



Janet T. Mills  
GOVERNOR

STATE OF MAINE  
DEPARTMENT OF TRANSPORTATION  
16 STATE HOUSE STATION  
AUGUSTA, MAINE 04333-0016

Dale F. Doughty  
ACTING COMMISSIONER

October 17, 2025  
Subject: Dover Bridge  
Bridge Replacement State  
WIN 023120.00  
Location: Dover-Foxcroft  
Amendment No. 2

Dear Sir/Ms.:

Please make the following changes to the Bid Documents:

In the Bid Book

On page 14, "NOTICE TO CONTRACTORS", CHANGE the bid opening date in the first paragraph which reads "October 22, 2025" per Amendment No. 1 to now read "**October 29, 2025**". Make this change in pen and ink.

**REMOVE**, pages 16 thru 26, "Proposal Schedule of Items", 11 pages, dated 9/8/2025 and **REPLACE** with the attached, revised "Proposal Schedule of Items" 12 pages dated 10/3/2025.

In the Bid Book (page 60 to page 62) **REMOVE** "SPECIAL PROVISION, SECTION 105 GENERAL SCOPE OF WORK (Environmental Requirements)" dated August 29, 2025 and **REPLACE** with the attached new SPECIAL PROVISION, SECTION 105 GENERAL SCOPE OF WORK (Environmental Requirements)" dated September 24, 2025.

**ADD** the attached "Appendix I-Bubble Curtain Specification" 17 pages to the bid book.

**ADD** the attached All-Way stop details at intersection of North Street and Summer Street 4 pages to the bid book.

**ADD** the attached "SPECIAL PROVISION, SECTION 105, GENERAL SCOPE OF WORK (Traffic Control and Management)" dated August 22, 2025 to the bid book.

**ADD** the attached "SPECIAL PROVISION, SECTION 643, TRAFFIC SIGNAL (Flashing Beacon Modification)" dated August 21, 2025 to the bid book.

**ADD** the attached "SPECIAL PROVISION, SECTION 645, HIGHWAY SIGNING (Remove and Salvage Highway Signs)" dated September 22, 2025 to the bid book.

**ADD** the attached “SPECIAL PROVISION, SECTION 645, HIGHWAY SIGNING (Solar Powered Flashing Sign)” dated October 8, 2025 to the bid book.

**ADD** the attached “SPECIAL PROVISION, SECTION 652, MAINTENANCE OF TRAFFIC (Temporary Modular Delineator Curb)” dated August 21, 2025 to the bid book.

**ADD** the attached “SPECIAL PROVISION, SECTION 652, MAINTENANCE OF TRAFFIC (Work Zone Traffic Control)” dated October 2, 2025 to the bid book.

In the Plan Set:

**REMOVE SHEET NUMBER 2 OF 64, ESTIMATED QUANTITIES**, dated 9/9/2025, and **REPLACE** with the attached, revised **SHEET NUMBER 2 OF 64, ESTIMATED QUANTITIES**, dated 10/2/2025.

**REMOVE SHEET NUMBER 30 OF 64, ABUTMENT NO. 1 FOOTING AND SEAL PLAN**, dated 8/27/2025, and **REPLACE** with the attached, revised **SHEET NUMBER 30 OF 64, ABUTMENT NO. 1 FOOTING AND SEAL PLAN**, dated 9/18/2025.

**REMOVE SHEET NUMBER 34 OF 64, ABUTMENT NO. 2 FOOTING PLAN AND PILE LAYOUT**, dated 8/27/2025, and **REPLACE** with the attached, revised **SHEET NUMBER 34 OF 64, ABUTMENT NO. 2 FOOTING PLAN AND PILE LAYOUT**, dated 9/24/2025.

**REMOVE SHEET NUMBER 39 OF 64, ABUTMENT NO. 2 ROCK SOCKET DETAILS**, dated 8/27/2025, and **REPLACE** with the attached, revised **SHEET NUMBER 39 OF 64, ABUTMENT NO. 2 ROCK SOCKET DETAILS**, dated 9/24/2025.

The following questions have been received:

**Question:** SP104 Utilities references subsurface utilities buried within the approaches. We cannot find where the locations are on the plans. Could a location be provided? There is also a pipe we saw on site located on the stream bed in the location of the temporary work trestle. Is this pipe active? If so, is it the Department’s intent for the contractor to construct a work trestle around the pipe?

**Response:** See amendment #1 for the response to the above question.

Consider these changes and information prior to submitting your bid on October 29, 2025.

Sincerely,

A handwritten signature in blue ink, appearing to read "George Macdougall". The signature is fluid and cursive, with a large initial "G" and "M".

George M.A. Macdougall P.E.  
Contracts & Specifications Engineer

Maine Department of Transportation

Proposal Schedule of Items

Proposal ID: 023120.00

Project(s): 023120.00

SECTION: 1 INITIAL GROUP

Alt Set ID: Alt Mbr ID:

Contractor: \_\_\_\_\_

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0010	201.23 REMOVING SINGLE TREE TOP ONLY	12.000 EA	_____	 _____	_____	 _____
0020	201.24 REMOVING STUMP	16.000 EA	_____	 _____	_____	 _____
0030	201.28 PRUNING SINGLE TREE	5.000 EA	_____	 _____	_____	 _____
0040	202.13 REMOVING EXISTING RAILINGS (RETAINED BY DEPARTMENT)	60.000 LF	_____	 _____	_____	 _____
0050	202.15 REMOVING EXISTING MANHOLE OR CATCH BASIN	7.000 EA	_____	 _____	_____	 _____
0060	202.19 REMOVING EXISTING BRIDGE	LUMP SUM		 LUMP SUM	_____	 _____
0070	202.202 REMOVING PAVEMENT SURFACE	400.000 SY	_____	 _____	_____	 _____
0080	203.20 COMMON EXCAVATION	1,200.000 CY	_____	 _____	_____	 _____
0090	203.2318 DISPOSAL OF SPECIAL WASTE	360.000 T	_____	 _____	_____	 _____
0100	203.25 GRANULAR BORROW	1,340.000 CY	_____	 _____	_____	 _____
0110	206.082 STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES	1,200.000 CY	_____	 _____	_____	 _____
0120	304.10 AGGREGATE SUBBASE COURSE - GRAVEL	1,000.000 CY	_____	 _____	_____	 _____

Maine Department of Transportation

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			Dollars	Cents	Dollars	Cents
0130	304.103 AGGREGATE SUBBASE - GRAVEL (TRUCK MEASURE)	30.000 CY	_____	 _____	_____	 _____
0140	403.2081 12.5 MM POLYMER MODIFIED HOT MIX ASPHALT	160.000 T	_____	 _____	_____	 _____
0150	403.209 HOT MIX ASPHALT 9.5 MM (SIDEWALKS, DRIVES, INCIDENTALS)	42.000 T	_____	 _____	_____	 _____
0160	403.211 HOT MIX ASPHALT (SHIMMING)	10.000 T	_____	 _____	_____	 _____
0170	403.2131 12.5 MM POLYMER MODIFIED HMA BASE	210.000 T	_____	 _____	_____	 _____
0180	409.15 BITUMINOUS TACK COAT - APPLIED	75.000 G	_____	 _____	_____	 _____
0190	501.237 NOISE ATTENUATION AND UNDERWATER NOISE MONITORING	LUMP SUM		 LUMP SUM	_____	 _____
0200	501.50 STEEL H-BEAM PILES 89 LBS/FT, DELIVERED	750.000 LF	_____	 _____	_____	 _____
0210	501.502 ROCK SOCKETED H-PILES	750.000 LF	_____	 _____	_____	 _____
0220	501.804 DRILLING EQUIPMENT MOBILIZATION	LUMP SUM		 LUMP SUM	_____	 _____
0230	502.219 STRUCTURAL CONCRETE, ABUTMENTS AND RETAINING WALLS	LUMP SUM		 LUMP SUM	_____	 _____

Maine Department of Transportation

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			Dollars	Cents	Dollars	Cents
0240	502.22 STRUCTURAL CONCRETE, ABUTMENTS AND RETAINING WALLS (PLACED UNDER WATER)	400.000 CY	_____	 _____	_____	 _____
0250	502.239 STRUCTURAL CONCRETE PIERS	LUMP SUM		LUMP SUM	_____	 _____
0260	502.24 STRUCTURAL CONCRETE PIERS (PLACED UNDER WATER)	215.000 CY	_____	 _____	_____	 _____
0270	502.26 STRUCTURAL CONCRETE ROADWAY AND SIDEWALK SLABS ON STEEL BRIDGES	LUMP SUM		LUMP SUM	_____	 _____
0280	502.291 SAW CUT GROOVING	LUMP SUM		LUMP SUM	_____	 _____
0290	502.31 STRUCTURAL CONCRETE APPROACH SLABS	LUMP SUM		LUMP SUM	_____	 _____
0300	502.49 STRUCTURAL CONCRETE CURBS AND SIDEWALKS	LUMP SUM		LUMP SUM	_____	 _____
0310	502.77 FIBER REINFORCED POLYMER BRIDGE DRAIN - TYPE: TYPE D	3.000 EA	_____	 _____	_____	 _____
0320	502.77 FIBER REINFORCED POLYMER BRIDGE DRAIN - TYPE: TYPE F	3.000 EA	_____	 _____	_____	 _____
0330	503.12 REINFORCING STEEL, FABRICATED AND DELIVERED	53,600.000 LB	_____	 _____	_____	 _____
0340	503.13 REINFORCING STEEL, PLACING	53,600.000 LB	_____	 _____	_____	 _____

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			Dollars	Cents	Dollars	Cents
0350	503.19 LOW-CARBON, CHROMIUM REINFORCEMENT - FABRICATED & DELIVERED	22,600.000 LB	_____	_____	_____	_____
0360	503.20 LOW-CARBON, CHROMIUM REINFORCEMENT - PLACING	22,600.000 LB	_____	_____	_____	_____
0370	504.702 STRUCTURAL STEEL FABRICATED AND DELIVERED, WELDED	LUMP SUM	LUMP	SUM	_____	_____
0380	504.71 STRUCTURAL STEEL ERECTION	LUMP SUM	LUMP	SUM	_____	_____
0390	505.08 SHEAR CONNECTORS	LUMP SUM	LUMP	SUM	_____	_____
0400	506.9104 THERMAL SPRAY COATING - SHOP APPLIED	LUMP SUM	LUMP	SUM	_____	_____
0410	511.07 COFFERDAM: ABUT NO.1	LUMP SUM	LUMP	SUM	_____	_____
0420	511.07 COFFERDAM: ABUT NO.2	LUMP SUM	LUMP	SUM	_____	_____
0430	511.07 COFFERDAM: PIER	LUMP SUM	LUMP	SUM	_____	_____
0440	512.081 FRENCH DRAINS	LUMP SUM	LUMP	SUM	_____	_____
0450	515.21 PROTECTIVE COATING FOR CONCRETE SURFACES	LUMP SUM	LUMP	SUM	_____	_____

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			Dollars	Cents	Dollars	Cents
0460	519.60 EXPANSION DEVICE - ASPHALTIC PLUG JOINT	55.000 LF	_____	 _____	_____	 _____
0470	523.52 BEARING INSTALLATION	15.000 EA	_____	 _____	_____	 _____
0480	523.5401 LAMINATED ELASTOMERIC BEARINGS, FIXED	5.000 EA	_____	 _____	_____	 _____
0490	523.5402 LAMINATED ELASTOMERIC BEARINGS, EXPANSION	10.000 EA	_____	 _____	_____	 _____
0500	524.30 TEMPORARY STRUCTURAL SUPPORT	1.000 EA	_____	 _____	_____	 _____
0510	526.301 PORTABLE CONCRETE BARRIER TYPE I	LUMP SUM		 LUMP SUM	_____	 _____
0520	526.323 TEXAS CLASSIC RAIL	LUMP SUM		 LUMP SUM	_____	 _____
0530	530.30 GFRP, REINFORCEMENT BARS, FABRICATED & DELIVERED	65,300.000 LF	_____	 _____	_____	 _____
0540	530.31 GFRP, REINFORCEMENT BARS, PLACING	65,300.000 LF	_____	 _____	_____	 _____
0550	603.159 12 INCH CULVERT PIPE OPTION III	44.000 LF	_____	 _____	_____	 _____
0560	603.169 15 INCH CULVERT PIPE OPTION III	114.000 LF	_____	 _____	_____	 _____
0570	603.179 18 INCH CULVERT PIPE OPTION III	46.000 LF	_____	 _____	_____	 _____

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			Dollars	Cents	Dollars	Cents
0580	603.199 24 INCH CULVERT PIPE OPTION III	18.000 LF	_____	 _____	_____	 _____
0590	603.76 12 INCH INLET GRATE UNIT	1.000 EA	_____	 _____	_____	 _____
0600	604.072 CATCH BASIN TYPE A1-C	3.000 EA	_____	 _____	_____	 _____
0610	604.092 CATCH BASIN TYPE B1-C	3.000 EA	_____	 _____	_____	 _____
0620	604.245 CATCH BASIN TYPE F4-C	1.000 EA	_____	 _____	_____	 _____
0630	604.252 CATCH BASIN TYPE A5-C	1.000 EA	_____	 _____	_____	 _____
0640	605.09 6 INCH UNDERDRAIN TYPE B	275.000 LF	_____	 _____	_____	 _____
0650	605.11 12 INCH UNDERDRAIN TYPE C	110.000 LF	_____	 _____	_____	 _____
0660	606.1301 31" W-BM GR, MID-WAY SPLICE-SGL FACED	50.000 LF	_____	 _____	_____	 _____
0670	606.1303 31" W-BM GR, MID-WAY SPLICE-15' RAD AND LESS	25.000 LF	_____	 _____	_____	 _____
0680	606.1304 31" W-BM GR, MID-WAY SPLICE-OVER 15' RAD	59.000 LF	_____	 _____	_____	 _____
0690	606.1305 31" W-BM GR, MID-WAY SPLICE FLARED TERMINAL	2.000 EA	_____	 _____	_____	 _____

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Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0700	606.1306 31" W-BM GR, MID-WAY SPLICE TANGENT TERMINAL	1.000 EA	_____	_____	_____	_____
0710	606.1307 BRIDGE TRANSITION (ASYMMETRICAL) - TYPE 1A	4.000 EA	_____	_____	_____	_____
0720	606.259 ANCHORAGE ASSEMBLY	1.000 EA	_____	_____	_____	_____
0730	606.353 REFLECTORIZED FLEXIBLE GUARDRAIL MARKER	8.000 EA	_____	_____	_____	_____
0740	607.163 CHAIN LINK FENCE - 4 FOOT P.V.C. COATED	85.000 LF	_____	_____	_____	_____
0750	607.24 REMOVE AND RESET FENCE	120.000 LF	_____	_____	_____	_____
0760	608.08 REINFORCED CONCRETE SIDEWALK	5.000 SY	_____	_____	_____	_____
0770	608.26 CURB RAMP DETECTABLE WARNING FIELD	57.000 SF	_____	_____	_____	_____
0780	609.11 VERTICAL CURB TYPE 1	330.000 LF	_____	_____	_____	_____
0790	609.12 VERTICAL CURB TYPE 1 - CIRCULAR	12.000 LF	_____	_____	_____	_____
0800	609.221 TERMINAL CURB TYPE 1	44.000 LF	_____	_____	_____	_____
0810	609.222 TERMINAL CURB TYPE 1 - CIRCULAR	37.000 LF	_____	_____	_____	_____

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Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0820	610.08 PLAIN RIPRAP	160.000 CY	_____	 _____	_____	 _____
0830	610.18 STONE DITCH PROTECTION	5.000 CY	_____	 _____	_____	 _____
0840	610.213 VOID FILLED RIPRAP	1,100.000 CY	_____	 _____	_____	 _____
0850	613.319 EROSION CONTROL BLANKET	150.000 SY	_____	 _____	_____	 _____
0860	615.07 LOAM	105.000 CY	_____	 _____	_____	 _____
0870	618.13 SEEDING METHOD NUMBER 1	5.000 UN	_____	 _____	_____	 _____
0880	618.14 SEEDING METHOD NUMBER 2	4.000 UN	_____	 _____	_____	 _____
0890	619.12 MULCH	9.000 UN	_____	 _____	_____	 _____
0900	619.14 EROSION CONTROL MIX	30.000 CY	_____	 _____	_____	 _____
0910	620.58 EROSION CONTROL GEOTEXTILE	950.000 SY	_____	 _____	_____	 _____
0920	626.11 PRECAST CONCRETE JUNCTION BOX	2.000 EA	_____	 _____	_____	 _____
0930	626.21 METALLIC CONDUIT	285.000 LF	_____	 _____	_____	 _____
0940	626.22 NON-METALLIC CONDUIT	265.000 LF	_____	 _____	_____	 _____

