0	79.0	8.2	19.0
S4		89.7	82.0	79.0	11.1	19.0
S5		88.5	82.0	79.0	9.9	19.0
N1	95.5	86.5	82.5	79.5	7.4	19.0
N2		85.4	82.5	79.5	6.3	19.0
N3		84.3	82.5	79.5	5.2	19.0
N4		83.4	81.5	78.5	5.3	20.0
N5		82.8	81.5	78.5	4.7	20.0

BRIDGE NO. 2 - PILE TABLE (All Dimensions in Feet)						
PILE	BOTTOM OF ABUTMENT STEM ELEVATION	APPROX. TOP OF BEDROCK ELEVATION	ESTIMATED TOP OF GROUT ELEVATION	ESTIMATED BOTTOM OF PILE ELEVATION	ESTIMATED BEDROCK EXCAVATION LENGTH	ESTIMATED PILE LENGTH
S1	96.5	85.8	81.5	78.5	7.7	21.0
S2		83.5	81.5	78.5	5.4	21.0
S3		84.7	81.5	78.5	6.6	21.0
S4		91.7	81.5	78.5	13.6	21.0
S5		89.6	81.5	78.5	11.5	21.0
N1	98.0	89.8	83.0	80.0	10.2	21.0
N2		90.5	83.0	80.0	10.9	21.0
N3		91.1	83.0	80.0	11.5	21.0
N4		90.7	83.0	80.0	11.1	21.0
N5		89.4	83.0	80.0	9.8	21.0

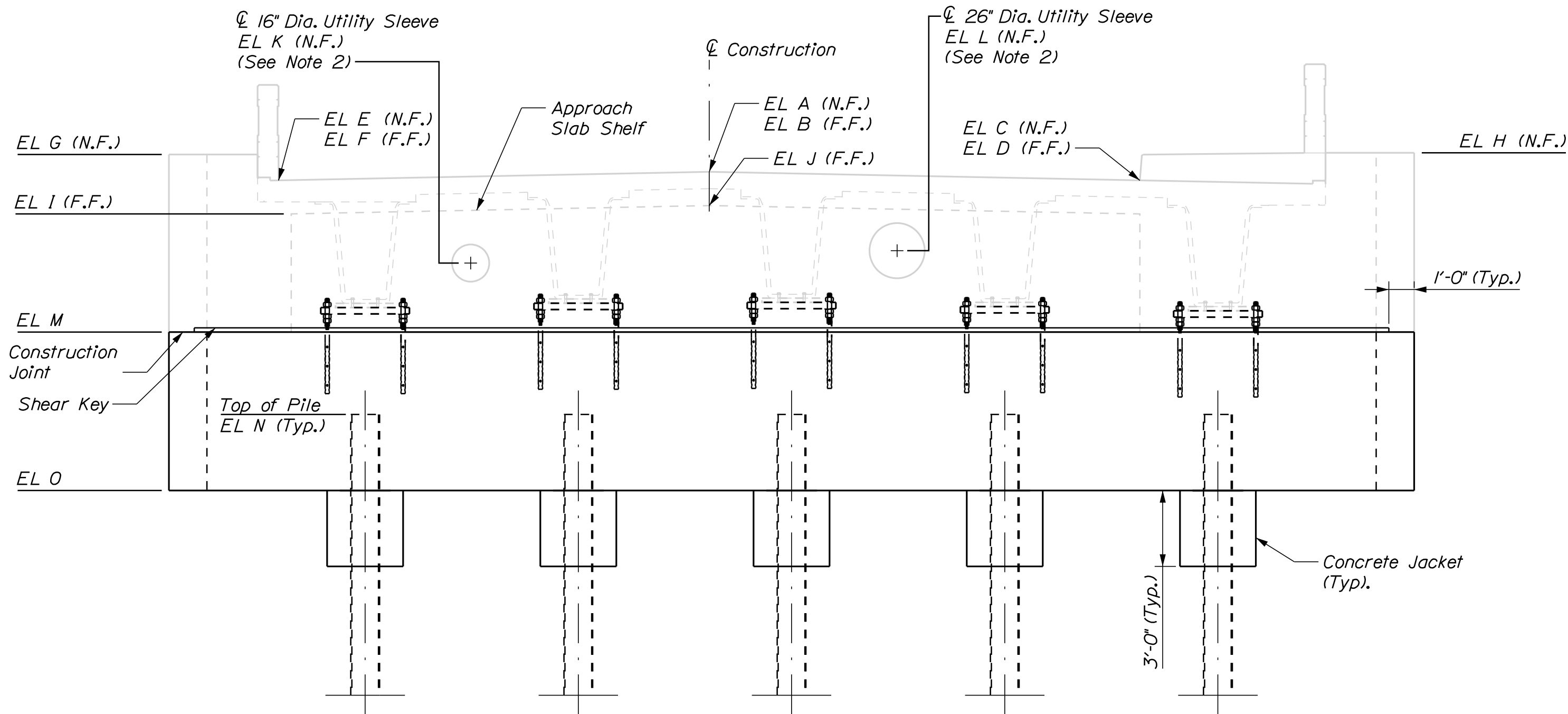
PILE TABLE NOTES:

- Top of rock elevations are provided to the nearest 0.1' for length calculation purposes, but they have been estimated using widely spaced explorations, and actual elevations will vary.
- For Bridge No. 1: Estimated top of grout elevation is 13' below bottom of abutment stem elevation unless approximate top of bedrock is more than 12' below bottom of abutment stem, in which case estimated top of grout is 1' below approximate top of rock. This provides a minimum rock socket depth of 4' with 3' grouted embedment.
- For Bridge No. 2: Estimated top of grout elevation is 15' below bottom of abutment stem elevation unless approximate top of bedrock is more than 14' below bottom of abutment stem, in which case estimated top of grout is 1' below approximate top of rock. This provides a minimum rock socket depth of 4' with 3' grouted embedment.
- Top of Rock is defined as the elevation at which the face of the rock excavation is completely beneath the bedrock surface, as determined by the Resident.
- Estimated Bedrock Excavation Length includes the plate thickness and minimum clearance. Estimated Pile Length includes the embedment into the abutment.

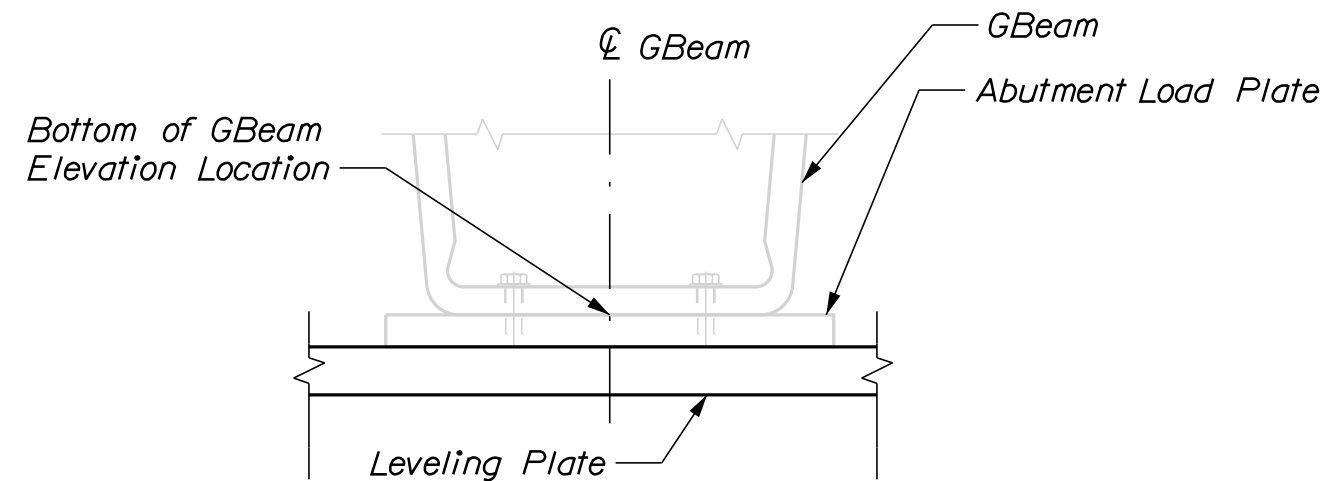




TYPICAL ABUTMENT PLAN
(Bridge No. 1, Abutment No. 1 shown, others similar)



TYPICAL ABUTMENT ELEVATION
(Bridge No. 1, Abutment No. 1 shown, others similar)



BOTTOM OF GIRDER ELEVATIONS AT ¢ OF BEARING (FT)					
	G1	G2	G3	G4	G5
BR. 1, ABUT. 1	102.16	102.33	102.50	102.46	102.29
BR. 1, ABUT. 2	102.93	103.09	103.26	103.22	103.06
BR. 2, ABUT. 1	103.64	103.80	103.97	103.93	103.77
BR. 2, ABUT. 2	105.14	105.31	105.48	105.44	105.27

ABUTMENT ELEVATIONS (FT)				
POINTS	BR. 1, ABUT. 1	BR. 1, ABUT. 2	BR. 2, ABUT. 1	BR. 2, ABUT. 2
A	107.57	108.32	109.04	110.53
B	107.56	108.34	109.03	110.56
C	107.23	107.98	108.70	110.19
D	107.22	108.00	108.69	110.22
E	107.23	107.98	108.70	110.19
F	107.22	108.00	108.69	110.22
G	108.25	109.00	109.73	111.21
H	108.30	109.08	109.78	111.30
I	105.89	106.67	107.37	108.89
J	106.22	107.00	107.70	109.22
K	103.93	104.76	105.40	106.90
L	104.50	105.26	105.97	107.47
M	101.16	101.93	102.64	104.14
N	98.00	98.50	99.50	101.00
O	95.00	95.50	96.50	98.00

NOTES

1. Typical abutment details for the anticipated completed abutment are shown for clarity; however, work associated with this ERP #6 includes construction of the Rock-Socketed H-Piles and the abutment/wingwalls up to the construction joint. Future work that is not part of this ERP #6 is shown for completeness in gray.
2. All abutment elevations are shown at center line of bearing, unless otherwise noted.
3. All elevations shown are in feet, unless otherwise noted.

