

Date:7/17/2024

Username:

Division: BRIDGE

Filename:\081_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

BASIC DESIGN STRESSES

Concrete:
 Class "A" f 'c = 5,000 psi

Reinforcing:
 Low-Carbon Chromium Steel f y = 100,000 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 of Drilled Shaft Pier Bents.

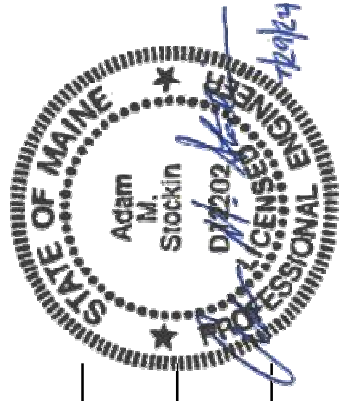
WIN 022511.01 022512.01

OLD TOWN
STILLWATER AVENUE
TITLE SHEET

SHEET NUMBER

B1

OF B10



SIGNATURE
P.E. NUMBER
DATE

PROJECT INFORMATION	PROGRAM	PROJECT MANAGER	DESIGNER	CONSULTANT	PROJECT RESIDENT	CONTRACTOR	PROJECT COMPLETION DATE
	BRIDGE	ANDREW LATHE	ADAM STOCKIN	WSP USA			

STATE OF MAINE DEPARTMENT OF TRANSPORTATION	APPROVED	COMMISSIONER:	CHIEF ENGINEER:
DATE			

ESTIMATED QUANTITIES			
ITEM NO.	DESCRIPTION	QUANTITY	UNIT
202.104	REMOVE EXISTING SUBSTRUCTURE - BRIDGE 2 PIER NO. 2	1	LS
203.2318	DISPOSAL OF SPECIAL WASTE	260	T
501.8016	4.5 FOOT DIAMETER DRILLED SHAFT	210	LF
501.804	DRILLING EQUIPMENT MOBILIZATION	1	LS
501.807	REMOVAL OF OBSTRUCTIONS	1	HR
501.82	CROSSHOLE SONIC LOGGING TESTING	1	EA
501.831	DRILLED SHAFT, ROCK SOCKET (4.5 FT DIA.)	153	LF
501.85	CORING OF DRILLED SHAFTS WITHOUT DEFECTS	1	LF
502.239	STRUCTURAL CONCRETE PIERS - BRIDGE 1 (48 CY)	1	LS
502.239	STRUCTURAL CONCRETE PIERS - BRIDGE 2 (96 CY)	1	LS
503.19	LOW-CARBON, CHROMIUM REINFORCEMENT, FABRICATED & DELIVERED - PIER BRIDGE 1	9,020	LB
503.19	LOW-CARBON, CHROMIUM REINFORCEMENT, FABRICATED & DELIVERED - PIER BRIDGE 2	18,040	LB
503.20	LOW-CARBON, CHROMIUM REINFORCEMENT, PLACING - PIER BRIDGE 1	9,020	LB
503.20	LOW-CARBON, CHROMIUM REINFORCEMENT, PLACING - PIER BRIDGE 2	18,040	LB
515.21	PROTECTIVE COATING FOR CONCRETE SURFACES - PIER BRIDGE 1 (110 SY)	1	LS
515.21	PROTECTIVE COATING FOR CONCRETE SURFACES - PIER BRIDGE 2 (210 SY)	1	LS
639.21	FIELD OFFICE, TYPE D	1	EA
659.10	MOBILIZATION	1	LS
801.05	PREINSULATED SEWER PIPE MATERIALS ONLY, 6-INCH	1	LS
801.13	SEWER FORCE MAIN, MATERIALS ONLY 6"	1	LS
830.132	SEWER MAIN BRIDGE CROSSING MATERIALS ONLY	1	LS



PROJ. MANAGER	ANDREW LATHE	BY	DATE
DESIGN-DETAILED	G. ERICKSON	G. ERICKSON	6/2024
CHECKED-REVIEWED	T. POLSON	T. POLSON	6/2024
DESIGNS-DETAILED2			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

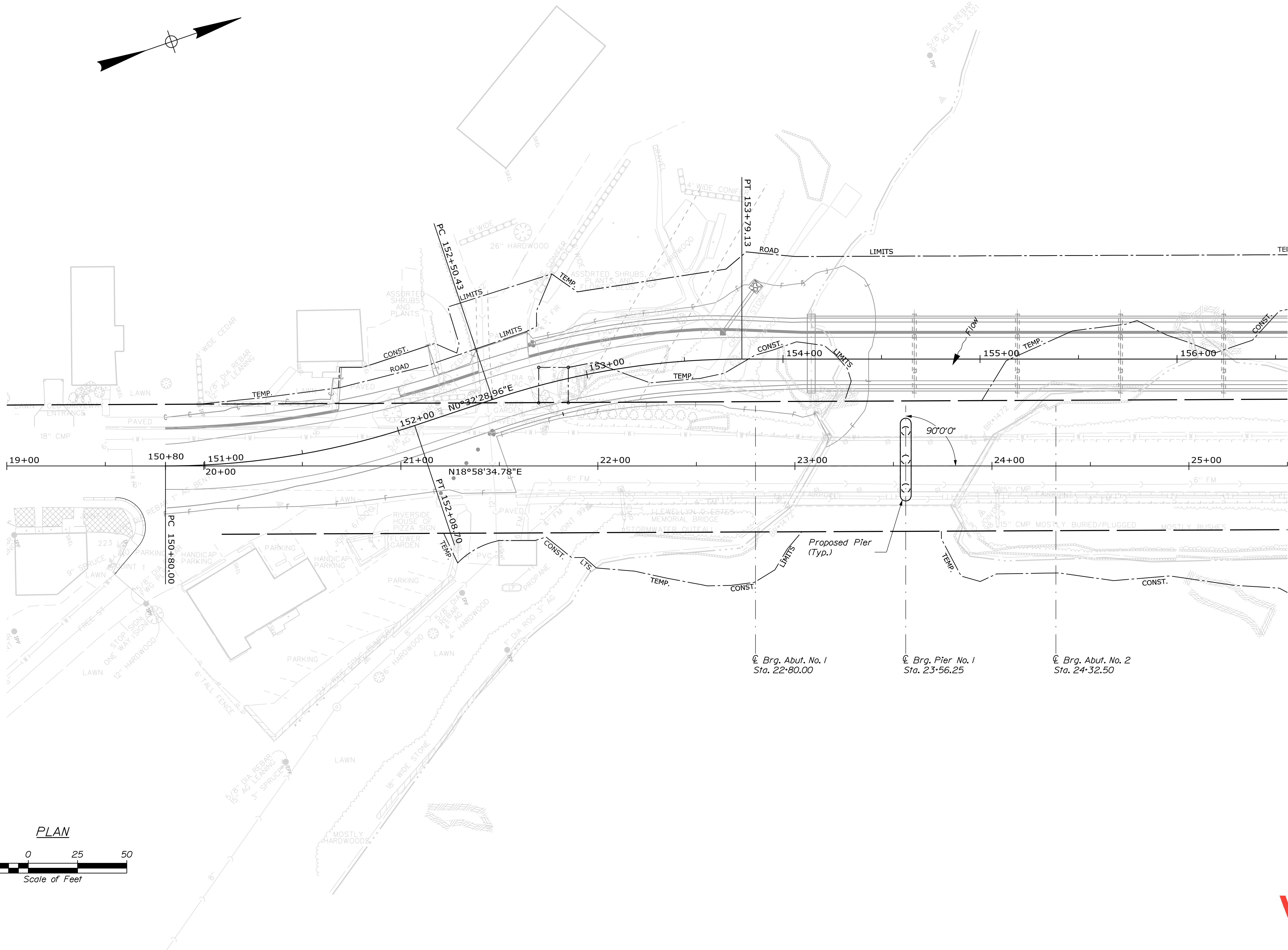
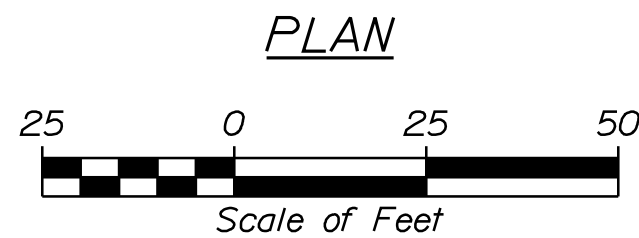
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Date:7/17/2024