Maine Department of Transportation

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Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0950	626.35 CONTROLLER CABINET FOUNDATION	1.000 EA	_____	 _____	_____	 _____
0960	626.421 24 INCH DIAMETER FOUNDATION	21.000 LF	_____	 _____	_____	 _____
0970	627.733 4" WHITE OR YELLOW PAINTED PAVEMENT MARKING LINE	2,650.000 LF	_____	 _____	_____	 _____
0980	627.75 WHITE OR YELLOW PAVEMENT & CURB MARKING	830.000 SF	_____	 _____	_____	 _____
0990	627.77 REMOVING PAVEMENT MARKINGS	500.000 SF	_____	 _____	_____	 _____
1000	627.78 TEMPORARY 4 INCH PAINTED PAVEMENT MARKING LINE, WHITE OR YELLOW	900.000 LF	_____	 _____	_____	 _____
1010	629.05 HAND LABOR, STRAIGHT TIME	40.000 HR	_____	 _____	_____	 _____
1020	631.12 ALL PURPOSE EXCAVATOR (INCLUDING OPERATOR)	8.000 HR	_____	 _____	_____	 _____
1030	631.14 GRADER (INCLUDING OPERATOR)	100.000 HR	_____	 _____	_____	 _____
1040	631.15 ROLLER, EARTH AND BASE COURSE (INCLUDING OPERATOR )	80.000 HR	_____	 _____	_____	 _____
1050	631.172 TRUCK - LARGE (INCLUDING OPERATOR)	80.000 HR	_____	 _____	_____	 _____

Maine Department of Transportation

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			Dollars	Cents	Dollars	Cents
1060	631.18 CHAIN SAW RENTAL (INCLUDING OPERATOR)	4.000 HR	_____	 _____	_____	 _____
1070	631.20 STUMP CHIPPER (INCLUDING OPERATOR)	8.000 HR	_____	 _____	_____	 _____
1080	631.21 ROAD BROOM (INCLUDING OPERATORS AND HAULER)	40.000 HR	_____	 _____	_____	 _____
1090	631.22 FRONT END LOADER (INCLUDING OPERATOR)	8.000 HR	_____	 _____	_____	 _____
1100	631.32 CULVERT CLEANER (INCLUDING OPERATOR)	4.000 HR	_____	 _____	_____	 _____
1110	634.160 HIGHWAY LIGHTING	LUMP SUM		 LUMP SUM	_____	 _____
1120	634.210 CONVENTIONAL LIGHT STANDARD	6.000 EA	_____	 _____	_____	 _____
1130	634.25 SERVICE POLE COMPLETE WITH CABINET AND CONTROLS	1.000 EA	_____	 _____	_____	 _____
1140	637.071 DUST CONTROL	LUMP SUM		 LUMP SUM	_____	 _____
1150	639.18 FIELD OFFICE TYPE A	1.000 EA	_____	 _____	_____	 _____
1160	643.61 FLASHING BEACON MODIFICATION	LUMP SUM		 LUMP SUM	_____	 _____
1170	643.62 RECTANGULAR RAPID FLASHING BEACON	1.000 EA	_____	 _____	_____	 _____

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Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
1180	645.109 REMOVE AND SALVAGE HIGHWAY SIGNS	10.000 EA	_____	 _____	_____	 _____
1190	645.292 REGULATORY, WARNING, CONFIRMATION AND ROUTE MARKER ASSEMBLY SIGNS TYPE II	100.000 SF	_____	 _____	_____	 _____
1200	645.513 ADVANCED SOLAR POWERED FLASHING WARNING SIGN	3.000 EA	_____	 _____	_____	 _____
1210	645.561 36" STOP SIGN - SOLAR POWERED	3.000 EA	_____	 _____	_____	 _____
1220	652.312 TYPE III BARRICADE	8.000 EA	_____	 _____	_____	 _____
1230	652.33 DRUM	100.000 EA	_____	 _____	_____	 _____
1240	652.34 CONE	75.000 EA	_____	 _____	_____	 _____
1250	652.343 TEMPORARY MODULAR DELINEATOR CURB	120.000 LF	_____	 _____	_____	 _____
1260	652.35 CONSTRUCTION SIGNS	1,400.000 SF	_____	 _____	_____	 _____
1270	652.361 MAINTENANCE OF TRAFFIC CONTROL DEVICES	LUMP SUM		 LUMP SUM	_____	 _____
1280	652.38 FLAGGER	600.000 HR	_____	 _____	_____	 _____

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			Dollars	Cents	Dollars	Cents
1290	652.41 PORTABLE CHANGEABLE MESSAGE SIGN	2.000 EA	_____	_____	_____	_____
1300	656.75 TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL	LUMP SUM	LUMP SUM	LUMP SUM	_____	_____
1310	659.10 MOBILIZATION	LUMP SUM	LUMP SUM	LUMP SUM	_____	_____
1320	660.21 ON-THE-JOB TRAINING (BID)	1,000.000 HR	_____	_____	_____	_____
1330	801.03 TEST PITS	2.000 EA	_____	_____	_____	_____
<b>Section: 1</b>			<b>Total:</b>		_____	_____
			<b>Total Bid:</b>		_____	_____

Town: Dover  
WIN #: 23120.00  
Date: September 24, 2025

SPECIAL PROVISION  
SECTION 105  
General Scope of Work  
(Environmental Requirements)

Work within stream (“In Stream Work,” see MaineDOT Standard Specifications 101.2 Definitions) requires special conditions to minimize impacts. The following special conditions shall apply to this project:

- I. In-Water Work is allowed July 15 – April 15.
- II. In-Water work window applies to the following water bodies at the following station #'s:
  1. Piscataquis River at project location
- III. Tree Clearing can occur at any time of year  
(there is no winter tree clearing window here)
- IV. Special Conditions:
  1. Special Conditions of US Army Corps of Engineers (USACE) General Permit apply (see permit and conditions in contract documents).
  2. The Contractor shall hold a pre-construction meeting with appropriate MaineDOT Environmental Office staff, other MaineDOT staff, and the Contractor(s) to review all procedures and requirements for avoiding and minimizing effects to Atlantic salmon (ATS). The following individuals/agencies shall be invited: ACOE (Rachel Antieau, [Rachel.h.antieau@usace.army.mil](mailto:Rachel.h.antieau@usace.army.mil)); U.S. Fish and Wildlife Service (USFWS)(Sarah Rubenstein, [sarah\\_rubenstein@fws.gov](mailto:sarah_rubenstein@fws.gov)).
  3. The contractor shall contact Kelby Houtz of MaineDOT Environmental Office (207- 441-1512); [Kelby.Houtz@maine.gov](mailto:Kelby.Houtz@maine.gov) ) at least 2 weeks prior to installation of any cofferdams to coordinate fish evacuation. Fish evacuation includes electrofishing. Electrofishing activities are prohibited when water temperature is greater than or equal to 22 degrees Celsius (71.6 degrees Fahrenheit).
  4. All areas of temporary stream or wetland fill must be within the specified limits on the plans and shall be restored to their original contour and character upon completion of the project. Temporary fill includes fill that received authorization and fill that mistakenly enters a resource (i.e., from slope failures, accidental broken sandbag cofferdams, miscellaneous construction materials, etc.)
  5. All in-water excavation shall be conducted within a cofferdam.
  6. All areas of disturbed wetland soil shall be mulched and seeded with an approved native or non-invasive herbaceous seed mix following construction and/or planted with native woody vegetation and trees appropriate during the first available planting season. In areas where there is little to no slope, and erosion and invasive species establishment is unlikely, the native woody vegetation on the site shall be allowed to regenerate naturally.
  7. Grubbing (removal) of roots and stumps in wetlands shall only occur in those areas subject to permanent impacts.
  8. All off-road equipment working within 25-feet of a stream (RUS) shall be cleaned to remove all soil, seeds, vegetation, or other debris that could contain seeds or reproductive portions of plants prior to entering the area to minimize the spread of noxious weeds. All equipment shall be inspected prior to offloading to ensure it is clean.
  9. Heavy construction equipment shall travel only over non-erodible stream substrate (e.g., ledge, cobble) and when approved by the MaineDOT Environmental Field Contact.
  10. Stabilization techniques (such as placing sheets of poly at the bypass outlet) will be used to protect the stream from scour caused by the high water velocities associated with bypass pumping activities.
  11. Bypass pumping systems will be sized to accommodate the predicted peak flow rate during construction. Predicted peak flows are provided to the contractor in the bid documents
  12. Sheet pile driving (if utilized) shall be completed using a vibratory hammer.

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13. The contractor shall fully remove all cofferdams from the stream immediately following completion of in-stream work using techniques to minimize turbidity releases. The contractor shall restore all areas of temporary stream bottom disturbance to their original contour and character upon completion of the project.
14. No equipment, materials, or machinery shall be stored, cleaned, fueled, or repaired within any wetland or stream resource. These activities shall occur more than 100 feet from any wetland or stream resource and shall follow the specifications of the SEWPCP.
15. All pumps and generators required for in-stream work shall be cleaned of external oil, grease, dirt, and mud such that turbid water does not drain to any wetland or stream. Any leaks of this equipment shall be fixed prior to entering streams or areas that drain directly to streams or wetlands. Operation shall follow the specifications of the SEWPCP.
16. For any required pumping operations, the Contractor will use a screen on each pump intake designed such that the approach velocity does not exceed 0.20 feet/second. Square or round screen face openings are not to exceed 3/32 inches (2.38 millimeters) measured on a diagonal. Criteria for slotted face openings shall not exceed 1/16 inches (approximately 1.75 millimeters) in the narrow direction. These screen criteria follow National Marine Fisheries Service (NMFS) guidance (NMFS 2008). Intake hoses shall be regularly monitored while pumping to minimize adverse effects to Atlantic salmon or other species.
17. Temporary causeways in stream channels will be constructed of non-erodible material, i.e., plain riprap or large riprap (per MaineDOT standard specifications) over geotextile fabric and will extend only to within 25 percent of the BFW of the stream or river.
18. Prior to release to a natural resource, any impounded water that has been in contact with concrete placed during construction must have a pH between 6.0 and 8.5, must be within one pH unit of the background pH level of the resource and must have a turbidity level no greater than the receiving resource. This requirement is applicable to concrete that is placed or spilled (including leakage from forms) as well as indirect contact via tools or equipment. Disposal or treatment of water not meeting release criteria shall be addressed in the SEWPCP. Discharging impounded water to the stream must take place in a manner that does not disturb the stream bottom or cause erosion. The Contractor shall be responsible for monitoring pH with a calibrated meter accurate to 0.1 units. A record of pH measurements shall be kept in the Environmental Field Representative's log. Concrete being placed as a seal in a cofferdam for bridge pier construction is considered "impounded water".
19. Round pile size is limited to less than 30 inches in diameter. H-pile size is limited to less than 14 inches.
20. A vibratory hammer will be used as much as possible for all pile driving activities.
21. Pile driving will occur during the day when fish are less active and Atlantic salmon migrations are minimized.
22. The contractor shall employ a bubble curtain for all in-water impact pile driving. The bubble curtain shall meet the design specifications and performance requirements in the attached **Bubble Curtain Specification (appended to this Special Provision)**. The contractor shall complete a performance test of the bubble curtain prior to any impact pile driving. The performance test shall confirm the calculated pressures and flow rates at each manifold ring.
23. **Hydroacoustic monitoring for impact pile driving shall be completed as follows for at least two piles:**
  - i. **Largest pile driven in-water (in at least two feet of water)**
  - ii. **A minimum of three hydrophones must be used, located approximately 33, 66, and 100 feet from the in-water sound producing activity.**
24. The Contractor shall retain the services of a qualified person or firm to prepare and implement a hydroacoustic monitoring plan following the attached **"Underwater Noise Monitoring Plan" template (appended to this Special Provision)**. The Contractor shall provide MaineDOT a completed draft hydroacoustic monitoring plan at least 45 days prior to implementation for review. **No in-stream noise generating activities may commence until MaineDOT has approved the monitoring protocol.**
25. The Contractor shall provide Hydroacoustic monitoring data to the Department. A preliminary data report

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- shall be submitted within 5 business days of pile driving activity. A final summary report of all the data must be submitted within 2 months of completion of in-water construction.
26. The contractor shall be responsible for implementing noise monitoring and noise attenuation as described above. Payment shall be made as a lump sum under Pay Item 501.237.
  27. In-water blasting is not allowed when Atlantic salmon could be present.
  28. Permanent riprap placed in a stream below the bankfull elevation shall be void-filled.
  29. All riprap placed outside of a cofferdam shall be cleaned prior to installation.
  30. Adult Atlantic salmon are not expected in the project area. If adult Atlantic salmon are observed during active construction, all activities shall cease and the MaineDOT shall immediately contact the Service's Maine Field Office at 207/378-6828 (Sarah Rubenstein) within 48 hours of occurrence.
  31. Abutment demolitions with a hoe ram will occur inside of a dewatered cofferdam or outside of the water.
  32. If piles are removed by cutting, they must be cut to one foot below the substrate level.
  33. If a pile is pulled from the substrate, the work will be completed using a BMP specifically for minimizing turbidity, such as a turbidity curtain.

#### Historic Resources:

34. Historic Resources are present adjacent to and along the Project. MaineDOT has completed consultation in accordance with Section 106 of the National Historic Preservation Act and Programmatic Agreement for the project as presented. The Contractor shall comply with the provisions from Standard Specification 105.9 related to changes in the design at these historic properties during construction including but not limited to tree clearing, property impacts, or project materials. The following is project-specific:
  - A. This project is located along and adjacent to Section 106 and Section 4(f) resources:
    1. Dover Industrial & Residential Historic District:
      - a. Station: 100+00 to 111+00 Right & Left, 200+00 to 203+00 Right & Left, 300+00 to 302+00 Right & Left, 400+00 to 402+00 Right and Left
  - B. Deviations from the approved project design during construction within the above-specified stations shall be approved by the MaineDOT Project Manager. Changes could have adverse effects to the historic resources and jeopardize federal funding.
  - C. See attached Memorandum of Agreement.

#### V. Approvals:

1. Temporary Soil Erosion and Water Pollution Control Plan
2. Permitted Resource Impacts (square feet), see ACOE permit for locations:

<u>Stream:</u> (sf)	<u>Wetland:</u> (sf)
<i>Perm. RUS/OHWM</i> – 4,955	0
<i>Temp. RUS/OHWM</i> – 5,685	

#### VI. All activities are prohibited (including placement and removal of cofferdams unless otherwise permitted by Regulatory Agencies) below the normal high water mark if outside the prescribed in-water work window, except for the following:

1. Work within a cofferdam constructed according to MaineDOT's Standard Specifications and in adherence with the contractor's approved "Soil Erosion and Water Pollution Control Plan".

#### VII. No work is allowed that completely blocks a river, stream, or brook without providing downstream flow.

NOTE: Regulatory Review and Approval is required to modify the existing In-Water work window. Requests for work window extensions must be submitted to the MaineDOT Environmental Office. Approval of requests for work window extensions is not guaranteed and may result in delays in construction schedule that are the sole responsibility of the contractor.

## Appendix I—Bubble Curtain Specification

These specifications are verbatim from National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS), Western Washington Fish and Wildlife Office Impact Pile Driving Sound Attenuation Specification

Unconfined Bubble Curtain Specifications:

1. General - An unconfined bubble curtain is composed of an air compressor(s), supply lines to deliver the air, distribution manifolds or headers, perforated aeration pipe, and a frame. The frame facilitates transport and placement of the system, keeps the aeration pipes stable, and provides ballast to counteract the buoyancy of the aeration pipes in operation.
2. The aeration pipe system shall consist of multiple layers of perforated pipe rings, stacked vertically in accordance with the following:

Water Depth (m)	No. of Layers
0 to less than 5	2
5 to less than 10	4
10 to less than 15	7
15 to less than 20	10
20 to less than 25	13

3. The pipes in all layers shall be arranged in a geometric pattern which shall allow for the pile being driven to be completely enclosed by bubbles for the full depth of the water column and with a radial dimension such that the rings are no more than 0.5 meters from the outside surface of the pile.
4. The lowest layer of perforated aeration pipe shall be designed to ensure contact with the substrate without burial and shall accommodate sloped conditions.
5. Air holes shall be 1.6 mm (1/16-inch) in diameter and shall be spaced approximately 20 mm (3/4 inch) apart. Air holes with this size and spacing shall be placed in four adjacent rows along the pipe to provide uniform bubble flux.
6. The system shall provide a bubble flux of 3.0 cubic meters per minute per linear meter of pipe in each layer (32.91 cubic feet per minute per linear foot of pipe in each layer). The total volume of air per layer is the product of the bubble flux and the circumference of the ring:

$$V_t = 3.0 \text{ m}^3/\text{min}/\text{m} * \text{Circum of the aeration ring in m}$$

or

$$V_t = 32.91 \text{ ft}^3/\text{min}/\text{ft} * \text{Circum of the aeration ring in ft}$$

7. Meters shall be provided as follows:

- a. Pressure meters shall be installed at all inlets to aeration pipelines and at points of lowest pressure in each branch of the aeration pipeline.
- b. Flow meters shall be installed in the main line at each compressor and at each branch of the aeration pipelines at each inlet. In applications where the feed line from the compressor is continuous from the compressor to the aeration pipe inlet the flow meter at the compressor can be eliminated.
- c. Flow meters shall be installed according to the manufactures recommendation based on either laminar flow or non-laminar flow.