KEY:

N.F. = Near Face
F.F. = Far Face
E.F. = Each Face



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2189401

BRIDGE NO. 1472
BRIDGE NO. 2806

WIN 022512.01
WIN 022511.01

BRIDGE PLANS

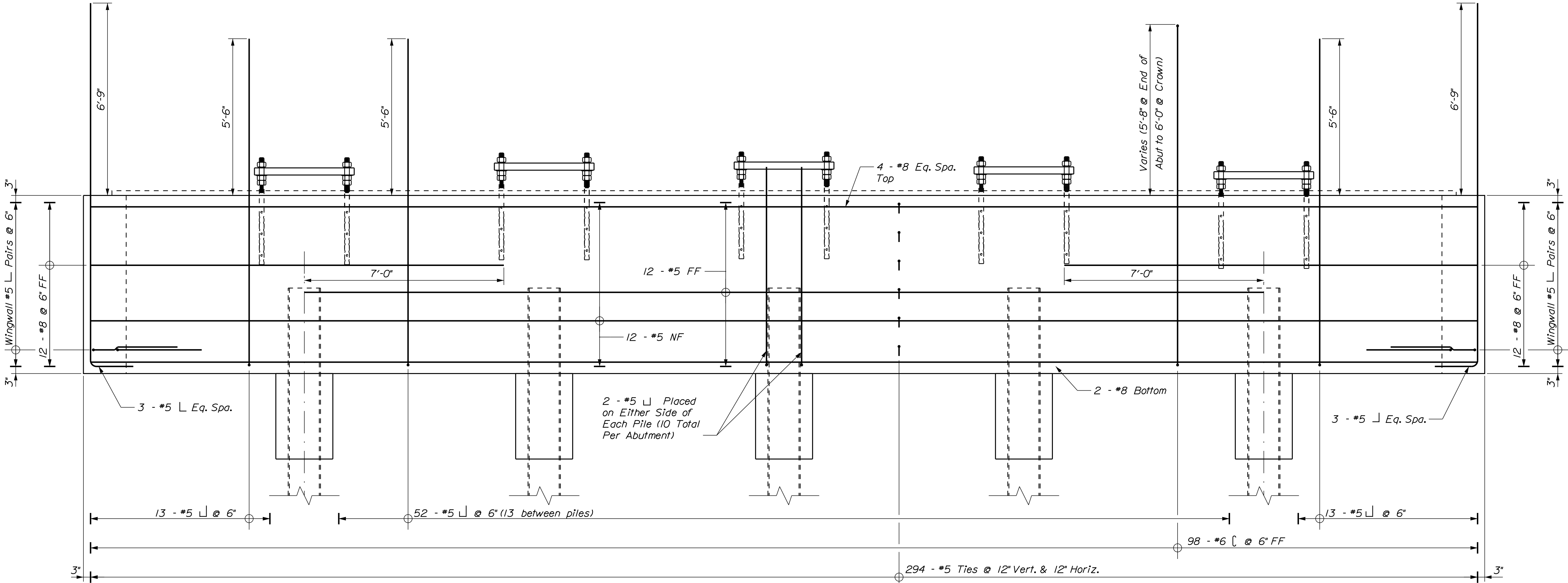
LLEWELLYN ESTES BRIDGES
STILLWATER RIVER
OLD TOWN
PENOBSCOT COUNTY

ABUTMENT
PLAN & ELEVATION

SHEET NUMBER

C9

OF C16



BRIDGE NO. 1 TYPICAL ABUTMENT REINFORCEMENT ELEVATION

Minimum Rebar Lap Splice Lengths:

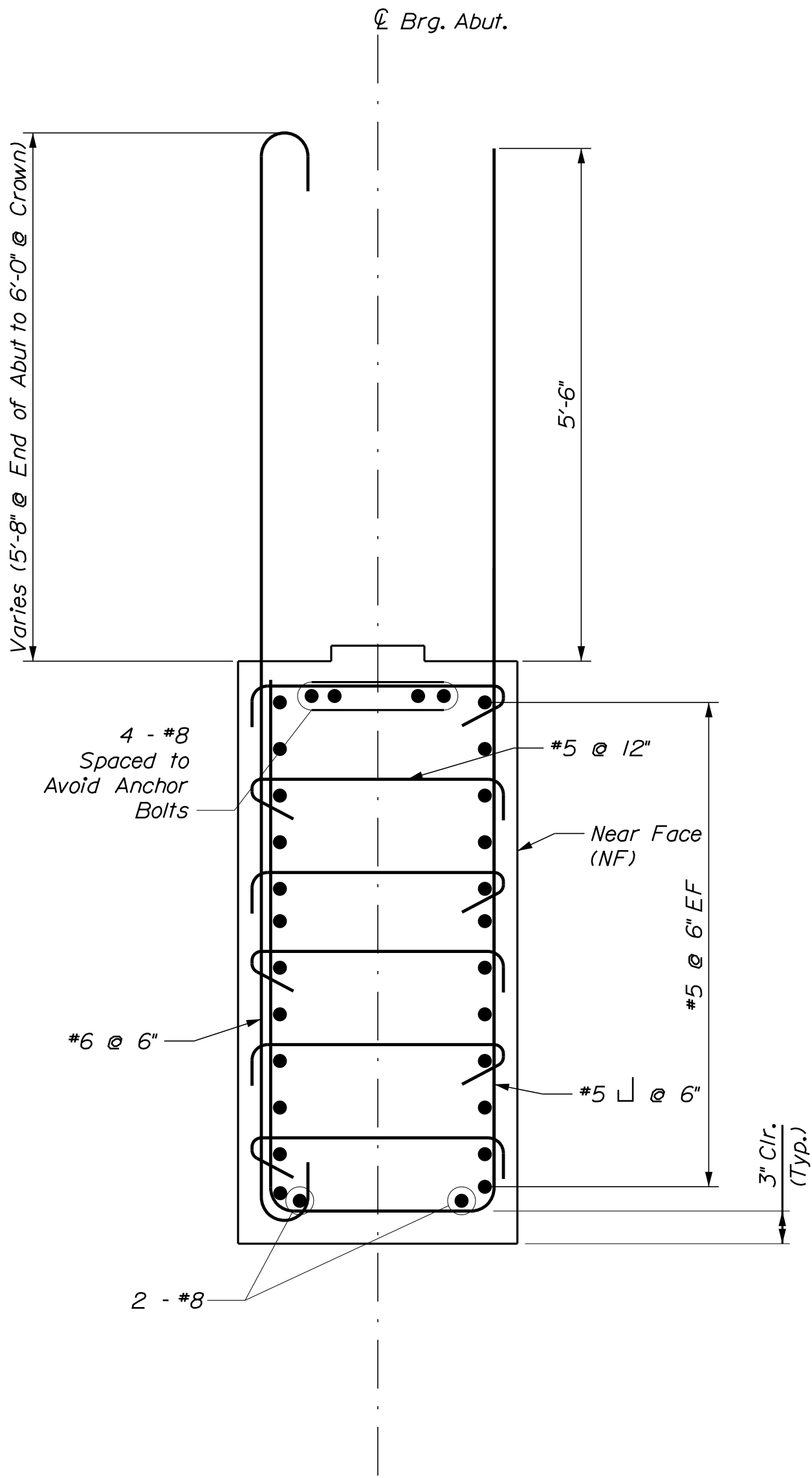
- #5 Bar: 4'-3"
- #6 Bar: 5'-1"
- #8 Bar: 6'-10"

NOTES

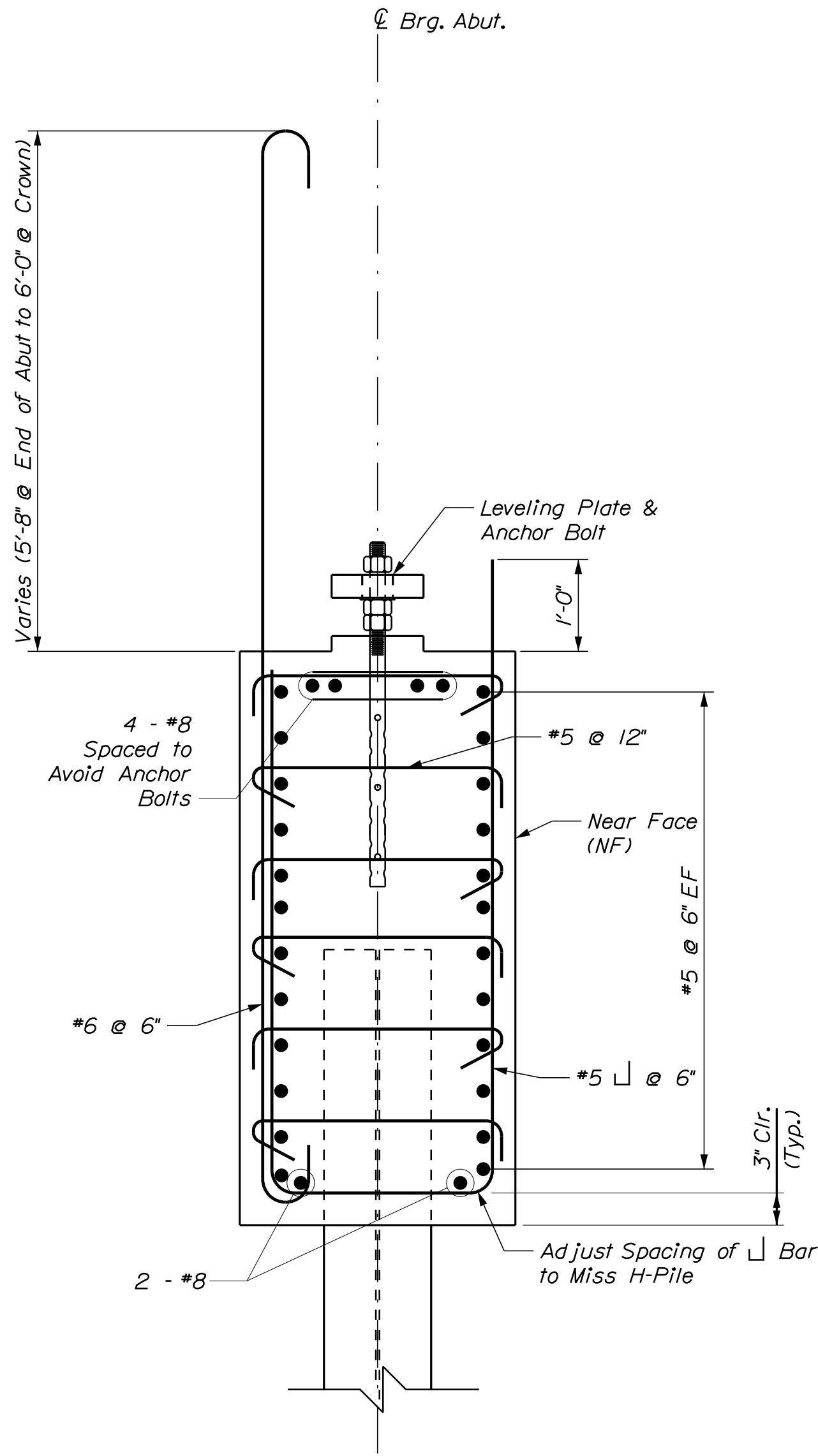
1. Upper portion of abutment stem will be constructed in the future and is not shown for clarity.