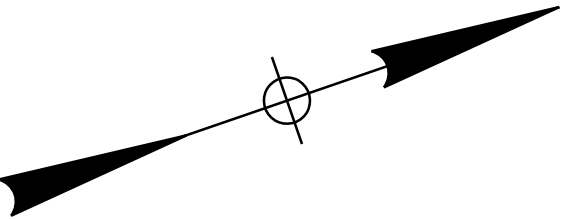
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Division: BRIDGE

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STATE OF MAINE		DEPARTMENT OF TRANSPORTATION	
2189401		SIGNATURE	
BRIDGE NO. 1472 BRIDGE NO. 2806		P.E. NUMBER	
WIN 022512.01 WIN 022511.01		DATE	
BRIDGE PLANS		FIELD CHANGES	
LLEWELLYN ESTES BRIDGES STILLWATER RIVER OLD TOWN PENOBSCOT COUNTY		SHEET NUMBER	
GENERAL PLAN		B3	
		OF B10	

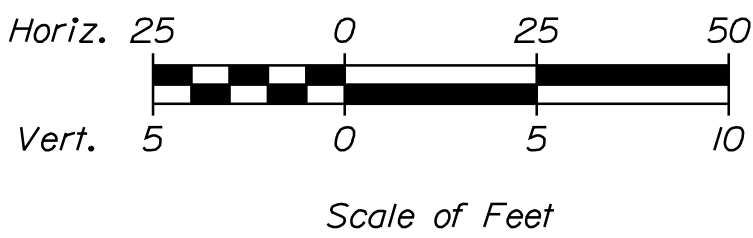
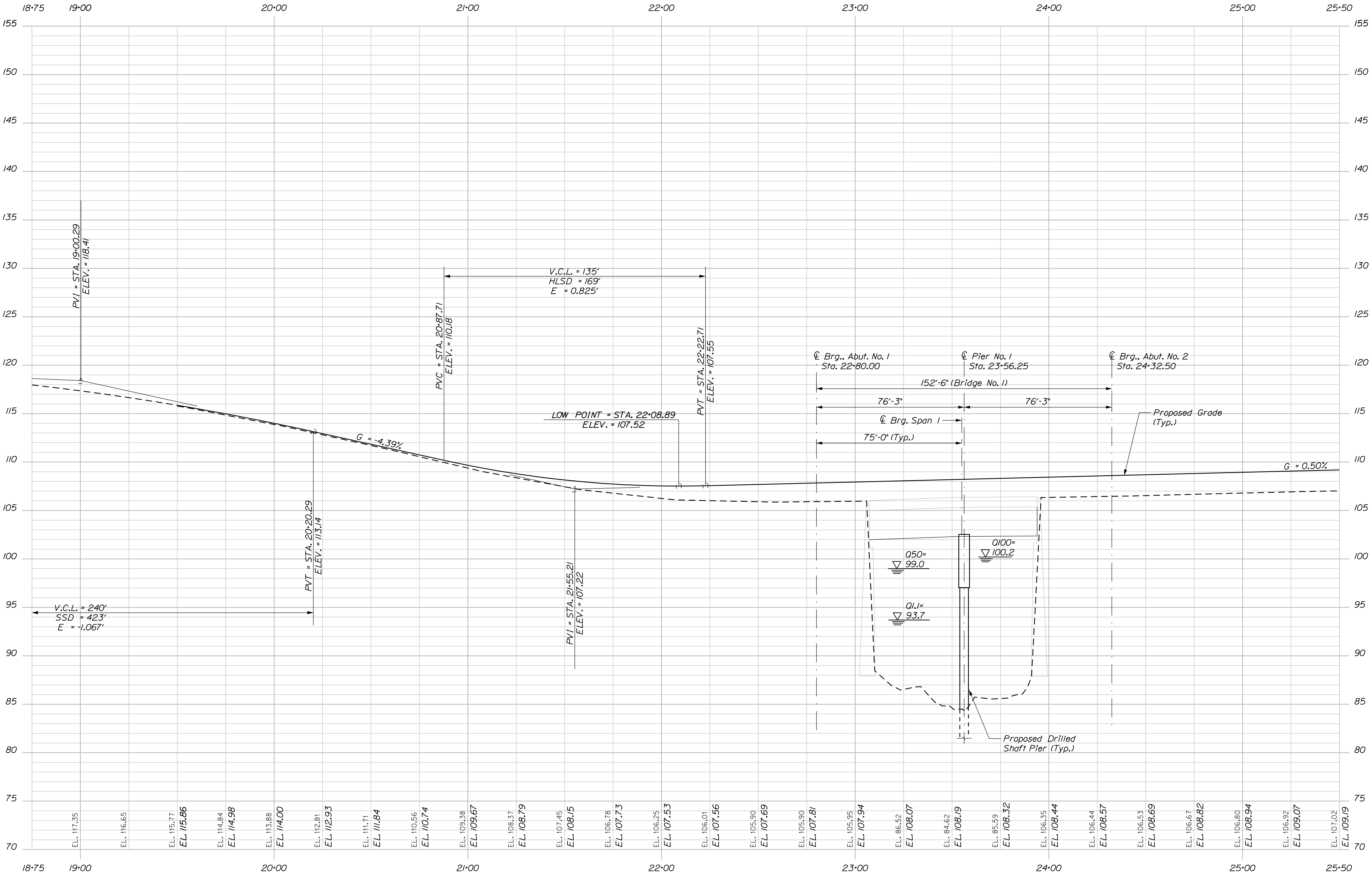


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SHEET NUMBER

B4

OF B10



Note: Profile provided for information only.