#### Confined Bubble Curtain Specifications:

1. General - A confined bubble curtain is composed of an air compressor(s), supply lines to deliver the air, distribution manifolds or headers, perforated aeration pipe(s), and a means of confining the bubbles.
  - a. The confinement (e.g. fabric, plastic or metal sleeve, or equivalent) shall extend from the substrate to a sufficient elevation above the maximum water level expected during pile installation such that when the air delivery system is adjusted properly, the bubble curtain does not act as a water pump (i.e., little or no water should be pumped out of the top of the confinement system).
  - b. The confinement shall contain resilient pile guides that prevent the pile and the confinement from coming into contact with each other and do not transmit vibrations to the confinement sleeve and into the water column (e.g. rubber spacers, air filled cushions).
2. In water less than 15 meters deep, the system shall have a single aeration ring at the substrate level. In waters greater than 15 meters deep, the system shall have at least two rings, one at the substrate level and the other at mid-depth.
3. The lowest layer of perforated aeration pipe shall be designed to ensure contact with the substrate without sinking into the substrate and shall accommodate for sloped conditions.
4. Air holes shall be 1.6 mm (1/16-inch) in diameter and shall be spaced approximately 20 mm (3/4 inch) apart. Air holes with this size and spacing shall be placed in four adjacent rows along the pipe to provide uniform bubble flux.
8. The system shall provide a bubble flux of 3.0 cubic meters per minute per linear meter of pipe in each layer (32.91 cubic feet per minute per linear foot of pipe in each layer). The total volume of air per layer is the product of the bubble flux and the circumference of the ring:

$$V_t = 3.0 \text{ m}^3/\text{min}/\text{m} * \text{Circ of the aeration ring in m}$$

or

$$V_t = 32.91 \text{ ft}^3/\text{min}/\text{ft} * \text{Circ of the aeration ring in ft}$$

5. Meters shall be provided as follows:
  - a. Pressure meters shall be installed at all inlets to aeration pipelines and at points of lowest pressure in each branch of the aeration pipeline.
  - b. Flow meters shall be installed in the main line at each compressor and at each branch of the aeration pipelines at each inlet. In applications where the feed line from the compressor is continuous from the compressor to the aeration pipe inlet the flow meter at the compressor can be eliminated.
  - c. Flow meters shall be installed according to the manufactures recommendation based on either laminar flow or non-laminar flow.

# UNDERWATER NOISE MONITORING PLAN

## **\*\**TEMPLATE*\*\***

*Replace underlined blue italic text with project information.*

*Blue italic text is guidance.*

**Plain, black text is template language.**

*All blue italic text should be replaced or omitted for final production.*

*Prepared by:*

*Name and full contact information*

*Signature Block*

*Date*

---

## **INTRODUCTION *(This section will be project specific)***

The full agency name proposes to detailed project description. See vicinity map (Figure 1).

**Figure 1. Vicinity map of name project.**

## **PROJECT AREA *(This section will be project specific)***

*Describe the location of the project, including all water bodies that are affected. Identify the USGS hydrologic unit, both the name and code, where the project is located. Include detailed maps and figures, when available, relative to environmental features that influence monitoring (e.g., geology, bathymetry, etc.).*

## **PERMIT/ESA CONDITIONS *(This section will be project specific and is applicable only when the ESA consultation is complete or Federal/State/local permits have been issued. Each agency should modify this section to reflect the various types of permit/ESA conditions that they see.)***

*Summarize the Federal/State/local permit conditions and the ESA requirements that relate to the underwater noise. Permit conditions include monitoring requirements, timing restrictions, etc. The ESA requirements are found in the Incidental Take Statement and Terms and Conditions sections of the biological opinion. These requirements vary between biological opinions, but can include monitoring requirements, timing restrictions, limits on cumulative sound exposure level (cSEL) at a given distance, description of the area where the thresholds must not be exceeded, the allowable number of piles driven per day, the allowable number of pile strikes per day, or a limit on the single strike SEL.*

## **PILE INSTALLATION LOCATION *(This section will be project specific)***

Figure 2 indicates the location of the provide location of the structure(s) in need of pile driving. There will be a total of XX piles driven as part of the name structure(s).

**Figure 2. Location of name structure(s) where pile driving activity will take place. *This information must be in enough detail to allow the reader to assess the monitoring locations.***

## **PILE INSTALLATION**

### ***Impact Pile Driving for Fish Consultations***

*Provide pile installation information. For example:*

Hydroacoustic monitoring will be conducted for X piles struck with an impact hammer. Piles chosen to be monitored are driven in water depths that are representative of mid-channel or typical water depths at the project location where piles will be driven.

*The number of piles to be monitored will depend on a variety of factors – some projects may require that all piles be monitored, while others may require a representative sample of piles be monitored. If a sample of piles is to be monitored, provide the considerations taken and the rationale used in choosing a representative number of piles, such as, bathymetry, total number of piles to be driven, substrate type, depth of water, distance from shore, river, or stream bank, and any other considerations, as appropriate. When monitoring a subset, a minimum of 5 piles should be monitored. Additional monitoring to produce a representative sample may be warranted when projects are driving a large number of piles, driving multiple piles of varying diameters in differing substrates, driving different types of piles, or driving piles in widely differing depths.*

Hydroacoustic monitoring of type of pile with impact driving will include:

- Monitoring *X piles, out of a total of Y piles driven for the project.*
- Testing sound attenuation system effectiveness.

Figure 3 indicates the location of the piles to be monitored and the approximate hydrophone locations for each pile being monitored. All hydrophones will be placed at least 1 m (3.3 feet) below the surface. *If only one hydrophone at one distance is to be used it is acceptable for the hydrophone to be placed 10 meters from the pile at midwater depth. If hydrophones will be placed at more than one distance from the pile and used to calculate transmission loss over distance, water depth should be at least 4m (13 ft) and it is suggested that the additional hydrophone nearest the pile be placed at least 3H from the pile where H is the water depth at the pile and at 0.7 to 0.85H depth from the surface. In waters less than 4m (13 ft) deep, a single hydrophone at midwater depth is sufficient<sup>1</sup>.* Hydrophones will be located *X* meters from each pile with a clear acoustic line-of-sight between the pile and the hydrophone. *Additional distances measured concurrently are desirable, if possible, to estimate the site specific range to the threshold boundary. Include any additional distances or depths where hydrophones will be located. If airborne noise monitoring is required, the primary measurement microphone shall be placed 50 feet (e.g. 15 meters) from the pile at least 6 feet above the ground or water, and shall have an unobstructed view of the length of the pile.*

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<sup>1</sup> Some projects may need or require more than one hydrophone to collect real time measurements at multiple locations or multiple distances. In these situations multiple hydrophones can be placed at midwater depths.

Figure 3. Location of the piles that will be monitored on the name structure(s).

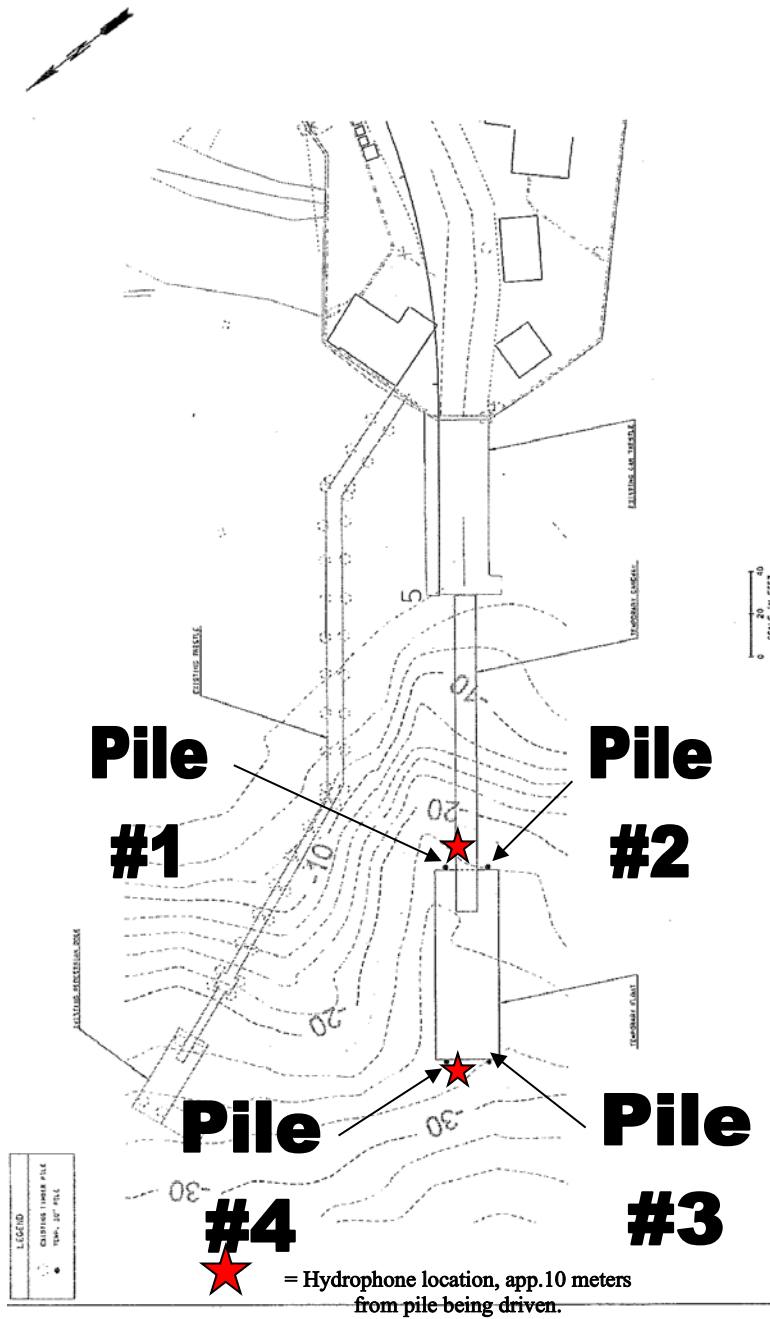


Table 1 lists the name structure(s) to be installed, the water depth, and the number and size of piles that will be installed.

**Table 1  
Depth, Number Piles to be Monitored**

Structure	Water Depth	Structural Components Installed
<u>Name structure</u>	<u>X feet to X feet</u>	<u>X - XX-inch diameter type of pile</u>

## CONTRACTOR REQUIREMENTS

The contractor will submit a detailed description of their qualifications, which must include a minimum of a bachelor’s degree in a related field<sup>2</sup> and 3 years’ experience in noise monitoring and analysis, and monitoring plan based on this template for approval by [INSERT AGENCY NAME]. A list of the contractors’ proposed sound level monitoring equipment shall be included along with specifications and a description of the purpose. The measurement range in terms of amplitude (in dB referenced to one micropascal (re: 1 uPa)), sensitivity and frequency shall be stated. A minimum frequency range of 20 Hz to 20 kHz and a minimum sampling rate of 48,000 Hz will be used when monitoring. Sampling rates higher than 48 kHz are preferred. Table 2 describes the minimum requirements of the equipment to be used. In addition to the equipment selection, quality control/quality assurance procedures should be described (e.g., how will system responses be verified and how will data be managed).

**Table 2.**

**Equipment for underwater sound monitoring (hydrophone, signal amplifier, and calibrator). All have current National Institute of Standards and Technology (NIST) traceable calibration. *This table is intended as a guideline and exact specifications can be adjusted to meet the needs of the individual project or contractors’ equipment.***

Item	Specifications	Minimum Quantity	Usage
<u>Hydrophone</u>	<u>Receiving Sensitivity- -211dB re 1V/μPa</u>	<u>1</u>	<u>Capture underwater sound pressures near the source and convert to voltages that can be recorded/analyzed by other equipment.</u>
<u>Hydrophone</u>	<u>Receiving Sensitivity – -200dB re 1/μPa</u>	<u>1</u>	<u>Capture underwater sound pressures for background levels and convert to voltages that can be recorded/analyzed by other equipment.</u>

<sup>2</sup> This can include Institute of Noise Control Engineering of the USA (INCE/USA) certification or related fields such as acoustics, physics, oceanography, geology or other physical sciences that have required coursework in physics.

<u>Signal Conditioning Amplifier</u>	<u>Amplifier Gain-</u> <u>0.1 mV/pC to 10 V/pC</u> <u>Transducer Sensitivity Range-</u> <u>10-12 to 103 C/MU</u>	<u>1</u>	<u>Adjust signals from hydrophone to levels compatible with recording equipment.</u>
<u>Calibrator (pistonphone-type)</u>	<u>Accuracy-</u> <u>IEC 942 (1988) Class 1</u>	<u>1</u>	<u>Calibration check of hydrophone in the field.</u>
<u>Digital Signal Analyzer</u>	<u>Sampling Rate-</u> <u>48kHz or greater</u>	<u>1</u>	<u>Analyzes and transfers digital data to laptop hard drive.</u>
<u>Microphone (free field type)</u>	<u>Range- 30 – 120 dBA</u> <u>Sensitivity-</u> <u>-29 dB ± 3 dB (0 dB = 1 V/Pa)</u> <u>Wind Screen</u>	<u>1</u>	<u>Monitoring airborne sounds from pile driving activities (if not raining).</u>
<u>If water velocity ~&gt; 1m/s, Flow shield</u>	<u>Open cell foam cover or functional equivalent</u>	<u>1/hydrophone</u>	<u>Eliminate flow noise contamination.</u>
<u>Laptop computer</u> <u>or</u> <u>Digital Audio Recorder</u>	<u>Compatible with digital signal analyzer</u>	<u>1</u>	<u>Record digital data on hard drive or digital tape.</u>
<u>Real Time and Post-analysis software</u>	<u>=</u>	<u>1</u>	<u>Monitor real-time signal and post-analysis of sound signals.</u>

To facilitate further analysis of data full bandwidth, time-series underwater signal shall be recorded as a text file (.txt) or wave file (.wav) or similar format. Recorded data shall not use data compression algorithms or technologies (e.g. MP3, compressed .wav, etc.).

## METHODOLOGY

### **Impact Pile Driving for Fish Consultations (and listed US FWS, diving sea bird, if relevant)**

*Underwater background sound level measurements are optional, however, if desired then the NMFS (2012a) guidance should be followed.*

*If one hydrophone at one distance is to be used it is acceptable for the hydrophone to be placed 10 meters from the pile and at midwater depth. If hydrophones will be placed at more than one distance from the pile it is suggested that the hydrophone nearest the pile be placed at least 3H from the pile where H is the water depth at the pile and 0.7 to 0.85H depth from the surface. The hydrophone(s) will be placed at X meters depth at a distance of X meters from each pile being monitored, in waters of X meters depth. If water velocity is 1 meter/second or greater, 1-3 meters off the bottom may be recommended for near field hydrophones and greater than 5 meters from the surface may be recommended for any far field hydrophones. A weighted tape measure will be used to determine the depth of the water. The hydrophone(s) will be attached to a nylon cord, a steel chain, or other proven anti-strum features if the current is swift enough to cause strumming of the line. The nylon cord or chain will be attached to an anchor that will keep the line the appropriate distance from each pile. The nylon cord or chain will be attached to a float or tied*

to a static line at the surface. The distances will be measured by a tape measure, where possible, or a range-finder. The acoustic path (line of sight) between the pile and the hydrophone(s) should be unobstructed in all cases.

*When collecting sound measurements in an area with currents (i.e., in rivers or tidally influenced areas), appropriate measures will be taken, when necessary, to ensure that the flow-induced noise at the hydrophone will not interfere with the recording and analysis of the relevant sounds (NMFS, 2012a). As a general rule, current speeds of 1.5 meters/second or greater are expected to generate significant flow-induced noise, which may interfere with the detection and analysis of low-level sounds such as the sounds from a distant pile driver or background sounds. If such measures are necessary, include a description of those measures. For example:*

*If it becomes necessary to reduce the flow-induced noise at the hydrophone, a flow shield will be described and installed around the hydrophone to provide a barrier between the irregular, turbulent flow and the hydrophone. If no flow shield is used in these situations, the current velocity will be measured and a correlation between the levels of the relevant sounds (background or pile driving) and current speed will be made to determine whether the data is valid and can be included in the analysis.*

The hydrophone calibration(s) will be checked at the beginning of each day of monitoring activity. *The method of calibration and calibration equipment used will be described.* NIST traceable calibration forms shall be provided for all relevant monitoring equipment. Prior to the initiation of pile driving, the hydrophone will be placed at the appropriate distance and depth as described above.

The onsite inspector/contractor will inform the acoustics specialist when pile driving is about to start to ensure that the monitoring equipment is operational. Underwater sound levels will be continuously monitored during the entire duration of each pile being driven with a minimum one-third octave band frequency resolution. The wideband instantaneous absolute peak pressure and Sound Exposure Level (SEL) values of each strike, and daily cumulative SEL should be monitored in real time during construction to ensure that the project does not exceed its authorized take level. Peak and rms pressures will be reported in dB (re: 1  $\mu$ Pa). SEL will be reported in dB (re: 1  $\mu$ Pa<sup>2</sup>·sec). Wideband time series recording is strongly recommended during all impact pile driving.