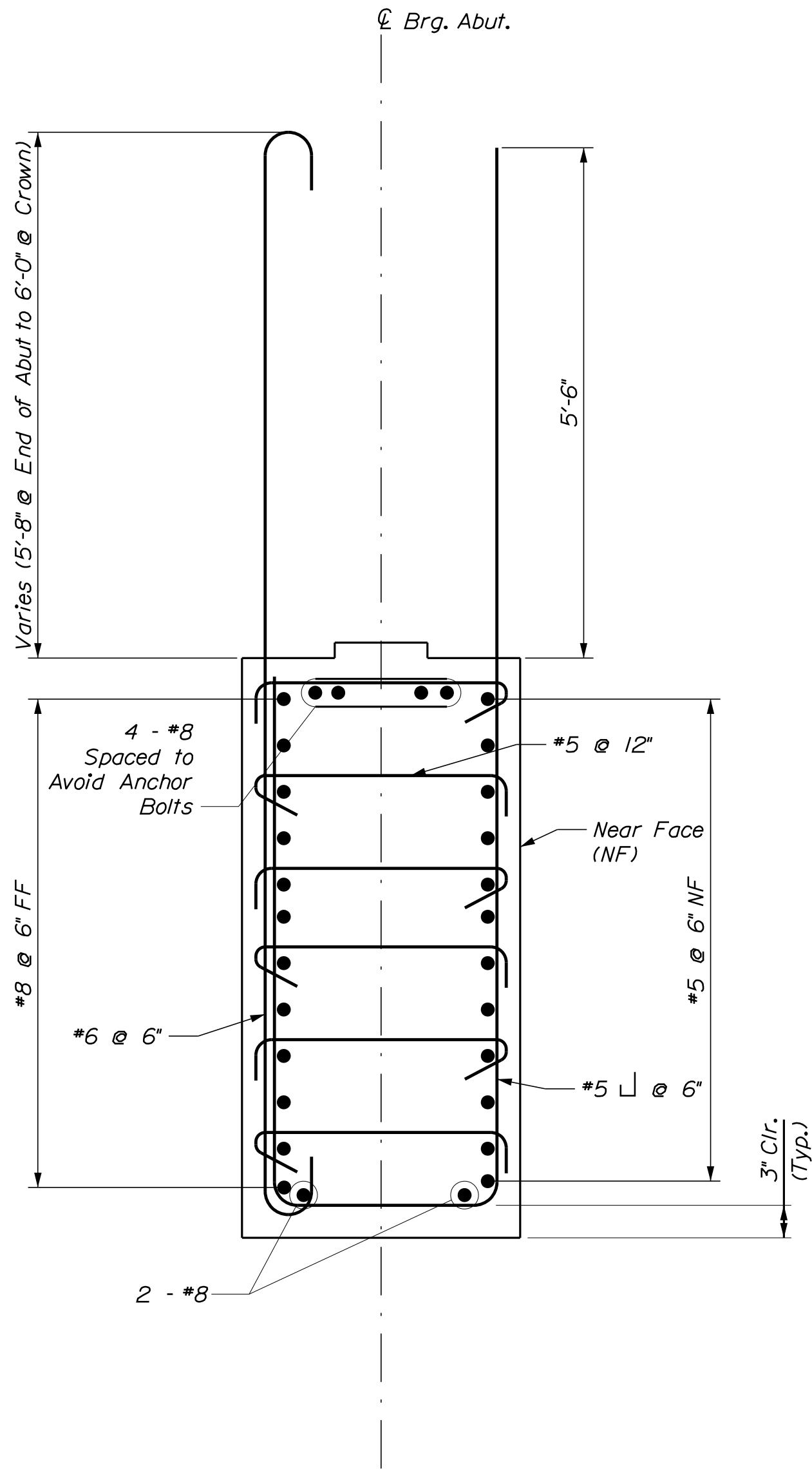
LLEWELLYN ESTES BRIDGES STILLWATER RIVER OLD TOWN PENOBSCOT COUNTY BRIDGE 1 ABUTMENT REINFORCING ELEVATION				PROJ. MANAGER		ANDREW	LATHE	BY	DATE	STATE OF MAINE DEPARTMENT OF TRANSPORTATION	
				DESIGN-DETAILED		G. ERICKSON	W. GERHOLD	12/2024			
				CHECKED-REVIEWED		T. POLSON	T. POLSON	12/2024			
				SIGNATURE							
BRIDGE 1 ABUTMENT REINFORCING ELEVATION				DESIGN2-DETAILED2						2189401	
				DESIGN3-DETAILED3							
				REVISIONS 1					P.E. NUMBER		
				REVISIONS 2							
				REVISIONS 3						BRIDGE NO. 1472 BRIDGE NO. 2806 WIN 022512.01 WIN 022511.01 BRIDGE PLANS	
				REVISIONS 4							
				FIELD CHANGES					DATE		



BRIDGE NO. 1 TYPICAL ABUTMENT SECTION
BETWEEN GIRDER/PILES



BRIDGE NO. 1 TYPICAL ABUTMENT SECTION
AT INTERIOR GIRDER/PILES



BRIDGE NO. 1 TYPICAL ABUTMENT SECTION
CANTILEVER

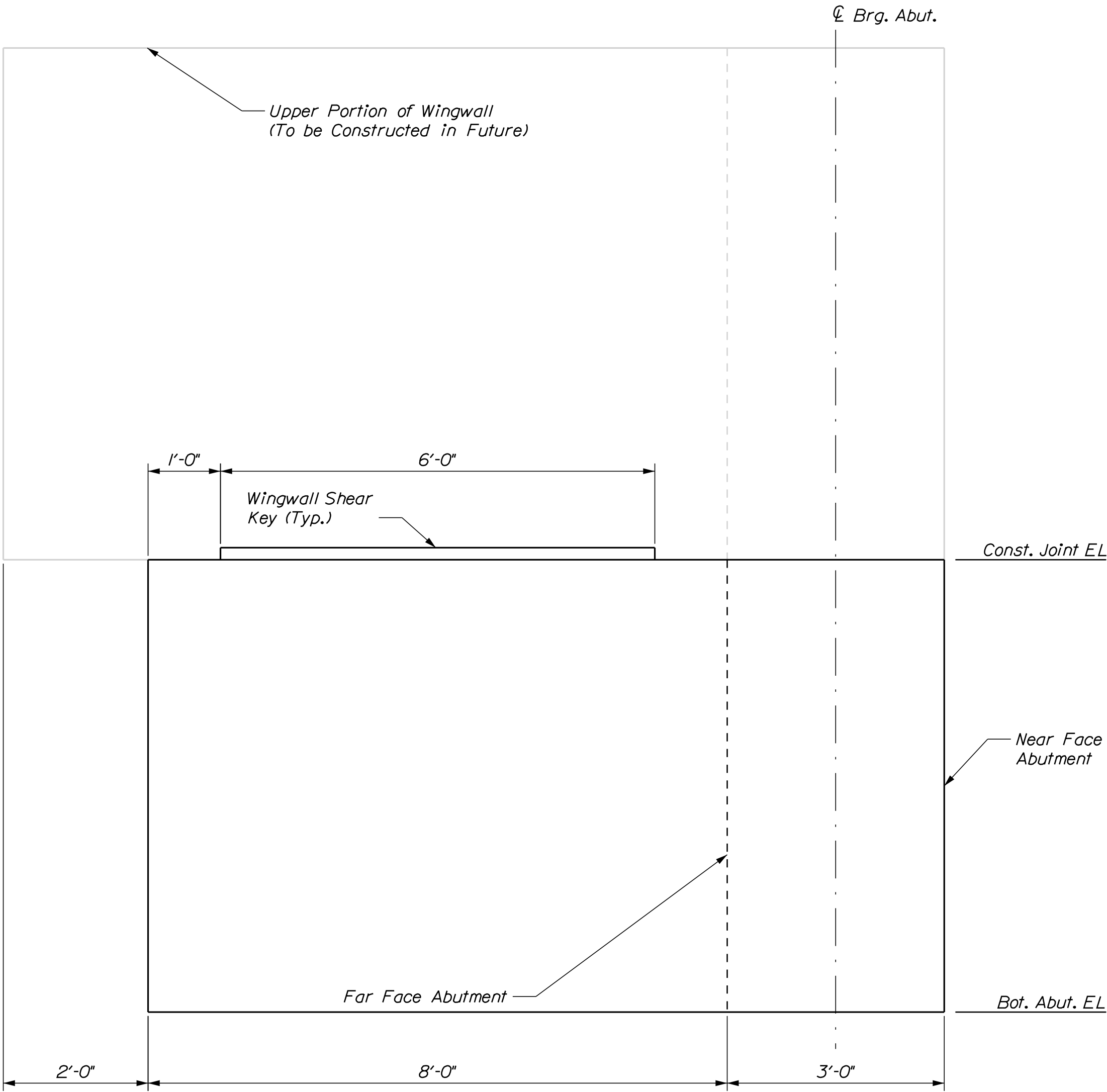
NOTES

1. Upper portion of abutment stem will be constructed in the future and is not shown for clarity.



PROJ. MANAGER	ANDREW LATHE	BY	DATE
DESIGN-DETAILED	G. ERICKSON	W. GERHOLD	12/2024
CHECKED-REVIEWED	T. POLSON	T. POLSON	12/2024
DESIGN-DETAILED			
DESIGN-DETAILED			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