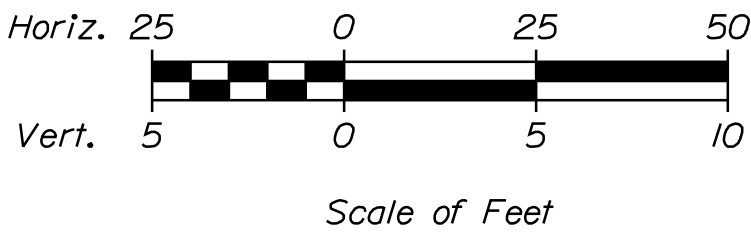
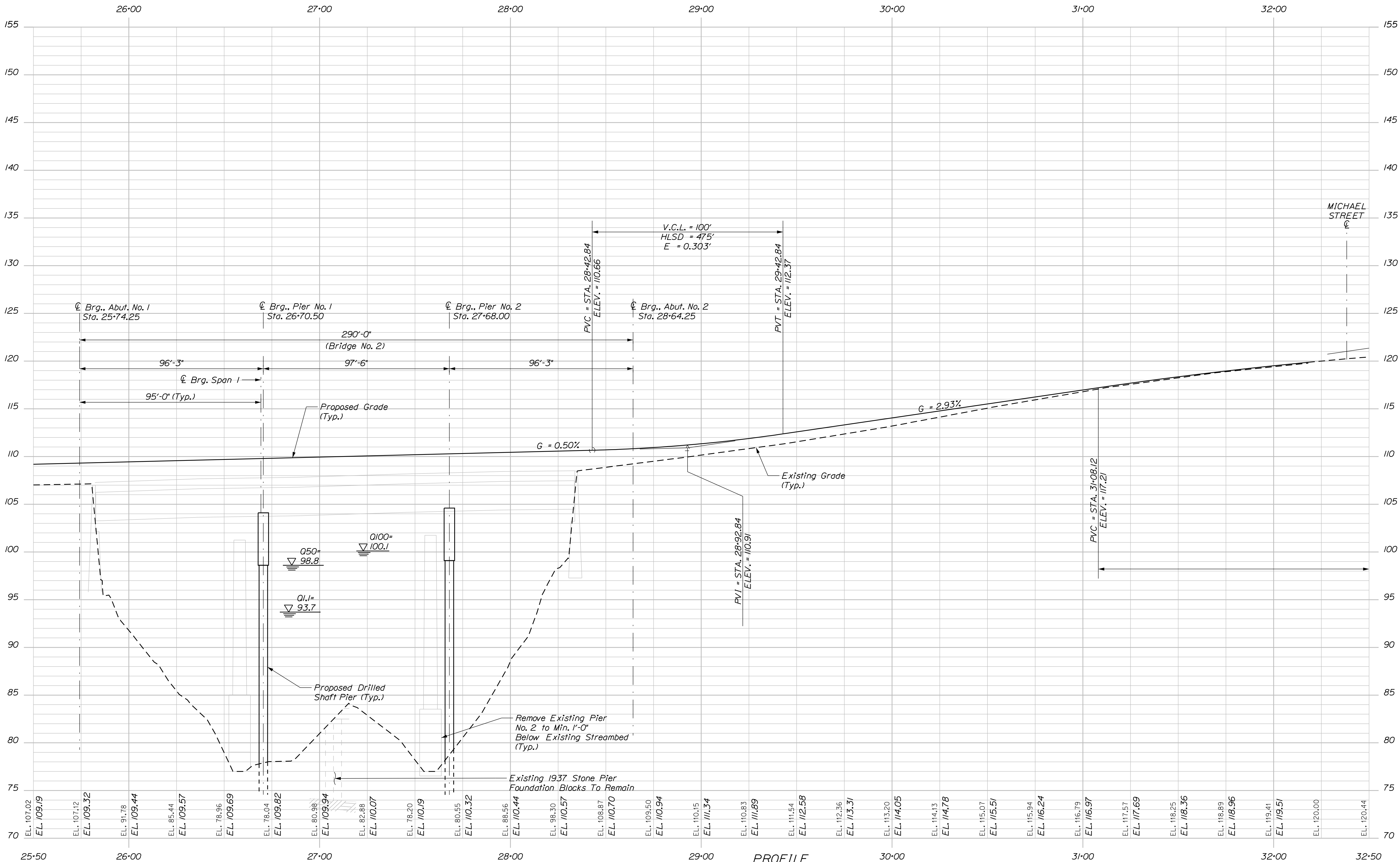
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	P.E. NUMBER					
LLEWELLYN ESTES BRIDGES STILLWATER RIVER PENOBSCOT COUNTY OLD TOWN		DATE		SHEET NUMBER		
PROFILE		DATE		B5 OF B10		

Date:7/17/2024

Username:

Division: BRIDGE

Filename: ... \0B6_Profile_02.dgn



Note: Profile provided for information only.



STATE OF MAINE		DATE		BY		PROJ. MANAGER	
DEPARTMENT OF TRANSPORTATION		6/2024		J. KHERA		ANDREW LATHE	
2189401		SIGNATURE				DESIGN-DETAILED	
BRIDGE NO. 1472		P.E. NUMBER				DESIGN-REVIEWED	
BRIDGE NO. 2806		DATE				DESIGN-DETAILED	
WIN 022512.01						REVISIONS 1	
WIN 022511.01						REVISIONS 2	
BRIDGE PLANS						REVISIONS 3	
						REVISIONS 4	
						FIELD CHANGES	
LLEWELLYN ESTES BRIDGES		PROFILE					
STILLWATER RIVER							
OLD TOWN		SHEET NUMBER					
PENOBSCOT COUNTY		B6					
		OF B10					

PIER DESIGN CRITERIA

1. Controlling AASHTO Load Combination - Extreme Event Limit State.
2. Stream flow:

Velocity of 14.1 fps @ Q50 skewed at 30° to longitudinal centerline of pier for Bridge No. 1.

Velocity of 14.2 fps @ Q50 skewed at 30° to longitudinal centerline of pier for Bridge No. 2.
4. Wind: 115 mph.
5. Ice:

Q1.1 - Thickness 1'-6", pressure 200 psi at EL. 93.7 (Modified Strength & Extreme Event II)

Q50 - Thickness 2'-6", pressure 100 psi at EL. 99.0 (Extreme Event II)

30% of nose force applied transverse to pier.

PIER NOTES

1. The bearing area shall be dressed in accordance with Standard Specifications subsection 523.09 prior to installation of the bearings.
2. Reinforcing steel shall have a minimum concrete cover of 2 inches unless otherwise noted.
3. Pier cap reinforcing steel shall conform to ASTM A1035, Alloy Type CS, Grade 100.
4. Concrete for pier caps shall be Class A, with a minimum compressive strength of 5,000 psi.
5. Protective Coating for Concrete Surfaces shall be applied to all exposed surfaces of the concrete pier caps.