Prior to, and during, the pile driving activity, environmental data will be gathered, such as water depth and tidal level, wave height, and other factors that could contribute to influencing the underwater sound levels (e.g. aircraft, boats, etc.). Start and stop time of each pile driving event and the time at which the bubble curtain or functional equivalent<sup>3</sup> is turned on and off will be logged.

The contractor or agency will provide the following information, in writing, to the contractor conducting the hydroacoustic monitoring for inclusion in the final monitoring report: a description of the substrate composition, approximate depth of significant substrate layers, hammer model and size, pile cap or cushion type, hammer energy settings and any changes to those settings during the piles being monitored, depth pile driven, blows per foot for the piles monitored, and total number of strikes to drive each pile that is monitored.

## **Sound Attenuation Monitoring**

All monitored piles may be tested with the sound attenuation system on and off (or presence and absence) to test its effectiveness<sup>4</sup>. To account for varying resistance as the pile is driven; the sound attenuation device will be turned off

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<sup>3</sup> A functional equivalent must function as well as or better than the attenuation device that was proposed during consultation or required by the ESA consultation or applicable permits. It must achieve the same or better sound level reductions that were used in the calculations during ESA consultation or the permitting process.

<sup>4</sup> Note: There may be circumstances where the U.S. Fish and Wildlife Service determines that unattenuated pile driving (striking the pile with the bubble curtain turned off) would pose a significant risk of injury to species. In those situations, the Service may request that unattenuated pile driving does not occur and that hydroacoustic monitoring be conducted to determine the extent at which certain thresholds are met instead. This will need to be determined on a case by case basis for projects that may affect listed species.

for *(describe schedule for turning on and off)* periods during the beginning, the middle third, and near the end of the drive. After turning off the attenuation system, pile driving should not resume for at least 2 minutes to allow time for air bubbles to completely disperse. *For piles that require less than 5 minutes to drive, pile driving should occur for only two periods with the bubbles off, one near the beginning and once near the end of the drive.*

## SIGNAL PROCESSING

### ***Impact Pile Driving for Fish Consultations (and any US FWS listed, diving sea bird)***

Post-analysis of the underwater pile driving sounds will include:

- Number of pile strikes per pile and per day.
- For each recorded strike (or each strike from a subset), determine the following:
  - The peak pressure, defined as the maximum absolute value of the instantaneous pressure (overpressure or underpressure).
  - The root mean squared sound pressure across 90% of the strikes energy (RMS<sub>90%</sub>).
  - Sound exposure level, measured across 90% of the accumulated sound energy (SEL<sub>90%</sub>). Calculation methodology is provided in Appendix A.
- Maximum, mean, and range of the peak pressure, with, and if applicable, without attenuation.
- Maximum, mean, range, and Cumulative Distribution Function (CDF) of the RMS<sub>90%</sub>, both with and if applicable, without attenuation where the CDF is used to report the percentage of RMS<sub>90%</sub> values above the thresholds.
- Maximum, mean, and range of the SEL<sub>90%</sub>, both with and if applicable, without attenuation.
- Cumulative SEL (cSEL) across all of the pile strikes. If SEL was calculated for all strikes, cSEL is estimated as indicated in Appendix A. If SEL was calculated for a subset of strikes, cSEL is estimated as follows:  $cSEL = SEL_{mean} + 10 * \log(\text{total \# strikes})$ .
- Where surrogate piles are monitored to represent a larger project, an estimate of the cSEL during a typical day of construction driving must be reported by summing the SEL over the expected number of pile strikes in a typical day for the larger project:  $cSEL = SEL_{mean} + 10 * \log(\#\text{strikes})$ . The SEL<sub>mean</sub> used in this calculation must correspond with the actual sound attenuation measures that will be used during construction of the larger project.
- A frequency spectrum both with and, *if applicable*, without attenuation, between a minimum of 20 and 20 kHz for up to eight successive strikes with similar sound levels.

*If airborne noise monitoring is required, both A-weighted and unweighted measurements will be acquired. Broadband back-to-back RMS  $L_{max}$  (peak) and  $L_{eq}$  (average) 5-minute measurements will be made over the duration of pile driving.  $L_{max}$  measurements should be taken with a portable analyzer set for "fast" response (125 msec). For at least one full pile sequence of each pile size and substrate type, frequency spectrum measurements ( $L_{max}$  and  $L_{eq}$ ) using a minimum resolution of one-third octave bands shall be taken to show the spectral content of the impact pile. If measuring background sound levels in the absence of construction is not possible, then report the  $L_{95}$  statistic.*

## ANALYSIS

### ***Impact Pile Driving for Fish Consultations***

Analysis of the data from the San Francisco-Oakland Bay Bridge Pile Installation Demonstration project (PIDP) indicated that 90 percent of the acoustic energy for most pile driving impulses occurred over a 50 to 100 millisecond period with most of the energy concentrated in the first 30 to 50 milliseconds (Illingworth and Rodkin, 2001). The RMS values computed for this project will be computed over the duration between where 5% and 95% of the energy of the pulse occurs. The SEL energy plot will assist in interpretation of the single strike waveform. The single strike

SEL associated with the highest absolute peak strike along with the total number of strikes per pile and per day will be used to calculate the cumulative SEL for each pile and each 24-hour period.

In addition a waveform analysis of the individual absolute peak pile strikes will be performed to determine any changes to the waveform with the *name type of noise attenuation device*. A comparison of the frequency content with and without noise attenuation will be conducted. Units of underwater sound pressure levels will be dB (re:1  $\mu\text{Pa}$ ) and units of SEL will be re:1  $\mu\text{Pa}^2\cdot\text{sec}$ .

## REPORTING

*If sound attenuation devices are used during the monitoring, include the following text and analysis:*

An analysis of the change in the waveform and sound levels with and without the *name type of noise attenuation device for impact driving* operating will be conducted.

Preliminary results for the daily monitoring activities, if required, will be submitted/reported to the primary point of contact<sup>5</sup> at each of the Services within *X hours* after monitoring concludes for the day. In addition a final draft report including data collected and summarized from all monitoring locations will be submitted to the Services within 90 days of the completion of hydroacoustic monitoring. The results will be summarized in graphical form and include summary statistics and time histories of impact sound values for each pile. A final report will be prepared and submitted to the Services within 30 days following receipt of comments on the draft report from the Services. The report shall include:

1. Size and type of piles.
2. A detailed description of the *name type of noise attenuation device*, including design specifications (*if applicable*).
3. The impact hammer energy rating used to drive the piles, make and model of the hammer.
4. A description of the sound monitoring equipment.
5. The distance between hydrophone(s) or microphone(s) and pile.
6. The depth of the hydrophone(s) and depth of water at hydrophone locations.
7. The distance from the pile to the water's edge.
8. The depth of water in which the pile was driven.
9. The depth into the substrate that the pile was driven.
10. The physical characteristics of the bottom substrate into which the piles were driven.
11. The total number of strikes to drive each pile and for all piles driven during a 24-hour period.
12. The underwater wideband background sound pressure level reported as the 50% CDF (*if applicable*).
13. The results of the hydroacoustic monitoring, as described under Signal Processing. An example table is provided in Appendix C for reporting the results of the monitoring.
14. The distance at which peak, cSEL, and rms values exceed the respective threshold values.
15. A description of any observable fish, marine mammal, or bird behavior in the immediate area will and, if possible, correlation to underwater sound levels occurring at that time.
16. *If airborne noise monitoring is required, broadband A-weighted and unweighted maximum, minimum, and average Lmax and Leq levels shall be tabulated for every pile. For each pile size and substrate type*

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<sup>5</sup> The primary point of contact is the biologist that conducted the Section 7 consultation for the Service(s). In the event that the consulting biologist is not available, communication regarding monitoring results and reports should be addressed to the manager of the consultation branch or division with a reference to the consultation title.

*frequency spectra (one-third octave minimum frequency resolution) charts will be included to show the frequency content of Lmax and Leq signatures. The frequency content of airborne noise background levels shall also be shown. Background sound levels or L95 surrogate for background sound shall be reported.*

## REFERENCES

- Illingworth and Rodkin, Inc. 2001. Noise and Vibration Measurements Associated with the Pile Installation Demonstration Project for the San Francisco-Oakland Bay Bridge East Span, Final Data Report, Task Order 2, Contract No. 43A0063.
- NMFS, 2012a. Guidance Document: Data Collection Methods to Characterize Underwater Background Sound Relevant to Marine Mammals in Coastal Nearshore Waters and Rivers of Washington and Oregon. Memorandum: NMFS Northwest Fisheries Science Center – Conservation Biology Division and Northwest Regional Office – Protected Resources Division, January 31, 2012.
- NMFS, 2012b. Guidance Document: Data Collection Methods to Characterize Impact and Vibratory Pile Driving Source Levels Relevant to Marine Mammals. Memorandum: NMFS Northwest Fisheries Science Center – Conservation Biology Division and Northwest Regional Office – Protected Resources Division, January 31, 2012.
- NMFS, 2012c. Guidance Document: Sound Propagation Modeling to Characterize Pile Driving Sounds Relevant to Marine Mammals. Memorandum: NMFS Northwest Fisheries Science Center – Conservation Biology Division and Northwest Regional Office – Protected Resources Division, January 31, 2012.
- Southall, B.L., A.E. Bowles, W.T. Ellison, J.J. Finneran, R.L. Gentry, C.R. Greene, D. Kastak, D.R. Ketten, J.H. Miller, P.E. Nachtigall, W.J. Richardson, J.A. Thomas, and P.L. Tyack. 2007. Marine Mammal Noise Exposure Criteria: Initial Scientific Recommendations. *Aquatic Mammals* 33(4): 411-521.

## APPENDIX A

### *Calculation of Cumulative SEL*

An estimation of individual SEL values can be calculated for each pile strike by calculating the following integral, where T is T<sub>90</sub>, the period containing 90% of the cumulative energy of the pulse (eq. 1).

$$SEL = 10 \log \left( \int_0^T \frac{p^2(t)}{p_0^2} dt \right) \text{ dB} \quad (\text{eq. 1})$$

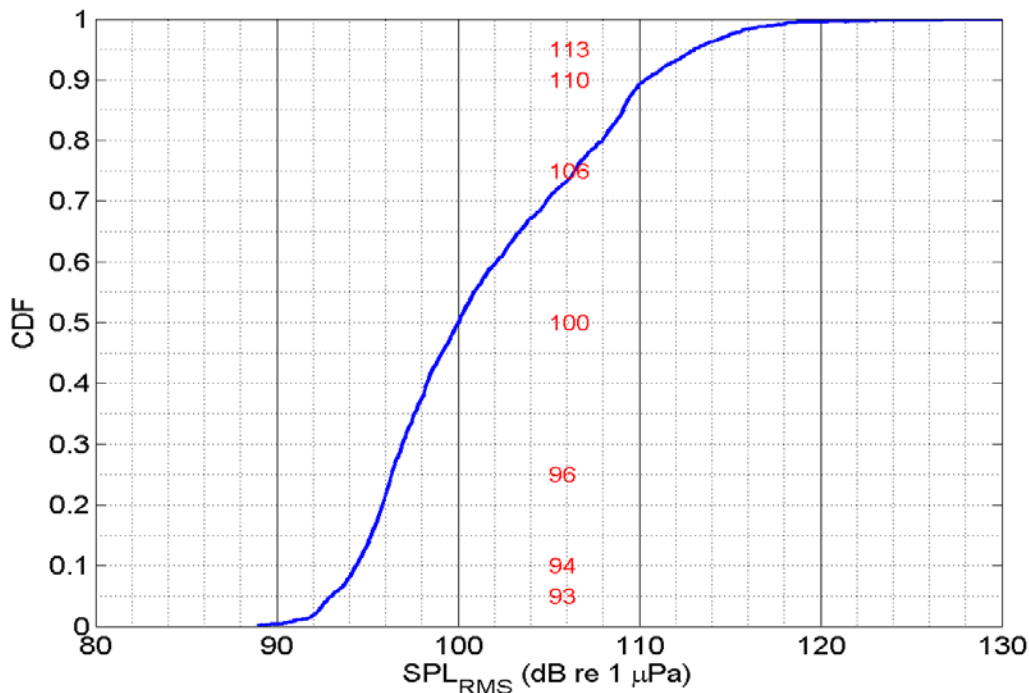
Calculating a cumulative SEL from individual SEL values cannot be accomplished simply by adding each SEL decibel level arithmetically. Because these values are logarithms they must first be converted to antilogs and then accumulated. Note, first, that if the single strike SEL is very close to a constant value (within 1 dB), then cumulative SEL = single strike SEL + 10 times log base 10 of the number of strikes N, i.e., 10Log<sub>10</sub>(N). However if the single strike SEL varies over the sequence of strikes, then a linear sum of the energies for all the different strikes needs to be computed. This is done as follows: divide each SEL decibel level by 10 and then take the antilog. This will convert the decibels to linear units (or uPa<sup>2</sup>•s). Next compute the sum of the linear units and convert this sum back into dB by taking 10Log<sub>10</sub> of the value. This will be the cumulative SEL for all of the pile strikes.

## APPENDIX B

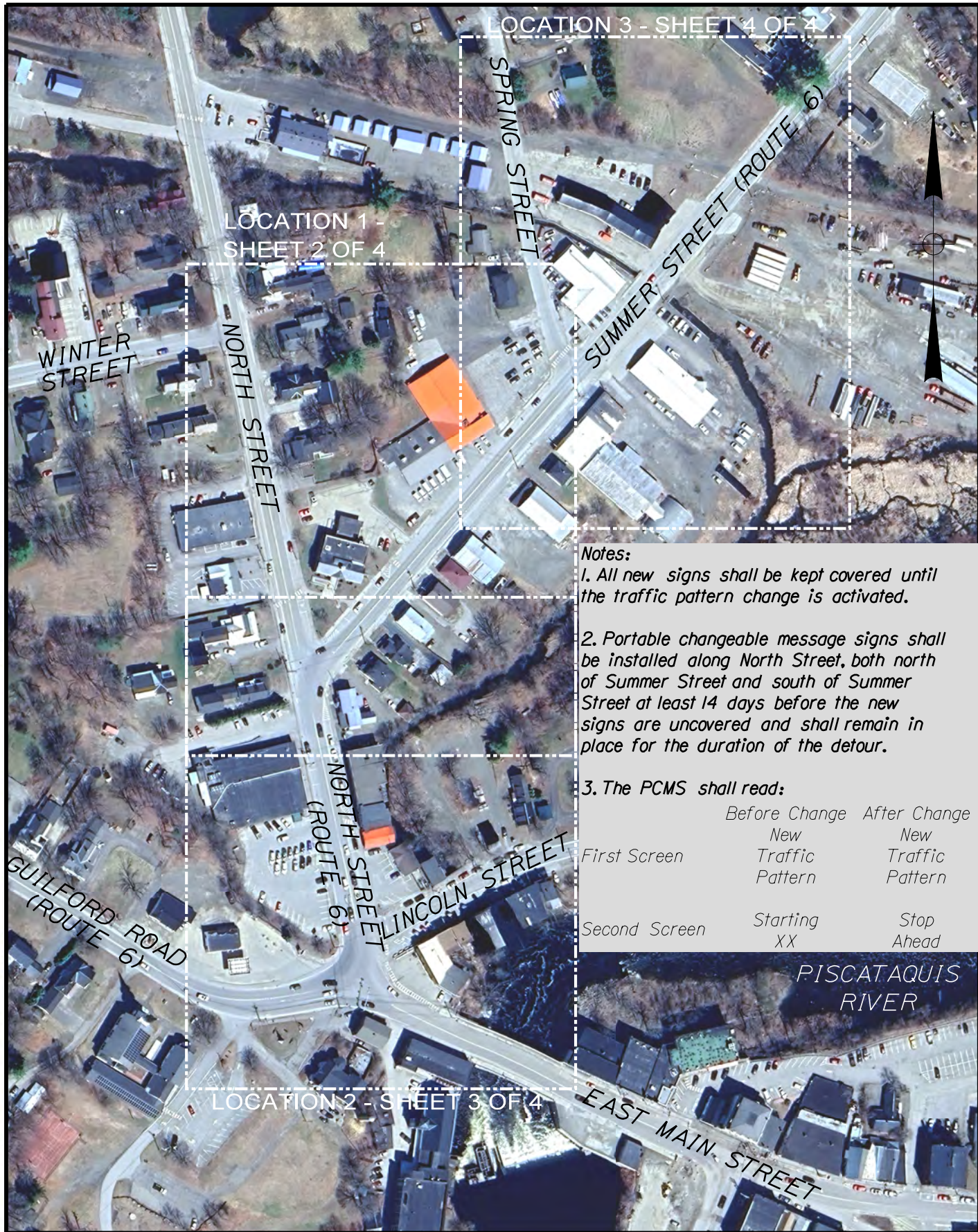
### ***Calculation of a Cumulative Distribution Function and Plot for Background Sound Level Analysis***

Data from three full 24-hour underwater measurement cycles (minimum) are used to calculate a 30-second Root Mean Square (RMS) value for each 30-second period for the entire dataset. The RMS should be calculated for both the full frequency range recorded as well as a separate dataset which has been passed through a high pass filter thus eliminating those frequencies below 1000 Hz. These datasets are then grouped into 24-hour periods. To determine if the data is approximately log-normal in distribution, each 24-hour period is plotted as a Probability Density Function (PDF). Each 24-hour period can be plotted on the same PDF plot. The plots should be approximately log normal in distribution and thus can be used in the further analysis. Each day of data should have an approximately Gaussian sigmoid shape, the differences between them and the ideal might be hard to spot, but the sigmoid from day to day will show noticeable variation. Data which does not approximate a log normal distribution should be excluded from further analysis.