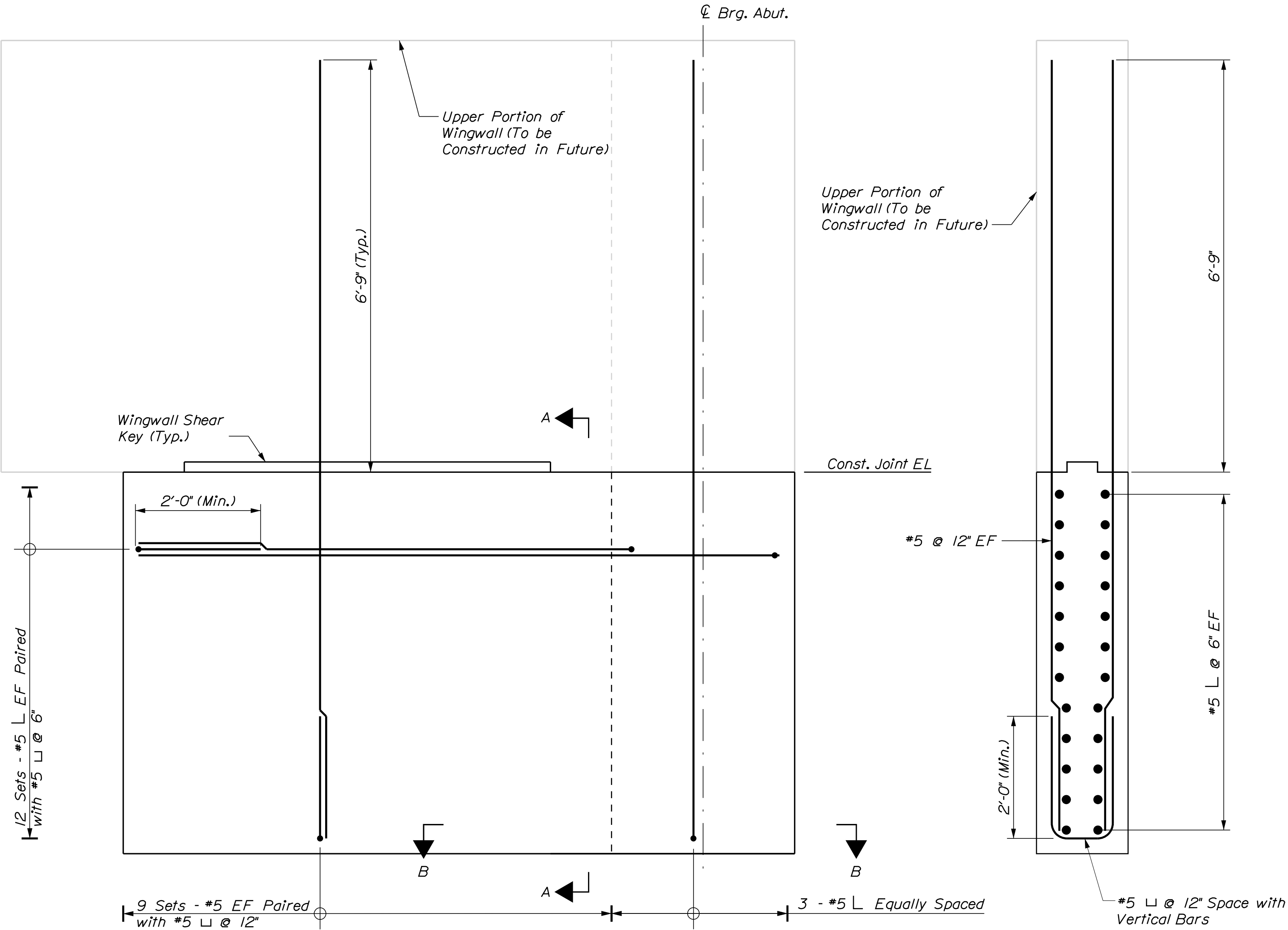
SIGNATURE	P.E. NUMBER	DATE



BRIDGE NO. 1 TYPICAL WINGWALL ELEVATION

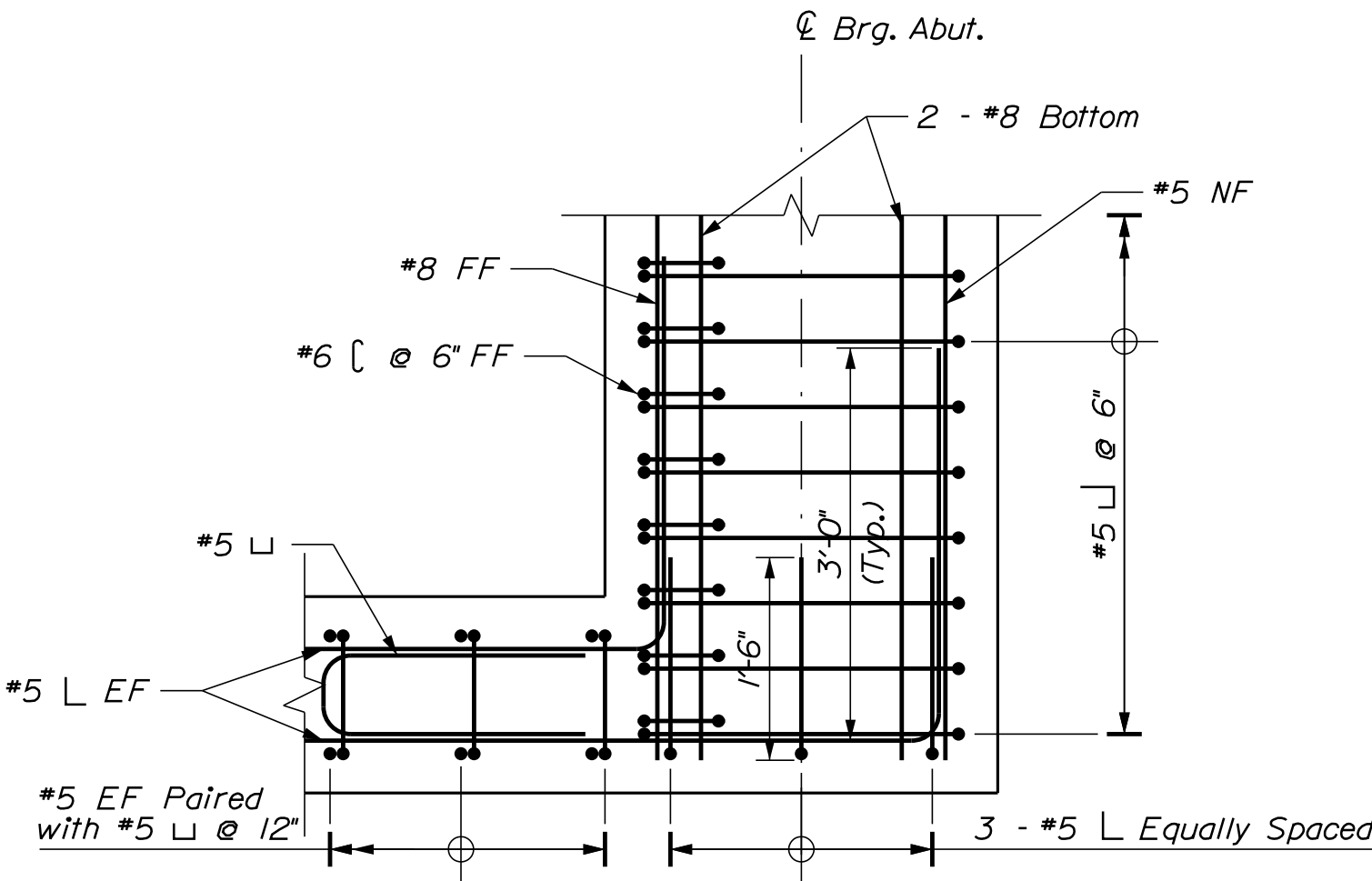
NOTES

1. Typical abutment/wingwall details for the anticipated completed abutment are shown for clarity; however, work associated with this ERP #6 includes construction of the Rock-Socketed H-Piles and the abutment/wingwalls up to the construction joint. Future work that is not part of this ERP #6 is shown for completeness in gray.

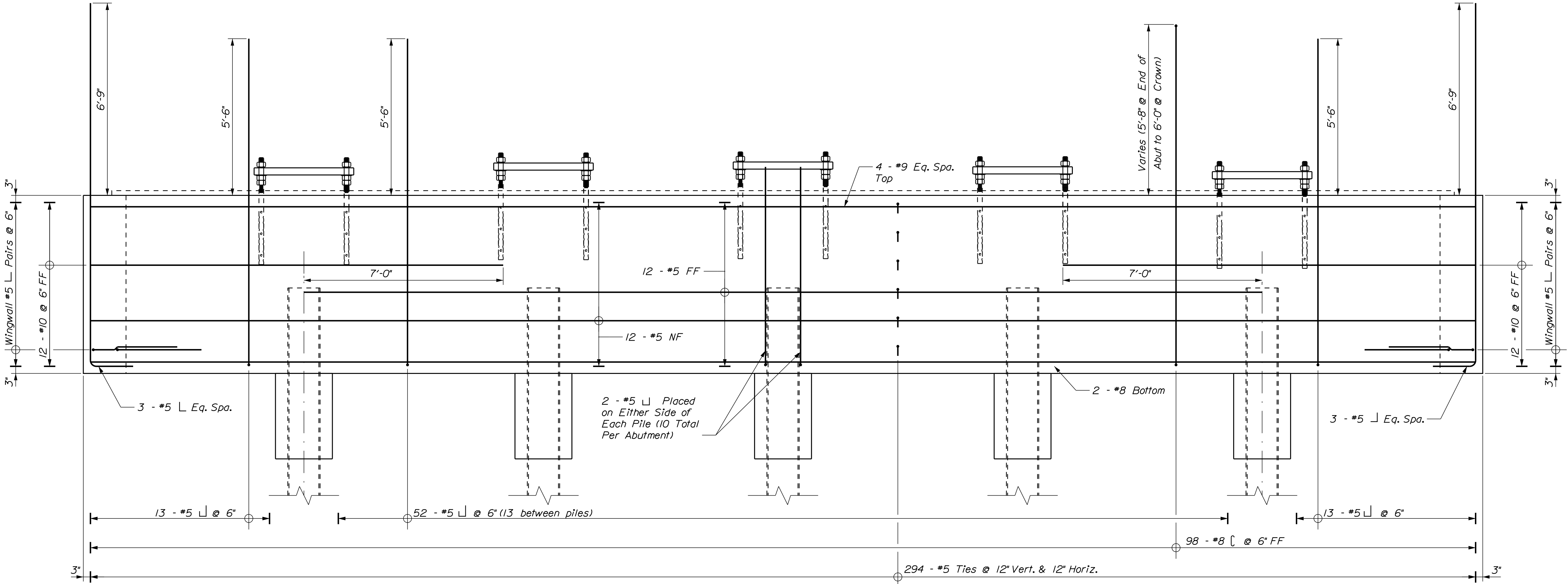


BRIDGE NO. 1 TYPICAL WINGWALL REINFORCEMENT ELEVATION
(Abutment Reinforcement not Shown for Clarity)

BRIDGE NO. 1 WINGWALL REINFORCEMENT
SECTION A-A



BRIDGE NO. 1 WINGWALL REINFORCEMENT
SECTION B-B



BRIDGE NO. 2 TYPICAL ABUTMENT REINFORCEMENT ELEVATION

Minimum Rebar Lap Splice Lengths:

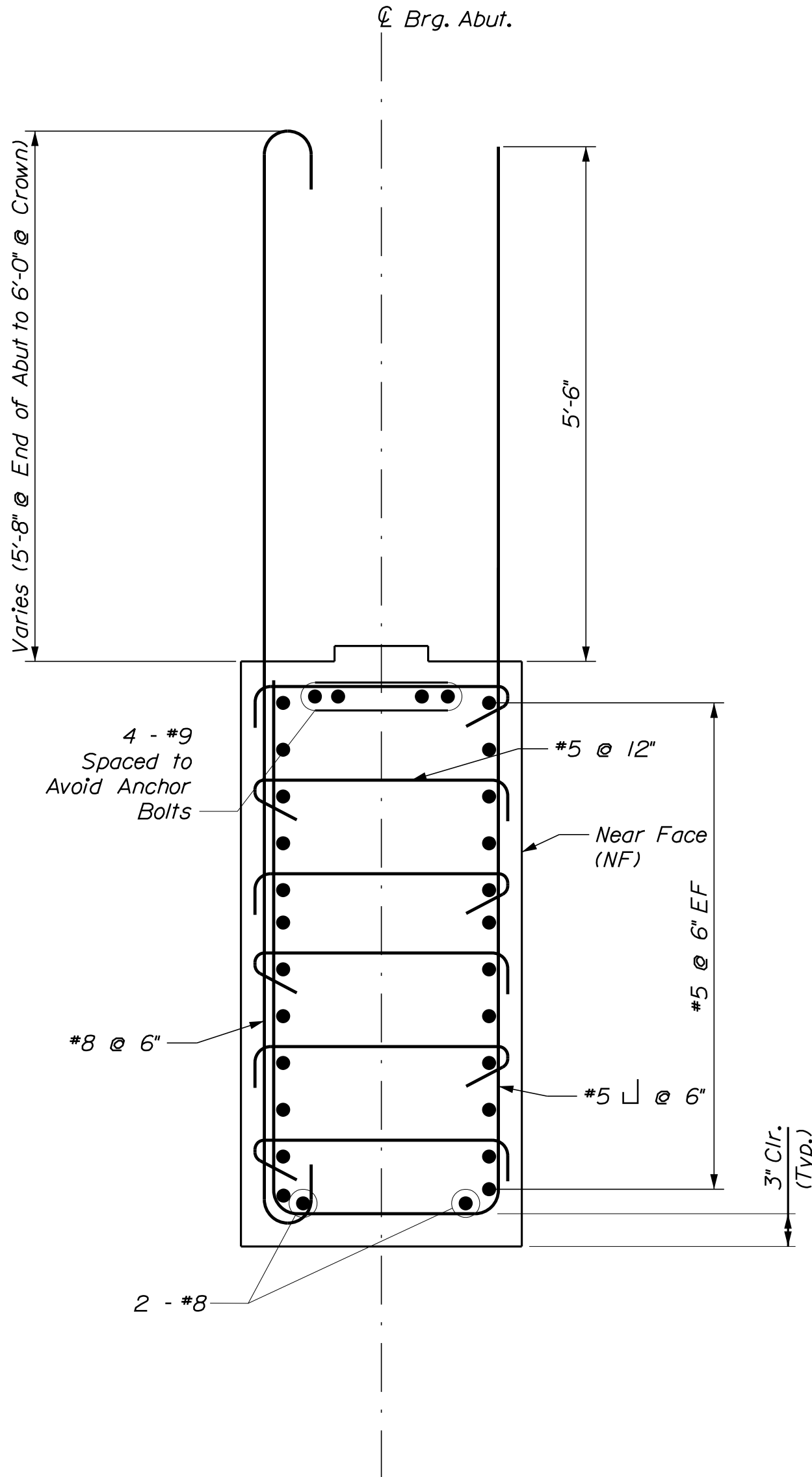
- #5 Bar: 4'-3"
- #6 Bar: 5'-1"
- #8 Bar: 6'-10"
- #9 Bar: 7'-8"

NOTES

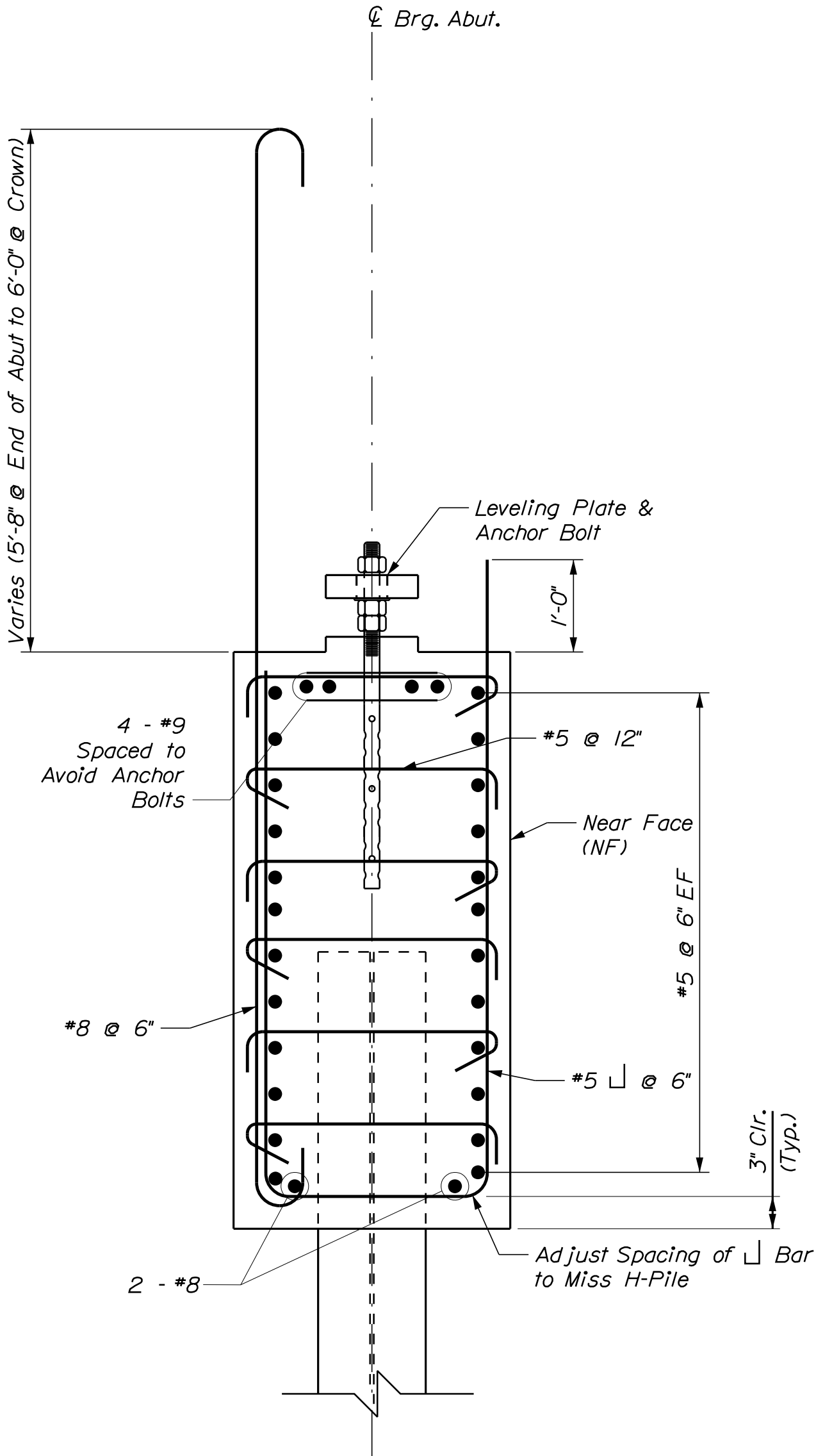
1. Upper portion of abutment stem will be constructed in the future and is not shown for clarity.



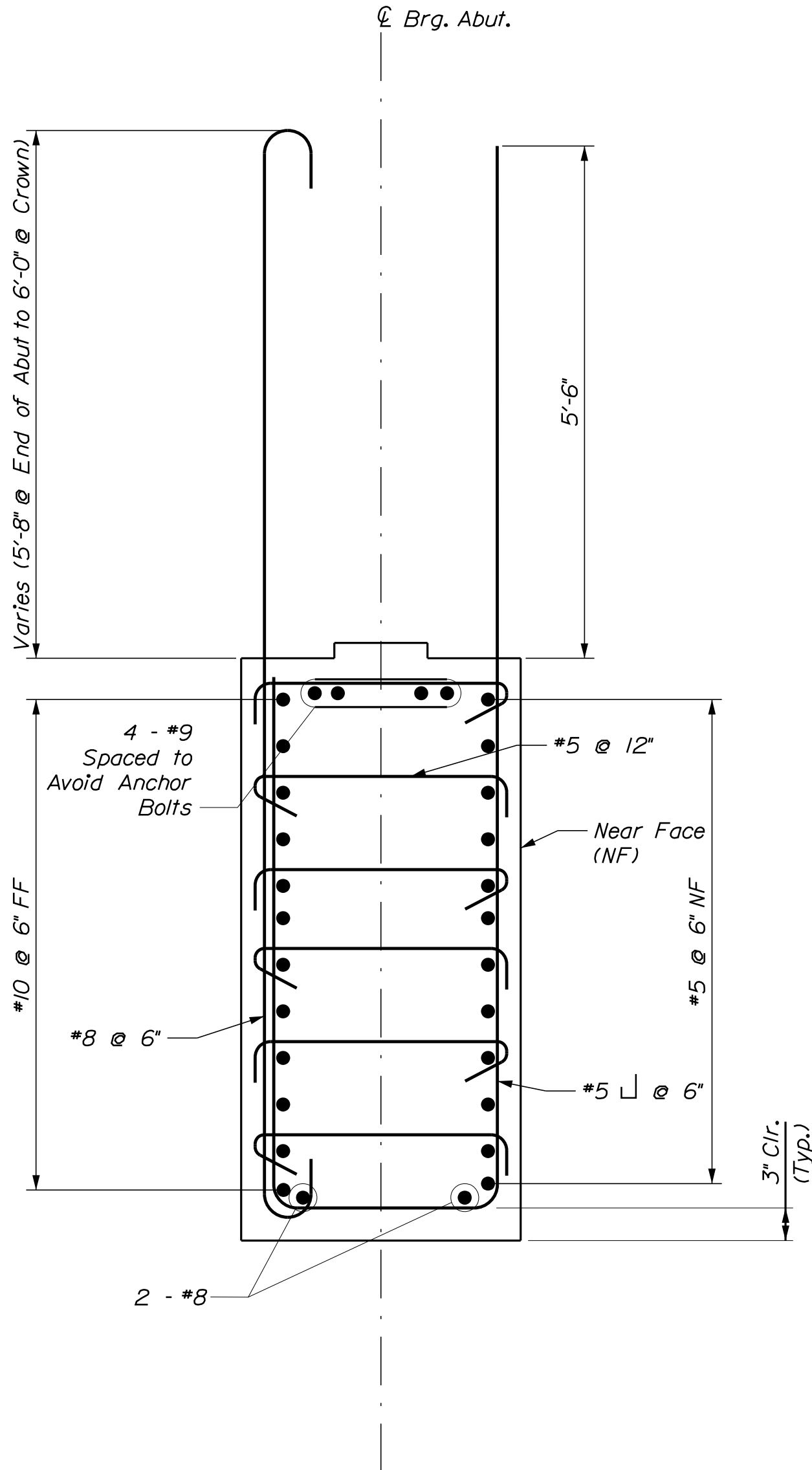
LLEWELLYN ESTES BRIDGES STILLWATER RIVER OLD TOWN PENOBSCOT COUNTY	STATE OF MAINE		
	DEPARTMENT OF TRANSPORTATION		
	2189401		
	BRIDGE NO. 1472 BRIDGE NO. 2806		
BRIDGE 2 ABUTMENT REINFORCING ELEVATION	SIGNATURE		
	P.E. NUMBER		
	DATE		
	FIELD CHANGES		
SHEET NUMBER		C13	
		OF C16	
		BRIDGE PLANS	