DRILLED SHAFT NOTES

1. The maximum factored shaft load is 1178 kips for Bridge No. 1 and 1424 kips for Bridge No. 2.
2. Each drilled shaft shall be constructed in a single concrete placement from bottom of rock socket to top of FRP Composite Casing. Concrete shall be Class A, with a minimum compressive strength of 5,000 psi.
3. Thermal Integrity Profiling (TIP) testing is required at all pier drilled shaft drilling locations, refer to Special Provision 501, Drilled Shafts for inspection and integrity testing requirements and procedures.
4. The bedrock surface and rock socket elevations indicated are estimates only. The bedrock surface and rock socket length at each drilled shaft shall be approved by the Resident.



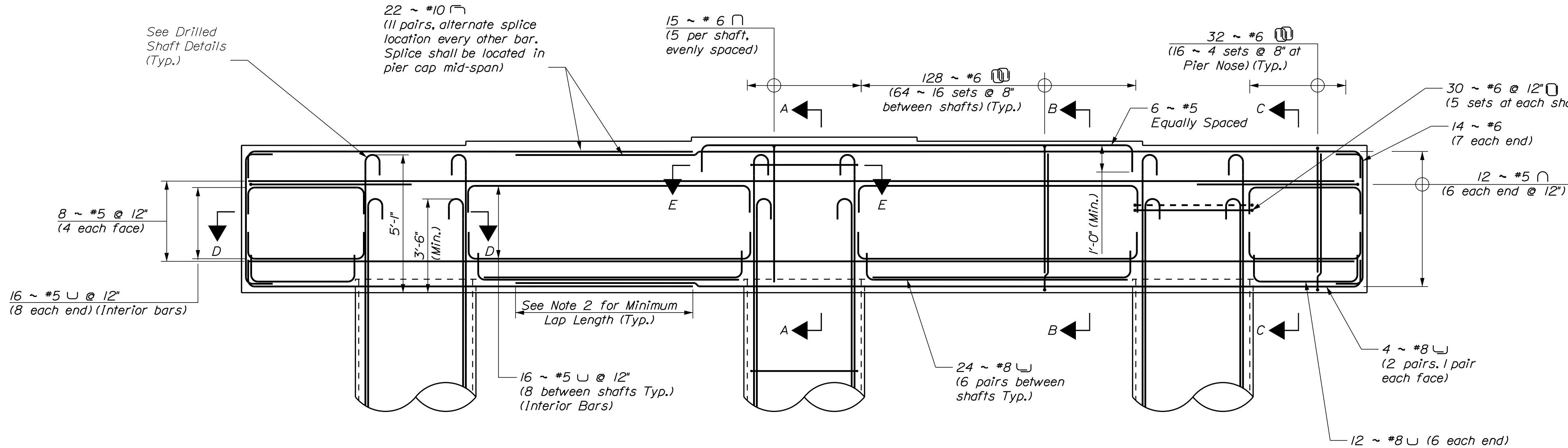
LLEWELLYN ESTES BRIDGES STILLWATER RIVER OLD TOWN PENOBSCOT COUNTY PIER NOTES	SHEET NUMBER		STATE OF MAINE DEPARTMENT OF TRANSPORTATION	
	B7		2189401	
	OF B10		BRIDGE NO. 1472 BRIDGE NO. 2806 WIN 022512.01 WIN 022511.01 BRIDGE PLANS	

PROJ. MANAGER	ANDREW LATHE	BY	DATE
DESIGNED-DETAILED	E. CARON	E. CARON	6/2024
CHECKED-REVIEWED	T. POLSON	T. POLSON	6/2024
DESIGNS-DETAILED			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