The Cumulative Distribution Function (CDF) plot is obtained by plotting the normalized cumulative sum vs. the bin location. You can also get the PDF from plotting the normalized bin count vs. the bin location. The normalized bin count is obtained by dividing the count column by (number of data points multiplied by the space between 2 consecutive bins). This provides the integral of the PDF equal to 1. For instructions on creating a histogram in Microsoft Excel, see: <http://www.vertex42.com/ExcelArticles/mc/Histogram.html>







LOCATION 1 - SHEET 2 OF 4

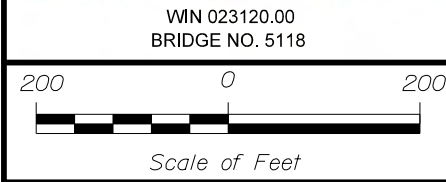
LOCATION 3 - SHEET 4 OF 4

LOCATION 2 - SHEET 3 OF 4

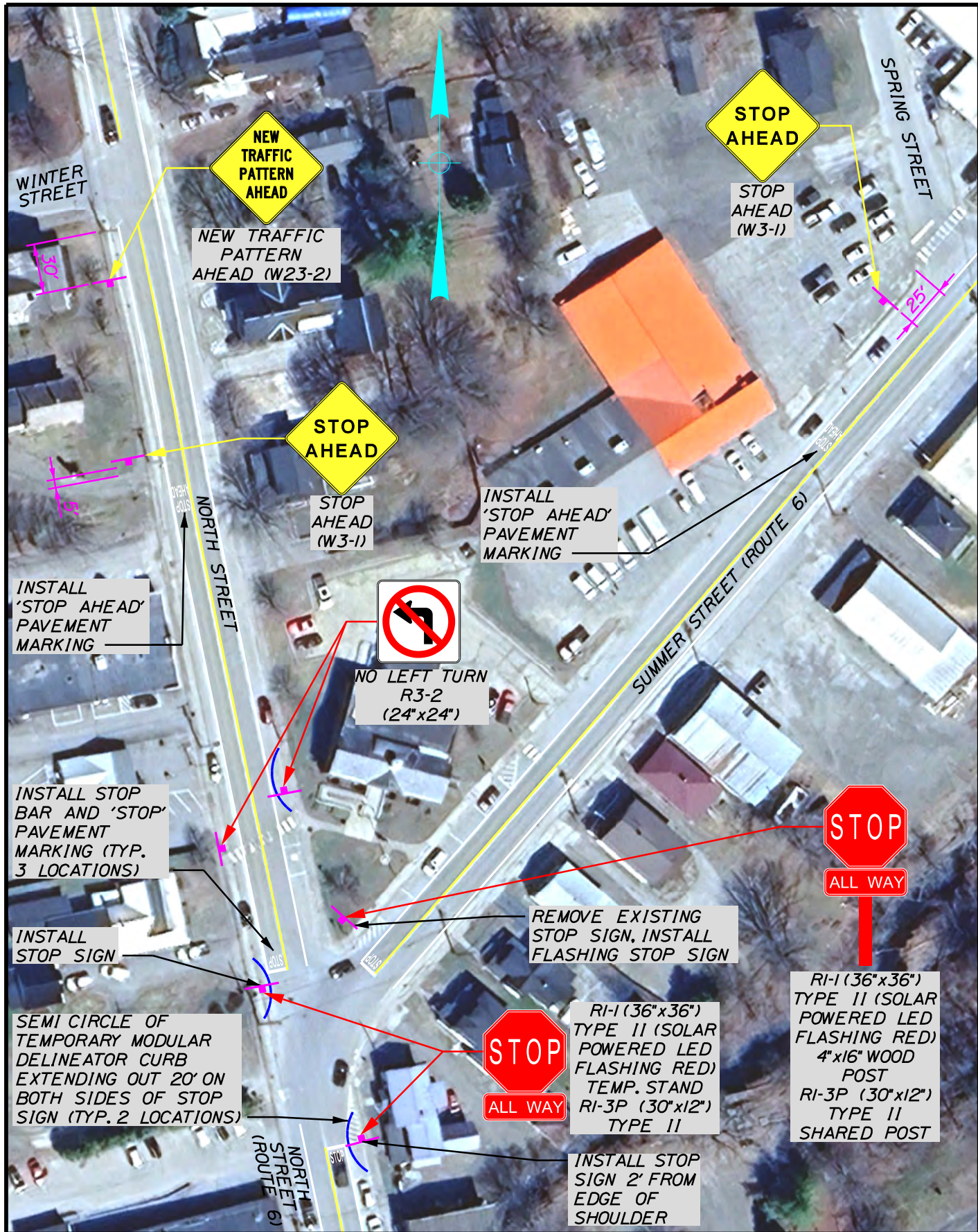
- Notes:**
1. All new signs shall be kept covered until the traffic pattern change is activated.
  2. Portable changeable message signs shall be installed along North Street, both north of Summer Street and south of Summer Street at least 14 days before the new signs are uncovered and shall remain in place for the duration of the detour.
  3. The PCMS shall read:

	Before Change	After Change
First Screen	New Traffic Pattern	New Traffic Pattern
Second Screen	Starting XX	Stop Ahead

PISCATAQUIS RIVER



**OVERALL DETOUR MAP  
DOVER BRIDGE, DOVER-FOXCROFT**



**NEW TRAFFIC PATTERN AHEAD**

NEW TRAFFIC PATTERN AHEAD (W23-2)

**STOP AHEAD**

STOP AHEAD (W3-1)

**STOP AHEAD**

STOP AHEAD (W3-1)

INSTALL 'STOP AHEAD' PAVEMENT MARKING

INSTALL 'STOP AHEAD' PAVEMENT MARKING



NO LEFT TURN R3-2 (24"x24")

INSTALL STOP BAR AND 'STOP' PAVEMENT MARKING (TYP. 3 LOCATIONS)

INSTALL STOP SIGN

SEMI CIRCLE OF TEMPORARY MODULAR DELINEATOR CURB EXTENDING OUT 20' ON BOTH SIDES OF STOP SIGN (TYP. 2 LOCATIONS)

REMOVE EXISTING STOP SIGN, INSTALL FLASHING STOP SIGN



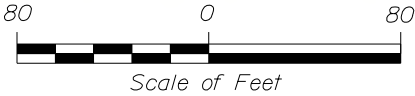
RI-1 (36"x36") TYPE II (SOLAR POWERED LED FLASHING RED) TEMP. STAND RI-3P (30"x12") TYPE II



RI-1 (36"x36") TYPE II (SOLAR POWERED LED FLASHING RED) 4"x16" WOOD POST RI-3P (30"x12") TYPE II SHARED POST

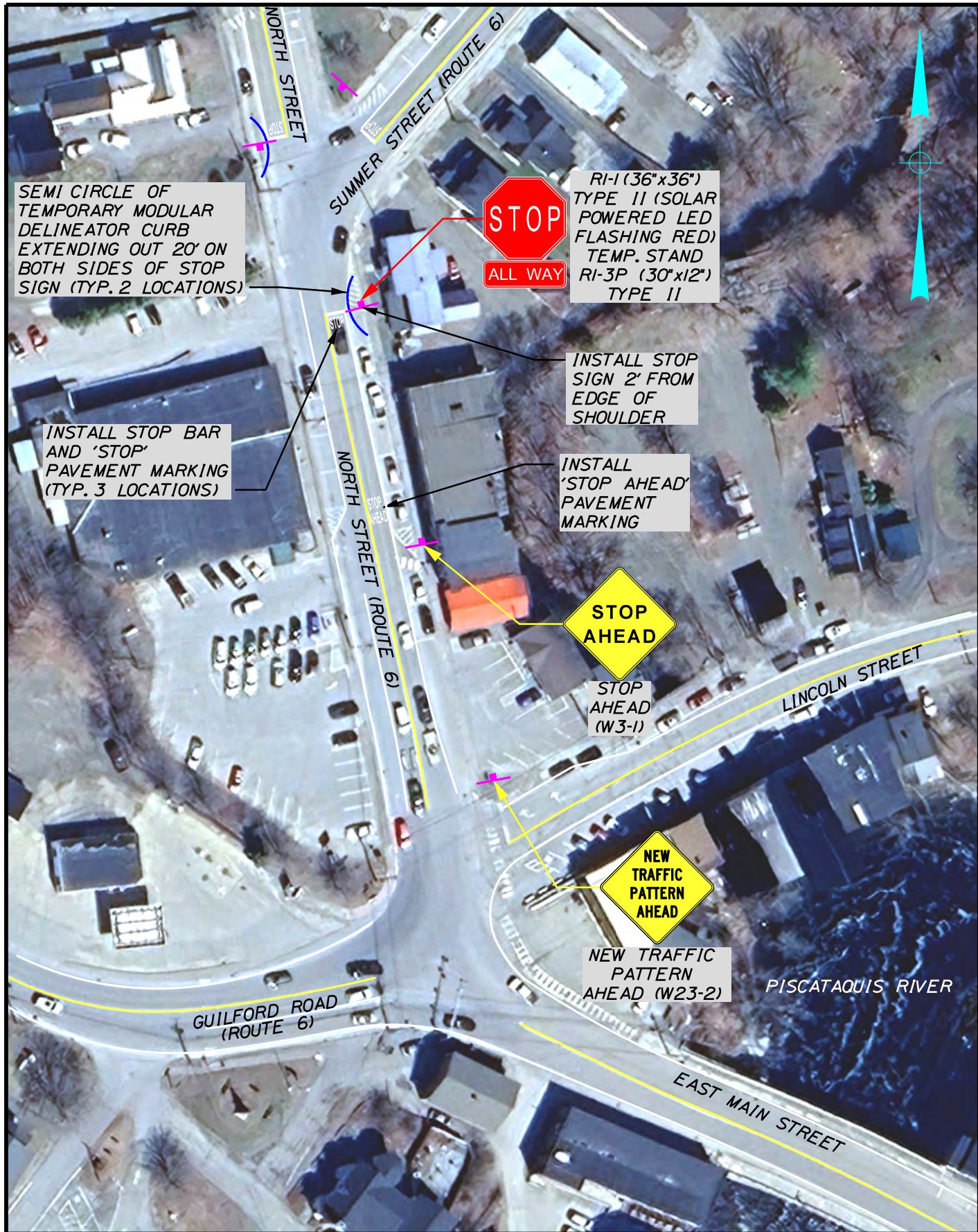
INSTALL STOP SIGN 2' FROM EDGE OF SHOULDER

WIN 023120.00  
BRIDGE NO. 5118



**LOCATION 1**  
**NORTH STREET**  
**NORTH OF SUMMER STREET**  
**DOVER BRIDGE, DOVER-FOXCROFT**

**2**



SEMI CIRCLE OF TEMPORARY MODULAR DELINEATOR CURB EXTENDING OUT 20' ON BOTH SIDES OF STOP SIGN (TYP. 2 LOCATIONS)



RI-1 (36"x36") TYPE II (SOLAR POWERED LED FLASHING RED) TEMP. STAND RI-3P (30"x12") TYPE II

INSTALL STOP SIGN 2' FROM EDGE OF SHOULDER

INSTALL STOP BAR AND 'STOP' PAVEMENT MARKING (TYP. 3 LOCATIONS)

INSTALL 'STOP AHEAD' PAVEMENT MARKING



STOP AHEAD (W3-1)



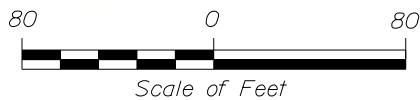
NEW TRAFFIC PATTERN AHEAD (W23-2)

WIN 023120.00  
BRIDGE NO. 5118  
80 0 80  
Scale of Feet

LOCATION 2  
NORTH STREET  
SOUTH OF SUMMER STREET  
DOVER BRIDGE, DOVER-FOXCROFT



WIN 023120.00  
BRIDGE NO. 5118



**LOCATION 3**  
**SUMMER STREET**  
**DOVER BRIDGE, DOVER-FOXCROFT**

SPECIAL PROVISION  
SECTION 105  
GENERAL SCOPE OF WORK  
(Traffic Control and Management)

Subsection 105.3 Traffic Control and Management shall be amended by the addition of the following:

Dover Bridge shall be closed to traffic during construction. Vehicular traffic shall be detoured on to Lincoln Street, Fairview Avenue, Summer Street/Route 6/16, North Street and East Main Street. Dover Bridge may be closed during construction as allowed per the Special Provision 107 – TIME (Scheduling of Work, Supplemental Liquidated Damages & Contract Completion Date).

Before the Dover Bridge is closed to traffic, the intersection of North Street and Summer Street shall be changed to an all-way stop. The existing stop sign at the end of Summer Street shall be removed. New stop signs, advanced stop warning signs, traffic pattern change ahead signs, pavement markings and temporary modular delineator curb shall be installed per the plans, special provisions and/or as directed by the Resident. The existing yellow flashing beacon shall be changed to a red flashing beacon.

Once the Dover Bridge is reopened to traffic, the North Street and Summer Street intersection shall be switched back to its original configuration. The red flashing beacon shall be changed back to a yellow flashing beacon. A new stop sign shall be installed at the end of Summer Street in its original location. The stop bars, pavement markings (stop and stop ahead) stop signs, advanced stop warning signs, temporary modular delineator curb and traffic pattern change ahead signs shall be removed from North Street. On Summer Street, the advanced stop warning sign and traffic pattern change ahead sign shall be removed.

The end of Vaughn Road from the driveway for the Essex Street Family Dental (station 301+10) to Essex Street shall be closed during construction. Vaughn Road traffic shall be detoured from Vaughn Road to E. Dover Road to Essex Street during construction.

Westbound traffic on Essex Street headed to Vaughn Road shall be detoured on to E. Maple Street. Westbound traffic on Vaughn Road headed to Essex Street shall be detoured on to Cedar Street. Local Traffic Only signs shall be placed at both ends of Elm Street.

The sidewalk on Dover Bridge will be closed during construction. Pedestrian traffic shall be detoured to the sidewalk on Lincoln Street.

Once Essex Street and/or Vaughn Road are reopened to traffic, at least one lane of traffic shall be maintained through the project area at all times, using temporary traffic signals or flaggers. Flaggers shall only be used for lane closures during daylight working hours. The minimum roadway width shall be 11 feet.

SPECIAL PROVISION  
SECTION 643  
TRAFFIC SIGNALS  
(Flashing Beacon Modification)

The provisions of Section 643 of the Standard Specifications shall apply with the following additions and modifications:

643.01 Description

The project includes the conversion of the existing yellow flashing intersection control beacon at the intersection of North and Summer Street to all led red lights and then back to all led yellow lights. This work needs to be coordinated with the installation of the temporary all-way stop signs to be installed at the North and Summer Street intersection.

643.02 General The flashing beacon may need to be shifted horizontally along the span wires/mast arms to meet current signal head to travel lane alignment requirements of the MUTCD.

643.11 Vertical Clearance

The contractor shall confirm that there is a minimum of 17 feet of clearance and adjust span and tether wires as required.

643.16 Final Cleaning Up

Old bulbs removed from the beacon shall be removed from the site by the Contractor and disposed of properly.

643.19 Basis of Payment

Flashing Beacon Modification will be paid for at the Contract lump sum price for each intersection. Payment will include full compensation for furnishing and installing all components needed to convert or replace the flashing beacon.

Payment will be made under the following:

<u>Pay Item</u>	<u>Pay Unit</u>
643.61 Flashing Beacon Modification	Lump Sum

**SPECIAL  
PROVISION  
SECTION 645  
HIGHWAY SIGNING**  
(Remove and Salvage Highway Signs)

Description

This work shall consist of removing the solar powered stop sign, advanced warning sign and Traffic Pattern Change ahead signs installed at the intersection of North Street and Summer Street and transporting them to a MaineDOT maintenance lot including any incidentals required in accordance with this special provision, plans and/or as directed by the Resident.

Storage and Transportation

The Contractor shall use care during removal of the stop sign and advanced warning sign. The stop sign and advanced warning shall be transported by the Contractor from the project site to the following location:

Maine Department of Transportation  
Guilford Maintenance Lot  
295 Water Street  
Guilford, Maine 04482

The Contractor shall contact the Resident and Cameron Smith, Maine DOT at (207) 592-1275 a minimum of 72 hours in advance of delivery of the signs.

Method of Measurement

Remove and Salvage Highway Signs will be measured for payment by the unit Each removed and salvaged.

Basis of Payment

Remove and Salvage Highway Signs will be paid for by the unit Each, which payment shall be full compensation for removing, transporting and delivering signs to the address noted above.

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
645.109	Remove and Salvage Highway Signs	Each

SPECIAL PROVISION  
SECTION 645  
HIGHWAY SIGNING  
(Solar Powered Flashing Sign)

Description

This work shall consist of furnishing and installing, new solar powered flashing signage (LED), sign and solar assembly support, solar panel, control circuit, battery and all appurtenances and incidentals required in accordance with this special provision, plans and/or as directed by the Resident.