BRIDGE NO. 2 TYPICAL ABUTMENT SECTION
BETWEEN GIRDER/PILES



BRIDGE NO. 2 TYPICAL ABUTMENT SECTION
AT INTERIOR GIRDER/PILES

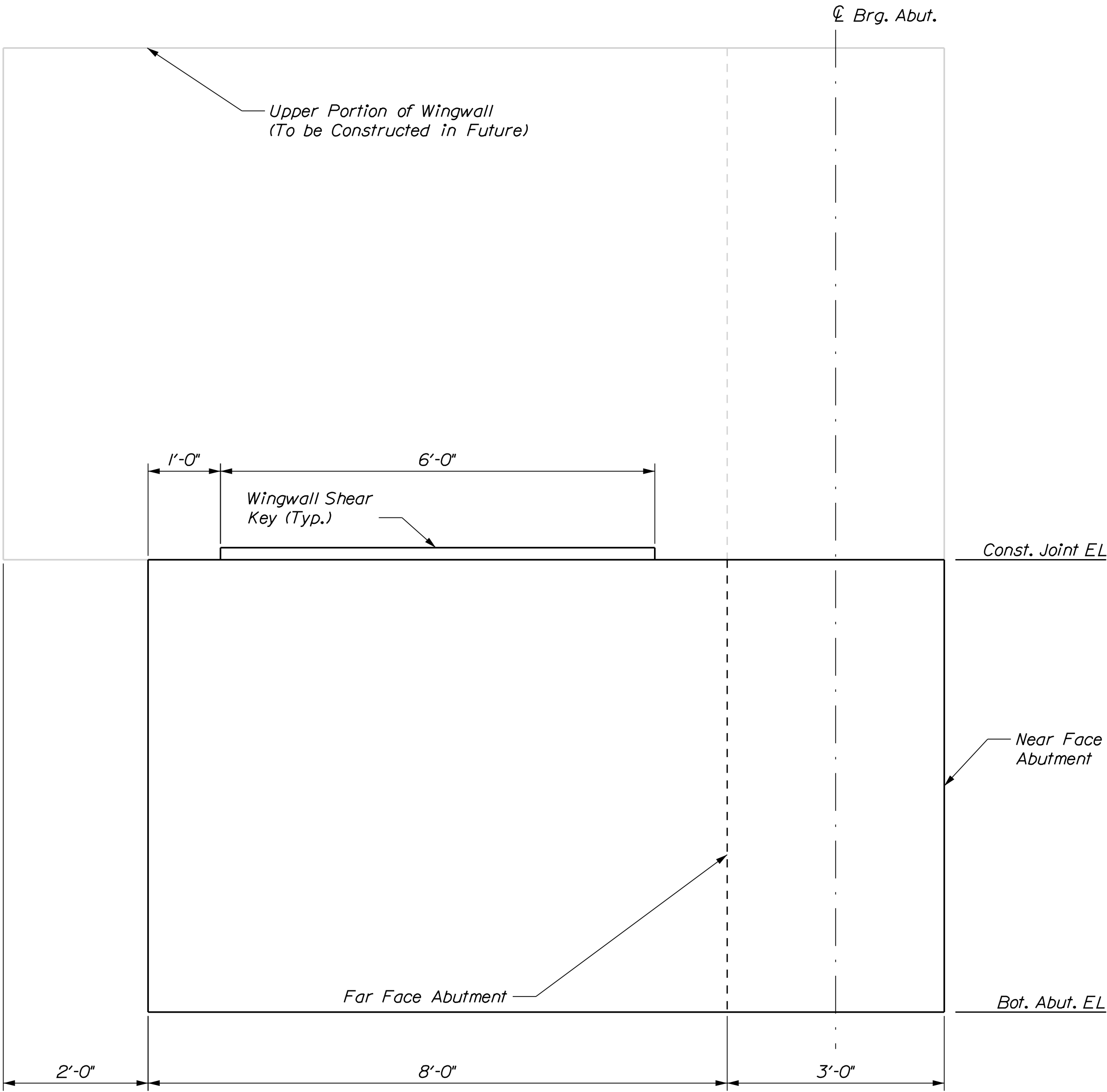


BRIDGE NO. 2 TYPICAL ABUTMENT SECTION
CANTILEVER
NOTES

1. Upper portion of abutment stem will be constructed in the future and is not shown for clarity.



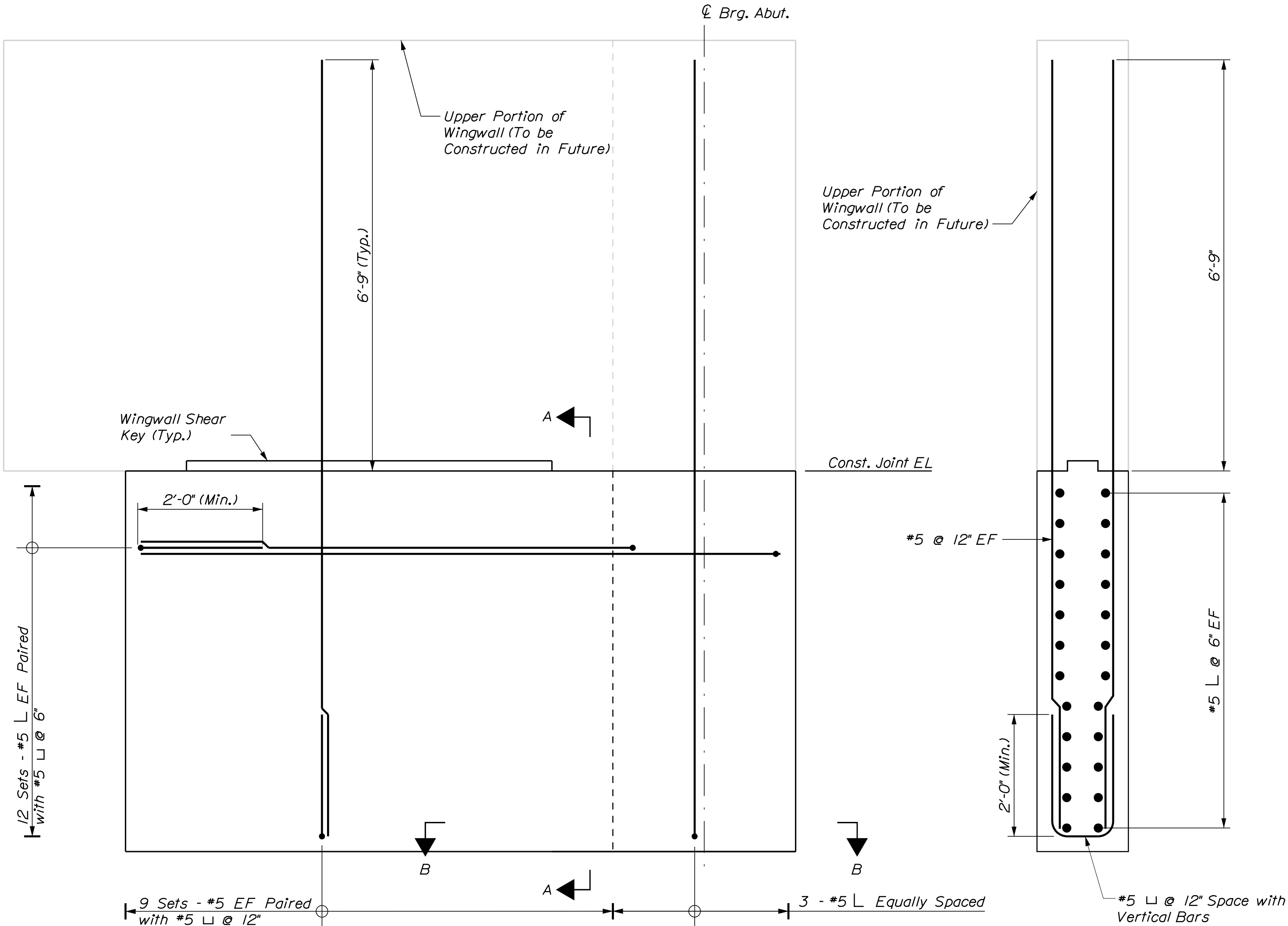
LLEWELLYN ESTES BRIDGES STILLWATER RIVER OLD TOWN PENOBSCOT COUNTY	STATE OF MAINE DEPARTMENT OF TRANSPORTATION		
	2189401		
	BRIDGE NO. 1472 BRIDGE NO. 2806		
	WIN 022512.01 WIN 022511.01		
BRIDGE 2 ABUTMENT REINFORCING SECTIONS	SIGNATURE	BY	DATE
	P.E. NUMBER		
	DATE		
	FIELD CHANGES		
SHEET NUMBER		BRIDGE PLANS	
C14		OF C16	