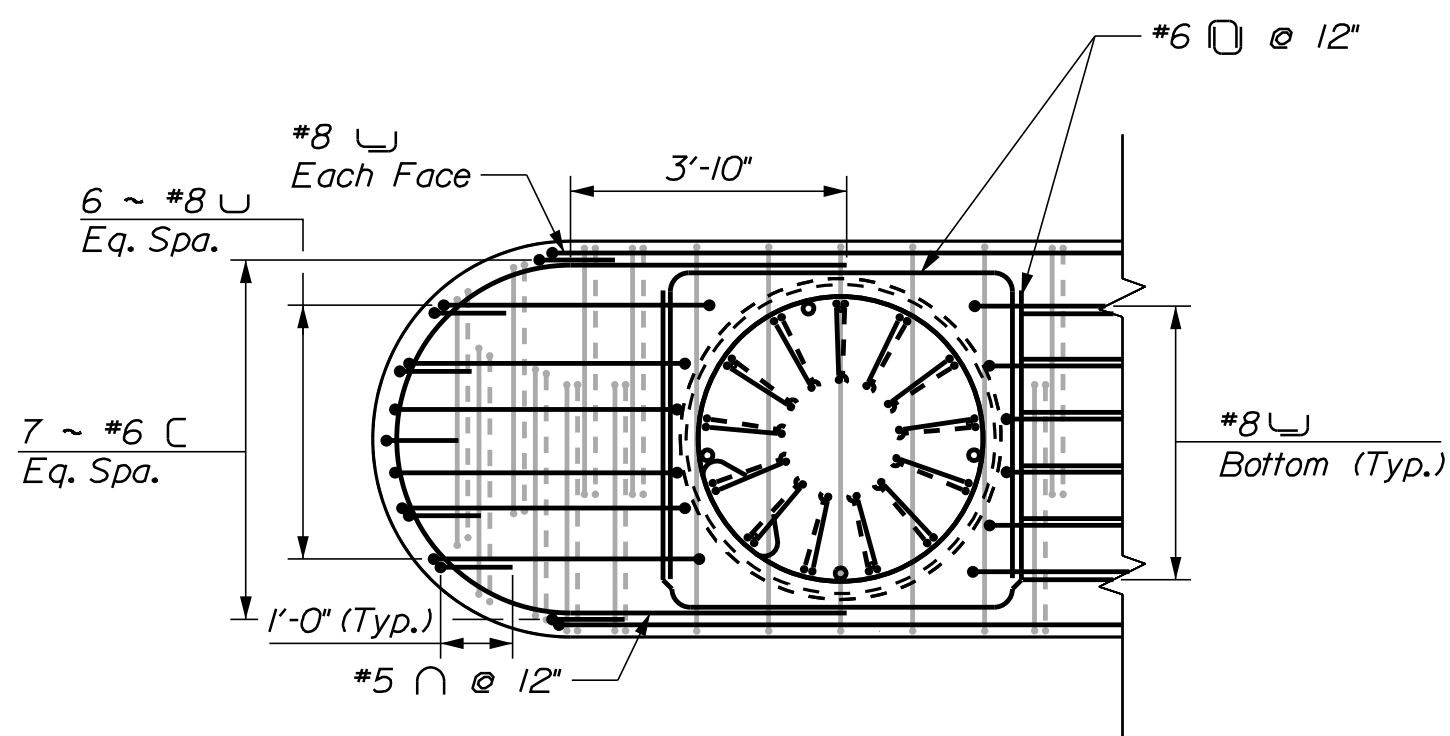
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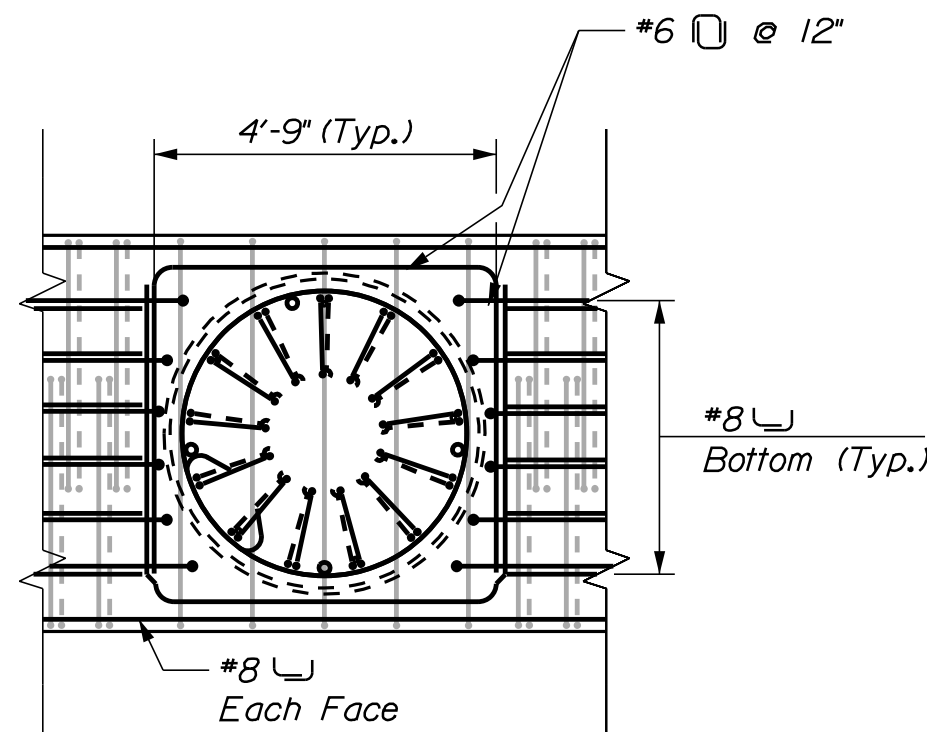
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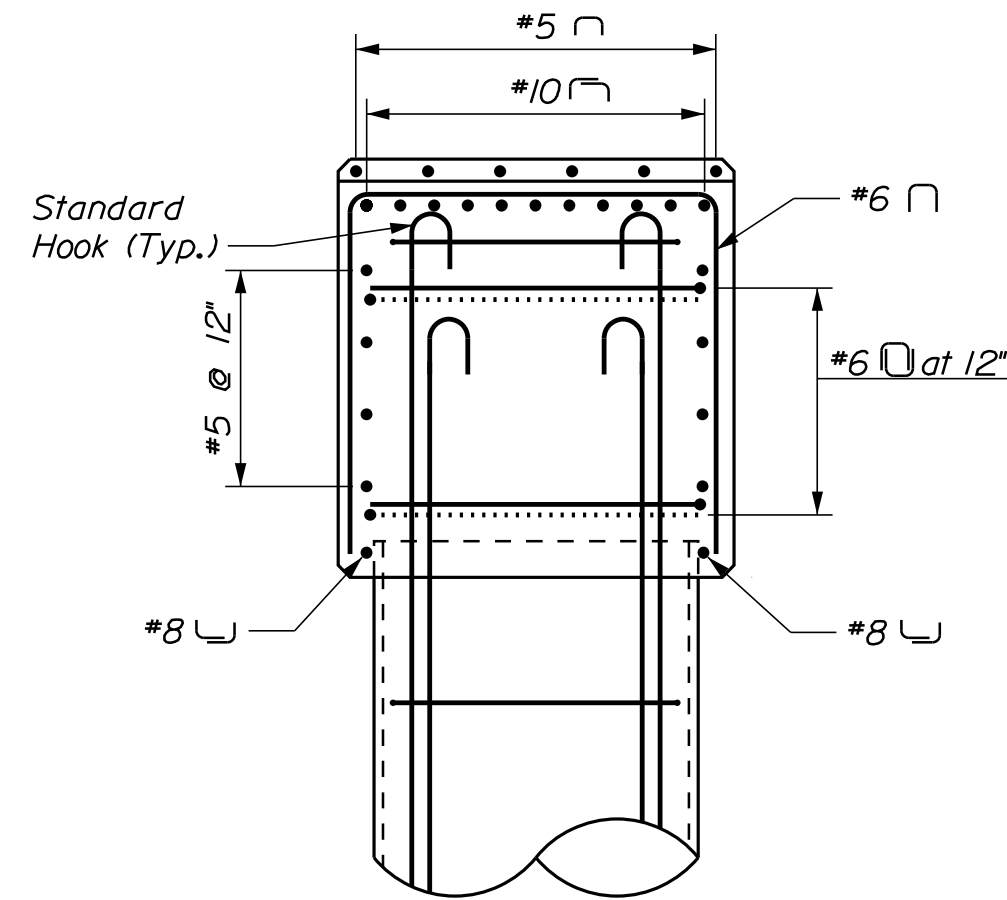
PIER REINFORCING ELEVATION



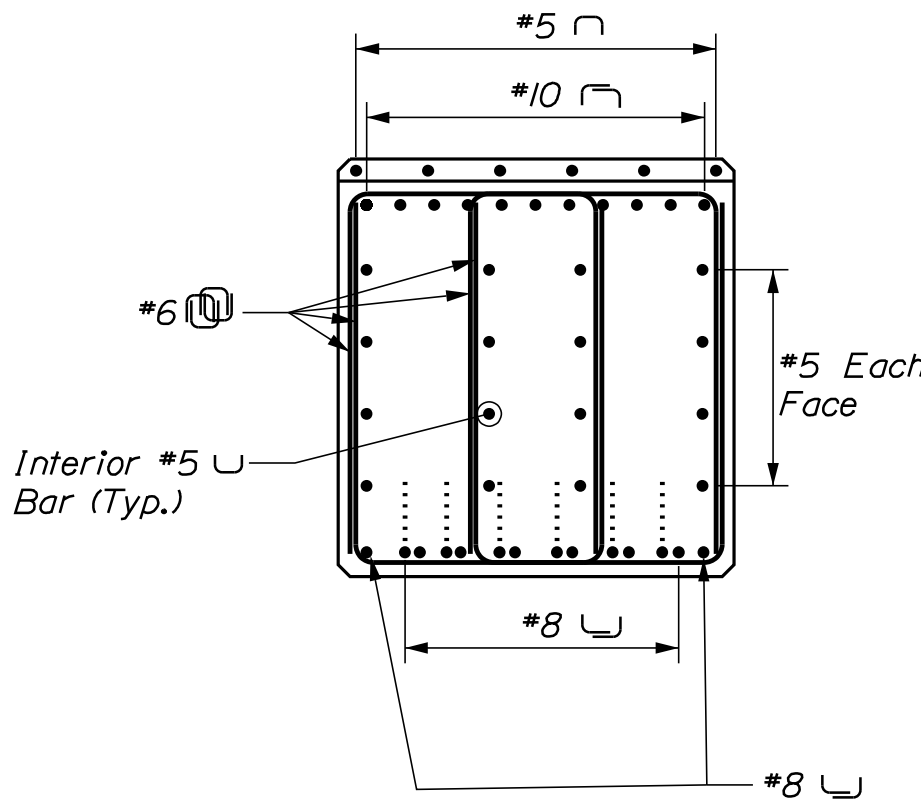
SECTION D-D
Stirrup Reinforcement Screened for Clarity
(Bridge No. 1 DS Rebar Layout Shown,
See Drilled Shaft Details for Bridge No. 2)