Conformity with Standards

Unless otherwise provided in this special provision, all materials shall conform to the following standards, as applicable.

- A. MaineDOT Standard Specifications
- B. AASHTO
- C. Manual on Uniform Traffic Control Devices (MUTCD)
- D. American with Disabilities Act (ADA)

Material Quality

Materials and manufactured products shall be new unless otherwise specified, free from defect, and in conformity with the contract. If there is no applicable standard set forth in this contract for a particular component, then the component shall be in accordance with industry standards prevailing at the time of bid.

When material is fabricated or treated with another material or where any combination of materials is assembled to form a finished product, any or all of which are covered by specifications, the Department may reject the finished product if any of the components do not comply with the specifications. The Department may reject materials not conforming to the Specifications at any time.

Material Specifications

The flashing signs (LED) shall be of the sizes specified on the plans.

The flashing sign assembly shall be a solar-powered Tapco BlinkerSign® LED-enhanced sign assembly, or approved equal. The high-intensity LEDs shall be visible in all weather and ambient light conditions to increase the conspicuity of the sign. The control circuitry shall monitor ambient light levels throughout the day and night and automatically regulate the brightness of the LED array to provide optimum visibility. The LED-enhanced sign shall be fully compliant with the Federal Highway Administration (FHWA) Manual on Uniform Traffic Control Devices (MUTCD).

The sign assembly shall include the following items:

1. Sign

- a. All signs shall conform to 2023 MUTCD section 2A.21 requirements for retroreflectivity and illumination.
- b. The flashing sign face shall have eight LEDs spaced uniformly around the sign perimeter.
- c. The sign blanks shall be 0.08" gauge aluminum minimum.
- d. Sheeting used shall be high intensity prismatic sheeting and include anti-graffiti overlay protection.
- e. All sign assemblies shall use anti-vandal fasteners to mount components to signs and signs to supports.

2. LEDs

- a. Each sign assembly shall include eight high power 1 watt LEDs that provide a maximum light intensity of up to 550,000mcd (millicandelas) with a viewing angle of 15°.
- b. Each LED shall be sealed in a 7/8" diameter, heat dissipating plastic enclosure to provide resistance to weather and vibration.
- c. All LED enclosures shall be mounted in a 1" hole and ultrasonically welded to the sign assembly to provide maximum strength and rigidity.
- d. All LEDs shall be wired in strings to activate simultaneously per MUTCD standards and wired in a manner (parallel) that all LEDs continue to flash in the event of failure of an individual LED.
- e. All wire used shall conform to military specifications, MIL-W-16878D, Type D, vinyl nylon jacket.
- f. Wiring shall be encapsulated inside a 1" x 3/8" aluminum extrusion secured to the sign assembly, to provide weather resistance and protection.
- g. All LED connectors shall conform to Ingress Protection, IP-67 rating, dust proof, and be protected from temporary immersion in water up to 1 meter deep for 30 minutes. Connectors shall be Deutsch DTM series.

- h. LEDs shall be visible from 2 miles line of sight at night and just under 1 mile during daylight hours.

3. Solar Panel

- a. All solar panels shall be up to 13.5" x 15" in size and provide up to 13.5 watts peak total output sized for all climate and geographical locations.
- b. All panels shall be mounted to an aluminum plate and bracket at an angle of 45°- 60° to provide maximum output. Bracket shall be secured to a 2-3/8" aluminum tube. Panel must face south.
- c. All fasteners used shall be anti-vandal.
- d. Wire used shall conform to military specifications, MIL-W-16878D, Type D, vinyl nylon jacket.
- e. The solar panel assembly shall be mounted directly to the back of the sign assembly and be fully self-contained on a 2-3/8" O.D. round aluminum housing.
- f. All solar panel connectors shall conform to Ingress Protection, IP-67 rating, dust proof, and protected from temporary immersion in water up to 1 meter deep for 30 minutes. Connectors shall be Deutsch DTM series.

4. Control Circuit

- a. The control circuit shall have the capability of independently flashing dual outputs. The flashing output current and duty cycle shall be programmable.
- b. The flashing output shall be 50 to 60 flashes per minute with 100msec duration on time. The outputs shall reach the output current as programmed for the duration of the 100msec pulse.
- c. The output current shall be individually programmable for day and night time operation. The day and night time mode will automatically be determined by solar panel charge input and adjust to match ambient lighting conditions.
- d. The controller shall provide 6 levels of brightness control determined by ambient conditions.
- e. The controller will manage the battery charge and LED brightness levels in order to accommodate 17 days of continuous use without any charge.
- f. The control circuit shall be potted in a cylindrical epoxy resin housing to be waterproof and housed in a 2-3/8" aluminum tube.

- g. The control circuit shall operate between the temperatures of -40° to +176°F (-40° to +80°C).
  - h. All circuit connectors shall conform to Ingress Protection, IP-67 rating, dust proof, and be protected from temporary immersion in water up to 1 meter deep for 30 minutes. Connectors shall be Deutsch DTM series.
5. Battery
- a. Batteries shall be sealed gel cell type with nominal rated capacity of 100 amp-hours or greater. Batteries shall operate between the temperatures of -40° to +176°F (-40° to +80°C).
  - b. Battery enclosure shall be attached to the sign support pole with anti-vandal fasteners. Enclosure shall be lockable. It shall conform to Ingress Protection, IP-67 rating, dust proof, and be protected from temporary immersion in water up to 1 meter deep for 30 minutes.
6. Support Pole
- a. Signs shall be mounted with a height of 7 feet between ground elevation and the bottom of the lowest sign. The sign support shall be a 6"x6" pressure treated wood pole, unless otherwise noted on the project plans. Poles shall be embedded to a minimum depth of 48 inches.

Warranty

The Tapco BlinkerSign® LED-enhanced sign assembly, or approved equal, shall have a 3-year unconditional warranty against all defects in material and workmanship.

Method of Measurement

Solar powered flashing signs will be measured for payment by the unit Each furnished and installed.

Basis of Payment

Advance Solar Powered Flashing Warning Sign and 30 Inch Stop Sign – Solar Powered will be paid for by the unit Each, which payment shall be full compensation for furnishing and installing all materials including, but not limited to, the flashing sign, LEDs, solar power components and assembly, control circuit, battery, control box, wood support pole and all appurtenances and incidentals required for a complete and functioning sign package.

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
645.513	Advanced Solar Powered Flashing Warning Sign	Each
645.561	36" Stop Sign – Solar Powered	Each

**SPECIAL PROVISION**  
**SECTION 652**  
**MAINTENANCE OF TRAFFIC**  
**(Work Zone Traffic Control)**

Subsection 652.2.5 is amended by adding the following:

Portable-Changeable Message Signs shall be furnished by the contractor for installation and use at the following locations:

1. Dover-Foxcroft on North Street, located approximately 500 feet to 1000 feet south of intersection with Summer Street and north of Main Street
2. Dover – Foxcroft on North Street, located approximately 500 feet to 1000 feet north of intersection with Summer Street

The Portable- Changeable Message Signs shall be in place a minimum of 2 weeks and a maximum of 4 weeks before the Dover Bridge closure.

The exact location of any Portable-Changeable Message Signs shall be approved by the Resident.

The Contractor shall provide, operate and maintain the Portable-Changeable Message Signs. The Contractor shall remove, transport and maintain the signs as directed by the Resident. The Contractor will be responsible for the day to day programming and operation of the signs.

Subsection 652.3.4 is amended by adding the following:

Advanced warning approach signs

30” by 60” signs (black on orange) with the following wording shall be in place a minimum of 2 weeks before the start of the bridge closure and no sooner than 4 weeks before the start of the bridge closure at the locations listed below:

Dover-Foxcroft on East Main Street

Westbound – located between 500 feet to 1500 feet east of Essex Street

This sign shall read as follows before the bridge closure:

ESSEX STREET  
BRIDGE CLOSED  
MAY 2026 THRU OCTOBER 2027

Dover-Foxcroft on East Main Street

Eastbound – located between 500 feet to 1500 feet west of Essex Street

This sign shall read as follows before the bridge closure:

ESSEX STREET  
BRIDGE CLOSED  
MAY 2026 THRU OCTOBER 2027

Dover-Foxcroft on Essex Street

Southbound – located approximately 300 feet north of Lincoln Street

This sign shall read as follows before the bridge closure:

ESSEX STREET  
BRIDGE CLOSED  
MAY 2026 THRU OCTOBER 2027

Dover-Foxcroft on Vaughn Road

Westbound – located just west of intersection with Cedar Street

This sign shall read as follows before the bridge closure:

ESSEX STREET  
BRIDGE CLOSED  
MAY 2026 THRU OCTOBER 2027

Dover-Foxcroft on Lincoln Street

Eastbound – located between Davis Street and Union Street

This sign shall read as follows before the bridge closure:

ESSEX STREET  
BRIDGE CLOSED  
MAY 2026 THRU OCTOBER 2027

The above dates indicated shall be adjusted as needed for the actual bridge closure window.

Once the detour is in place and the bridge is closed to traffic, cover the dates with plaques stating “Use Detour”.

The exact location of these advanced warning signs shall be approved by the Resident.

SPECIAL PROVISION  
SECTION 652  
MAINTENANCE OF TRAFFIC  
(Temporary Modular Delineator Curb)

Description: This work shall consist of furnishing, installing, and maintaining temporary modular delineator curb system in accordance with the Manufacturer's recommendations in reasonably close conformity with the plans and specifications or as directed by the Resident.

Materials: Temporary modular delineator curb system shall be or approved equal:

<u>Manufacturer</u>	<u>Model</u>
Impact Recovery Systems	IRS Tuff Curb XLP
Pexco, LLC.	Flexi-Guide FG 300 Interstate Grade Curb System
Shur-Tite Products	SHUR-CURB Trffc Chnizr #SF0200

Impact Recovery Systems-IRS Tuff Curb XLP

Curb and end sections shall be colored yellow. Use MPD flex post channelizing markers that are 36 inches in height, yellow in color and with two 3" wraps of white (or silver) color ASTM Type V reflective tape.

Pexco, LLC. - Flexi-Guide FG 300 Interstate Grade Curb System

Delineator posts shall be model FG 300 EFX, 36 inches in height, orange in color and with two 3" wraps of white (or silver) color ASTM Type V reflective tape. Posts shall be spaced at 3 feet on center.

Curbs shall be Interstate Grade, orange in color and contain two recessed acrylic reflective lenses. Adhesive for anchoring curbs shall be approved by manufacturer for cold weather applications. Anchor bolts will not be allowed.

Shur-Tite Products-SHUR-CURB Trffc Chnizr #SF0200

Curb and end sections shall be colored yellow. Use vertical markers that are 36 inches in height, yellow in color and with two 3" wraps of white (or silver) color ASTM Type V reflective tape.

Dover-Foxcroft  
Dover Bridge #5118  
WIN 023120.00  
August 21, 2025

Construction Requirements: Temporary modular delineator curb systems shall be installed in accordance with manufacturer's specifications and Special Provision 652.

Method of Measurement: Temporary modular delineator curb systems will be measured per linear foot, complete in place and accepted.

Basis of Payment: The accepted quantity of Temporary Modular Delineator Curb systems will be paid for at the contract unit bid price per linear. Payment will be full compensation for all materials, labor, equipment, and incidentals necessary to furnish, install and maintain the flexible delineators and all associated hardware complete in place. Payment will also include full compensation for the removal of the delineators, bases and base adhesives to the Resident's satisfaction when the construction activity is complete.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
652.343 Temporary Modular Delineator Curb	LF

Date: 10/2/2025

Username: common

Division: BRIDGE

Filename: ... \002\_Estimated Quantities.dgn

ESTIMATED QUANTITIES			
ITEM NO.	DESCRIPTION	QUANTITY	UNIT
201.23	REMOVING SINGLE TREE TOP ONLY	12	EA
201.24	REMOVING STUMP	16	EA
201.28	PRUNING SINGLE TREE	5	EA
202.13	REMOVING EXISTING RAILINGS - RETAINED BY DEPARTMENT	60	LF
202.15	REMOVING EXISTING MANHOLE OR CATCH BASIN	7	EA
202.19	REMOVING EXISTING BRIDGE (1950 CY)	1	LS
202.202	REMOVING PAVEMENT SURFACE	400	SY
203.20	COMMON EXCAVATION	1200	CY
203.2318	DISPOSAL OF SPECIAL WASTE	360	T
203.25	GRANULAR BORROW	1340	CY
206.082	STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES	1200	CY
304.10	AGGREGATE SUBBASE COURSE - GRAVEL	1000	CY
304.103	AGGREGATE SUBBASE COURSE - GRAVEL, TRUCK MEASURE	30	CY
403.2081	HOT MIX ASPHALT, 12.5 MM NOMINAL MAXIMUM SIZE (POLYMER MODIFIED)	160	T
403.209	HOT MIX ASPHALT, 9.5 MM NOMINAL MAXIMUM SIZE (SIDEWALKS, DRIVES, ISLANDS & INCIDENTALS)	42	T
403.211	HOT MIX ASPHALT, 9.5 MM NOMINAL MAXIMUM SIZE (SHIMMING)	10	T
403.2131	HOT MIX ASPHALT, 12.5 MM NOMINAL MAXIMUM SIZE (BASE AND INTERMEDIATE BASE COURSE)(POLYMER MODIFIED)	210	T
409.15	BITUMINOUS TACK COAT, APPLIED	75	G
501.237	NOISE ATTENUATION AND UNDERWATER NOISE MONITORING	1	LS
501.50	STEEL H-BEAM PILES 89 LB/FT. DELIVERED	750	LF
501.502	ROCK-SOCKETED H-PILES 89 LB/FT. IN PLACE	750	LF
501.804	DRILLING EQUIPMENT MOBILIZATION, ROCK-SOCKETED H-PILE	1	LS
502.219	STRUCTURAL CONCRETE ABUTMENTS AND RETAINING WALLS (475 CY)	1	LS
502.22	STRUCTURAL CONCRETE ABUTMENTS AND RETAINING WALLS (PLACED UNDER WATER)	400	CY
502.239	STRUCTURAL CONCRETE PIERS (310 CY)	1	LS
502.24	STRUCTURAL CONCRETE PIERS (PLACED UNDER WATER)(215 CY)	215	CY
502.26	STRUCTURAL CONCRETE ROADWAY & SIDEWALK SLAB ON STEEL BRIDGES (320 CY)	1	LS
502.291	SAW CUT GROOVING (9188 SF)	1	LS
502.31	STRUCTURAL CONCRETE APPROACH SLABS (21 CY)	1	LS
502.49	STRUCTURAL CONCRETE CURBS AND SIDEWALKS (125 CY)	1	LS
502.77	FRP BRIDGE DRAIN - TYPE D	3	EA
502.77	FRP BRIDGE DRAIN - TYPE F	3	EA
503.12	REINFORCING STEEL, FABRICATED AND DELIVERED	53600	LB
503.13	REINFORCING STEEL, PLACING	53600	LB
503.19	LOW-CARBON CHROMIUM REINFORCEMENT, FABRICATED AND DELIVERED	22600	LB
503.20	LOW-CARBON CHROMIUM REINFORCEMENT, PLACING	22600	LB
504.702	STRUCTURAL STEEL FABRICATED AND DELIVERED, WELDED (465,000 LB)	1	LS
504.71	STRUCTURAL STEEL ERECTION (465,000 LB)	1	LS
505.08	SHEAR CONNECTORS (3110 EA)	1	LS
506.9104	THERMAL SPRAY COATING - SHOP APPLIED (465,000 LB)	1	LS
511.07	COFFERDAM (ABUTMENT NO. 1)	1	LS
511.07	COFFERDAM (ABUTMENT NO. 2)	1	LS
511.07	COFFERDAM (PIER)	1	LS
512.081	FRENCH DRAINS (190 LF)	1	LS
515.21	PROTECTIVE COATING FOR CONCRETE SURFACES (1400 SY)	1	LS
519.60	EXPANSION DEVICE - ASPHALTIC PLUG JOINT	55	LF
523.52	BEARING INSTALLATION	15	EA
523.5401	LAMINATED ELASTOMERIC BEARINGS, FIXED	5	EA
523.5402	LAMINATED ELASTOMERIC BEARINGS, EXPANSION	10	EA
524.30	TEMPORARY STRUCTURAL SUPPORT	1	EA
526.301	PORTABLE CONCRETE BARRIER, TYPE 1 (120 LF)	1	LS
526.323	TEXAS CLASSIC RAIL (554 LF)	1	LS
530.30	GFRP REINFORCEMENT BARS, FABRICATED & DELIVERED	65300	LF
530.31	GFRP REINFORCEMENT BARS, PLACED	65300	LF
603.159	12 INCH CULVERT PIPE OPTION III	44	LF
603.169	15 INCH CULVERT PIPE OPTION III	114	LF
603.179	18 INCH CULVERT PIPE OPTION III	46	LF
603.199	24 INCH CULVERT PIPE OPTION III	18	LF
603.76	12 INCH INLET GRATE UNIT	1	EA
604.072	CATCH BASIN TYPE A1-C	3	EA
604.092	CATCH BASIN TYPE B1-C	3	EA
604.245	CATCH BASIN TYPE F4-C	1	EA
604.252	CATCH BASIN TYPE A5-C	1	EA
605.09	6 INCH UNDERDRAIN TYPE B	275	LF
605.11	12 INCH UNDERDRAIN TYPE C	110	LF
606.1301	3"W-BEAM GUARDRAIL - MID-WAY SPLICE - SINGLE FACED	50	LF
606.1303	3"W-BEAM GUARDRAIL - MID-WAY SPLICE, 15' RADIUS AND LESS	25	LF
606.1304	3"W-BEAM GUARDRAIL - MID-WAY SPLICE, OVER 15' RADIUS	59	LF
606.1305	3"W-BEAM GUARDRAIL - MID-WAY SPLICE, FLARED TERMINAL	2	EA
606.1306	3"W-BEAM GUARDRAIL - MID-WAY SPLICE, TANGENT TERMINAL	1	EA
606.1307	BRIDGE TRANSITION (ASYMMETRICAL) - TYPE 1A	4	EA
606.259	ANCHORAGE ASSEMBLY	1	EA
606.353	REFLECTORIZED FLEXIBLE GUARDRAIL MARKER	8	EA
607.163	CHAIN LINK FENCE - 4 FOOT - PVC COATED	85	LF
607.24	REMOVE AND RESET FENCE	120	LF
608.08	REINFORCED CONCRETE SIDEWALK	5	SY
608.26	CURB RAMP DETECTABLE WARNING FIELD	57	SF
609.11	VERTICAL CURB TYPE 1	330	LF
609.12	VERTICAL CURB TYPE 1 - CIRCULAR	12	LF
609.221	TERMINAL CURB TYPE 1	44	LF
609.222	TERMINAL CURB TYPE 1 - CIRCULAR	37	LF
610.08	PLAIN RIPRAP	160	CY
610.18	STONE DITCH PROTECTION	5	CY
610.213	VOID-FILLED HEAVY RIPRAP	1100	CY
613.319	EROSION CONTROL BLANKET	150	SY