BRIDGE NO. 2 TYPICAL WINGWALL ELEVATION

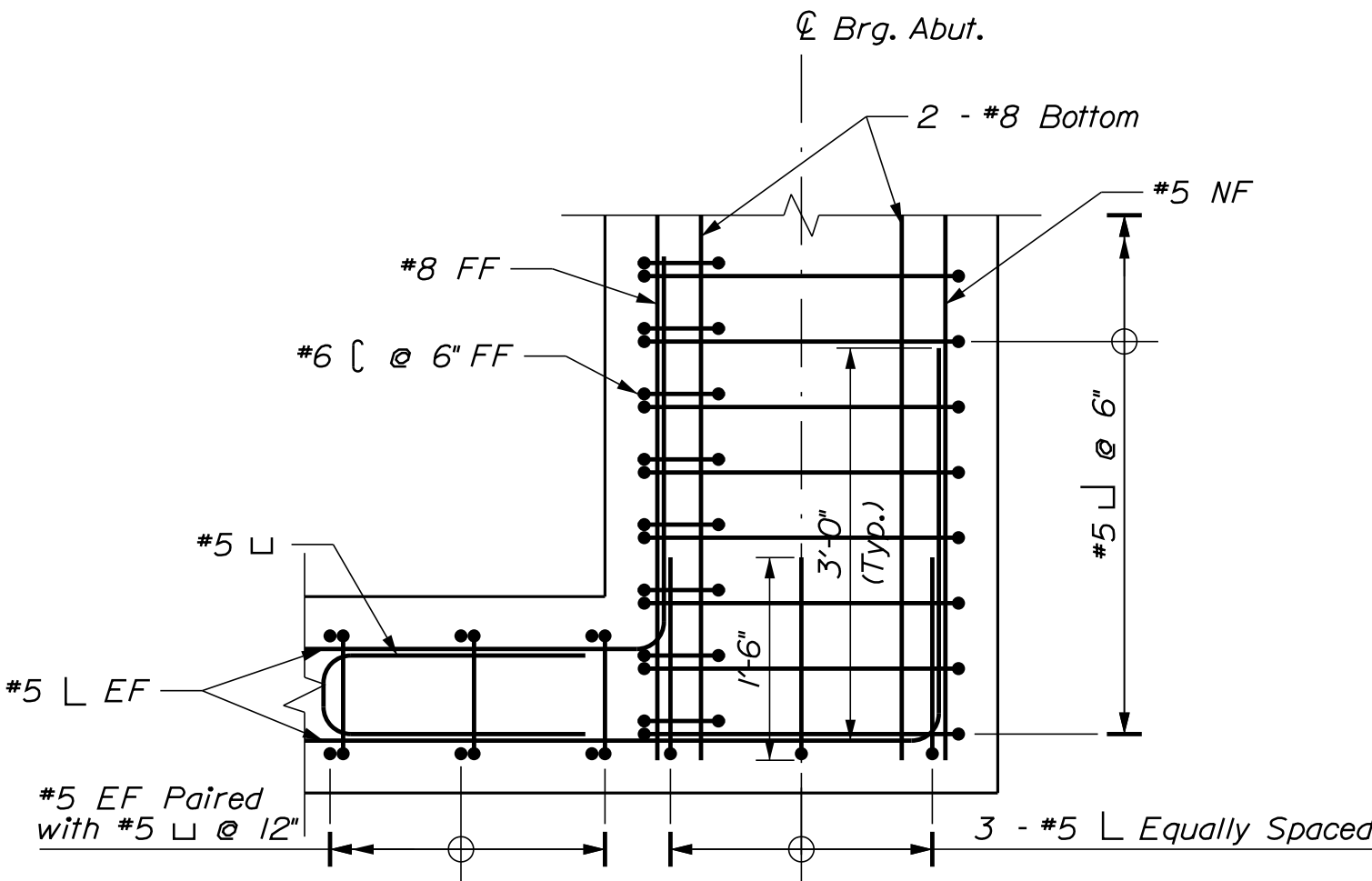
NOTES

1. Typical abutment/wingwall details for the anticipated completed abutment are shown for clarity; however, work associated with this ERP #6 includes construction of the Rock-Socketed H-Piles and the abutment/wingwalls up to the construction joint. Future work that is not part of this ERP #6 is shown for completeness in gray.



BRIDGE NO. 2 TYPICAL WINGWALL REINFORCEMENT ELEVATION
(Abutment Reinforcement not Shown for Clarity)

BRIDGE NO. 2 WINGWALL REINFORCEMENT
SECTION A-A



BRIDGE NO. 2 WINGWALL REINFORCEMENT
SECTION B-B



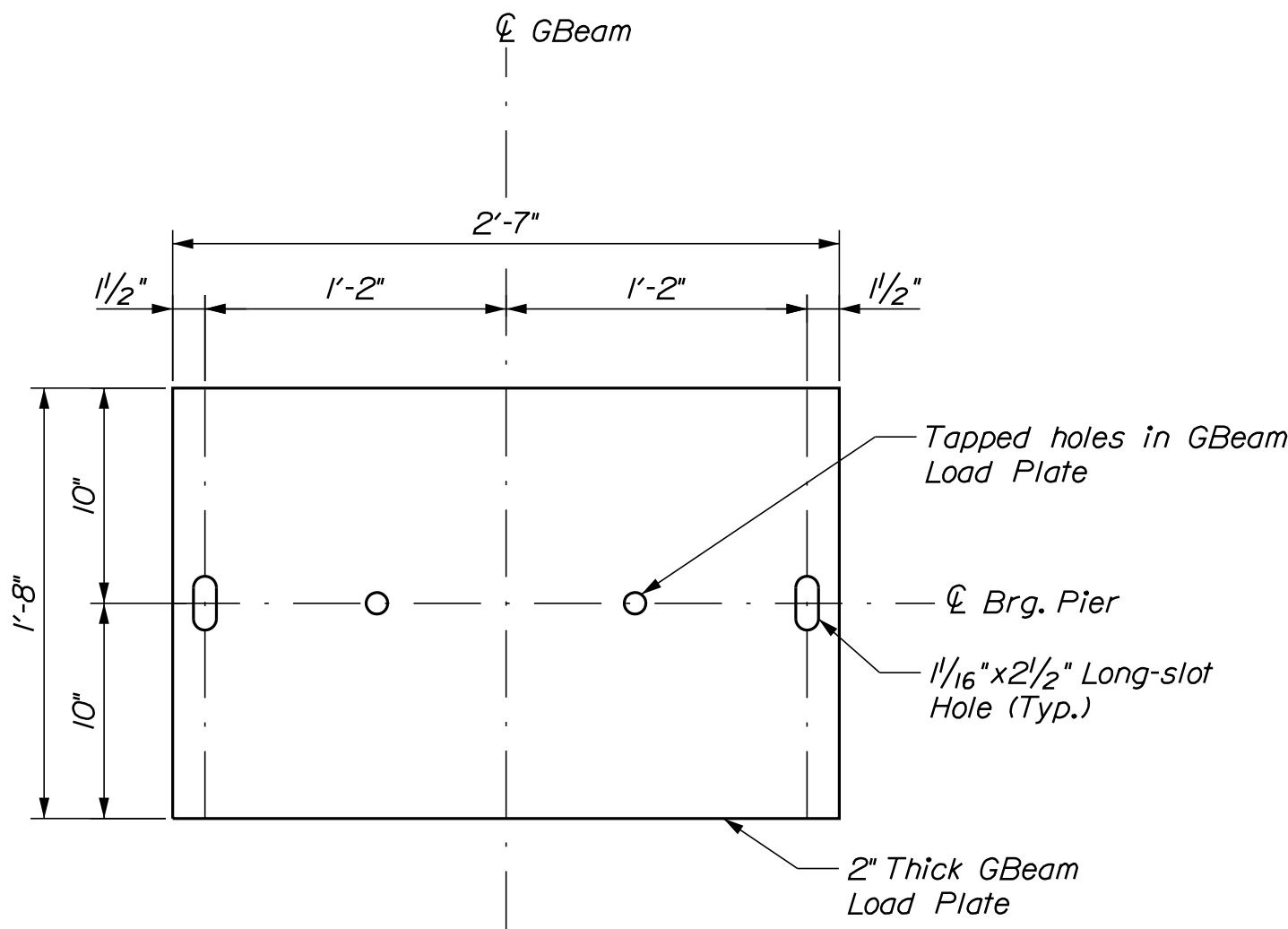
SHEET NUMBER C15 OF C16	LLEWELLYN ESTES BRIDGES STILLWATER RIVER OLD TOWN				PENOBSCOT COUNTY		PROJ. MANAGER ANDREW LATHE		BY	DATE	STATE OF MAINE DEPARTMENT OF TRANSPORTATION
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Date:1/24/2025

Username:

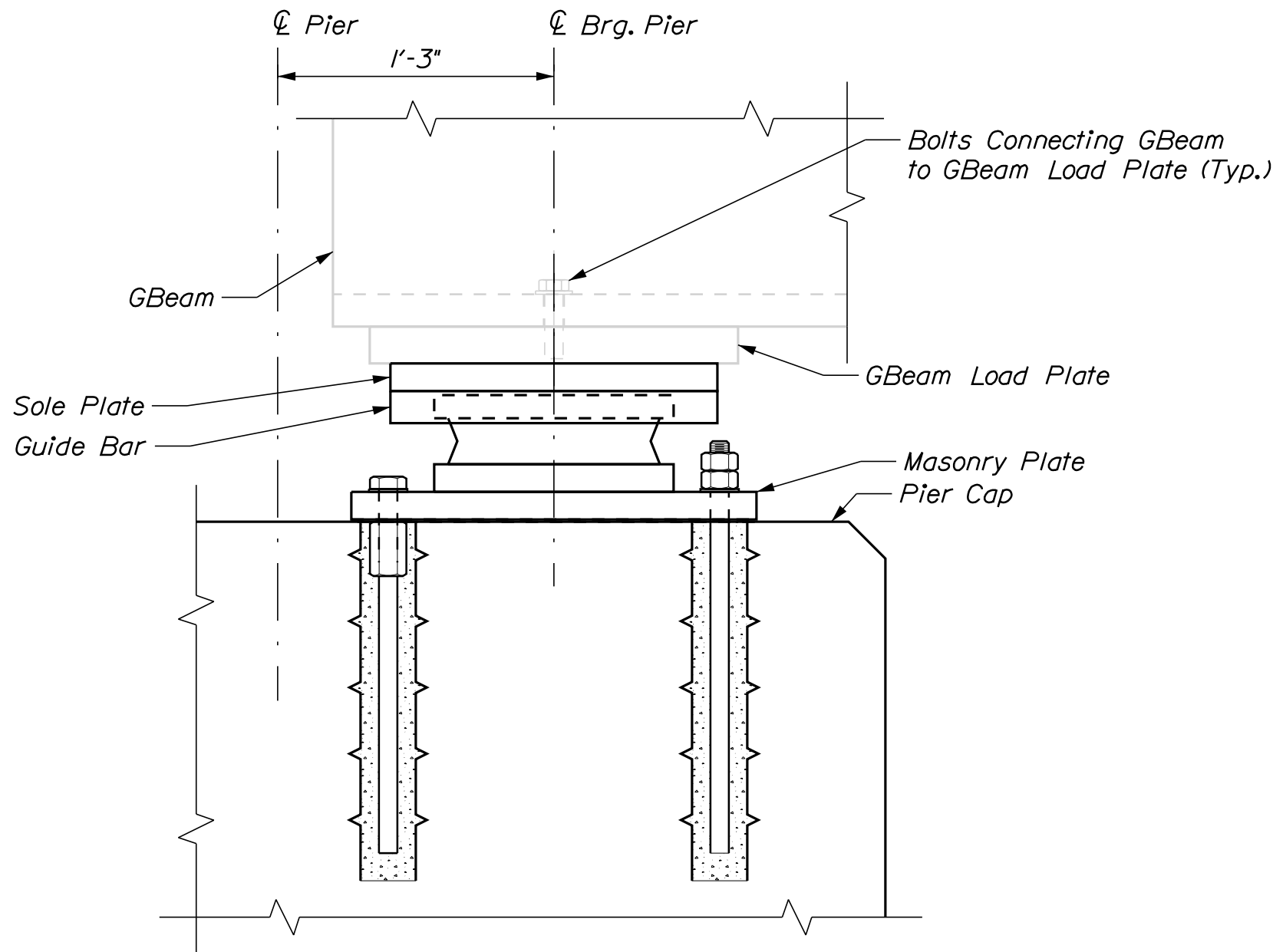
Division: BRIDGE

Filename: ... \C16_Br1_pierbrg.dgn

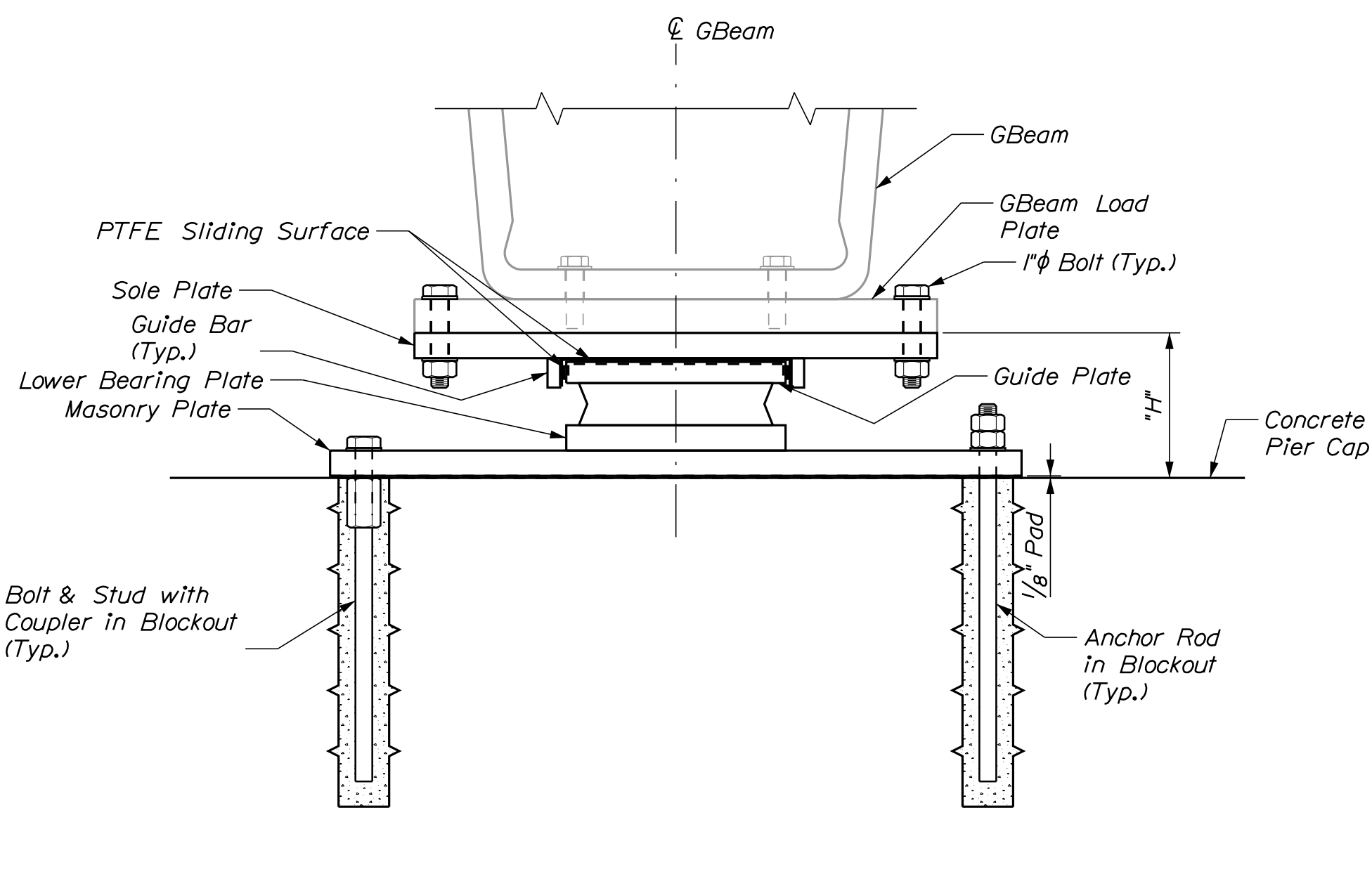


GBEAM LOAD PLATE - PLAN

(GBeam Load Plate provided by GBeam Manufacturer)



~ LONGITUDINAL ELEVATION ~



~ TRANSVERSE SECTION ~

UNI-DIRECTIONAL BEARING

DISC BEARING NOTES

- The actual dimension "H" shall be the responsibility of the Contractor. Dimensions and sizes of plates not shown are dependent on design loads, capacity, and the manufacturer of the bearings. The shop drawings, prepared by the manufacturer, shall provide all pertinent bearing information. The final top of pier cap elevations shall be determined by the Contractor and submitted with the shop drawings prior to construction of the piers.
- Masonry plates shall be placed on 1/8" thick preformed pads in accordance with the specifications.
- All steel, unless otherwise specified, shall meet the requirements of ASTM A709, Grade 50.
- Bearing anchorage shall be either Anchor Rod with double nuts and washers in blockouts, or Bolt & Stud with Coupler in breakout, at the Contractor's option, both options shown in details.
- Anchorage spacing shall be coordinated with the bearing manufacturer and shall satisfy the spacing requirements shown in the details.
- Anchor bolts shall meet the requiremetns of ASTM F3125, Grade A325, Type 1.
- Anchor rods shall meet the requirements of ASTM F1554, Grade 105 and shall be swedged on the embedded portion of the rod.
- Heavy hex nuts for anchor rods shall meet the requirements of ASTM A563, Grade D or DH.
- Anchor bolts, rods, washers, and nuts shall be galvanized to ASTM A153 or ASTM B695, Class 50, Type 1. Payment for galvanizing will be considered incidental to the disc bearing pay items.
- Bearings shall be coated in accordance with Standard Specifications Section 506, Protective Coating - Steel (Thermal Spray Coating). Payment for Coatings for Disc Bearings will be considered incidental to the disc bearing pay items.
- The abbreviation "PTFE" indicates polytetrafluoroethylene.
- All PTFE, including guide and restraint surfaces, shall be unfilled.
- PTFE minimum bearing pressure shall be 1 ksi under total service loading and 3 ksi under total strength loading.
- Average compressive stresses on the disc shall be computed using the minimum plan area of the unstressed disc, excluding the area of any holes.
- The design temperature range shall be 150°F (-30°F to 120°F).
- Design of the sole plates and masonry plates is the responsibility of the Bearing Manufacturer. Payment for these shall be considered incidental to the disc bearing pay items.
- The minimum thickness of the sole plate and masonry plate shall not be less than 1/2".
- Strength Limit State rotations shown in the Disc Bearing Design Table do not include an allowance for uncertainties of 0.01 radians, as defined in AASHTO LRFD Bridge Design Specifications, 9th Edition 2020.
- Anchor rods shall have a minimum embedment of 18 inches below the top of pier cap.
- Bearings shall be designed with a thermal load factor of 1.2.
- Longitudinal horizontal forces do not include friction forces at expansion bearings.
- All bearings shall be marked prior to shipping. The marks shall include the bearing location on the bridge(s), and a direction arrow that points upstation. All marks shall be permanent and shall be visible after the bearing is installed. Bearings shall be restrained during transit.
- Bearing installation shall be in strict conformance with the Standard Specifications and the manufacturer's recommendations.
- The GBeam, GBeam Load Plate, and bolts connecting the GBeam to the GBeam Load Plate shall be supplied by the GBeam manufacturer.
- The bearing manufacturer is responsible for the design and fabrication of the disc bearing assembly that shall be detailed to connect to the GBeam Load Plate using 1" ASTM F3125, Grade A325, Type 1 bolts. Bolts connecting the GBeam Load Plate to the disc bearing sole plate shall be supplied by the bearing manufacturer.
- Unfactored design rotations are provided in the table below. Non-composite dead load rotation - Stage 1 considers the non-composite rotation due to GBeam and wet concrete induced dead load rotations from the first deck placement (mid-span region). Non-composite dead load rotation - Stage 2 considers the beam end rotations attributed to the second deck placement (negative moment regions), considering the partially composite deck placed in Stage 1.
- The bolts connecting the GBeam Load Plate to the disc bearing sole plate shall be installed with a 1/4" gap between washer and bottom of sole plate prior to the Stage 1 deck pour. At the completion of the Stage 2 deck pour, tighten nuts.
- Uni-directional bearings shall allow 1/4"* of movement prior to guide engagement. All bearings shall satisfy the minimum rotation value in the Standard Specifications.
- Anchor rods shall be grouted in place using a material listed on the MaineDOT Qualified Product List of Concrete Anchoring Systems.

DISC BEARING DESIGN TABLE																		
Location	Bearing Type	Design Load Per Bearing (kips)											Assumed Bearing Height (H) (in.) (See Note 1)	Design Rotations - Service (radians)			Long. Displacement (in.)	
		Vertical Design Loads						Horizontal Design Loads						Non-Comp DL Rotation (Stage 1)	Non-Comp DL Rotation (Stage 2)	Superimposed Dead + Live Rotation	Disp. Due to Beam End Rotation	Disp. Due to One-Way Thermal
		Strength (Total Load)	Extreme Event (Total Load)	Service			Strength		Extreme Event		Service							
				Dead Load	Max. Live Load	Min. Live Load	Long.	Trans.	Long.	Trans.	Long.	Trans.						
Bridge 1 Pier	Uni-Directional	305	133	87	93	0	0	8	0	42	0	8	8.625	0.0130	0.0024	0.0062	0.37	0.00
Bridge 2 Piers	Uni-Directional	345	157	107	100	-17	0	10	0	50	0	10	8.625	0.0179	0.0030	0.0077	0.50	0.50



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
2189401
BRIDGE NO. 1472
BRIDGE NO. 2806
BRIDGE PLANS

PROJ. MANAGER ANDREW LATHE
DESIGN-DETAILED G. ERICKSON
CHECKED-REVIEWED T. POLSON
DESIGN-DETAILED T. POLSON
REVISIONS 1
REVISIONS 2
REVISIONS 3
REVISIONS 4
FIELD CHANGES

DATE 12/2024
BY W. GERHOLD
T. POLSON
SIGNATURE
P.E. NUMBER
DATE

LLEWELLYN ESTES BRIDGES
STILLWATER RIVER
PENOBSCOT COUNTY
OLD TOWN
PIER BEARING DETAILS

SHEET NUMBER
C16
OF C16