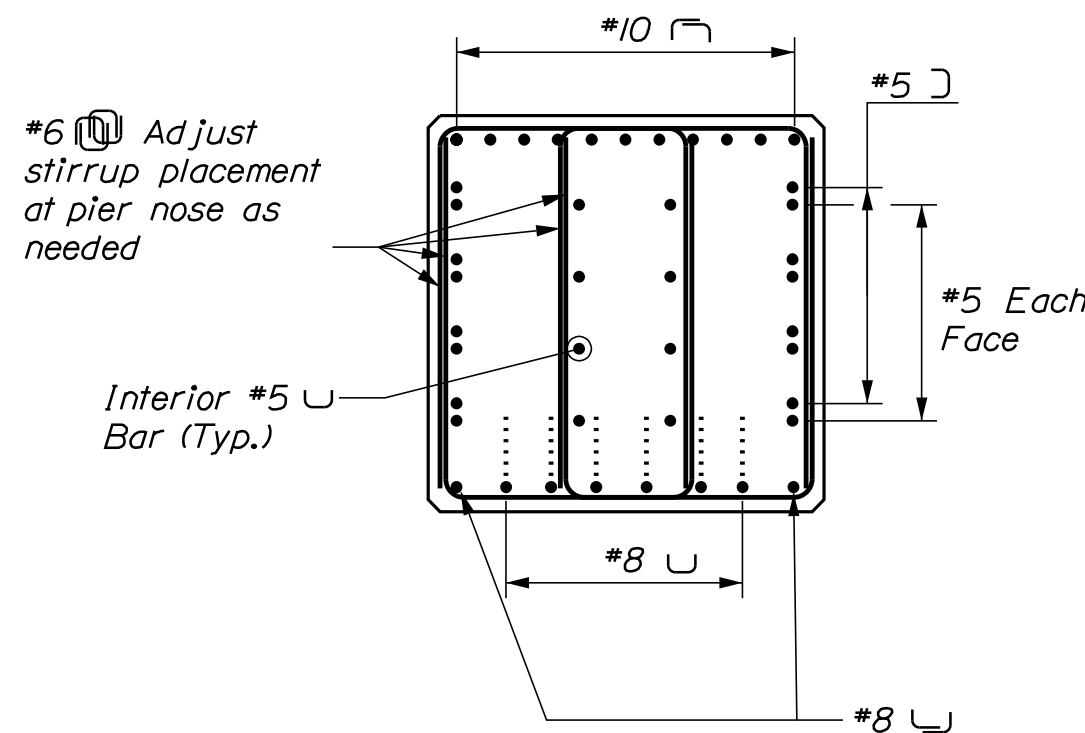
SECTION E-E
Top Horizontal Reinforcement Omitted for Clarity
Stirrup Reinforcement Screened for Clarity
(Bridge No. 1 DS Rebar Layout Shown,
See Drilled Shaft Details for Bridge No. 2)