ESTIMATED QUANTITIES			
ITEM NO.	DESCRIPTION	QUANTITY	UNIT
615.07	LOAM	105	CY
618.13	SEEDING METHOD NUMBER 1	5	UN
618.14	SEEDING METHOD NUMBER 2	4	UN
619.12	MULCH	9	UN
619.14	EROSION CONTROL MIX	30	CY
620.58	EROSION CONTROL GEOTEXTILE	950	SY
626.11	PRECAST CONCRETE JUNCTION BOX	2	EA
626.21	METALLIC CONDUIT	285	LF
626.22	NON-METALLIC CONDUIT	265	LF
626.35	CONTROLLER CABINET FOUNDATION	1	EA
626.421	24-INCH DIAMETER FOUNDATION	21	LF
627.733	4" WHITE OR YELLOW PAINTED PAVEMENT MARKING LINE	2650	LF
627.75	WHITE OR YELLOW PAVEMENT & CURB MARKING	830	SF
627.77	REMOVING EXISTING PAVEMENT MARKINGS	500	SF
627.78	TEMPORARY 4" PAINTED PAVEMENT MARKING LINE, WHITE OR YELLOW	900	LF
629.05	HAND LABOR, STRAIGHT TIME	40	HR
631.12	ALL PURPOSE EXCAVATOR (INCLUDING OPERATOR)	8	HR
631.14	GRADER (INCLUDING OPERATOR)	100	HR
631.15	ROLLER, EARTH AND BASE (INCLUDING OPERATOR)	80	HR
631.172	TRUCK - LARGE (INCLUDING OPERATOR)	80	HR
631.18	CHAIN SAW RENTAL (INCLUDING OPERATOR)	4	HR
631.20	STUMP CHIPPER RENTAL (INCLUDING OPERATOR)	8	HR
631.21	ROAD BROOM (INCLUDING OPERATORS AND HAULER)	40	HR
631.22	FRONT END LOADER (INCLUDING OPERATOR)	8	HR
631.32	CULVERT CLEANER (INCLUDING OPERATORS)	4	HR
634.160	HIGHWAY LIGHTING	1	LS
634.210	CONVENTIONAL LIGHT STANDARD	6	EA
634.25	SERVICE POLE COMPLETE WITH CABINET AND CONTROLLER	1	EA
637.071	DUST CONTROL	1	LS
639.18	FIELD OFFICE, TYPE A	1	EA
643.61	FLASHING BEACON MODIFICATION	1	LS
643.62	RECTANGULAR RAPID FLASHING BEACONS	1	EA
645.109	REMOVE AND SALVAGE HIGHWAY SIGNS	10	EA
645.292	REGULATORY, WARNING, CONFIRMATION, AND ROUTE MARKER ASSEMBLY SIGNS TYPE II	100	SF
645.513	ADVANCED SOLAR POWERED FLASHING WARNING SIGN	3	EA
645.561	36" STOP SIGN - SOLAR POWERED	3	EA
652.312	TYPE III BARRICADES	8	EA
652.33	DRUM	100	EA
652.34	CONE	75	EA
652.343	TEMPORARY MODULAR DELINEATOR CURB	120	LF
652.35	CONSTRUCTION SIGNS	1400	SF
652.361	MAINTENANCE OF TRAFFIC CONTROL DEVICES	1	LS
652.38	FLAGGERS	600	HR
652.41	PORTABLE-CHANGEABLE MESSAGE SIGN	2	EA
656.75	TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL	1	LS
659.10	MOBILIZATION	1	LS
660.21	ON-THE-JOB TRAINING	1000	HR
801.03	TEST PITS	2	EA



STATE OF MAINE		DEPARTMENT OF TRANSPORTATION		2312000		WIN		023120.00		BRIDGE PLANS	
DOVER BRIDGE		PISCATAQUIS RIVER		DOVER-FOXCROFT PISCATAQUIS COUNTY		ESTIMATED QUANTITIES		ESTIMATED QUANTITIES		SHEET NUMBER	
PROJ. MANAGER	M. WIGHT	BY	D. BURGESS	DATE	8/22/25	CHECKED	E. BROWNELL	DATE	8/22/25	SIGNATURE	
DESIGN	P. POMEROY	DESIGNED	J. BURGESS	DATE	10/2/25	DESIGNED		DATE		P.E. NUMBER	
REVISIONS 1		REVISIONS 2		REVISIONS 3		REVISIONS 4		DATE		DATE	
ESTIMATED QUANTITIES											
2											
OF 64											

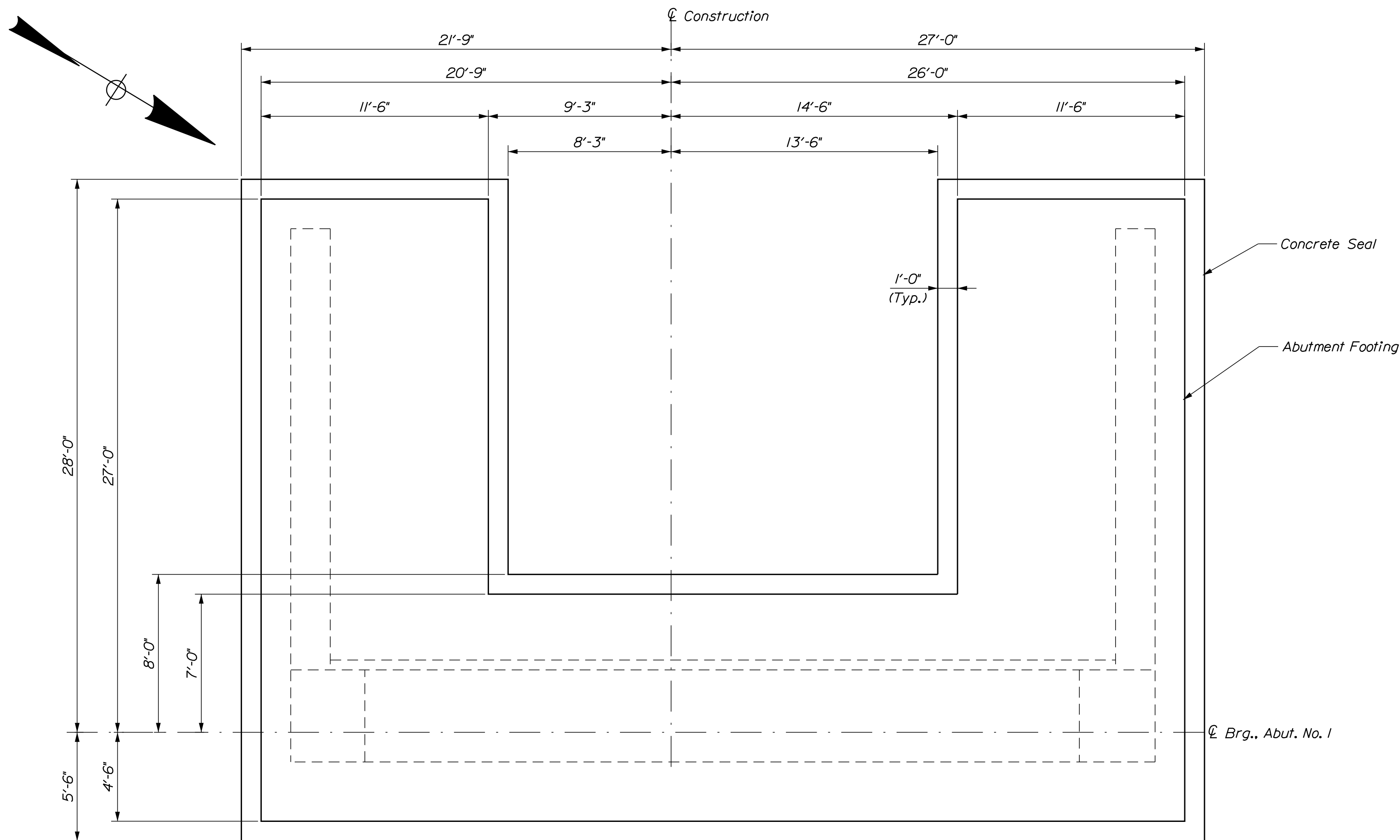
**Thornton Tomasetti**

Date: 9/18/2025

Username: common

Division: BRIDGE

Filename: ... \MST\A030\_Abut1\Fig\_01.dgn



ABUTMENT NO. 1 FOOTING AND SEAL - PLAN

SEAL NOTES

- When sheet piling is used for seal cofferdams, appropriate rolled corners shall be used, and the inside face of the sheet piling shall be at, or outside of, the seal concrete dimensions shown.
- The seal concrete placement dimensions shown represent the minimum seal size necessary to meet design requirements and are not based on the use of any particular sheet pile section.
- The horizontal pay limit for seal concrete will be to the dimensions shown on the plans. No additional payment will be made for concrete placed outside these limits.
- The depth of the seal is set for a water elevation of 333.7. If the water elevation at the time of construction is higher, the depth of the seal shall be adjusted.
- At the option of the Resident, bedrock which protrudes above a horizontal plane 12 inches below the proposed bottom of seal elevation may be removed. Payment for bedrock removal shall be made under Item No. 206.092 Structural Rock Excavation - Major Structures.
- Seal concrete shall be placed on bedrock cleaned of all weathered rock, loose fractured rock and soil. The bedrock subgrade shall be confirmed to be relatively level. Where the bedrock slope exceeds 4H:1V, the bedrock surface shall be benched to create level steps or made completely level. Cofferdam excavation and reporting shall be in accordance with Special Provision 511 - Cofferdams.
- The bedrock will vary in nature, slope, and degree of fracturing. Bedrock elevations shown are estimated based on boring information. Actual rock elevations may vary. After the foundation excavations are completed and all unsound bedrock removed, the Contractor shall survey the foundation bedrock and provide exact bedrock elevations to the Resident for review and approval by the Engineer.
- Each seal shall be cored full depth in at least four (4) locations to ensure that the seal is satisfactorily placed. The final core run shall sample the bedrock interface and a minimum of one (1) foot of bedrock. Seal core locations will be approved by the Department. Seal concrete cores will be a minimum of three (3) inch outer diameter and stored in boxes and labeled. In the event that voids or other defects are indicated, the Contractor shall correct the defects in a manner approved by the Department. For each core that reveals a defect, two (2) additional cores shall be taken in approximately the same area in locations approved by the Department. All core holes shall be filled using non-shrink grout selected from the MaineDOT Qualified Products List of Grout Materials. The cost of coring and repairs will be considered incidental to related pay items.

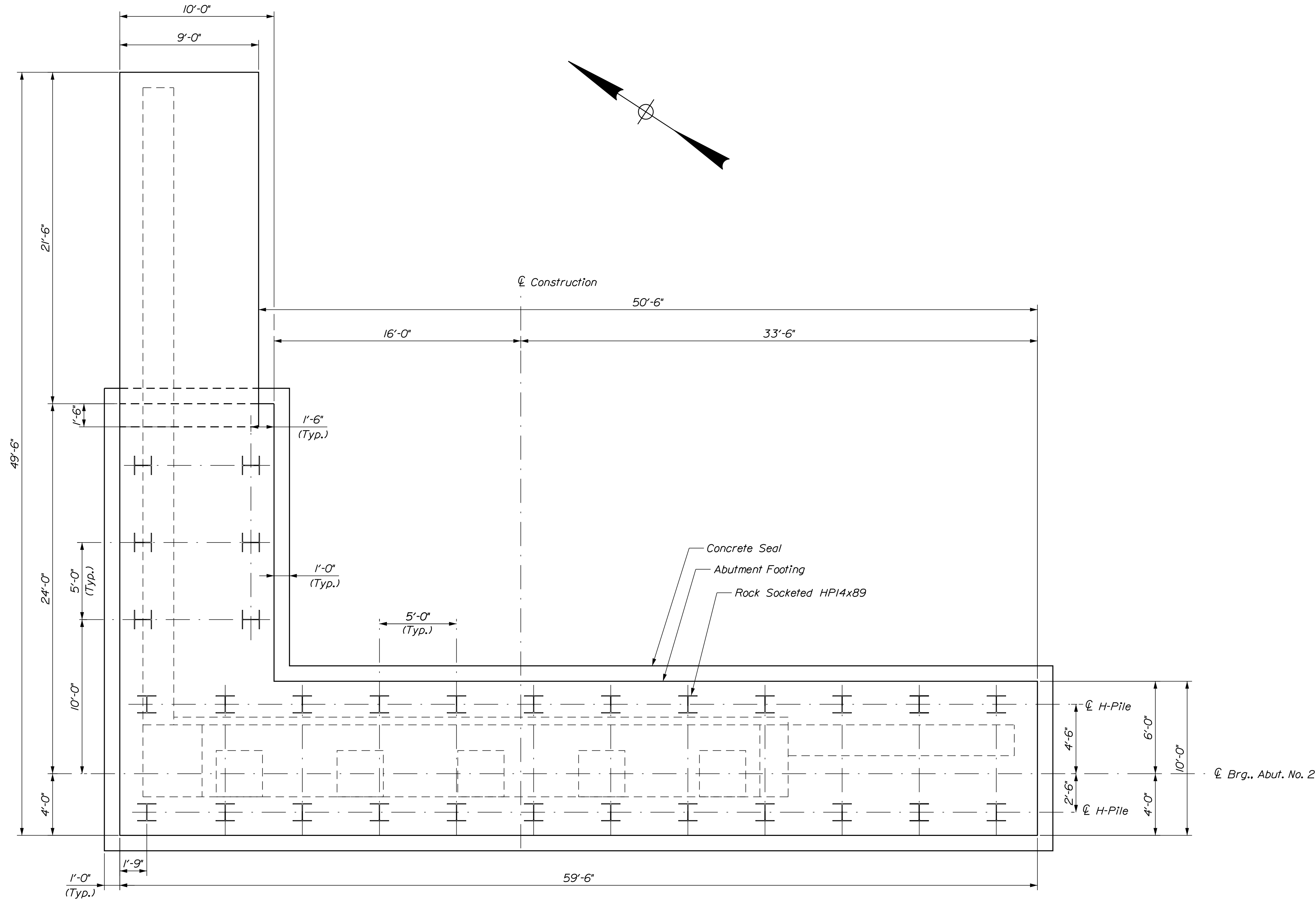
ABUTMENT NOTES

- The maximum factored applied footing pressure is 12 ksf at Abutment No. 1 at the Strength Limit State.
- Structural Earth Excavation, Abutments and Retaining Walls, required more than 12 inches below the bottom of the structure will be paid for in accordance with Standard Specifications Section 206, Structural Excavation.
- Reinforcing steel shall have a minimum concrete cover of 2 inches in the walls and 3 inches in the footings unless otherwise noted.
- Place drains with a 4-inch diameter in the breastwall and wingwalls at 10 feet maximum spacing. The exact location will be determined by the Resident.
- Cover joints where waterstops are not required in accordance with Standard Details Section 502.
- Construct French Drains behind the abutments and wingwalls in accordance with Standard Specifications Section 512, French Drains.
- Abutments, wingwalls, and their footings shall be backfilled with Granular Borrow. Pay limits will be the structural excavation limits in cut areas and a vertical plane located 10 feet behind the walls in fill areas.
- When bedrock protrudes above the bottom of footing, the footing may be raised and the vertical reinforcing may be cut in the field with the approval of the Resident. The minimum footing elevations are shown on the Plans and shall not be lowered without prior approval of the Engineer of Record. Payment for adjusting the footing elevations and reinforcing steel will be considered incidental to the related Contract Items. No separate payment will be made.
- Abutment concrete shall be placed on bedrock cleaned of all weathered rock, loose fractured rock and soil. The bedrock subgrade shall be confirmed to be relatively level. Where the bedrock slope exceeds 4H:1V, the bedrock surface shall be benched to create level steps or made completely level. The Resident shall approve the bedrock subgrade prior to the placement of the abutment concrete.
- Prior to placing abutment concrete, the bedrock subgrade shall be washed with high-pressure water and air.



STATE OF MAINE		DEPARTMENT OF TRANSPORTATION		2312000		WIN 023120.00		BRIDGE PLANS	
DOVER BRIDGE		PISCATAQUIS RIVER		DOVER-FOXCROFT PISCATAQUIS COUNTY		ABUTMENT NO. 1		FOOTING AND SEAL PLAN	
PROJ. MANAGER	CHECKED	DESIGNED	DATE	BY	DATE	SIGNATURE	P.E. NUMBER	DATE	5118
DESIGN-DETAILED	P. POMEROY	D. BURGESS	8/22/25	D. BURGESS	8/22/25				
CHECKED-REVIEWED	E. BROWNELL	J. BURGESS							
DESIGN-DETAILED									
DESIGN-DETAILED									
REVISIONS 1	SEAL NOTES		9/24/25						
REVISIONS 2									
REVISIONS 3									
REVISIONS 4									
FIELD CHANGES									
SHEET NUMBER									
30									
OF 64									

**Thornton Tomasetti**



ABUTMENT NO. 2 FOOTING - PLAN

**PILE NOTES**

- The maximum factored pile load is 245 kips at the Strength Limit State.
- Estimate of piles required:  
Abutment No. 2: 30 ~ HPI4x89
- Bedrock at the site is variable. Pile lengths are estimated to vary between 15 feet and 30 feet.
- H-pile material shall be ASTM A572, Grade 50.
- Piles shall be placed in accordance with Special Provision Section 501 (Rock Socketed H-Pile Foundation) of the Contract Documents.
- Piles shall not be out of position shown by more than 2 inches in any direction.

**RETAINING WALL NOTES**

- Prior to construction of the upstream wingwall at Abutment No. 2, the subgrade shall be compacted with at least four passes of a smooth wheel vibratory compactor that weighs at least 10,000 pounds. In confined areas, compact with a vibratory plate compactor that weighs at least 200 pounds and imparts an impact load of at least 2.5 tons.
- Where exposed footing subgrades are at or near the groundwater surface, static compaction may be recommended by the Geotechnical Engineer in lieu of vibratory compaction.
- Loose or soft zones of existing fill at subgrade level should be over-excavated and replaced with compacted granular borrow.
- If fill is placed below the groundwater level, the fill should be crushed stone wrapped in a non-woven geotextile. The non-woven geotextile shall meet the requirements for subgrade separation per Standard Specification Section 722.04 and shall have a minimum lap of 2 feet. Payment for this non-woven geotextile shall be considered incidental to related Contract Items.



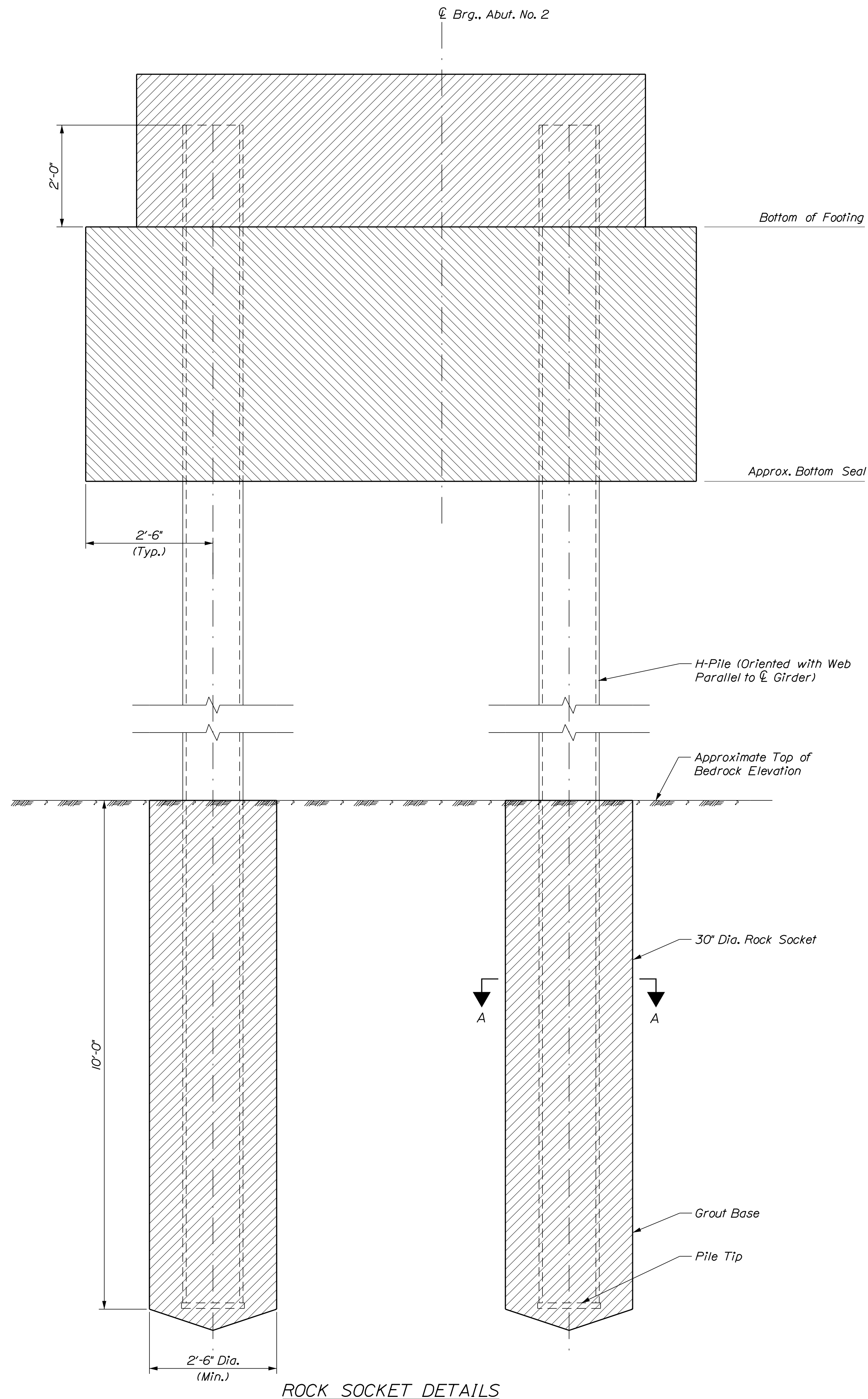
STATE OF MAINE	DEPARTMENT OF TRANSPORTATION	2312000	WIN	023120.00	BRIDGE PLANS
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PROJ. MANAGER	M. WIGHT	BY	DATE
DESIGN-DETAILED	P. POMEROY	D. BURGESS	8/22/25
CHECKED-REVIEWED	E. BROWNELL	J. BURGESS	8/22/25
DESIGN-DETAILED	RETAINING WALL NOTES	P.E. NUMBER	DATE
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

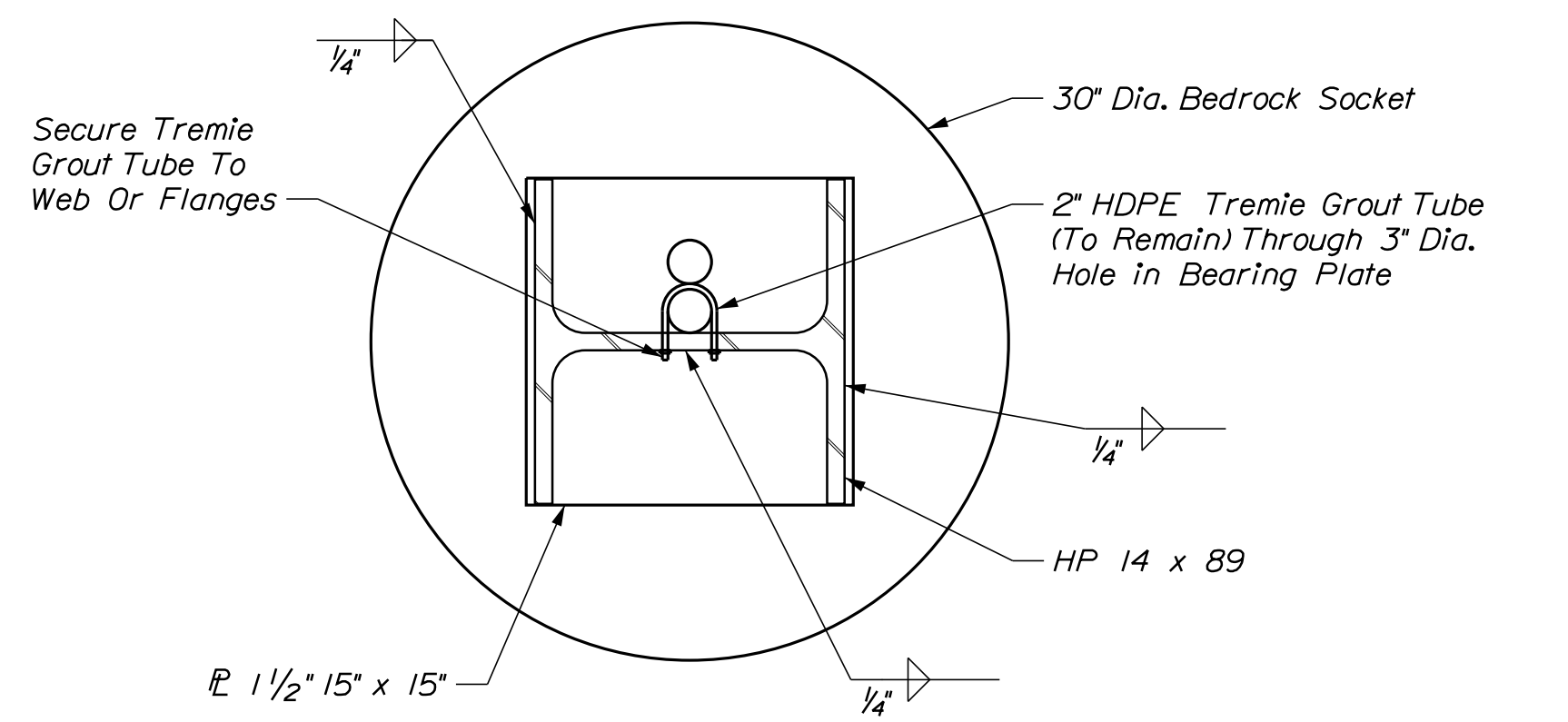
DOVER BRIDGE	DOVER-FOXcroft	PISCATAQUIS COUNTY
PISCATAQUIS RIVER		
ABUTMENT NO. 2 FOOTING		
PLAN AND PILE LAYOUT		

SHEET NUMBER	34
OF 64	

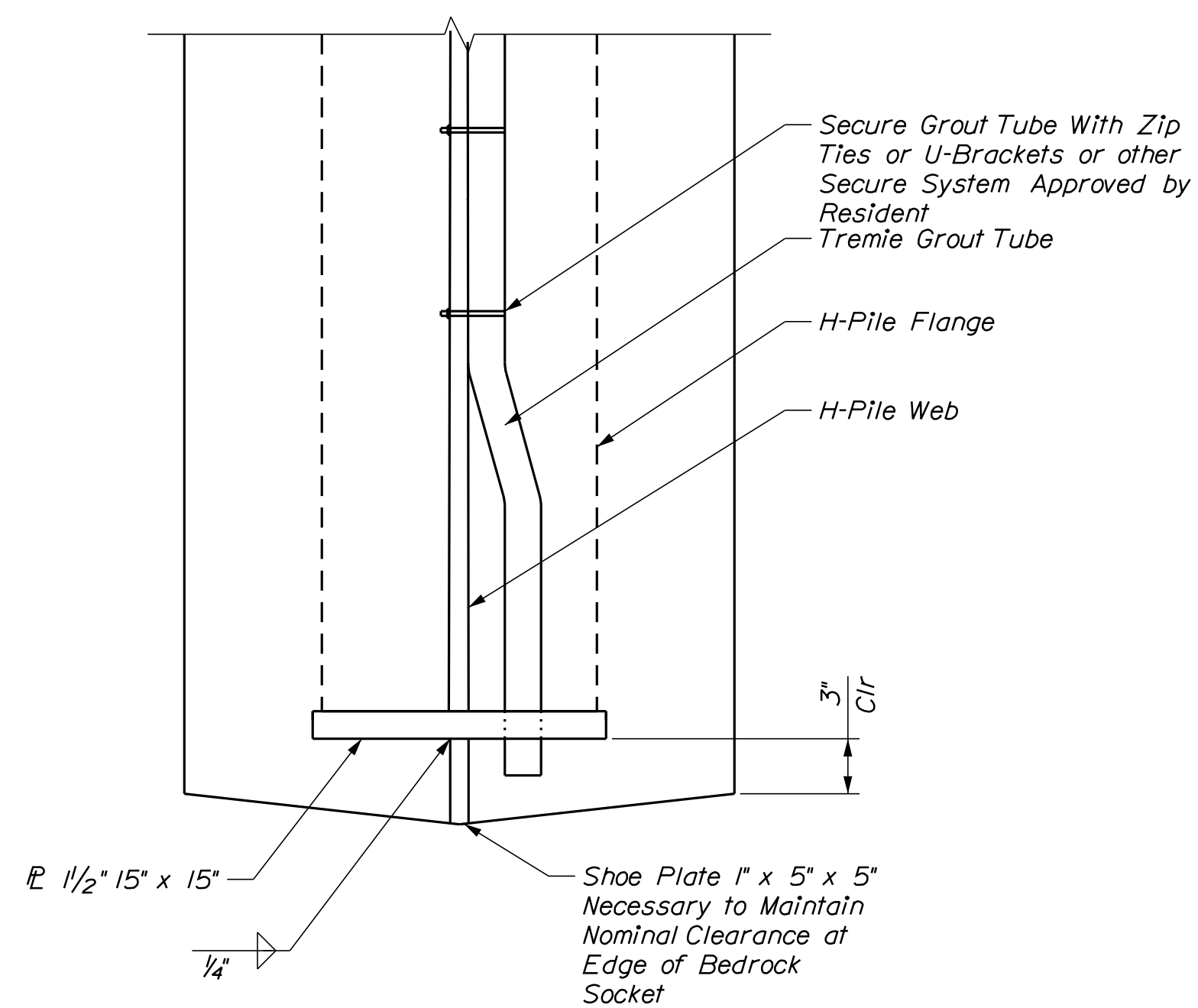




ROCK SOCKET DETAILS



SECTION A-A  
(Shown prior to grouting)



DETAIL A  
(Shown prior to grouting)

BOTTOM OF SEAL ELEVATION (FT.)					
Abutment No. 2	Bottom of Abutment Elevation (ft)	Approximate Top of Bedrock Elevation (ft)	Estimated Top of Grout Elevation (ft)	Estimated Bottom of Pile Elevation (ft)	Estimated Pile Length (ft)
Left	325	309	309	299	30
Right	325	323	323	313	15

**PILE NOTES**

1. Approximate top of bedrock elevations are based on widely spaced explorations. Actual bedrock elevations may vary.
2. Top of Bedrock is defined as the elevation at which the full diameter of the rock excavation equipment is beneath the bedrock surface, as determined by the Resident.
3. Estimated pile lengths are based on approximate bedrock elevation. Required pile lengths may vary, depending on actual bedrock elevation.

4. Bedrock elevations shall be probed with a drill rig at the pile locations prior to installation of production piles. A total of eight (8) probes shall be taken at alternating pile lines along the abutment and upstream wingwall. If bedrock is encountered deeper than EI. 307, the Contractor shall notify the Engineer for direction prior to proceeding with pile installation. Prior to conducting probes, the Contractor shall submit the proposed probing equipment and locations to the Geotechnical Engineer for review. The cost for probes will be considered incidental to related Pay Items.



**Thornton Tomasetti**

PROJ. MANAGER	BY	DATE
DESIGN-DETAILED: P. POMEROY	D. BURGESS	8/22/25
CHECKED-REVIEWED: E. BROWNELL	J. BURGESS	8/22/25
DESIGN-DETAILED:		
REVISIONS 1	FILE NOTES	9/24/25
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

DOVER BRIDGE  
PISCATAQUIS RIVER  
DOVER-FOXCROFT PISCATAQUIS COUNTY  
ABUTMENT NO. 2  
ROCK SOCKET DETAILS

SHEET NUMBER

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OF 64