SECTION A-A



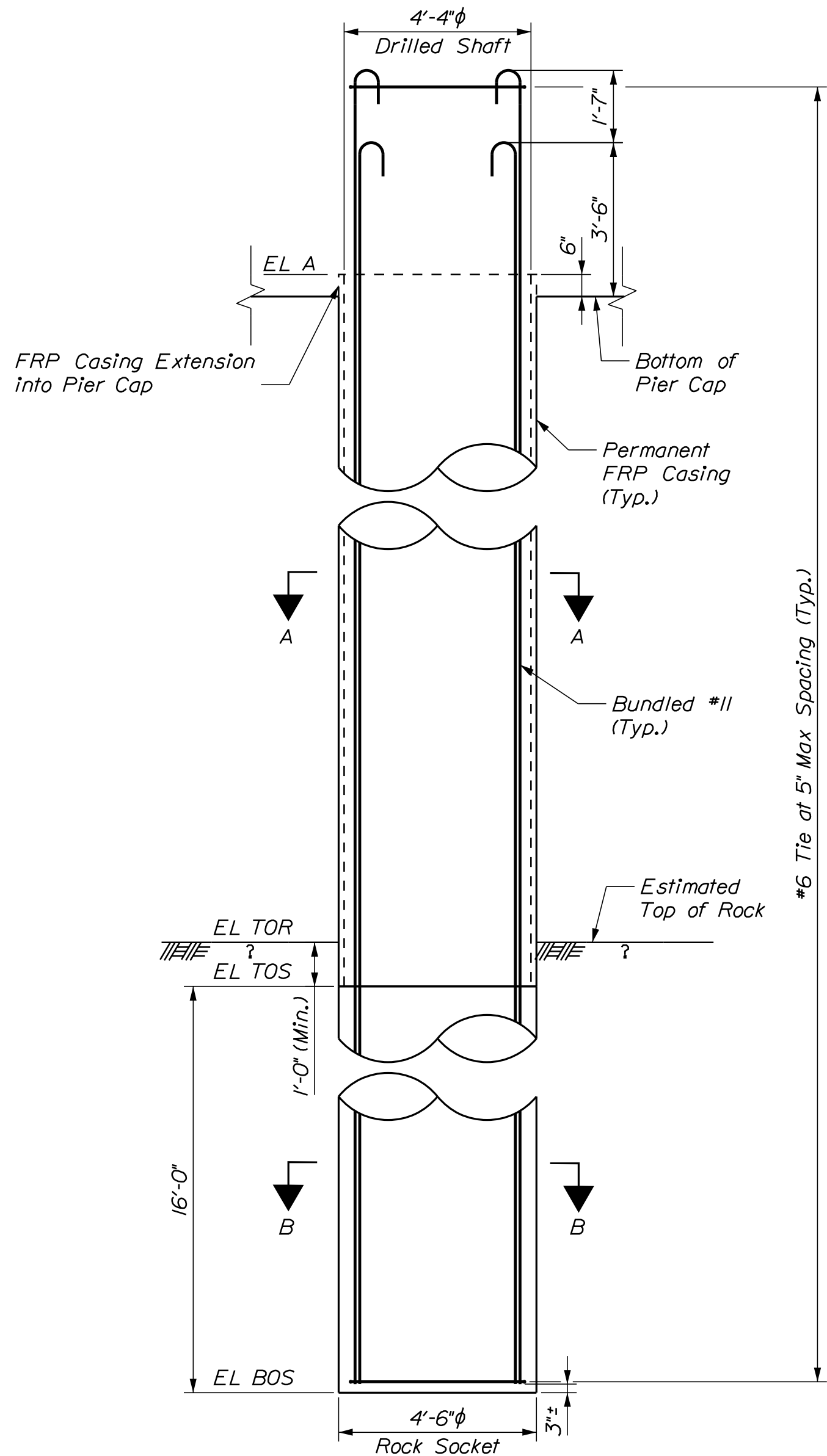
SECTION B-B



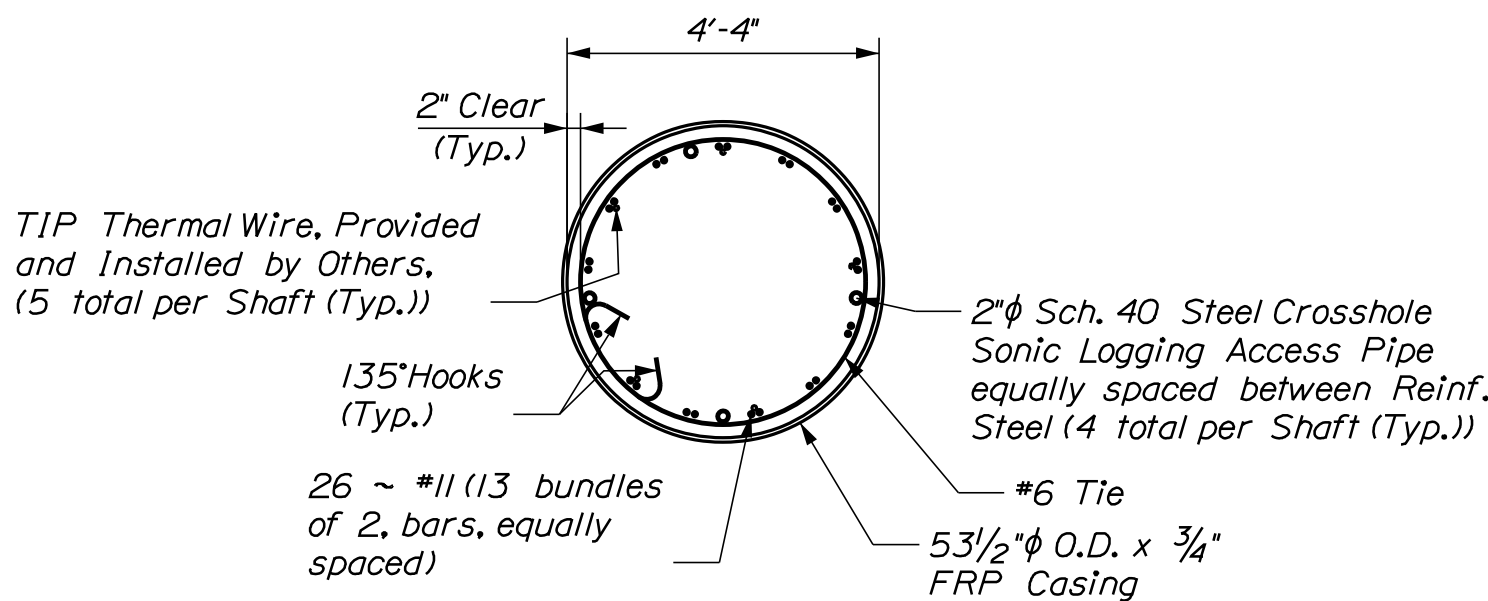
SECTION C-C

NOTES:

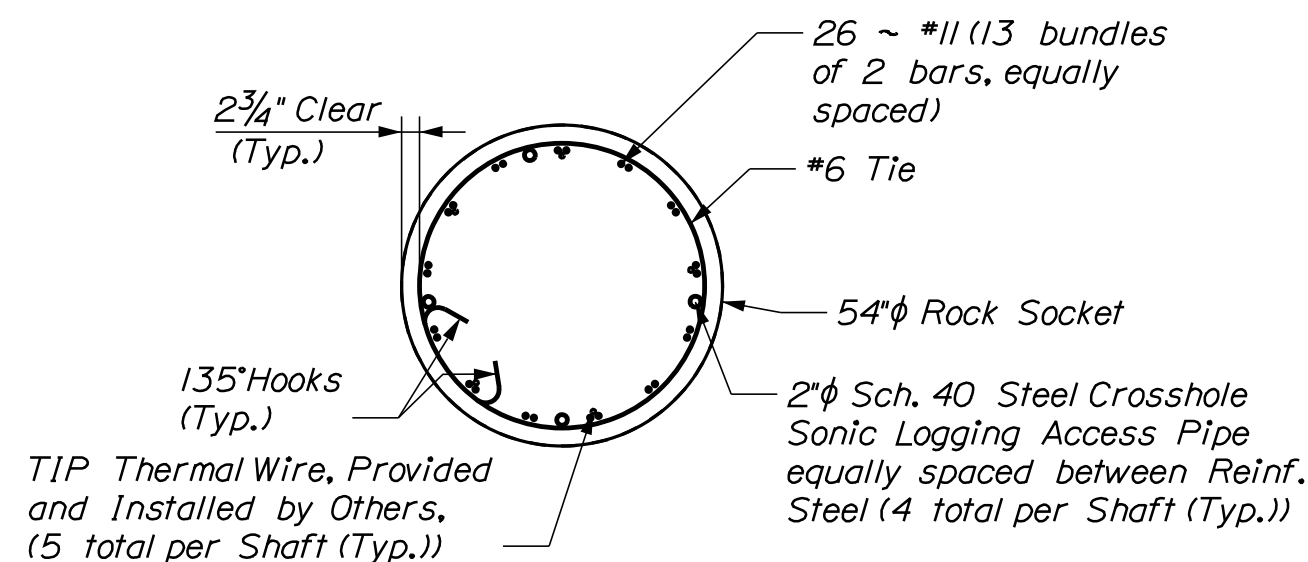
- *5 reinforcement shall have a minimum lap splice length of 3'-10"
*6 reinforcement shall have a minimum lap splice length of 4'-7"
*8 reinforcement shall have a minimum lap splice length of 4'-8"
*10 reinforcement shall have a minimum lap splice length of 8'-2"
Drilled shaft vertical reinforcement shall not be spliced.
- Adjust reinforcing steel in cap to avoid conflicts with bearing anchor rods.



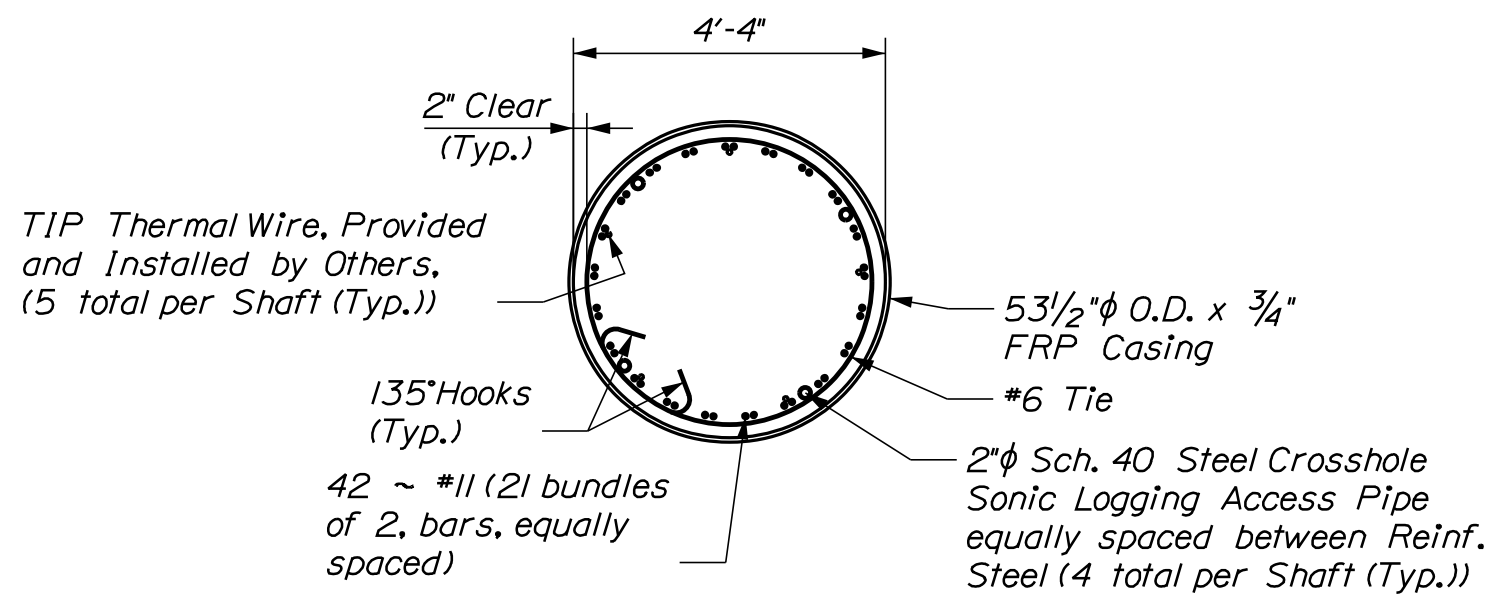
TYPICAL DRILLED SHAFT DETAIL



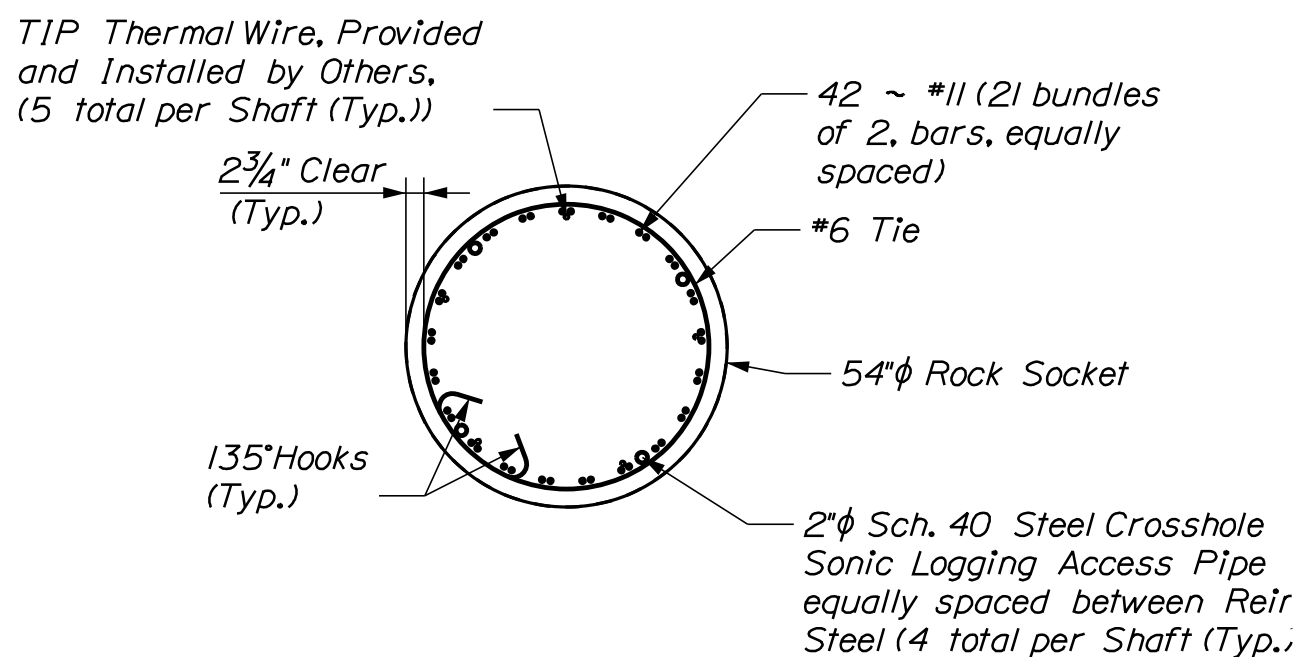
SECTION A-A
(Bridge No. 1 Drilled Shafts)



SECTION B-B
(Bridge No. 1 Drilled Shafts)



SECTION A-A
(Bridge No. 2 Drilled Shafts)



SECTION B-B
(Bridge No. 2 Drilled Shafts)

Bridge 1 Drilled Shaft Elevations (All Elevations in Feet)	
	Pier 1
Elevation "A"	96.69
Estimated "High" TOR	85.0
Estimated "Low" TOR	80.0
Estimated "High" TOS	84.0
Estimated "Low" TOS	79.0
Estimated "High" BOS	68.0
Estimated "Low" BOS	63.0

Bridge 2 Drilled Shaft Elevations (All Elevations in Feet)		
	Pier 1	Pier 2
Elevation "A"	98.26	98.75
Estimated "High" TOR	79.0	81.0
Estimated "Low" TOR	69.0	76.0
Estimated "High" TOS	78.0	80.0
Estimated "Low" TOS	68.0	75.0
Estimated "High" BOS	62.0	64.0
Estimated "Low" BOS	52.0	59.0

"TOR" = Estimated Top of Bedrock
"TOS" = Estimated Top of Rock Socket (Coincides with bottom of FRP casing)
"BOS" = Estimated Bottom of Rock Socket

NOTES:

- Estimated bedrock elevations refer to the approximate range in top of rock elevations at the drilled shafts as interpreted from the boring logs. Estimated permanent casing and socket elevations consider a nominal 12" embedment of FRP in bedrock. Actual FRP embedment may vary based on drilling and installation methods. The required socket depth is measured below the as-installed FRP tip elevation.
- Drilled Shaft and Rock Socket reinforcing steel shall conform to ASTM A1035, Alloy Type CS, Grade 100.
- Circular tie splices shall be staggered around the perimeter of the shaft. Circular ties shall terminate in 135° hooks.
- Permanent FRP casing shall be seated into rock and shall provide a seal around the entire casing perimeter suitable for confinement of concrete during placement, see Special Provision 501 Drilled Shafts.
- Drilled shaft vertical reinforcement shall be terminated with standard 180° hooks in the pier cap. Hooked bars within each bundle shall be terminated at different elevations as shown in the Typical Drilled Shaft Detail.

